AGENDA:

1. Minutes of the 8 May 2013 Meeting

2. Communications to Graduate Council

3. Announcements/Remarks – Interim Dean of the Graduate School, Chair of Graduate Council

4. Reports of Standing Committees of Graduate Council

   a) Committee on Committees and Procedures – Ken Davis, Chair
      Items for discussion/vote:
      1) Nominations for 2013–2014 Graduate Council Standing Committees – Appendix A
      2) Proposed clarification to language in Graduate Council Standing Rules – Appendix B1 [Graduate Council Bylaws are attached as Appendix B2 for reference only; no revisions are proposed in the Bylaws at this time.]

      Informational item:
      3) List of Graduate Council membership for 2013–2014 – Appendix C

   b) Committee on Programs and Courses – Christina Grozinger, Chair
      Items for discussion/vote (Appendices D–K):
      1) Program Change: Health Administration—change in the requirements for the Master of Health Administration (M.H.A.) degree (Penn State Harrisburg) – Appendix D
      2) Program Change: Change in degree requirements for the Master of Professional Studies (M.P.S.) in the graduate program in Information Sciences and change in the requirements for and the name of the option in Information Assurance and Decision Support to Cybersecurity and Information Assurance (College of Information Sciences and Technology) – Appendix E
      3) New Program: BioRenewable Systems, offering the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees (College of Agricultural Sciences) – Appendix F
      4) New Program: Organization Development and Change, offering the Master of Professional Studies (M.P.S.) (College of Education) – Appendix G
      5) New Program: Dual-title graduate degree program in Clinical and Translational Sciences, offering the Doctor of Philosophy (Ph.D.) degree (intercollege graduate degree program academically housed in the College of Medicine) – Appendix H
      6) Program Change: Nutritional Sciences adoption of the proposed dual-title graduate degree program in Clinical and Translational Sciences for the Ph.D. (College of Health and Human Development) – Appendix I
      7) Program Change: Biomedical Sciences adoption of the proposed dual-title
graduated degree program in Clinical and Translational Sciences for the Ph.D. (College of Medicine) – Appendix J

Informational item (Appendix K):
8) Program Change: Addition of off-site delivery (in Lancaster, PA) of the Master of Business Administration (M.B.A.) degree program in Business Administration (Penn State Harrisburg) – Appendix K

c) Committee on Academic Standards – Jon Nussbaum, Chair
Item for discussion/vote (Appendix L, with supporting materials Appendices L1–L4):
1) Proposed revisions to Graduate Council policies related to extended and off-campus graduate degree programs and graduate courses – Appendix L

d) Committee on Fellowships and Awards – Robert Edwards, Chair

e) Committee on Graduate Research – David Spencer, Chair

f) Committee on Graduate Student and Faculty Issues – Lori Francis, Chair

5. Reports of Special Committees

a) Graduate School’s Graduate Exhibition Subcommittee – Libby Tisdell, Graduate Council liaison on the Subcommittee

6. Special Reports

a) Graduate Student Association

7. Unfinished Business

8. New Business

9. Comments and Recommendations for the Good of the Graduate Community

Coffee - 3:10 PM; Business - 3:30 PM
GRADUATE COUNCIL

Graduate Council met on Wednesday, May 8, 2013, at 3:30 p.m. in 102 Kern Graduate Building. Dr. Henry Foley, Vice President for Research and Dean of the Graduate School, chaired the meeting. One correction was made to the minutes of the meeting of April 17, 2013: in the Committee on Fellowships and Awards report, second sentence, “accepted” should replace “reviewed.” The minutes of the meeting of April 17, 2013, were approved pending execution of this revision.

COMMUNICATIONS TO GRADUATE COUNCIL

None

ANNOUNCEMENTS BY THE CHAIR/REMARKS OF THE VICE PRESIDENT FOR RESEARCH AND DEAN OF THE GRADUATE SCHOOL

Dean Foley introduced guests from the Research IT Planning Committee: Dr. Robert D. Hume, Evan Pugh Professor of English Literature; Dr. Vivek Kapur, Professor of Veterinary and Biomedical Science and Associate Director of the Huck Institute of the Life Sciences; and Dr. D. Scott Bennett, Distinguished Professor and Head, Political Science.

Dr. Hume presented a summary of the report from the Research IT Strategic Plan Committee. Highlights from the presentation follow:

- The Committee found serious problems: research computing at Penn State is suffering from lack of coordination, severe central underfunding, and near total absence of faculty input in decision making. This situation is contributing to a decline in the research computing capability vs. peer institutions.

- The Committee strongly recommends a radically revamped administrative structure that would bring Penn State into line with “Best Practice” as found in most comparable institutions. “Research Computing” (which is highly individualized and a la carte) needs to be decoupled from “Enterprise Computing” (which needs a high degree of conformity). The committee recommends moving Research Computing and Cyberinfrastructure (RCC) computing and other research components from IT to the office of the Vice President for Research, to be overseen by a faculty “chief” and a broadly-based faculty advisory committee.

- The underlying principle is that the faculty should have a strong voice in research computing decisions and administration. The Committee’s recommendations have been endorsed by the Evan Pugh Professors, the Research Institute Directors, and the University Research Council, who voted on a formal resolution: “The changes proposed
by the Research IT Committee for Strategic Planning are long-overdue, much needed, and have enthusiastic support for urgent and immediate implementation” (passed unanimously).

The University Faculty’s Senate Committee on Research unanimously passed an essentially identical resolution. The Research IT Committee asked for the endorsement of Graduate Council and is seeking endorsement from other relevant bodies. Graduate Council unanimously voted to endorse the resolution. The full report (with links to various other documents) can be found at [http://sites.psu.edu/researchitcommittee/](http://sites.psu.edu/researchitcommittee/).

**REPORTS OF STANDING COMMITTEES OF GRADUATE COUNCIL**

**Committee on Committees and Procedures**

Dr. Foley recognized Dr. Ken Davis, Chair, Committee on Committees and Procedures.

Dr. Davis introduced the procedure for the election of new members to the 2013–2014 Committee on Committees and Procedures. The Committee on Committees and Procedures consists of six elected graduate faculty members (three newly elected and three continuing) and one elected graduate student member (newly elected each year). The main duty of the committee is to recommend appointment of members of all other Graduate Council committees.

The three continuing members of the Committee are Ken Davis (College of Earth and Mineral Sciences), Jon Nussbaum (College of the Liberal Arts), and David Spencer (College of Engineering).

On behalf of the Committee on Committees and Procedures, Dr. Davis presented the following slate of nominees:

**Graduate Faculty members**

- Kristin Eckert (Penn State College of Medicine)
- Lori Francis (College of Health and Human Development)
- Taylor Greer (College of Arts and Architecture)
- Christina Grozinger (College of Agricultural Sciences)
- Bill Johnson (Penn State Erie)
- Katsuhiko Murakami (Eberly College of Science)

**Graduate students**

- Gabriel Caceres (Astronomy and Astrophysics)
- Lauren Goldar (History)
- Katherine Kragh-Buetow (Materials Science and Engineering)
- Doug Whalen (Plant Pathology)
- Stephanie Wilson (Human Development and Family Studies)
Ballots were distributed to all current Graduate Council members in attendance (in person and by interactive videoconferencing), who were asked to vote for three graduate faculty members (each for a two-year term) and one graduate student member (for a one-year term). No nominations were made from the floor.

Election results were delivered to Dr. Foley prior to Council’s adjournment for the year. The newly elected Graduate Faculty members for 2013–2015 are Lori Francis, Christina Grozinger, and Katsuhiko Murakami, and the newly elected graduate student member for 2013–2014 is Gabriel Caceres.

Committee on Programs and Courses

Dr. Foley recognized Dr. Jeya Chandra, Chair, Committee on Programs and Courses.

Dr. Chandra presented the following graduate program proposals on behalf of the Committee on Programs and Courses with a motion and a second to approve the proposals (Appendices B and C):

1)  Program Change: Information Sciences and Technology—change in the degree requirements for the Doctor of Philosophy (Ph.D.) in Information Sciences and Technology (College of Information Sciences and Technology) – Appendix B, Page B1
2)  New Program: Renewable Energy and Sustainability Systems, offering the Master of Professional Studies (M.P.S.) degree (intercollege graduate degree program academically housed in the College of Agricultural Sciences) – Appendix C, Page C1

Appendices B and C were removed from the slate for discussion.

Questions regarding text on pages B6 and B7 of Appendix B were raised: 1) regarding the proposer’s intention for the minimum TOEFL score required for admission to the program (page B6); 2) regarding the term “6-hour” under Degree Requirements, first paragraph, first sentence, on page B6; and 3) regarding an apparent typographical error on page B7, first complete paragraph, final sentence. After discussion, Graduate Council voted to approve the proposal, pending confirmation by the Graduate School of the proposer’s intention regarding the TOEFL score and execution by the Graduate School of the following editorial changes in the proposal: change “6-hour” to read “6-credit” on page B6, and correct “duel-title” to read “dual-title” on page B7.

Council members pointed out that Appendix C contained several incorrect (outdated) references to academic units within the College of Agricultural Sciences. Appendix C was approved pending receipt of the revised proposal containing the correct titles of all academic units.

One informational item was presented to Council by Dr. Chandra (Appendix D):
3) Program Change: Mechanical Engineering—addition of off-site (online) delivery of the Master of Science (M.S.) degree – Appendix D, Page D1

Dr. Vasilatos-Younken noted that this is a special program change proposal: a one-time exception by Dean Foley to allow off-campus (online) delivery of the existing Master of Science degree in Mechanical Engineering on an “experimental basis,” to allow assessment of the ability of the program to maintain the integrity of this research degree, and in particular the culminating experience, which is an original research paper. Graduate Council policy restricts the offering of online graduate degrees at Penn State to professional master’s degrees; the academic (research) degrees, the M.A., M.S., and Ph.D., are not allowed per Graduate Council to be offered online.

The graduate program in Mechanical Engineering appealed to the Dean of the Graduate School to be allowed to propose a trial online delivery of the M.S. in Mechanical Engineering; the program assured Dean Foley that the rigor and integrity of the research degree would not be compromised by online delivery. Although the professional M. Eng. in Mechanical Engineering degree is available instead of the M.S., feedback that the program gathered from experts in the Mechanical Engineering field and corporate advisers overwhelmingly indicates that the background and research training acquired in an M.S. degree program is significantly more desirable in the field of mechanical engineering than the professional training acquired in an M.Eng. degree program.

The one-time exception to the Graduate Council policy will allow Mechanical Engineering to propose online delivery of the existing M.S. degree program for a three-year trial; during that time, no other proposals to offer academic degrees online will be considered.

Dr. Vasilatos-Younken stressed that the exception granted by Dean Foley to allow this experiment does not change Graduate Council policy. She noted that following the three-year trial period, the program will be required to report back to the Programs & Courses Committee and the Dean, and it is possible that off-site delivery will not be allowed to continue. Given the resources that must be expended for course design and delivering the program for three years, this is a risk assumed by the department and college.

Committee on Academic Standards

Dr. Foley recognized Dr. Jon Nussbaum, representing the Committee on Academic Standards.

Dr. Nussbaum reported that the Committee had met earlier in the day and discussed several items. He indicated that the Committee discussed four documents: “Guidelines for Submitting Proposals for Extended and Off-Campus Graduate Degree Programs,” “Residency and Related Policies for Off-Campus Graduate Programs,” the Graduate Council definitions of 500- and 800-level courses, and the “Expedited Review Process of Limited Off-site Course Offerings.” The Committee discussed and approved final revisions and clarifications in these documents, which will be presented to Graduate Council at the September meeting for discussion/vote.
Dr. Nussbaum also noted that the Committee continued its discussion of the formation of a special ad hoc subcommittee that will examine and make recommendations to revise the criteria for Graduate Faculty membership and reengineer the Graduate Faculty nomination process. The special subcommittee will meet over the summer, with a goal of presenting its recommendations to the Committee on Academic Standards in the fall.

Committee on Fellowships and Awards

Dr. Foley reported on behalf of Dr. Robert Edwards, Chair, Committee on Fellowships and Awards, that the Committee had not met since the previous meeting of Graduate Council.

Committee on Graduate Research

Dr. Foley recognized Dr. David Spencer, Chair, Committee on Graduate Research.

Dr. Spencer reported that the Committee had not met since the previous meeting of Graduate Council.

Committee on Graduate Student and Faculty Issues

Dr. Foley recognized Dr. Adrian Wanner, Chair, Committee on Graduate Student and Faculty Issues.

Dr. Wanner reported that the Committee had met earlier in the day and discussed the results of the family leave survey conducted by the Graduate Student Association (GSA) and the Commission for Women (CFW). The Committee concluded that awareness about the new guidelines for parental leave seems to be quite limited among the graduate student population and faculty advisers. In addition, the Committee began to address the issue of including questions about prior academic discipline history and criminal record on graduate applications. Both of these topics will continue to be on the Committee's agenda in the fall.

REPORTS OF SPECIAL COMMITTEES

Graduate School’s Graduate Exhibition Subcommittee

Dr. Foley recognized Libby Tisdell, Graduate Council liaison on the Graduate School’s Graduate Exhibition Subcommittee.

Dr. Tisdell reported that the Subcommittee had not met since the previous meeting of Graduate Council.

SPECIAL REPORTS

Graduate Student Association

Dr. Foley recognized Ms. Becky McCauley, representing the GSA.
Ms. McCauley indicated that the GSA had nothing to report, but thanked Council for its support of GSA concerns throughout the 2012–2013 academic year.

UNFINISHED BUSINESS

None

NEW BUSINESS

None

COMMENTS AND RECOMMENDATIONS FOR THE GOOD OF THE GRADUATE COMMUNITY

None

There being no further comments, the meeting adjourned at 4:45 p.m.
DATE: September 3, 2013
FROM: Kenneth Davis, Chair, Committee on Committees and Procedures
TO: Graduate Council
VIA: Regina Vasilatos-Younken, Interim Dean of the Graduate School, Chair, Graduate Council
RE: Nominations for 2013–2014 Standing Committees of Graduate Council

Nominations for one-year appointments to standing committees of Graduate Council were made from the 2013–2014 list of Graduate Council elected and additional members and from recommendations from college/school deans. Criteria for making the selections included Council members’ expressions of interest and the maintenance of balanced representation among disciplines and colleges/schools.

The nominees in the following lists were approved by the Committee on Committees and Procedures; the individuals designated as chair were nominated and have indicated their willingness to serve as chair if the committees so agree (except in the case of the Executive Committee, which is chaired by the Graduate Council chair).

The individuals whose names are listed in italics are not nominees to be voted on by Graduate Council members but are appointed to serve according to Graduate Council Bylaws and Standing Rules.

**Executive Committee**
Jogesh Babu, Professor of Statistics, Eberly College of Science
Roger Finke, Professor of Sociology and Religious Studies, College of the Liberal Arts
Sophia McClennen, Professor of Comparative Literature, Spanish and Women’s Studies School of International Affairs

*Kenneth Davis, Chair, Committee on Committees and Procedures*
*Caroline Eckhardt, University Faculty Senate Liaison*
*Robert Edwards, Chair, Committee on Fellowships and Awards*
*Lori Francis, Chair, Committee on Graduate Student and Faculty Issues*
*Christina Grozinger, Chair, Committee on Programs and Courses*
*Jon Nussbaum, Chair, Committee on Academic Standards*
*David Spencer, Chair, Committee on Graduate Research*
*Regina Vasilatos-Younken, Interim Dean of the Graduate School, Chair, Graduate Council*
Committee on Academic Standards
Taylor Greer, Associate Professor of Music, College of Arts and Architecture
James Kasting, Evan Pugh Professor of Geosciences, College of Earth and Mineral Sciences
Phillip Laplante, Professor of Software Engineering, Penn State Great Valley
Seraj Mackertich, Associate Professor of Engineering, Penn State Harrisburg
Jon Nussbaum, Chair, Professor of Communication Arts and Sciences and Human Development and Family Studies, College of the Liberal Arts
Mary Beth Oliver, Distinguished Professor of Communications, College of Communications
Qian Wang, Associate Professor of Mechanical Engineering, College of Engineering
Gregory Ziegler, Professor of Food Science, College of Agricultural Sciences
Regina Vasilatos-Youken, Interim Dean of the Graduate School, Ex Officio
Cynthia Nicosia, Director, Graduate Enrollment Services, Ex Officio
Elizabeth Price, Executive Director of Graduate Education Administration, Ex Officio

Committee on Fellowships and Awards
George Anghelcev, Assistant Professor of Communications, College of Communications
Kesha Baptiste-Roberts, Assistant Professor of Nursing, School of Nursing
Squire Booker, Professor of Chemistry and Biochemistry & Molecular Biology, Eberly College of Science
Robert Edwards, Chair, Edwin Erle Sparks Professor of English and Comparative Literature, College of the Liberal Arts
Andras Hajnal, Professor of Neural and Behavioral Sciences, College of Medicine
C. Clare Hinrichs, Professor of Rural Sociology, College of Agricultural Sciences
William H. A. Johnson, Associate Professor of Management, Penn State Erie
John Kelmelis, Professor of International Affairs, School of International Affairs, School of International Affairs
Seungjin Kim, Associate Professor of Mechanical Engineering, College of Engineering
Lynette Kvasny, Associate Professor, College of Information Sciences and Technology
Anthony Kwasnica, Associate Professor of Business Economics, Smeal College of Business
Jonathan Mathews, Associate Professor of Energy and Mineral Engineering, College of Earth and Mineral Sciences
Paul Morgan, Associate Professor of Education, College of Education
Timothy Murtha, Associate Professor of Landscape Architecture, College of Arts and Architecture
Stephen Schappe, Associate Professor of Management, Penn State Harrisburg
Sagnika Sen, Assistant Professor of Management Information Systems, Penn State Great Valley
Krista Wilkinson, Professor of Communication Sciences and Disorders, College of Health and Human Development
Barbara Struble, Director, Graduate Fellowships and Awards Administration, Ex Officio

Committee on Graduate Research
Mallika Bose, Associate Professor of Landscape Architecture, College of Arts and Architecture
Milton Cole, Distinguished Professor of Physics, Eberly College of Science
Chris Craighead, Associate Professor of Supply Chain Management, Smeal College of Business
Kristin Eckert, Professor of Pathology, College of Medicine
Kit Hume, Edwin Erle Sparks Professor of English, College of the Liberal Arts
Peter Molenaar, Distinguished Professor of Human Development and Family Studies, College of Health and Human Development
David Spencer, Chair, Professor of Aerospace Engineering, College of Engineering
Richard St. Clair, Associate Professor of Theatre, College of Arts and Architecture
Elizabeth Tisdell, Professor of Adult Education, Penn State Harrisburg
Doug Whalen, Graduate Student in Plant Pathology, College of Agricultural Sciences
Chris Yengo, Associate Professor of Cellular and Molecular Physiology, College of Medicine

Suzanne Adair, Assistant Dean for Graduate Student Affairs; Director, Office of Postdoctoral Affairs, Ex Officio

Committee on Graduate Student and Faculty Issues
Gabriel Caceres, Graduate Student in Astronomy and Astrophysics, Eberly College of Science
Kenneth Davis, Professor of Meteorology, College of Earth and Mineral Sciences
Roger Finke, Professor of Sociology and Religious Studies, College of the Liberal Arts
Lori Francis, Chair, Assistant Professor of Biobehavioral Health, College of Health and Human Development
Alan Johnson, Walther H. Ott Professor of Avian Biology, College of Agricultural Sciences
Katherine Kragh-Buetow, Graduate Student in Materials Science and Engineering, College of Engineering
Gretchen Kuldau, Associate Professor, College of Agricultural Sciences
Katsuhiko Murakami, Associate Professor of Biochemistry and Molecular Biology, Eberly College of Science
Zoubeida Ounaies, Dorothy Quiggle Professorship, College of Engineering
Stephanie Wilson, Graduate Student in Human Development and Family Studies, College of Health and Human Development

Suzanne Adair, Assistant Dean for Graduate Student Affairs; Director, Office of Postdoctoral Affairs, Ex Officio
Robert Crane, Interim Director, Directorate of Global Relations and Promotion, University Office of Global Programs, Ex Officio
Stephanie Preston, Senior Director, Graduate Educational Equity Programs, Ex Officio
Paul Simenson, Director, Student Aid Programs, Office of Student Aid, Ex Officio
Andrea Dowhower, Assistant Vice President for Student Affairs, Division of Student Affairs, Ex Officio

Committee on Programs and Courses
Thomas Bowers, Associate Professor of Psychology, Penn State Harrisburg
Roy Clariana, Professor of Education, College of Education
Janet Fogg, Assistant Professor of Nursing, School of Nursing
Lauren Golder, Graduate Student in History, College of the Liberal Arts
Christina Grozinger, Chair, Associate Professor of Entomology, College of Agricultural Sciences
Todd LaJeunesse, Assistant Professor of Biology, Eberly College of Science
Joan M. Redwing, Professor of Materials Science and Engineering, College of Earth and Mineral Sciences
Frank Ritter, Professor of Information Sciences and Technology, Psychology, and of Computer Science and Engineering, College of Information Sciences and Technology
Adriana (Janet) van Hell, Professor of Psychology and Linguistics, College of the Liberal Arts
Krista Wilkinson, Professor of Communication Sciences and Disorders, College of Health and Human Development

Regina Vasilatos-Younken, Interim Dean of the Graduate School, Ex Officio
Cynthia Nicosia, Director, Graduate Enrollment Services, Ex Officio
Elizabeth Price, Executive Director of Graduate Education Administration, Ex Officio
Proposed clarification to language in
Graduate Council Standing Rules, Article II, Section D

The Committee on Committees and Procedures unanimously approved the minor editorial
revision to clarify the language in Article II, Section D, noted below. The Committee will be
reviewing the Bylaws and the Standing Rules of Graduate Council this academic year and will
present additional revisions/clarifications to Council at future meetings (the Bylaws are attached
as Appendix B2 for reference only; no revisions are proposed in the Bylaws at this time).

http://www.gradsch.psu.edu/index.cfm/council/standingrules/

Standing Rules of Graduate Council

ARTICLE I -- RULES OF PROCEDURE

Section A

1. A quorum for the transaction of business shall consist of twenty-five Council members.
2. The rules of procedure in the meetings of the University Graduate Council, except as may
be otherwise specified in the Articles of Authority and Standing Rules, shall be those of
Robert's Rules of Order, Newly Revised 1990. All motions, except as may be otherwise
specified in these documents, shall be determined by a majority of the votes cast. Roll
Call votes may be initiated by the decision of the Chair or by five or more of the Council
members present and voting.

Section B

The order of business at each regular meeting of the Council shall be as follows:

1. Minutes of the preceding meeting.
2. Communications to the Graduate Council.
3. Announcements by the Chair.
4. Remarks of the Vice President for Research [as appropriate].
5. Reports of Standing Committees.
6. Reports of Special Committees.
7. Special reports.
8. Unfinished business.
10. Comments and recommendations for the good of the graduate community.

The order of business may be changed by the Chair prior to any meeting. Any or all items in this
section may be suspended at any regular meeting of the Council by a two-thirds (2/3) vote of the
members present and at any special meeting by decision of the Chair.
Section C

The order of business for any special meeting of the Council as outlined in the Bylaws, Article III, Section A, Number 2, shall be determined by the Chair.

Section D

An agenda and appendices shall be distributed at least six (6) days before the regular meeting to which they pertain to all members of the Council and to all non-Council members of Council Committees. Each academic and principal administrative unit of the University and the Graduate Student Association shall be sent a copy. The organizations shall receive the aforesaid agenda with appendices on the same time schedule as do Council members.

Section E

1. A Council member may introduce, by a direct motion from the floor, new business that he or she considers to be important. When such a motion has been made and seconded, it shall be laid on the table until the next regular meeting of the Council unless the Chair calls a special meeting to consider this item before the next regular meeting.
2. Any member of the faculty, administration, or graduate student body not a member of the council may request the privilege of the floor on any item of business already before the Council. Such a request must be made to the Chair at least four calendar days before the meeting at which the faculty member, administrator, or graduate student wishes to speak.
3. Only members of the Council may introduce new business.
4. At the discretion of the Chair, any member of the Board of Trustees, faculty, administration, student body, or staff not a member of the Council may be granted the privilege of the floor to make comments and recommendations for the good of the graduate community. Requests shall be made to the Chair, in writing, through the Secretary to the Council, at least four (4) calendar days prior to the meeting.
5. The Chair shall have the authority to place a time limit on the remarks of any nonmember of the Council.
6. The rules of this section may be suspended only by a two-thirds vote of the Council members present.

Section F

New Standing Rules of the Council and amendments to these rules may be acted upon only after they have been presented in writing to all Council members at least six days before a regular meeting of the Council, except that this requirement may be suspended by a two-thirds vote of the Council members present.

Section G

The Council shall send minutes of its meetings to those specified in Section D.
ARTICLE II -- GRADUATE COUNCIL COMMITTEE STRUCTURE

Section A

Committees may be created according to the provisions of Article II, Section B, of the Articles of Authority of the Graduate Council. A roster of Graduate Council members, as well as membership on Standing and Ad Hoc Committees, shall be made available to the University community on the Graduate Council section of The Graduate School's website.

Section B

The Chair or the Chair’s designated representative is an ex officio member of all Standing Committees.

Section C

All Standing Committees except the Committee on Committees and Procedures may add to their membership with the approval of the Committee on Committees and Procedures.

All Standing Committees are encouraged to invite individuals to render testimony or advice on particular questions as circumstances might indicate. All Standing Committees may appoint Ad Hoc Subcommittees as needed.

Section D

All Standing Committees must be chaired by Elected Members (i.e., Graduate Faculty) of Graduate Council members. The other appointed members of the committees should be representatives of the graduate community and need not be members of the Graduate Council.

Section E

All committee positions, except those of the Committee on Committees and Procedures, are tenable for one year, from the first meeting of the fall semester in a given year to the first meeting of the fall semester of the next year. Positions on the Committees and Procedures are tenable for two years. No member of a given committee may serve longer than four consecutive years. Exceptions may be approved by the Graduate Council.

Section F

Standing Committees of the Graduate Council:

Preamble: In addition to the Committee on Committees and Procedures, there are Policy-Making Committees, Implementation Committees, and Ad Hoc Committees of the Graduate Council.
The Policy-Making Committees of the Graduate Council shall be knowledgeable in the major areas of intellectual pursuit, i.e., health and life sciences, basic and applied physical sciences, social and behavioral sciences, and the arts and humanities. All presiding officers of Policy Committees and Subcommittees must be members of the Graduate Council. A substantial proportion of the members of these Committees shall be Graduate Council members, and the membership shall be divided approximately equally among the major intellectual areas of knowledge. The presiding officers of all Implementation Committees shall be members of the Graduate Council, but the committee membership may be from the Graduate Faculty at large.

- Committee on Committees and Procedures
- Policy Making Committees
  - Executive Committee
  - Committee on Academic Standards
  - Committee on Programs and Courses
    - Subcommittee on Program Review and Evaluation
    - Subcommittee on New and Revised Programs and Courses
  - Committee on Graduate Research
  - Committee on Graduate Student and Faculty Issues
- Implementation Committee
  - Committee on Fellowships and Awards
- Ad Hoc Committees
Bylaws of the Graduate Council

Note: In the following articles, the term "Chair" signifies the Dean of the Graduate School, who serves (see Art. II) as the permanent chairperson of the Council. The term "Dean" signifies the Dean of the Graduate School.

ARTICLE I -- COUNCIL MEMBERSHIP

Section A -- Elected Members

1. There shall be approximately forty-five elected Graduate Faculty members of the Council. Each shall serve for a term of two years.
2. The elected Council members shall be apportioned among the voting units (as defined in Number 8 of this section) as follows: one group of seats (block A), equal to the number of voting units, shall be assigned one per unit; the remaining group of seats (block B) shall be assigned in proportion to the number of Graduate Faculty members in each unit by the procedure detailed in Number 3 of this section.
3. As of December 31 of each year, the Chair shall make an accurate summary of the number of Graduate Faculty members in each voting unit of the Graduate School. On the basis of this summary, the Chair shall compute the exact number of block B seats that must be assigned to each voting unit in order to achieve exact proportional representation. Numbers with fractions shall be rounded up to the next whole number if the fraction is one-half or greater and otherwise rounded down to the next whole number.
4. The Chair shall notify the chief academic administrator of each voting unit each year of the total number of persons to be elected from that unit at the next annual election. This number shall ordinarily consist of one-half of the total of the one representative allotted to each unit in Number 2 of this section plus the number computed by the procedure outlined in Number 3. In the event that the voting unit has only one representative, that unit will select its representative every other year. In the event that the voting unit has an odd number of representatives, the Chair will inform the presiding officer of the voting unit of the exact number to be elected for the year in question.
5. Prior to March 1 of each year, the members of the Graduate Faculty within each voting unit shall nominate its members of the Council and an equal number of alternates. The voting members of the Graduate Faculty within each voting unit shall establish by a majority vote their own method of nominating candidates for election, as well as other rules for the conduct of the election. Nothing in this section shall be construed to prevent election through a written ballot sent to all eligible voters. The election must be completed by April 1.
6. Immediately following the election, the presiding officer of the voting unit shall transmit to the Chair the names of those elected. Newly elected members shall take office at the beginning of the fall semester following the election.
7. The Chair shall inform each voting unit about the attendance of each member of the unit and participation in Graduate Council affairs. The voting unit may replace an inactive Council member by an elected alternate at its discretion. Notice of the selection of a replacement shall be given in writing to the Chair by the presiding officer of the voting unit.

8. The voting units shall be the colleges and schools of the University offering graduate programs, including Great Valley School of Graduate Professional Studies, the School of International Affairs, and the School of Nursing. Additional voting units may be established by vote of the Council.

9. Each member of the Graduate School at University Park or at other graduate program locations designated as a voting unit shall be affiliated with the voting unit of his or her principal appointment. Any member of the Graduate Faculty whose principal appointment is not with an established voting unit shall be assigned to the voting unit that nominated the individual for membership in the Graduate Faculty.

10. The chief academic administrator of the voting unit, or an individual designated by that administrator, shall preside over that voting unit for the purpose of conducting elections to the Council.

Section B -- Qualifications of Members and Alternates

1. Faculty membership in the Council shall be limited to Members of the Graduate Faculty.

2. No elected member of the Council may serve more than four consecutive years.

3. An elected alternate shall meet all the qualifications of an elected member of Council.

Section C -- Additional Members and Participants in the Council

1. The Dean of the Graduate School (the "Chair") shall be a voting member of the Council, ex officio. The Senior Associate Dean, Associate Dean(s), and/or Assistant Dean(s) of the Graduate School, as appropriate, shall be voting members of the Council, ex officio.

2. The Associate Vice President for Research and the Assistant Vice President for Research shall be non-voting members of the Council, ex officio. The Associate Vice President for Academic Outreach and Executive Director for Penn State World Campus or a designee shall be a non-voting member of Graduate Council, ex officio. The person must be a member of the Graduate Faculty and will serve as liaison between the Graduate Council and the World Campus. The Dean of the Dickinson School of Law will recommend to the Chair a designee who is a member of the Graduate Faculty who shall be a non-voting member of the Graduate Council, ex officio.

3. A member of the Council of the University Faculty Senate designated by that body shall be a voting member of the Council. The individual selected must be a Member of the Graduate Faculty.

4. With the concurrence of the Council, the Chair may invite guests to attend and participate in Council meetings at any time.

5. The Graduate Student Association, in its capacity as the officially sanctioned graduate student organization, shall be responsible for conducting an election to choose five graduate students to serve for one year as voting members of the Council. In electing
graduate students to the Council, no more than one shall be chosen from the same voting unit as defined in Article I, Section A, Number 8.

Prior to March 1 of each year, the members of the Graduate Student Association shall be called together by their President to elect graduate student members of the Council and an equal number of alternates. The members of the Graduate Student Association shall establish by a majority vote their own method of nominating candidates for election, as well as other rules for the conduct of the election. Nothing in this section shall be construed to prevent election through a written ballot sent to all eligible voters. The election must be completed by April 1.

Replacement of members by alternates shall be made in a manner similar to the replacement procedure for faculty members in Article I, Section A, Number 7.

ARTICLE II -- COUNCIL ORGANIZATION

Section A -- Officers

1. The officers of the Council shall be the Chair and a Secretary to the Council.
2. The Dean shall serve as the permanent chairperson (the "Chair") of the Council. In his/her absence, a Council member or a member of the administrative staff of the Graduate School may be designated by the Chair to preside.
3. The Secretary to the Council shall be appointed by the Chair.

Section B -- Committees

1. Standing Committees of the Council may be established by the Council.
2. Prior to April 30 of each year the Council shall elect persons to serve on a Committee on Committees and Procedures for a two-year period. Total committee membership shall consist of seven persons, including one graduate student, who will be members of the new Council.
3. Each year before the first Council meeting of the fall semester, the Committee on Committees and Procedures shall prepare a roster of proposed Standing Committee assignments.
4. The newly elected Council at its first meeting shall review the recommendations of the Committee on Committees and Procedures and appoint members to Standing Committees.
5. The Chair may appoint Ad Hoc Committees of the Council for special purposes.
6. Graduate students shall be eligible to serve on all committees.

ARTICLE III -- COUNCIL MEETINGS

Section A -- Time and Place of Meetings

1. Regular meetings of the Council shall normally be held once a month at a regular time and place designated by the Chair.
2. Special meetings of the Council may be called by the Chair upon adequate notice to its members.
3. Regular meetings of the Council may be omitted upon adequate notice to the members when lack of business justifies such action.

ARTICLE IV -- FACULTY LEGISLATIVE AUTHORITY

Section A -- Faculty Recourse

1. Actions of the Council may be revised or nullified in the following manner:
   a. Within thirty days after the publication of any action of the Council, any member of the Graduate Faculty may challenge the action by presenting to the Secretary of the Council a petition signed by fifty members of the Graduate Faculty requesting that a review be made of the action by the Council.
   b. Within two weeks of receipt of the petition, the Council shall meet with representatives of the petitioners to attempt to resolve the difficulties.
   c. If the objection is not resolved, the Chair shall call a meeting of the Graduate Faculty as soon as feasible for the specific purpose of discussing the action that has been challenged.
   d. To become an official action, a motion to replace, overturn, revise, or nullify the contested action of the Council passed at such a special meeting by majority vote must be sustained by the Graduate Faculty by means of a ballot mailed to all members. The decision to sustain or reject the motion shall be based upon a majority vote of those voting on the issue.

Section B -- Regular Graduate Faculty Meetings

1. There shall be one regular meeting of the Graduate Faculty each year. The agenda for the meeting shall be set by the Chair in consultation with the Council. The major agenda item shall be the annual report of the Dean of the Graduate School to the Graduate Faculty. Items for the good of the Graduate School may be discussed. Normally no legislation will be enacted at this meeting. Legislative action may be taken only when preceded by a petition submitted to the Chair thirty days prior to the meeting, signed by at least fifty Graduate Faculty members. To become effective, any legislation enacted requires approval by the Graduate Faculty through a mail ballot. The decision to sustain or reject the legislation shall be based upon a majority vote of those voting on the issue.

Section C -- Special Graduate Faculty Meetings

1. Special meetings of the Graduate Faculty may be called by the Chair on his or her own initiative or upon receipt of petitions signed by fifty Graduate Faculty members. To become effective, any legislative action taken at such a meeting requires approval by the Graduate Faculty through a mail ballot. The decision to sustain or reject the legislation shall be based upon a majority vote of those voting on the issue.
ARTICLE V -- IMPLEMENTATION

The Office of the Dean shall promulgate Graduate School regulations to implement the policies and intent of the Council. However, the Office of the Dean shall have the authority to grant exceptions in individual cases to any rule or regulation where special conditions warrant such action.

ARTICLE VI -- PROCEDURE

The Council shall establish its rules of procedure.

ARTICLE VII -- AMENDMENT

An amendment to the Bylaws may be adopted at any meeting of the Council by a two-thirds vote of those Council members present, providing that the amendment has been presented in writing at the preceding regular meeting.
2013–2014 Graduate Council Membership List

http://www.gradsch.psu.edu/index.cfm/council/council-membership/

**ELECTED MEMBERS (voting)**

Jogesh Babu, Professor of Statistics, Eberly College of Science
Ali Borhan, Professor of Chemical Engineering, College of Engineering
Mallika Bose, Associate Professor of Landscape Architecture, College of Arts and Architecture
*Thomas Bowers, Associate Professor of Psychology, Penn State Harrisburg
*Roy Clariana, Professor of Education, College of Education
Milton Cole, Distinguished Professor of Physics, Eberly College of Science
Chris Craighead, Associate Professor of Supply Chain Management, Smeal College of Business
Ken Davis, Professor of Meteorology, College of Earth and Mineral Sciences
Kristin Eckert, Professor of Pathology, College of Medicine
Robert Edwards, Edwin Erle Sparks Professor of English and Comparative Literature, College of the Liberal Arts
*Roger Finke, Professor of Sociology and Religious Studies, College of the Liberal Arts
**Janet Fogg, Assistant Professor, School of Nursing
Lori Francis, Associate Professor of Biobehavioral Health, College of Health and Human Development
*Taylor Greer, Associate Professor of Music, College of Arts & Architecture
Christina Grozinger, Associate Professor of Entomology, College of Agricultural Sciences
Andras Hajnal, Professor of Neural and Behavioral Sciences, College of Medicine
Simon Hooper, Associate Professor of Education, College of Education
*Kit Hume, Edwin Erle Sparks Professor of English, College of the Liberal Arts
*Alan L. Johnson, Walther H. Ott Professor in Avian Biology, College of Agricultural Sciences
William Johnson, Associate Professor of Management, Penn State Erie
**James F. Kasting, Evan Pugh Professor of Geosciences, College of Earth and Mineral Sciences
*Gretchen Kuldau, Associate Professor, College of Agricultural Sciences
*Todd LaJeunesse, Assistant Professor of Biology, Eberly College of Sciences
Philip Laplante, Professor of Software Engineering, Penn State Great Valley
**Seroj Mackertich, Associate Professor of Engineering, Penn State Harrisburg
*Sophia McClennen, Professor of Comparative Literature, Spanish and Women's Studies, School of International Affairs
*Peter Molenaar, Distinguished Professor of Human Development and Family Studies, College of Health and Human Development
**Katsuhiko Murakami, Associate Professor of Biochemistry and Molecular Biology, Eberly College of Science
Jon Nussbaum, Professor of Communication Arts and Sciences and Human Development and Family Studies, College of the Liberal Arts
Mary Beth Oliver, Distinguished Professor of Communications, College of Communications
*Zoubeida Ounaies, Dorothy Quiggle Professorship, College of Engineering
*Joan M. Redwing, Professor of Materials Science & Engineering, College of Earth and Mineral Sciences
*Ed Reutzel, Associate Professor of Supply Chain Management, Smeal College of Business
*Frank Ritter, Professor, College of Information Sciences and Technology
**David Spencer, Professor of Aerospace Engineering, College of Engineering
*Richard St. Clair, Associate Professor of Theatre, College of Arts & Architecture
Elizabeth [Libby] Tisdell, Professor of Adult Education, Penn State Harrisburg
Adriana [Janet] van Hell, Professor of Psychology and Linguistics, College of the Liberal Arts
Qian Wang, Associate Professor of Mechanical Engineering, College of Engineering
**Krista Wilkinson, Professor of Communication Sciences and Disorders, College of Health and Human Development
Chris Yengo, Associate Professor or Cellular and Molecular Physiology, College of Medicine
Greg Ziegler, Professor of Food Science, College of Agricultural Sciences

**ADDITIONAL MEMBERS AND PARTICIPANTS IN THE COUNCIL

Dean of the Graduate School (voting)
Regina Vasilatos-Younken, Interim Dean of the Graduate School (Chair)

Senior Associate Dean (voting)
[currently vacant]
Assistant Dean of the Graduate School (voting)
Suzanne Adair, Assistant Dean for Graduate Student Affairs and Director of the Office of Postdoctoral Affairs

World Campus Liaison (non-voting)
David Sylvia, Director of Academic Affairs for Graduate Programs, World Campus

Dickinson School of Law Member (non-voting)
Jamison Colburn, Joseph H. Goldstein Faculty Scholar and Professor of Law

University Faculty Senate Council Liaison (voting)
Caroline Eckhardt, Professor of Comparative Literature and English

Graduate Student Association Members (voting)
*Gabriel Caceres, Astronomy and Astrophysics
*Lauren Golder, History
*Katherine Kragh-Buetow, Materials Science and Engineering
*Doug Whalen, Plant Pathology
*Stephanie Wilson, Human Development and Family Studies

Participant at the request of the Chair (non-voting)
Elizabeth Price, Executive Director of Graduate Education Administration

Administrative Support to Graduate Council
Pam Krewson, Administrative Support Assistant

*Newly elected  **Re-elected
GRADUATE COUNCIL COMMITTEE ON PROGRAMS AND COURSES

SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES

PROGRAM, OPTION, OR MINOR PROPOSAL FORM

Submit 1 copy of the proposal form and 25 copies of the supporting documentation as outlined below to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building. The proposals will be transmitted to the Dean of the Graduate School for consideration by the Graduate School’s Subcommittee on New and Revised Programs and Courses, and the Committee on Programs and Courses. For a detailed explanation of the form, see the Guide to Curricular Procedures.

College Department: Penn State Harrisburg School of Public Affairs
or Instructional Area

NEW PROGRAM, OPTION OR MINOR

Designation of program
Classification of Instructional
Programs Code (CIP)
Designation of option
Designation of minor

Indicate effective date

OLD PROGRAM, OPTION, OR MINOR: Change _X_ Drop ___

Old designation of program
Health Administration
Old designation of option
Old designation of minor
New designation of program (if changed) New
assignment of minor (if changed) New designation of minor (if changed)

Indicate effective date Upon approval

SUBMITTED BY

[Signature]

Date 3/21/13
In Charge of Graduate Program

NOTED BY

[Signature]

Date 3/21/13
College Representative to Graduate Council Subcommittee on New and Revised Programs and Courses

APPROVED BY

[Signature]

Date 3/21/13
Dean of College

RECOMMENDED BY

[Signature]

Date 4/30/013
Subcommittee on New and Revised Programs and Courses

[Signature]

Date 9/11/2013
Committee on Programs and Courses

NOTED BY

[Signature]

Date 9/11/2013
Dean of the Graduate School
CHANGES IN PROGRAMS, OPTIONS*, AND MINORS** (including program name changes)

A. A revised version of the affected area showing both the old program requirements and the new program requirements (so that the reviewers can determine what specifically is being changed). The proposal should include a side-by-side comparison of entry requirements, number of credits required, specific courses to be taken, etc. A copy of the revision to the Graduate Bulletin copy must be included, and the proposer is requested to use underlining, bolding, or italics to indicate changes.

See attached

B. A justification for changes made, such as updating instruction, together with an indication of expected enrollments and any effects on existing programs.

Consistent with suggestions from the Graduate School to other programs, we added regionally to complete the phrase “regionally accredited college”

We deleted language under Program Requirements related to statistics and computer software, to bring this into consonance with the revised Master of Public Administration version. HADM 503 is cross-listed with PADM 503, so that there should be consistency in the narrative. With the change of catalog copy for PADM 503, the narrative statement is no longer operative.

As to the original logic for the change in 503, the prerequisite was dropped because the program currently does impose sufficient statistics requirements. These requirements are covered in PADM 503, which is a core course within the MPA (and MHA) curriculum. This course explicitly addresses relevant research methodologies that are relevant to administration, planning, and public policy. In addition, it has been difficult to enforce and maintain the integrity of this requirement. It has not proven to be effective in terms of helping students to better understand the contents of Research Methods (PADM 503). A main reason for this is that the prerequisite does not specify what specific statistical skills were needed before entering the program or why. This has resulted in a variety of statistics courses being approved for purposes of meeting the prerequisite. Courses taken the semester before entering the program or five years before entering the program were both acceptable. In addition, it was also recognized that many students that met the requirement did not have sufficient prior understanding of statistics. As a result, instructors ended up teaching basic statistics concepts. As such, the statistics prerequisite turned into a formality without significance.

The graduate faculty listing has been changed, to note changes in personnel.
C. Include written response from departments affected by the changes.

   See attached
Health Administration (H ADM)

STEVEN A. PETERSON, Interim Graduate Program Coordinator
School of Public Affairs, Penn State Harrisburg
W-153 Olmsted Building; 717-948-6042

Degree Conferred:
M.H.A.

Graduate Faculty

- Goktug Morcol, Ph.D. (Virginia Tech) Associate Professor of Public Administration
- Bing Ran, Ph.D. (Waterloo) Assistant Professor of Public Administration
- Triparna Vasavada, Ph.D. (SUNY-Albany) Assistant Professor of Public Administration

Recognizing that the national health care system is in a period of reform and redesign, the program emphasis involves design/redesign in a 36-credit curriculum. Based on eight core courses defined as the foundation of administration in health care, the degree is designed for part-time professional students already engaged in health administration careers. The mission of the program is to further student knowledge and skills in a continuous learning cycle. Students are expected not only to know the existing health system, but are to develop a capability for design consistent with demands of access to care, management, and control of costs and quality of care delivery.

Part-time students may start the program at the beginning of any semester. They usually take one or two 3-credit courses each semester. Students may also take one or two courses during the summer session to maintain steady progress toward the degree. All Health Administration courses are available during the evening for the convenience of part-time students. A student may complete the M.H.A. on a part-time basis in about two to four years.

Admission Requirements

Applicants must have received their baccalaureate degree from an accredited college or university prior to starting the graduate program. Applicants who are still completing their baccalaureate requirements at the time of the application may be admitted to the Graduate School conditional on the awarding of the baccalaureate degree.
Admission to the MHA program is based on clear suitability for the MHA program as demonstrated by the application as a whole, to include: a completed application, evidence of a bachelor's degree from an accredited college; a statement of career and educational goals; a successful undergraduate record with a grade-point average of 3.00 (with particular attention given to the last two years of undergraduate work); satisfactory scores on the Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT) are required if the GPA is less than 3.00; three years of work experience; and names of three references willing to provide recommendations.

The GPA requirement may be relaxed if the student has professional experience or other strong evidence suggesting likely success in the MHA program. Some applicants may be accepted on a non-matriculated probationary basis, pending performance at the B (3.00) level over 15 hours of approved credit.

Program Requirements

All undergraduate degrees are acceptable for admission. All students are expected to have had at least an introductory course in statistics and statistical software.

If these introductory knowledge and skill areas have not been completed prior to admission they must be satisfied prior to completion of 12 graduate credits. Reading and introductory courses--for which not graduate credit is given--are available at Penn State Harrisburg. The computer area may be satisfied by completing a 1-credit computer course: P ADM 486 Applied Statistical Package.

The degree requires a minimum of 36 graduate credits, including a 3-credit, faculty-supervised paper. Three credits of 400-level work may be included in the electives. An overall 3.00 (B) grade-point average must be earned in all 400- and 500-level work.

REQUIRED COURSES: 24 credits
H ADM 539, H ADM 540, H ADM 541, H ADM 542, H ADM 545, P ADM 503, P ADM 506, P ADM 510

ELECTIVE CONCENTRATION: 9 credits
H ADM 543, H ADM 546, H ADM 548, H ADM 551, H ADM 552, H ADM 597, P ADM 505, P ADM 511, P ADM 512, P ADM 514, P ADM 515, P ADM 516, P ADM 520

CAPSTONE COURSE: 3 credits
H ADM 594

Courses

Graduate courses carry numbers from 500 to 599 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may
register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

HEALTH ADMINISTRATION (H ADM) course list

DATE LAST REVIEWED BY GRADUATE SCHOOL: 5/26/04

Faculty updated: 6/5/12
REVISED BULLETIN COPY

Health Administration (H ADM)

STEVEN A. PETERSON, Interim Graduate Program Coordinator
School of Public Affairs, Penn State Harrisburg
W-153 Olmsted Building; 717-948-6042 6050

Degree Conferred:
M.H.A.

Graduate Faculty

- Karen Buhr (Carleton University) Lecturer of Health Administration
- Christina Daley, Ph. D. (Indiana University of Pennsylvania) Lecturer of Health Administration
- Hengameh Hosseini (Marywood) Assistant Professor of Health Administration
- Goktug Morcol, Ph.D. (Virginia Tech) Associate Professor of Public Administration
- Bing Ran, Ph.D. (Waterloo) Assistant Professor of Public Administration
- Triparna Vasavada, Ph.D. (SUNY-Albany) Assistant Professor of Public Administration

Recognizing that the national health care system is in a period of reform and redesign, the program emphasis involves design/redesign in a 36-credit curriculum. Based on eight core courses defined as the foundation of administration in health care, the degree is designed for part-time professional students already engaged in health administration careers. The mission of the program is to further student knowledge and skills in a continuous learning cycle. Students are expected not only to know the existing health system, but are to develop a capability for design consistent with demands of access to care, management, and control of costs and quality of care delivery.

Part-time students may start the program at the beginning of any semester. They usually take one or two 3-credit courses each semester. Students may also take one or two courses during the summer session to maintain steady progress toward the degree. All Health Administration courses are available during the evening for the convenience of part-time students. A student may complete the M.H.A. on a part-time basis in about two to four years.

Admission Requirements

All undergraduate degrees in any major are acceptable for admission. Applicants must have either (1) a baccalaureate degree from a regionally accredited U.S. institution or (2) a tertiary (postsecondary) degree that is deemed comparable to a four-year bachelor's degree from a regionally accredited U.S. institution. This degree must be from an officially recognized degree-
granting institution in the country in which it operates received their baccalaureate degree from an accredited college or university prior to starting the graduate program. Applicants who are still completing their baccalaureate requirements at the time of the application may be admitted to the Graduate School conditional on the awarding of the baccalaureate degree.

Admission to the MHA program is based on clear suitability for the MHA program as demonstrated by the application as a whole, to include:

- a completed online Graduate School application and payment of the application fee,
- evidence of a bachelor's degree from an regionally accredited college as outlined above;
- a statement of career and educational goals;
- a successful undergraduate record with a minimum grade-point average of 3.00 (with particular attention given to the last two years of undergraduate work);
  - satisfactory scores on the Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT) are required if the GPA is less than 3.00 (typically, applicants who have scores of 1,000 or higher on the GRE and are admitted to the program tend to be successful in the program);
- three years of work experience; and
- names of three references willing to provide recommendations.

The GPA requirement may be relaxed if the student has professional experience or other strong evidence suggesting likely success in the MHA program. Some applicants may be accepted admitted on a non-matriculated probationary provisionally provisional basis; the condition for removal of provisional status is obtaining a grade-point average of 3.00 pending performance at the level over 15 hours of approved credits of approved courses within two semesters.

The language of instruction at Penn State is English. All international applicants must take and submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, or a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). Applicants with iBT speaking scores between 15 and 18 may be considered for provisional admission, which requires completion of specified remedial English courses ESL 114G (American Oral English for Academic Purposes) and/or ESL 116G (ESL/Composition for Academic Disciplines) and attainment of a grade of B or higher. The minimum acceptable composite score for the IELTS is 6.5.

International applicants are exempt from the TOEFL/IELTS requirement who have received a baccalaureate or a graduate degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, and Wales.
Program Requirements

All undergraduate degrees are acceptable for admission. All students are expected to have had at least an introductory course in statistics and statistical software. If these introductory knowledge and skill areas have not been completed prior to admission they must be satisfied prior to completion of 12 graduate credits. Reading and introductory courses—for which no graduate credit is given—are available at Penn State Harrisburg. The computer area may be satisfied by completing a 1-credit computer course: P ADM 486 Applied Statistical Package.

The degree requires a total of 36 credits, with a minimum of 336 graduate-credits at the 500-level, including a 3-credit capstone course (faculty-supervised paper); up to Three credits of 400-level work may be included in the electives. An overall 3.00 (B) grade-point average must be earned in all 400- and 500-level coursework.

REQUIRED COURSES: 24 credits
H ADM 539, H ADM 540, H ADM 541, H ADM 542, H ADM 545, P ADM 503, P ADM 506, P ADM 510

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HEALTH ADMINISTRATION (H ADM) course list

DATE LAST REVIEWED BY GRADUATE SCHOOL: 5/26/04
Faculty updated: 2/20/13
## CONSULTATION RECORD

<table>
<thead>
<tr>
<th>Contact</th>
<th>Date Contacted</th>
<th>Date Responded</th>
<th>Comments (see attached)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christopher Calkins, HHD</td>
<td>January 21, 2013</td>
<td></td>
<td>Have asked for a response four times without receiving comments</td>
</tr>
<tr>
<td>Dennis Shea, HHD</td>
<td>January 21, 2013</td>
<td>February 5, 2013</td>
<td>Supportive</td>
</tr>
<tr>
<td>Raffy Luquis, PSH</td>
<td>January 21, 2013</td>
<td>January 21, 2013</td>
<td>Supportive</td>
</tr>
<tr>
<td>Roger Anderson, COM</td>
<td>January 21, 2013</td>
<td>February 5, 2013</td>
<td>Supportive</td>
</tr>
<tr>
<td>Steven Schappe, PSH</td>
<td>January 21, 2013</td>
<td>January 21, 2013</td>
<td>Supportive</td>
</tr>
</tbody>
</table>
Sorry, Steve, just forgot to look this over. On behalf of HPA, I support the changes.

Dennis

From: "STEVEN AMES PETERSON" <sap12@psu.edu>
To: "CHRISTOPHER ALAN CALKINS" <cxc20@psu.edu>, "Dennis Shea" <dgs4@psu.edu>, "Roger Anderson" <rta11@psu.edu>
Cc: "ASHLEY EVALYNE MARRERO" <avm5176@psu.edu>, "KATE CORBIN TOMPKINS" <katespa@psu.edu>
Sent: Tuesday, February 5, 2013 12:35:14 PM
Subject: Re: Peer consultation

Hello all--

A follow up. The changes in the attached are minor and really do not have much effect on your various programs. But the University does expect consultation and I would appreciate it if you could take a few moments and indicate your response to the changes.

Thanks a lot.

Steve

Steven A. Peterson
Director, School of Public Affairs
Penn State Harrisburg
777 W. Harrisburg Pike
Middletown, PA 17057

Phone: 717-948-6154
E-mail: sap12@psu.edu

----- Original Message ----- 
From: "STEVEN AMES PETERSON" <sap12@psu.edu>
To: "CHRISTOPHER ALAN CALKINS" <cxc20@psu.edu>, "Dennis Shea" <dgs4@psu.edu>, "RAFFY REINALDO LUQUIS" <orl100@psu.edu>, "Roger Anderson" <rta11@psu.edu>, "STEPHEN PATRICK SCHAPPE" <sxs28@psu.edu>
Cc: "ASHLEY EVALYNE MARRERO" <avm5176@psu.edu>, "KATE CORBIN TOMPKINS" <katespa@psu.edu>
Sent: Monday, January 21, 2013 9:41:07 AM
Subject: Peer consultation

Our Master of Health Administration programs has a handful of changes that need to be made: adding "regionally" to describe eligibility of students to apply; change in description of statistics/computer software to bring the language into consistency with the MPA program changes recently approved by the Graduate Council; updating the
I am sending this to each of you for any comments that you might have. The Graduate Council expects outreach to relevant programs in the system, even if changes are minor, to get their input/approval/disapproval. I look forward to your response.

Thanks.

Steve Peterson

Steven A. Peterson
Director, School of Public Affairs
Penn State Harrisburg
777 W. Harrisburg Pike
Middletown, PA 17057

Phone: 717-948-6154
E-mail: sap12@psu.edu

--

Dennis G. Shea, Ph.D.
Department Head and Professor of Health Policy and Administration
Penn State
604 Ford Building
University Park, PA 16802
Phone: 814-863-2901
Fax: 814-863-2905
Cell: 814-777-8086
Email: dshea@psu.edu

"Yet teaching would be a less satisfying, less demanding profession were it not for the fact that every committed teacher works within the possibility that a student will say: 'You changed my life'; to teach without some awareness of that possibility is to sell short teaching's great mysteries" Ken Elbe

"Of all the forms of inequality, injustice in health care is the most shocking and inhumane." Martin Luther King, Jr.
Hi, Dr. Petersen.

Roger Anderson and the Penn State MPH program support the proposed changes. Do you need an official letter of support?

Thank you,
Farah

Farah Kauffman, MPH
Associate Director for Operations
Penn State Master of Public Health (MPH) Program
Penn State College of Medicine
Department of Public Health Sciences, A210
600 Centerview Drive, Suite 2200
Hershey, PA 17033
Tel: (717) 531-4294
Fax: (717) 531-0608
fkauffman@psu.edu
http://www.mphprogram.psu.edu

Apply Now! The Penn State MPH Program is accepting applications for fall 2013 enrollment. The deadline to apply is March 1, 2013. To begin your application, please visit www.gradsch.psu.edu/portal.

-----Original Message-----
From: STEVEN AMES PETERSON [mailto:sap12@psu.edu]
Sent: Tuesday, February 05, 2013 12:35 PM
To: CHRISTOPHER ALAN CALKINS; Dennis Shea; Roger Anderson
Cc: ASHLEY EVALYNE MARRERO; KATE CORBIN TOMPKINS
Subject: Re: Peer consultation

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Steven A. Peterson  
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Middletown, PA 17057

Phone: 717-948-6154  
E-mail: sap12@psu.edu

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To: "CHRISTOPHER ALAN CALKINS" <cxc20@psu.edu>, "Dennis Shea" <dgs4@psu.edu>, "RAFFY REINALDO LUQUIS" <orl100@psu.edu>, "Roger Anderson" <rta11@psu.edu>, "STEPHEN PATRICK SCHAPPE" <sxs28@psu.edu>  
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Thanks.

Steve Peterson

Steven A. Peterson  
Director, School of Public Affairs  
Penn State Harrisburg  
777 W. Harrisburg Pike  
Middletown, PA 17057

Phone: 717-948-6154  
E-mail: sap12@psu.edu
Steve,

I have no problem with the changes submitted for the Master in Health Administration. Thus, you got my approval. Please let me know if you need any additional information from me.

Sincerely,

Raffy Luquis.

From: "STEVEN AMES PETERSON" <sap12@psu.edu>
To: "CHRISTOPHER ALAN CALKINS" <cxc20@psu.edu>, "Dennis Shea" <dgs4@psu.edu>, "RAFFY REINALDO LUQUIS" <orl100@psu.edu>, "Roger Anderson" <rta11@psu.edu>, "STEPHEN PATRICK SCHAPPE" <sxs28@psu.edu>
Cc: "ASHLEY EVALYNE MARRERO" <avm5176@psu.edu>, "KATE CORBIN TOMPKINS" <katespa@psu.edu>
Sent: Monday, January 21, 2013 9:41:07 AM
Subject: Peer consultation

Our Master of Health Administration programs has a handful of changes that need to be made: adding "regionally" to describe eligibility of students to apply; change in description of statistics/computer software to bring the language into consistency with the MPA program changes recently approved by the Graduate Council; updating the faculty listing.

I am sending this to each of you for any comments that you might have. The Graduate Council expects outreach to relevant programs in the system, even if changes are minor, to get their input/approval/disapproval. I look forward to your response.

Thanks.

Steve Peterson
Steve,

Thanks for the chance to review your proposed changes to the MHA.

The School of Business Administration has no objections and is pleased to support your proposal.

Regards,

Steve

Stephen P. Schappe, Ph.D.
Director, School of Business Administration
Penn State Harrisburg
777 W. Harrisburg Pike
Middletown, PA 17057
717-948-6141
http://hbg.psu.edu/sba
### GRADUATE COUNCIL COMMITTEE ON PROGRAMS AND COURSES

#### SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES

**PROGRAM, OPTION, OR MINOR PROPOSAL FORM**

Submit 1 copy of the proposal form and 25 copies of the supporting documentation as outlined on the reverse side of this form to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building. The proposals will be transmitted to the Dean of the Graduate School for consideration by the Graduate School’s Subcommittee on New and Revised Programs and Courses, and the Committee on Programs and Courses. For a detailed explanation of the form, see the [Guide to Curricular Procedures](#).

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### NEW PROGRAM, OPTION OR MINOR

Designation of program

Classification of Instructional Programs

Code (CIP)

Designation of option

Designation of minor

Indicate effective date

### OLD PROGRAM, OPTION, OR MINOR: Change X Drop _____

Old designation of program

Master of Professional Studies in Information Sciences

Old designation of option

Information Assurance and Decision Support

Old designation of minor

New designation of program (if changed)

Cybersecurity and Information Assurance

New designation of option (if changed) New designation of minor

Indicate effective date Fall 2013
SUPPORTING DOCUMENTATION REQUIRED FOR PROGRAMS, OPTIONS, OR MINORS (Adds, Changes, or Drops)

All proposals must include a justification statement for action being taken. Submit 1 copy of the proposal form and 25 copies of the supporting documents to the University Curriculum Coordinator at the University Faculty Senate Office. It is important that the proposal include a copy of the program in a format suitable for inclusion in the Graduate Degree Programs Bulletin. Prepare documentation in the outline format as shown below. The proposer is reminded that the Subcommittee and Committee reviewing the proposed program may not have knowledge of the field and is encouraged to provide as much documentation as possible for the reviewers. All proposals, whether a new program or a program change, must be consecutively paginated or the proposal will be returned to the proposing unit. In addition, a table of contents needs to be included in the proposal.

NEW PROGRAMS, OPTIONS* AND MINORS**

A. The objectives of the program: an explanation of how the proposal meets the new educational objectives and/or strengthens existing programs of the college(s) and the University; what students may expect to accomplish through the new program; and a statement of how the new offering does not duplicate other degree programs within the department/college/University.

B. A list of new courses to be established as a part of the new offering.

C. A complete program statement. This should be an arrangement of courses in accordance with degree requirements and with identification of the pattern of scheduling. A list of the required courses, typical electives, etc. that will logically be taken by a student enrolling in the new program should be included. Courses that are new courses should be distinguished from existing courses. Any statement must be submitted in a format for bulletin copy with additional material if necessary (provide both a hard copy and on diskette).
Program Change Proposal

Master of Professional Studies in Information Sciences

Contact: Dr. Peter K. Forster, Executive Director
Online Education, College of IST
Pkfl@psu.edu  (814) 863-8304
January 29, 2013
Summary

The Master of Professional Studies in Information Sciences (MPS-IS), first offered by the College of Information Sciences in fall 2009, was originally comprised of a base program and two options (i.e., Software Development and Information Assurance and Decision Support). The Software Development option was dropped in 2011 due to student migration to another Penn State online master of professional studies degree (Master of Professional Studies in Software Engineering). With one option remaining, the College is submitting a program change due to the results of rapid growth in the technology industry, changes in lexicon and faculty and student feedback on the curriculum collected over a 3-year period.

IST wishes to keep the broad Information Sciences degree designation to maintain the program’s flexibility to incorporate additional information sciences-related options in the future.

The following documentation outlines these proposed changes:

1) Option name change from Information Assurance and Decision Support to Cybersecurity and Information Assurance;
2) Core, Prescribed and Elective Course changes.
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# Supporting Documentation

A. Comparison of current vs. proposed requirements

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<th>Current Base Program</th>
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<tr>
<td>33 credits</td>
<td>33 credits</td>
<td>Information Assurance and Decision Support (33 credits)</td>
<td>Cybersecurity and Information Assurance (33 credits)</td>
<td>Option Name Change</td>
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Core Courses (9 credits)  
IST 552 (or INFSY 540), IST 554, IST 562.

Core Courses (9 credits)  
IST 852 (or INFSY 540), IST 554, IST 516.

Core Courses (9 credits)  
IST 552 (or INFSY 540), IST 554, IST 562.

Core Courses (9 credits)  
IST 852 (or INFSY 540), IST 554, IST 516.

- Replace Base and Option Core Courses
- IST 562 with IST 516
- IST 552 revised as 852 (course proposal attached)

<table>
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<tr>
<th>Master’s Project IST 594 (3 credits)</th>
<th>Master’s Project IST 594 (3 credits)</th>
<th>Master’s Project IST 594 (3 credits)</th>
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| Prescribed Courses (12 credits): IST 516, IST 521 (or IST 522), IST 532 (or IST 531) and IST 564 |
| Prescribed Courses (12 credits): IST 521 (or IST 522), IST 532 (or IST 531), IST 562 and IST 564 |
| Prescribed Courses (12 credits): IST 515, 555, IST/STAT 557, and IST 885 |
| Replace Prescribed Base and Option Courses: Base: IST 562 replaces IST 516 as a prescribed course Option: IST 456 replaces IST/STAT 557 IST 515 revised as 815 (course proposal attached) |
| Elective Courses (9 credits) |
| Elective Courses (9 credits) |
| Elective Courses (9 credits) |
| Elective Courses (9 credits): IST 451, 454, 564, or IN SC 561. |
| Specify Cybersecurity and Information Assurance Option Elective Courses |
B. Justification

New Option Name: The new option title, ‘Cybersecurity and Information Assurance’, better reflects the academic curriculum that is being taught by our faculty in this MPS-IS option. It also allows the College of IST to more effectively leverage our role as a National Security Agency (NSA) certified Center of Academic Excellence in Cyber Security and Information Assurance.

To a great extent, the current academic content being taught focuses on cyber security principles of maintaining the confidentiality, integrity, and accessibility of information rather than the breadth of an interdisciplinary option that focuses on information assurance and decision-support. The current curriculum provides in-depth exploration into understanding the nature of information and networks, recognizing the multiple internal and external threats posed to cyber-space, including preventing unwanted intrusions, illicit insider corruption or dissemination of data, and unexpected losses from natural or man-made disaster. It is a broad option that teaches approaches and skills that are applicable to the business, medical, and industrial sectors as well as government.

Students who successfully complete IST 451, 454, 456 and 554 are eligible to be certified by the NSA as an Information Systems Security Professional (NSA certification #4011). The option successfully prepares graduates to work in the areas of cyber-security and information assurance in the federal government or the private sector. With a growing national focus on cyber-security and information assurance, having an option that is highly recognized by government and industry enhances the reputation of the program, the College, and the University. By changing the name to ‘Cybersecurity and Information Assurance,’ the College is able to strengthen the connection between the option’s curriculum and this important certification.

Additionally, IST’s faculty expertise currently is more aligned with this new title and market research, conducted by the World Campus, indicates that the new title would have greater appeal in an increasingly competitive adult learner market space.

Finally, our faculty and former and current students contend that the title change more accurately coincides with their experience in the program and meets the latters’ expectations from the program.
Replace Base and Option Core Course: Penn State’s Graduate School requires a sharing of core courses among a base program and its related options. Meeting this requirement has provided an opportunity to change the core courses in the MPS-IS, more clearly differentiating the base program and the Cybersecurity and Information Assurance option. In the base program and the option’s core, IST 562 was replaced by IST 516. IST 516 Web and Internet Information Retrieval, a de facto substitute for many students over the past two years, offers highly relevant information that is pertinent to students’ work responsibilities. IST 562: Introduction to Theoretical Foundations of Information Science was developed with competencies directed toward a single organization. The course objectives are more theoretical and require advanced mathematical skills. Our assessments indicate these requirements appeal to a small set of students who are seeking skills that support industrial-focused research, but are less relevant to many students expecting the MPS to be more application oriented. Retaining IST 562 as a prescribed course in the base program allows us to serve the small subset of students and more clearly differentiates the more theoretical base program from the more applied option.

When the program was developed, limited consideration was given to using 800-level courses. As the program has matured, it has become apparent that an important program competency is to offer curriculum and approaches that facilitate transferring knowledge and skills to the workplace. The applied focus of 800-level courses facilitates this process. As a result, IST 552 and 515 are being revised to meet the requirements for being re-numbered as IST 852 and 815, respectively.

Replace Prescribed Requirement: Given that faculty expertise and curriculum focus have been on cybersecurity and information assurance, making IST 456: Security and Risk Management a prescribed course strengthens, integrates and synthesizes the goals of the curriculum. Although a 400-level course, the IST 456 content offers an applied approach to network security and risk management that is critical to understanding cybersecurity. IST/STAT 557 (STAT 897D), was less integrated and provided limited tangible benefits to the curriculum. Additionally, IST/STAT 557 presented a heavily theoretical approach that is important in a PhD program but does not meet the spirit or mission of an MPS as does IST 456.

Cybersecurity and Information Assurance Option Elective Courses: By specifying elective choices for the Cybersecurity and Information Assurance option, students have a more direct pathway for degree completion and may take better advantage of the NSA certifications associated with this program. The elective choices are IST 451 Network Security, 454 Computer and Cyber Forensics, 564 Crisis, Disaster and Risk Management, and IN SC 561 Web Security and Privacy.
C. Departments Affected by the Changes

Overall, the impact on other departments is anticipated to be minimal. This change does impact the Eberly College of Science because IST/STAT 557 would no longer be part of the degree program.

There is a potential concern that the Cybersecurity and Information Assurance option duplicates the Computer Science and Engineering (CSE) option, which is approved but not operational, in the inter-college Master of Professional Studies in Homeland Security (iMPS in HLS). The Cybersecurity and Information Assurance option, in fact, complements the other options in the iMPS in HLS by introducing human-centric analysis to what goes on outside the computer as it relates to homeland security topics such as preventing terrorist attacks, the use of chemical, biological, radiological, or nuclear materials in the United States, and reducing the vulnerability of critical infrastructure. Human-centric refers to both the psychological and data mining aspects of human-computer interaction. It is based on the understanding that the human remains at the center of analytic processes and is ultimately responsible for understanding the nuances of data mining and data interpretation.

Furthermore, the Cybersecurity and Information Assurance option appeals to a significantly broader and different audience than just those involved in homeland security strategy and operations. This program takes a multidimensional perspective on cyber-domains that is defined by using a socio-technical approach to generate solutions to complex problems. This approach integrates the technical aspects of cyber-security with the human or individual, organizational, and social influences.

The knowledge and skills acquired in the Cybersecurity and Information Assurance option have broad government and industry application. Key concepts such as identifying and mitigating the insider threat or using structured analytics to improve situational awareness are critical to ensuring information confidentiality, integrity, and accessibility. The option is designed to improve the knowledge and skills of cybersecurity specialist whether they are managing medical records for Highmark, conducting information operations against Iran or mitigating a network intrusion at Bank of America.
Information Sciences and Technology (IST)

DAVID L. HALL, Dean, College of Information Sciences and Technology
MICHAEL McNEESE, Associate Dean for Research and Graduate Programs

Office of the Dean
College of Information Sciences and Technology
The Pennsylvania State University
332 Information Sciences and Technology Building
University Park, PA 16802-6823
Dean's office: 814-865-3528; Graduate office: 814-865-8711

Degree Conferred

Ph.D., M.S.

M.P.S. in Information Sciences

The Graduate Faculty

University Park:
Reka Albert, Ph.D. (Notre Dame) Affiliate Associate Professor of Information Sciences and Technology; Associate Professor of Physics
John W. Bagby, J.D. (Tulsa) Professor of Information Sciences and Technology
Christian Brady, Ph.D. (Oxford) Dean, Schreyer Honors College; Affiliate Professor of Information Sciences and Technology; Associate Professor of Classical Studies and Jewish Studies
Guoray Cai, Ph.D. (Pittsburgh) Associate Professor of Information Sciences and Technology, Geography, and Computer Science and Engineering
Brian Cameron, Ph.D. (Penn State) Senior Lecturer in Information Sciences and Technology
John Carroll, Ph.D. (Columbia) Edward M. Frymoyer Chair Professor of Information Sciences and Technology
Chao-Hsien Chu, Ph.D. (Penn State) Professor of Information Sciences and Technology; Director, Professional Master's Degrees; Affiliate Professor, Management Science and Information Systems, Smeal College of Business
Shawn Clark, Ph.D. (Penn State) Senior Lecturer in Information Sciences and Technology
Henry C. “Hank” Foley, Ph.D. (Penn State) Vice President for Research and Dean of the Graduate School; Professor of Information Sciences and Technology, and Chemical Engineering
Frederico T. Fonseca, Ph.D. (Maine) Associate Dean for Undergraduate Studies; Associate
Professor of Information Sciences and Technology, Geography, and Computer Science and Engineering
Peter K. Forster, Ph.D. (Penn State) Senior Lecturer in Information Sciences and Technology
C. Lee Giles, Ph.D. (Arizona) David Reese Professor of Information Sciences and Technology; Professor of Computer Science and Engineering
Edward J. Glantz, Ph.D. (Penn State) Professor of Practice in Information Sciences and Technology
Christopher H. Griffin, Ph.D. (Penn State) Affiliate Faculty of Information Sciences and Technology; Research Associate, Applied Research Lab
Jens Grossklags, Ph.D. (California, Berkeley) Assistant Professor of Information Sciences and Technology
David L. Hall, Ph.D. (Penn State) Dean; Professor of Information Sciences and Technology, and Electrical Engineering
John Harwood, Ph.D. (Nebraska) Senior Director, Teaching and Learning with Technology; Associate Professor of Information Sciences and Technology; Associate Professor of English
Steven R. Haynes, Ph.D. (London School of Economics) Senior Lecturer in Information Sciences and Technology
John Horgan, Ph.D. (Univ College, Cork, Republic of Ireland) Associate Professor of Information Sciences and Technology; Associate Professor of Science, Technology, and Society; Director, International Center for the Study of Terrorism
Bernard James Jansen, Ph.D. (Texas A&M) Associate Professor of Information Sciences and Technology
Alexander Klippel, Ph.D. (Bremen) Assistant Professor of Geography; Affiliate Faculty, College of Information Sciences and Technology
Soundar Kumara, Ph.D. (Purdue) Affiliate Professor of Information Sciences and Technology
Lynette Kvasny, Ph.D. (Georgia State) Associate Professor of Information Sciences and Technology
Phillip LaPlante, Ph.D. (Stevens Inst) Professor of Software Engineering and Affiliated Faculty of Information Sciences and Technology
Dongwon Lee, Ph.D. (UCLA) Associate Professor of Information Sciences and Technology; Affiliate Associate Professor of Computer Science and Engineering
Ping Li, Ph.D. (Leiden) Professor of Psychology and Linguistics; Affiliate Professor of Information Sciences and Technology
Peng Liu, Ph.D. (George Mason) Professor of Information Sciences and Technology; Affiliate Professor of Computer Science and Engineering, and Information Systems and Supply Chains
Carleen Maitland, Ph.D. (Delft University of Technology) Associate Professor of Information Sciences and Technology
Alan MacEachren, Ph.D. (Kansas) Affiliate Professor of Information Sciences and Technology; E. Willard and Ruby S. Miller Professor of Geography
William McGill, Ph.D. (Maryland), Assistant Professor of Information Sciences and Technology
Michael D. McNeese, Ph.D. (Vanderbilt) Associate Dean of Research and Graduate Programs; Professor of Information Sciences and Technology, and Psychology
Prasenjit Mitra, Ph.D. (Stanford) Associate Professor of Information Sciences and Technology
Burt Monroe, Ph.D. (Oxford) Affiliate Faculty of Information Sciences and Technology
David Mudgett, Ph.D. (Yale) Senior Lecturer in Information Sciences and Technology
Karl Mueller, Ph.D. (California, Berkeley) Professor of Chemistry; Affiliate Professor of
Information Sciences and Technology
Rosalie Ocker, Ph.D. (Rutgers) Senior Lecturer in Information Sciences and Technology
Irene Petrick, Ph.D. (Penn State) Senior Lecturer in Information Sciences and Technology
Erika Poole, Ph.D. (Georgia Tech) Assistant Professor of Information Sciences and Technology
Sandeep Purao, Ph.D. (Wisconsin–Milwaukee) Associate Professor of Information Sciences and Technology
Pamda Raghavan, Ph.D. (Penn State) Professor of Computer Science and Engineering; Affiliate Professor of Information Sciences and Technology
A. (Ravi) Ravindran (California, Berkeley) Professor of Industrial Engineering; Chair, Enterprise Integration Consortium
Madhu Reddy, Ph.D. (California, Irvine) Associate Professor of Information Sciences and Technology
Frank E. Ritter, Ph.D. (Carnegie Mellon) Professor of Information Sciences and Technology, Computer Science and Engineering, and Psychology
Mary Beth Rosson, Ph.D. (Texas at Austin) Professor of Information Sciences and Technology
Timothy Ryan, Ph.D. (Texas at Austin) Assistant Professor of Biological Anthropology and Geosciences; Assistant Professor of Information Sciences and Technology
Jungwoo Ryoo, Ph.D. (Kansas) Assistant Professor of Information Sciences and Technology
Gerald M. Santoro, Ph.D. (Penn State) Senior Lecturer in Information Sciences and Technology
Stuart Selber, Ph.D. (Michigan Tech) Associate Professor of English and Science, Technology, and Society; Affiliate Associate Professor of Information Sciences and Technology
Donald Shemanski, J.D. (Georgetown) Professor of Practice in Information Sciences and Technology
Timothy Simpson, Ph.D. (Georgia Tech) Professor of Mechanical Engineering and Industrial Engineering; Affiliate Professor of Information Sciences and Technology
Allan Sonsteby, Ph.D. (Penn State) Affiliated Faculty of Information Sciences and Technology; Associate Director, Communications and Navigation Office
Anna Squicciarini, Ph.D. (University of Milan, Italy) Assistant Professor of Information Sciences and Technology
Andrea Tapia, Ph.D. (New Mexico) Associate Professor of Information Sciences and Technology
James B. Thomas, Ph.D. (Texas) Dean, Smeal College of Business; Professor of Information Sciences and Management
Eileen M. Trauth, Ph.D. (Pittsburgh) Professor of Information Sciences and Technology; Affiliate Professor of Women's Studies, International Affairs, Labor Studies and Employee Relations, Management and Organization
James Z. Wang, Ph.D. (Stanford) Professor of Information Sciences and Technology, and Computer Science and Engineering
Dinghao Wu, Ph.D. (Princeton) Senior Lecturer and Research Scientist in Information Sciences and Technology
Heng Xu, Ph.D. (National Singapore) Assistant Professor of Information Sciences and Technology
Jinzhao Xu, Ph.D. (Cornell) Distinguished Professor of Mathematics; Affiliate Faculty of Information Sciences and Technology
John Yen, Ph.D. (California, Berkeley) Director, Strategic Research Initiatives; Professor of Information Sciences and Technology; Affiliate Professor of Computer Science and Engineering
Xiaolong (Luke) Zhang, Ph.D. (Michigan) Associate Professor of Information Sciences and Technology
Sencun Zhu, Ph.D. (George Mason) Associate Professor of Information Sciences and Technology, and Computer Science and Engineering

**Great Valley:**
Adrian Sorin Barb, Ph.D. (Missouri) Assistant Professor of Information Science
Joanna F. DeFranco, Ph.D. (New Jersey Inst of Tech) Assistant Professor of Information Science
Kathryn W. Jablokow, Ph.D. (Ohio State) Associate Professor of Mechanical Engineering
Phillip A. Laplante, Ph.D. (Stevens Inst) P.E. Professor of Software Engineering
John I. McCool, Ph.D. (Temple) Distinguished Professor of Systems Engineering
Colin Neill, Ph.D. (Wales, United Kingdom) Associate Professor of Software Engineering
James Nemes, D.Sc. (George Washington) Division Head and Professor of Mechanical Engineering
Michael J. Piovoso, Ph.D. (Delaware) Professor of Electrical Engineering
Robin G. Qiu, Ph.D. (Penn State) Associate Professor of Information Science
David W. Russell, Ph.D. (Council for National Academic Awards, United Kingdom) Professor of Electrical Engineering
Raghvinder S. Sangwan, Ph.D. (Temple) Associate Professor of Information Science
Kailasam Satyamurthy, Ph.D. (Clemson) Assistant Professor of Information Science

**Harrisburg:**
Melvin L. Billingsley, Ph.D. (George Washington) Professor of Information Systems
Gregory A. Crawford, Ph.D. (Rutgers) Librarian; Director, Penn State Harrisburg Library
Rhoda Joseph, Ph.D. (CUNY, Baruch College), Assistant Professor of Information Systems
Roderick Lee, Ph.D. (Penn State) Assistant Professor of Information Systems
Parag C. Pendharkar, D.B.A. (Southern Illinois) Professor of Information Systems
Girish Subramanian, Ph.D. (Temple) Professor of Information Systems
Gayle J. Yaverbaum, Ph.D. (Temple) Professor of Information Systems

**Program Description**

The Doctor of Philosophy degree in Information Sciences and Technology offers advanced graduate education for students contemplating careers in academic teaching and research, or research in a non-academic setting. The program is interdisciplinary in nature and expects scholarship at the highest level exhibiting depth of competency in at least one of the core areas of the Information Sciences and Technology and an understanding of the integration of the critical constructs that drive the field: people, information, and technology.

The Master of Science in Information Sciences and Technology is an interdisciplinary degree program that focuses on the theoretical, application-oriented, and educational issues facing a digital, global economy. The program is designed to build an understanding of how information and technology fundamentally impact (and are impacted by) people, organizations, and the world community. Topical areas within IST span a broad range including: human computer interaction,
computational techniques, applications (e.g., bio-informatics and geographical information systems), societal issues (such as digital divide issues), user issues (e.g., computer-aided cognition), and information systems design and development providing exposure and grounding in many of the aspects of the information sciences. The program is especially attractive to students interested in gaining state-of-the-art understanding of information technology and its use as a solution in multiple venues.

The Master of Professional Studies in Information Sciences (also referred to as Master in Information Sciences as an abbreviated program name) is an innovative program that targets professionals and organizational leaders who wish to seek a professional education and training program that can (1) empower them to assume greater responsibilities related to information sciences and information technologies, and/or (2) assist them in transitioning into a career that utilizes information science and information technologies to deal with information-centric challenges. The purpose of the proposed professional master program is to produce professionals and organizational leaders who not only can select and draw upon the necessary foundations within the information sciences and information technology areas, test the applicability of these foundations for addressing a given issue, and apply resulted solutions, but also can be aware of the multitude of technological trends and environmental factors that organizations must address in the changing global economy.

The Master of Professional Studies in Information Sciences (MPS-IS) is an innovative program that targets professionals and organizational leaders who wish to seek a professional education and training program. The purpose of the professional master program is to produce professionals and organizational leaders who not only can select and draw upon the necessary foundations within the information sciences and information technology areas, test the applicability of these foundations for addressing a given issue, and apply resulted solutions, but also can be aware of the multitude of technological trends and environmental factors that organizations must address in the changing global economy.

The MPS-IS equips students to be able to:

a. Understand and analyze the profound information and technological changes sweeping the world;
b. Meet the challenges by developing innovative solutions using the foundations of information sciences and technology;
c. Have a clear advantage in today’s highly competitive and dynamic environment by continuously learning new trends, issues and innovations.

Admission Requirements

Requirements listed here are in addition to general Graduate Council requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin. Applicants must hold either
(1) a baccalaureate degree from a regionally accredited U.S. institution or (2) a tertiary (postsecondary) degree that is deemed comparable to a four-year bachelor’s degree from a regionally accredited U.S. institution. This degree must be from an officially recognized degree-granting institution in the country in which it operates. Applicants are required to submit scores from the general portions of the Graduate Record Examinations (GRE) or the Graduate Management Admissions Test (GMAT), three letters of reference, and a one-three page personal statement of relevant experience and goal. In addition, applicants to the Ph.D. and M.S. programs are required to submit a current resume, statement of research interests, and a sample of applicant's writing (e.g., technical paper, etc.). The GRE or GMAT requirement may be waived for applicants to the Professional Master Program if the student has five or more years of relevant information sciences and technology working experience.

Because the program is multidisciplinary in nature, students from many different disciplines may be acceptable for entry into the program. A bachelor's degree in a related area (e.g., engineering and science), while not necessary for admission, is helpful in the successful completion of the degree. It is expected that students will have a basic level of competency in statistics as well as computer and information technology (related work experience can be used to demonstrate such competency). A student may be accepted into the program with "provisional status" for no more than one year while work is completed to meet these expectations.

It is expected that the successful applicant has an overall grade point average of 3.00 (on a 4.00 scale) or higher for their undergraduate study (and/or graduate-level studies). However, accomplishments demonstrated through work experience and recommendation letters from the applicant’s academic adviser or employer will also play an important role in making the admission decision. The most qualified applicants will be accepted into the program until all spaces for new students are filled.

The language of instruction at Penn State is English. All international applicants must take and submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, or a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). Applicants with iBT speaking scores between 15 and 22 18 may be considered for provisional admission, which requires completion of specified remedial English courses ESL 114G (American Oral English for Academic Purposes) and/or ESL 116G (ESL/Composition for Academic Disciplines) and attainment of a grade of B or higher. The minimum acceptable composite score for the IELTS is 6.5.

International applicants are exempt from the TOEFL/IELTS requirement who have received a baccalaureate or a graduate degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, and Wales.

**Degree Requirements**
Doctoral Degree Requirements

The doctoral degree requirements include the general requirements of the Graduate Council as listed under the Doctoral Degree Requirements. To complete a Ph.D. degree, students must in their first semester take the 6-credit introduction to interdisciplinary research methods (IST 501), one of the three foundations courses (IST 510, IST 520, IST 530), and one credit of graduate colloquium (IST 590). In their second semester, students must take the remaining two foundations courses and a second credit of graduate colloquium.

In addition to these first-year requirements, doctoral students must complete 12 credits of research methodology courses selected to introduce or amplify methods relevant to their doctoral research agenda, and 12 credits of specialization courses, also selected to reinforce their research training.

In addition, all candidates must be competent in the English language and must have demonstrated skills in the communication of ideas both verbally and in writing commensurate with the requirement of scholarly and professional work. The candidacy examination will be used as an occasion to assess English proficiency and plan for remediation (including additional courses, mentoring, or experiences) for all students. A brief critical literature review in three complementary research areas will be included as part of the candidacy assessment process. The foreign language and communication requirement may be fulfilled through demonstrating computer language proficiency (assessed through courses taken) or a minimum of 9 credits of 500-level statistics courses. Students must have completed 18 graduate credits before taking the candidacy exam and must complete the candidacy exam within three semesters. Students must pass the Ph.D. comprehensive examination after completion of most of the course work, usually at the end of the student’s second year in the program. A research-based dissertation must be completed under the direction of the Ph.D. committee, with the student submitting a dissertation proposal and defending that proposal in the defense examination.

General guidance of a doctoral candidate is the responsibility of a doctoral committee consisting of four or more active members of the Graduate Faculty, which includes at least two faculty members in the major field. The dissertation adviser must be a member of the doctoral committee. The dissertation adviser usually serves as chair, but this is not required. If the candidate is also pursuing a dual-title field of study, a co-chair representing the dual-title field must be appointed.

At least one regular member of the doctoral committee must represent a field outside the candidate’s major field of study in order to provide a broader range of disciplinary perspectives and expertise. This committee member is referred to as the "Outside Field Member." In cases where the candidate is also pursuing a dual-title field of study, the dual-title representative to the committee may serve as the Outside Field Member.

Additionally, in order to avoid potential conflicts of interest, the primary appointment of at least one regular member of the doctoral committee must be in an administrative unit that is outside the unit in which the dissertation adviser’s primary appointment is held (i.e., the adviser’s administrative home; in the case of tenure-line faculty, this is the individual’s tenure home). This
committee member is referred to as the "Outside Unit Member." In the case of co-advisers, the Outside Unit Member must be from outside the administrative home(s) of both co-advisers. In some cases, an individual may have a primary appointment outside the administrative home of the student’s dissertation adviser and also represent a field outside the student’s major field of study; in such cases, the same individual may serve as both the Outside Field Member and the Outside Unit Member.

M.S. Degree Requirements

The M.S. in Information Sciences and Technology requires a minimum of 30 credits at the 400 level or above, with at least 18 credits at the 500 level or above; 27 of the 30 credits must be earned at University Park. These credits are distributed among the following requirements:

**Core Courses (9 credits).** All candidates are expected to develop a broad understanding of the core constructs of people, information, technology, and the significant interactions among those elements by choosing 3 from the following: IST 501, IST 511 or IST 512, IST 521 or IST 522, IST 531 or IST 532.

**Specialization Courses (12-15 credits).** In consultation with his/her advisor, a candidate is expected to choose courses in one or more areas customized to support the thesis or project requirement. In addition to advanced courses in IST, a support area could be in law, business, education, engineering, the liberal arts, science, or any area that is linked to the information sciences. Students pursuing the thesis option must take 12 credits of specialization courses; those pursuing the project option must take 15 credits.

**Research Methods (3 credits).** All candidates must develop a basic understanding of the research methods utilized in the information sciences, by taking at least one research methods course offered in IST or elsewhere. The focus of the course must be on the methods being learned rather than application of some method to a research topic.

**Thesis or Project (3-6 credits).** Students may choose a thesis or project option. Students who choose the thesis option must write a thesis and register for 6 credits of IST 600. The thesis should focus on a well-defined problem relevant to the information sciences. Students who choose the project option must complete a project and register for 3 credits of IST 594. The project is to be a focused piece of technical work that applies the student's expertise and knowledge base, and that is documented and presented as a research paper. The student must present the thesis or project in a public presentation and successfully defend the thesis/project to the adviser and committee.

**Language and Communication.** All candidates must be competent in the English language and must have demonstrated skills in the communication of ideas both orally and in writing commensurate with the requirement of professional work. The foreign language and communication requirement may be fulfilled through demonstrating computer language proficiency (assessed through courses taken).
M.P.S. Degree Requirements

The Master of Professional Studies degree in Information Sciences program requires a minimum of 33 credits, 24 of which must be earned at Penn State. Up to 9 graduate credits may be transferred in from an accredited institution (as is permissible by the Graduate School). At least 18 credits must be courses at the 500 level and above. A student will first take 9 credits of core courses. The student will then take 12 credits of prescribed courses for the base program or the Information Assurance and Decision Support (IADS) Option. The remaining 9 course credits of electives are chosen in consultation with the student’s advisor. Lastly, the student must complete a master project guided by the student’s advisor. A student can choose to be in the Base Program or in the IADS Option. These credits are distributed among the following requirements:

The MPS-IS program requires a minimum of 33 credits, 24 of which must be earned at Penn State. Up to 9 graduate credits may be transferred in from an accredited institution (as is permissible by the Graduate School). At least 18 credits must be courses at the 500 level and above. A student will first take 9 credits of core courses. The student will then take 12 credits of prescribed courses for the base program or the Cybersecurity and Information Assurance Option. An additional 9 credits are elective courses. Lastly, the student must complete a master project guided by the student’s advisor. A student can choose to be in the Base Program or in the Cybersecurity and Information Assurance (CIA) Option. These credits are distributed among the following requirements and reflected by completion of 3 credits of IST 594.

Core Courses (9 credits). The core of the Master in Information Sciences program consists of four courses — IST 552 (or INFSY 540), IST 554, IST 562, and IST 594 — for a total of 12 credits. The core of the MPS-IS consists of three courses — IST 852 or INFSY 540, IST 554, and IST 516 — These courses represent the core technical foundations to study Information Sciences and Technology.

The Base Program (12 credits of prescribed courses and 9 credits of electives). The base program consists of four prescribed (required) courses — IST 562, IST 521 (or IST 522), IST 532 (or IST 531) and IST 564 — and 9 credits of elective courses, in addition to the 9-credit core and three 3-credit capstone course. It is designed for students who do not have a special interest in mind. The elective courses are chosen in consultation with the student’s advisor. Hence, it offers the flexibility that enables the student to build an in-depth knowledge and skills about information sciences tailored to his/her interests and background. Students from the Harrisburg region can also select courses from Penn State Harrisburg Campus to fulfill the prescribed courses (by substitution) and 9 credits of electives.

Master’s Project (3 credits). The project requires all students in the MPS-IS Master in Information Sciences program to focus on a well-defined issue or problem relevant to the information sciences and technology. The student will submit a project proposal to his/her faculty advisor for approval. Upon completion of the project, the student will share or present the project results at a final presentation as a component of IST 594.

Information Assurance and Decision Support (IADS) Option (12 credits of prescribed courses and 9 credits of electives). The IADS option consists of four prescribed (required) courses, IST
515, IST 555, IST/STAT 557, and IST 885, and 9 credits of elective courses, in addition to the 9-
credit core and three-credit capstone courses. These courses enable the student to focus on
developing knowledge and skills for information analysis, information assurance and decision
support including theories, techniques, and applications of data mining, data fusion, information
search, information security, and intelligent resource allocation. Students who prefer more
flexibility in time and location can take the online courses, offered through World Campus as
meeting elective requirements.

Cybersecurity and Information Assurance (CIA) Option (12 credits of prescribed courses and 9
credits of electives). The CIA option consists of four prescribed (required) courses, IST 815, IST
555, IST456, and IST 885, 9 credits of elective courses, IST 451, 454, 564, or IN SC 561,
in addition to the 9-credit core and three-credit capstone courses. These courses enable the
student to focus on developing knowledge and skills for information analysis, information
assurance and decision support including theories, techniques, and applications of data mining,
data fusion, information search, information security, and intelligent resource allocation.

Master’s Project (3 credits). The project requires all students in the Master MPS-IS to focus on a
well-defined issue or problem relevant to the information sciences and technology. The student
will submit a project proposal to his/her faculty advisor for approval. Upon completion of the
project, the student will share or present the project results at a final presentation as a component
of IST 594.

Language and Communication. All candidates must be competent in the English language and
must have demonstrated skills in the communication of ideas both orally and in writing
commensurate with the requirement of professional work. The foreign language and
communication requirement may be fulfilled through demonstrating computer language
proficiency (assessed through courses taken).

Courses

Graduate courses carry numbers from 500 to 699 or 800 to 899. Advanced undergraduate
courses numbered between 400 and 499 may be used to meet some graduate degree requirements
when taken by graduate students. Courses below the 400 level may not. A graduate student may
register for or audit these courses in order to make up deficiencies or to fill in gaps in previous
education but not to meet requirements for an advanced degree.
D. Evidence of Consultation

College of Science
From: ANDREW GEORGE STEPHENSON [mailto:as4@psu.edu]
Sent: Monday, December 17, 2012 1:48 PM
To: Brandy Bower
Subject: Re: REQUEST for Consultation - MPS in Information Sciences

Mike,
The proposed changes for the Master of Professional Studies in Information Sciences (MPS-IS) are fine with the College of Science. --Andy

Andrew G Stephenson
Distinguished Professor of Biology
Associate Dean for Research and Grad Education
Eberly College of Science
Penn State University
517 Thomas Building
University Park, PA 16802
(814) 865-9591

Great Valley
From: Nemes, James [mailto:jan16@gv.psu.edu]
Sent: Thursday, January 03, 2013 2:41 PM
To: Pete Forster
Subject: RE: REQUEST for Consultation - MPS in Information Sciences

Pete,

We have no objection to the option name change or curriculum change. Since the Software Option has been removed and Great Valley faculty do not contribute to the base or remaining option, it probably makes sense to remove them from the faculty listed in the Bulletin.

Best of luck with the proposal.

Jim

James A. Nemes, D.Sc.
Interim Director of Academic Affairs
Professor of Mechanical Engineering
School of Graduate Professional Studies
Penn State Great Valley
30 East Swedesford Road
Malvern, PA 19355-1443
Phone: 610-648-3335
Fax: 610-648-3377
jan16@psu.edu
World Campus

From: DAVID M SYLVIA [mailto:dms39@psu.edu]
Sent: Thursday, December 20, 2012 8:45 AM
To: Pete Forster
Cc: Brandy Bower; Sonya Leitzell
Subject: REQUEST for Consultation - MPS in Information Sciences

Pete,

The World Campus supports the proposed name change of the option in the Master of Professional Studies in Information Sciences to Cybersecurity and Information Assurance. We are pleased to continue our partnership with the College of Information Sciences and Technology to deliver the MPS in IS under Revenue Distribution Category (RDC) 2 as described in the Memorandum of Agreement dated June 17, 2011. We do have a few suggested edits on the proposal that are noted directly in the attached document file.

We also look forward to working with IST in the coming year on additional market driven options for this professional graduate degree.

Best regards,
David

******************************************************************************

David M. Sylvia, Professor
Director of Academic Affairs for Graduate Programs
Penn State Online, The World Campus
222G Outreach Building
University Park, PA 16802-7012
Office: 814-865-3397, Fax: 814-863-7042
e-mail: dmsylvia@psu.edu
For students: www.worldcampus.psu.edu
For faculty: weblearning.psu.edu/world-campus
Dear Pete,
Thanks for the opportunity to review the program change proposal. We support your efforts and wish you well.

Regards,
Peter Idowu, Ph.D., P.E.
Assistant Dean for Graduate Studies
Associate Professor of Electrical Engineering

Penn State Harrisburg
C-114 Olmsted Building
777 W. Harrisburg Pike, Middletown PA 17057
(717) 948-6303 - Phone
(717) 948-6737 - Fax
idowu@psu.edu

College of Engineering
Consultation requested:
Appendix E, Page E24

From: "Brandy Bower" <bbower@ist.psu.edu>
To: "Brandy Bower" <bbower@ist.psu.edu>
Cc: "fan1@psu.edu", "nua1@psu.edu", "as4@psu.edu", "as4@psu.edu", "pl1@psu.edu", "pl1@psu.edu", dms96@psu.edu
Sent: Tuesday, December 11, 2012 1:39 PM
Subject: REQUEST for Consultation - MPS in Information Sciences

Sent on behalf of Michael McNeese, Associate Dean for Research, Graduate Studies and Academic Affairs in the College of Information Sciences and Technology

Dear Colleagues,

Attached for your review is a program change for the Master of Professional Studies in Information Sciences (MPS-IS). The summary pages at the beginning of this document outline the proposed changes which include:

1. Changing the option name to Cybersecurity and Information Assurance from Information Assurance and Decision Support, and
2. A slight revision of the MPS-IS core curriculum to meet Graduate School requirements.

During the summer you provided feedback on our proposal to change the name of the MPS-IS. We took your suggestions seriously and agree that maintaining the MPS-IS as a broad degree meets the University’s and the College’s goals. Thus, we are proposing to change the name of our option name to more clearly reflect the curriculum that is being taught and to strengthen our connections to the National Security Agency. We greatly appreciate your review and support of this change. Please e-mail Peter Forster (pk1@psu.edu) and Brandy Bower (bbower@ist.psu.edu) with your comments and support.

Your reply would be appreciated before leaving for the holiday break.

Sincerely,

Mike McNeese

c/o Brandy Bower

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Brandy L. Bower
Assistant to the Associate Dean for Research, Graduate Studies and Acad. Affairs
College of Information Sciences and Technology
The Pennsylvania State University
333 IST Building
University Park, PA 16802-4823
814-865-6370
814-865-5514 (Fax)

Dear,

Thank you for the same-sex look forward to reviewing the proposal.

Drew

Dear,

We are preparing to submit a program change for Master of Professional Studies in Information Sciences and have asked for RPS support as part of the consultation process. The proposed change includes re-naming our Information Assurance and Decision Support option to Cybersecurity and Information Assurance and a few related course changes. The new option title better reflects the academic curriculum that is being taught by our faculty and allows us to now effectively leverage our role as a National Security Agency certified Center of Academic Excellence in Cyber Security and Information Assurance.

In the past, a concern was raised that our name might compete with Engineering’s planned option in Computer and Network Security (CNS) in the MPS in Homeland Security. Our curriculum takes a multi-dimensional perspective on cyber-security that is defined by using a socio-technical approach to provide solutions to complex problems. It explores the nature of information and networks and recognizes the multiple external threats posed to cyber-space. Our approach integrates the human or individual organizational, and social influences of cybersecurity with the technical aspects, interest in human-centric analysis to understand threats and vulnerabilities in cyber-space extends beyond the Homeland Security/Intelligence and encompasses industry, government, and the non-profit organizations regardless of their specialty.

I believe our option complements the forthcoming CNS option and may provide opportunities for inter-College cooperation on a new certificate. We look forward to Engineering’s support for the change and discussion on collaboration.

Drew

David L. Hall
Dean and Professor
College of Information Sciences and Technology
Phone: 814-865-5514
GRADUATE COUNCIL COMMITTEE ON PROGRAMS AND COURSES

SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES PROGRAM, OPTION, OR MINOR PROPOSAL FORM

Submit 1 copy of the proposal form and 25 copies of the supporting documentation as outlined below to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building. The proposals will be transmitted to the Dean of the Graduate School for consideration by the Graduate School's Subcommittee on New and Revised Programs and Courses, and the Committee on Programs and Courses. For a detailed explanation of the form, see the Guide to Curricular Procedures.

College Department or Instructional Area
College of Agricultural Sciences, Department of Agricultural and Biological Engineering

NEW PROGRAM, OPTION OR MINOR

Designation of program
BioRenewable Systems
Classification of Instructional Programs
Code (CIP)
Designation of option
Designation of minor

Indicate effective date Fall 2013

OLD PROGRAM, OPTION, OR MINOR: Change ______ Drop ______

Old designation of program

Old designation of option

Old designation of minor

New designation of program (if changed)

New designation of option (if changed)

New designation of minor (if changed)

Indicate effective date

SUBMITTED BY

NOTED BY

APPROVED BY

RECOMMENDED BY

NOTED BY

Date 11/2/12
Date 19 December, 2012
Date 12/17/2012
Date 3/20/2013
Date 9/15/2013
Date 9/19/2013

SUPPORTING DOCUMENTATION REQUIRED FOR PROGRAMS, OPTIONS, OR MINORS
(Adds, Changes, or Drops)

http://www senate.psu.edu/curriculum_resources/guide/grad_proposal_form.html[10/16/2012 1:09:10 PM]
Proposal for a New Graduate Program

BioRenewable Systems (BRS)

Unit Proposing the New Graduate Program:
Department of Agricultural and Biological Engineering
Contact Information: Paul H. Heinemann, Head
Email: phh@psu.edu
Telephone: 814-865-2633

College Affiliation:
College of Agricultural Sciences
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A. Objectives of the Program

The overall goal is to establish a world renowned research-oriented graduate program in renewable biologically-based materials, products, and processes that fully integrates scientific research with the principles of systems technology, business, management, marketing, leadership development, and entrepreneurship. Toward that end, the major objectives are:

1. Offer M.S. and Ph.D. graduate degrees that integrate science and technology with business, management, marketing, entrepreneurship, and leadership;
2. Provide advanced educational and research experiences that prepare graduates to lead the development and advancement of the growing biobased economy via industrial, governmental, and academic positions;
3. Develop and maintain a high-quality graduate degree program for students who otherwise might have wanted to apply to the Agricultural and Biological Engineering (ABE) graduate program but who do not have an undergraduate engineering but are qualified for an advanced degree in biorenewable systems;
4. Offer a competitive graduate degree program for students specifically interested in science and business-related aspects of biobased products and materials such as wood and wood-based products, bioenergy, and sustainable/renewable biological systems;
5. Promote advanced, interdisciplinary research addressing the science, technology, and business approaches to sustainable and safe bioenergy, bio-based materials, and bioproducts and their supply chains, including the integration of marketing, management, entrepreneurship, and leadership; and
6. Enhance economic development by offering a continuing supply of well-educated and qualified future employees to both existing stakeholders from the agricultural and forest products industries and to an emerging, growing, and broader stream of biorenewable systems stakeholders in companies such as: chemical, pharmaceutical, cosmetics, materials and energy recovery, biobased packaging/processing for food and other products, sustainable systems including safety, and bioenergy.

B. List of New Courses for the Proposed Program

- BRS 500 Research Methods (3)\(^1\): Introduction to research philosophies, methodologies, issues and policies; measures of research quality; research report writing; research ethics.
- BRS 501 Biobased Polymers (3)\(^1\): The chemistry, structure-property relationships, and industrial applications of biobased polymers from plant and agricultural feedstocks.
- BRS 502 Human Behavior in Management and Technology (1)\(^1\): Develop an understanding of the relationship between human behavior and professional activities including management, leadership, and ethical decision making.
- BRS 511 Structural BioComposites (3)\(^2\): Manufacture and practices related to the production of engineered biocomposites processed from lignocellulosic materials.
- BRS 550 Applied Bioproducts Marketing (3)\(^2\): Bioproduct marketing applications for solid and engineered wood products and biorefinery value chain output including environmental services, energy, fuels, and co-products.
• BRS 551 Sustainable Business Strategies (2): Coverage of business strategies that relate to sustainability and environmental issues.
• BRS 590 Colloquium (1-3): Continuing seminars which consist of a series of individual lectures by faculty, students, or outside speakers.
• BRS 594 Research Topics (1-9): Supervised student activities on research projects identified on an individual or small-group basis.
• BRS 595 Internship (1-6): Supervised, research-oriented, off-campus, nongroup instruction, including field experiences, practicums, or internships. Written and oral critique of activity required.
• BRS 596 Individual Studies (1-9): Creative projects, including nonthesis research, which are supervised on an individual basis and which fall outside the scope of formal courses.
• BRS 597, 598 Special Topics (1-9): Formal courses given on a topical or special interest subject which may be offered infrequently; several different topics may be taught in one year or semester.
• BRS 599. Foreign Studies (1-2 per semester, maximum of 4): Courses offered in foreign countries by individual or group instruction.
• BRS 600 Thesis Research (1-15): No description.
• BRS 601 Ph.D. Dissertation Full Time (0): No description
• BRS 602 Supervised Experience in College Teaching (1-3 per semester/maximum of 6): Provides an opportunity for supervised and graded teaching experience in biorenewable systems courses.
• BRS 611 Ph.D. Dissertation Part-Time (0): No description.

\[1 \text{Required course for students enrolled in BRS graduate program} \]
\[2 \text{Elective course for students enrolled in BRS graduate program} \]
\[3 \text{Required course for Ph.D. students enrolled in BRS program} \]

C. Program Statement

BRS is positioned to be a world renowned graduate program in renewable biologically-based materials, products, and processes that fully integrates scientific research with the principles of systems technology, business, management, marketing, leadership development, and entrepreneurship. Toward that end, the academic and professional requirements for BioRenewable Systems are closely related to the disciplinary focus of agricultural and biological sciences, technological innovation and application, and business, management, and leadership within the continually evolving biobased sectors. This makes BRS unique from other fields of science and management. To promote and fulfill this uniqueness, continuation of courses in science, business, management, and technology at the graduate level is encouraged and expected.
C.1 M.S. Program of Study

Each M.S. program of study must meet the following requirements:

<table>
<thead>
<tr>
<th>Credits</th>
<th>Required (Core):</th>
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<tbody>
<tr>
<td></td>
<td>BRS 500 Research Methods(^1) 3 cr</td>
</tr>
<tr>
<td></td>
<td>BRS 501 Biobased Polymers 3 cr</td>
</tr>
<tr>
<td></td>
<td>BRS 502 Human Behavior in Management and Technology 1 cr</td>
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</table>

<table>
<thead>
<tr>
<th>Credits</th>
<th>Electives:(^2)</th>
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<tbody>
<tr>
<td>6/5</td>
<td>Select two courses from the following list:</td>
</tr>
<tr>
<td>3 cr</td>
<td>BRS 511 Structural BioComposites</td>
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<tr>
<td>3 cr</td>
<td>BRS 550 Applied Bioproducts Marketing</td>
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<tr>
<td>2 cr</td>
<td>BRS 551 Sustainable Business Strategies</td>
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<tr>
<td>3 cr</td>
<td>ABE 559 Biological Systems Simulation</td>
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<tr>
<td>3 cr</td>
<td>BE 464 Bioenergy Systems Engineering</td>
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<tr>
<td>3 cr</td>
<td>FOR 880 Bioenergy Feedstock</td>
</tr>
<tr>
<td>3 cr</td>
<td>ABE 888 Conversion Technologies for Bioenergy Production</td>
</tr>
<tr>
<td>3 cr</td>
<td>ABE 885 Biomass Harvest and Logistics</td>
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<tr>
<td>3 cr</td>
<td>ABE 884 Biomass Energy Systems</td>
</tr>
<tr>
<td>3 cr</td>
<td>ASM 426 Management of Safety and Health Issues in Production</td>
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<td>3 cr</td>
<td>Agriculture and Related Businesses</td>
</tr>
<tr>
<td>3 cr</td>
<td>or ENVSE 450 Environmental Health and Safety</td>
</tr>
<tr>
<td>3 cr</td>
<td>EME 801 Bioenergy Markets, Policy, and Regulation</td>
</tr>
</tbody>
</table>

Statistics 4XX or 5XX 3 cr
Additional 4XX or 5XX courses 8/93 cr
BRS 600 Thesis Research 6 cr
Total: 30 cr

\(^1\)To be cross listed with ABE 500 Research Methods in Agricultural and Biological Engineering; a course change proposal for ABE 500 has been initiated in the CSCS reflecting changes in course title, abbreviated title, and minor word changes in the course description.

\(^2\)Program/Instructor approval response in Appendix I (except for ASM 426 and BE 464, which are offered by the ABE Department proposing the BRS program)

\(^3\)Course credits should total at least 24 credits.

A total of at least 18 credits must be from 500-level or above courses and all courses used to meet course requirements above must be 4XX or 5XX. In addition to the above listed course requirements, every graduate student must fulfill the Scholarship and Research Integrity (SARI) requirement. SARI requirement consists of two parts: (1) completion of BRS 500 with a grade of B or better and (2) completion of online training program at: [http://www.research.psu.edu/training/sari/program](http://www.research.psu.edu/training/sari/program), in Physical Sciences
and Engineering or Social and Behavioral Sciences. The online SARI requirement must be completed within one year from date of enrollment in the program of study.

A minimum grade point average of 3.00 is required for graduation. Only grades of C or better are accepted for 400-level or above non-remedial courses. All courses must be approved by the student’s M.S. Advisory Committee as having significance and value for the degree program. All requirements for the M.S. degree, whether satisfied on University Park campus or elsewhere, must be met within eight years from the first semester of graduate study.

**M.S. Advisory Committee:** An initial Adviser will be assigned to each entering graduate student by the Department Head, in consultation with the Graduate Program Coordinator and the faculty member agreeing to serve as adviser. To the extent possible, research interests of the student and assigned Adviser will be compatible. New graduate students are highly encouraged to visit with various faculty members concerning opportunities for thesis research activities. After the student has decided on the preferred research area, s/he should inform the Graduate Program Coordinator or Department Head—by the middle of the first semester of study—of the preferred faculty member to serve as permanent Adviser. Each student should schedule at least a one-hour meeting each week with the permanent adviser to ensure adequate communications.

An M.S. Advisory Committee must consist of at least three faculty, all of whom are members of the Graduate Faculty. The chair (or Co-chair) of the Advisory Committee will be a BRS Graduate Faculty member and will serve as the student’s thesis Adviser. Students are encouraged to have one member of the committee from outside the BRS Graduate Program in a field related to the thesis problem. If a student selects a minor, then one member of the committee must be a graduate faculty member of the minor department. As the culminating experience, each M.S. degree student must complete a thesis in their research field of study.

**Thesis Defense:** Each M.S. degree student must complete a defense of the M.S. thesis, which consists primarily of presenting and defending their near-final version of thesis draft. The Graduate Program Coordinator must be notified of the exam by a copy of the scheduling letter sent to the Advisory Committee; no scheduling form is required. The defense of the thesis should be well-prepared including any appropriate visual aids. One of the aims of the preparation should be to synthesize the important conclusions based on the experimental design and/or supporting theory and statistical analysis in a time-efficient presentation, leaving ample time for questions and discussion. The focus of the examination will be the specific research problem addressed; however, it may cover the entire field of BioRenewable Systems. A favorable vote of at least two-thirds of the committee is required for passing. If a candidate fails, the committee will determine whether another examination may be taken.
Schedule for M.S. Requirements: Many of the M.S. degree requirements are listed in approximate chronological order on the following page. It is the student’s responsibility to ensure that these and all other requirements are met in a timely manner. It is expected that M.S. students should complete the degree in a timely manner consistent with the research and funding program developed. Table 1 shows coursework for a student enrolled in M.S. program of study in BRS. The proposed schedule in Table 1 allows full-time students to complete the courses in three semesters plus a summer session.
# SUGGESTED SCHEDULE FOR M.S. DEGREE

<table>
<thead>
<tr>
<th>Requirement (responsibility of M.S. student to ensure completion)</th>
<th>Suggested Completion Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommend permanent Adviser.</td>
<td>Middle of first semester.</td>
</tr>
<tr>
<td>Submit to Adviser a list of courses to comprise graduate plan of study.</td>
<td>End of first semester.</td>
</tr>
<tr>
<td>Recommend to Graduate Coordinator faculty members to serve on Advisory Committee.</td>
<td>End of first semester.</td>
</tr>
<tr>
<td>Transfer credit from undergraduate or post-baccalaureate program, if appropriate.</td>
<td>End of first semester.</td>
</tr>
<tr>
<td>Prepare thesis research project proposal for Adviser.</td>
<td>End of first semester, following BRS 500*.</td>
</tr>
<tr>
<td>Complete semiannual progress report form.</td>
<td>Each January and July.</td>
</tr>
<tr>
<td>Submit plan of study and thesis project proposal to Advisory Committee for approval (copy to Graduate Program Coordinator).</td>
<td>End of first semester, following BRS 500*.</td>
</tr>
<tr>
<td>SARI: Online tutorial and certificate. Must be completed within one year from the date of enrollment in the program of study.</td>
<td>Give a copy of the completion certificate to the Graduate Program Coordinator.</td>
</tr>
<tr>
<td>Inform Graduate Recorder of the intention to graduate.</td>
<td>Beginning of semester or summer session in which degree is expected.</td>
</tr>
<tr>
<td>Pay thesis fee.</td>
<td>Beginning of semester or summer session in which degree is expected.</td>
</tr>
<tr>
<td>Submit draft thesis to Adviser.</td>
<td>Early in last semester.</td>
</tr>
<tr>
<td>Submit draft thesis to the Office of Theses and Dissertations for format review.</td>
<td>Within published timelines.</td>
</tr>
<tr>
<td>Schedule Thesis Defense and distribute copies of thesis to Advisory Committee members and Graduate Program Coordinator.</td>
<td>Distribute thesis only AFTER the thesis has been approved by Adviser for distribution and at least one week prior to thesis defense date.</td>
</tr>
<tr>
<td>Present departmental seminar based on results of thesis research; schedule through the Seminar Chair.</td>
<td>After Thesis Defense if practical; otherwise, as close to it as is practical.</td>
</tr>
<tr>
<td>Submit original copy of thesis to Department Head for signature, then to Graduate School’s Office of Theses and Dissertations.</td>
<td>After Advisory Committee signs and prior to Graduate School deadline.</td>
</tr>
<tr>
<td>Departure meeting with Department Head.</td>
<td>Two weeks prior to departure.</td>
</tr>
<tr>
<td>Prepare manuscript(s) for publication based on thesis research activity.</td>
<td>Prior to departure.</td>
</tr>
<tr>
<td>Disassemble research apparatus and clean as necessary; return equipment and supplies to designated areas. Clean office, desk and file space; empty all drawers and shelves and remove posters.</td>
<td>Prior to departure.</td>
</tr>
<tr>
<td>Return departmental keys, books, software, supplies, etc. to Administrative Assistant.</td>
<td>Prior to departure.</td>
</tr>
<tr>
<td>Provide one electronic copy of thesis to Adviser.</td>
<td>Prior to departure.</td>
</tr>
</tbody>
</table>

*Not all students will be prepared to complete the research proposal for BRS 500 during their first semester; Advisers have the discretion of delaying BRS 500 and completion of the research proposal until the end of the 3rd semester. In these cases, the student (1) should submit a plan of study to their committee at the end of the first semester and (2) work closely with the Adviser to ensure timely completion of the program of study.
Table 1 – Example of a Course Schedule for M.S. Program of Study in BRS

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>BRS 500(^1)</td>
<td>Research Methods</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 501(^1)</td>
<td>Biobased Polymers</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 502(^1)</td>
<td>Human Behavior in Management and Technology</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Technical selection in specialty area or an elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Credits</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Spring</td>
<td>BRS 550(^1)</td>
<td>Applied Bioproducts Marketing</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 511(^1)</td>
<td>Structural BioComposites</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 551(^1)</td>
<td>Sustainable Business Strategies</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>BRS 600</td>
<td>Thesis research</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Credits</td>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>STAT 500</td>
<td>Applied Statistics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ABE 559</td>
<td>Biological Systems Simulation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 600</td>
<td>Thesis research</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Credits</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Overall Total Course Credits</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

\(^1\) New courses

C.2 Ph.D. Program of Study

Each Ph.D. program of study, for students holding M.S. degrees, must meet the following requirements:

<table>
<thead>
<tr>
<th>Required (Core):</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRS 500 Research Methods(^1)</td>
<td>3</td>
</tr>
<tr>
<td>BRS 501 Biobased Polymers(^1)</td>
<td>3</td>
</tr>
<tr>
<td>BRS 502 Human Behavior in Management and Technology(^1)</td>
<td>3</td>
</tr>
<tr>
<td>Communications or International Language/Culture</td>
<td>3</td>
</tr>
<tr>
<td>BRS 602 Supervised College Teaching</td>
<td>1</td>
</tr>
<tr>
<td>Electives:</td>
<td></td>
</tr>
<tr>
<td>BRS 5XX (excluding BRS 500, 590-596) or select from list(^2)</td>
<td>6</td>
</tr>
</tbody>
</table>

\(^1\) Requirement Waived if previously completed

\(^2\) See list of elective courses in section C.1 M.S. Program of Study

Except as specified above, no particular courses, total number of courses or total credits are required by the BRS program. The total coursework is approximately 30 to 36 credits beyond the M.S. The student’s Ph.D. Advisory Committee will determine the
minimum requirements in such supporting areas as science, technology, and business. The candidate is expected to develop a program of study and submit it to the Advisory Committee for consideration and approval within the first two semesters after enrollment in the program of study. In addition to the above listed coursework requirements, every graduate student must fulfill the Scholarship and Research integrity (SARI) requirement. The SARI requirement consists of two parts (1) completion of BRS 500 with a grade of B or better, and (2) completion of an online training program at http://www.research.psu.edu/training/sari/program, in Physical Sciences and Engineering or Social and Behavioral Sciences. The online SARI requirement must be completed within one year from the date of enrollment in the program of study. Table 2(a) shows coursework for a student enrolled in Ph.D. program of study in BRS but has completed the M.S. program of study; whereas, Table 2(b) shows coursework for a student enrolled in the direct B.S. to Ph.D. program of study in BRS. The proposed schedule in Table 2(a) allows full-time M.S. to Ph.D. students to complete the courses in four semesters; whereas, Table 2(b) allows full-time B.S. to Ph.D. students to complete the courses in six semesters.

Table 2(a) – Example of a Course Schedule for Students Enrolled in the M.S. to Ph.D. Program of Study in BRS

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>STAT 501</td>
<td>Regression Methods</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 500,1,2</td>
<td>Research Methods</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 501,1,2</td>
<td>Biobased Polymers</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 502,1,2</td>
<td>Human Behavior in Management and Technology</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>10</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>STAT 502</td>
<td>Experimental Design</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Business/Management elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Technical selection in specialty area(s) or elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>ABE 559,2</td>
<td>Biological Systems Simulation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective course in communication (from selection list)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Business/Management elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>9</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>Technical selection in specialty area(s) or elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Business/Management elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 602,1</td>
<td>Supervised College Teaching</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>7</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Overall Total Course Credits</strong></td>
<td></td>
<td><strong>35</strong></td>
</tr>
</tbody>
</table>

1 New courses
2 Requirement waived if previously completed
Table 2(b) – Example of a Course Schedule for Students Enrolled in the B.S. to Ph.D. Program of Study in BRS

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BRS 500&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>Research Methods</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 501&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>Biobased Polymers</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 502&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>Human Behavior in Management and Technology</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>STAT 500</td>
<td>Applied Statistics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>10</strong></td>
</tr>
<tr>
<td></td>
<td>BRS 550&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>Applied Bioproducts Marketing</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 511&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>Structural BioComposites</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BRS 551&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>Sustainable Business Strategies</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STAT 501</td>
<td>Regression Methods</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ABE 559&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Biological Systems Simulation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Technical selection in specialty area(s) or elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>9</strong></td>
</tr>
<tr>
<td></td>
<td>STAT 502</td>
<td>Experimental Design</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Business/Management elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>6</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3</th>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Business/Management elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Technical selection in specialty area(s) or elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elective course in communication (from selection list)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>9</strong></td>
</tr>
<tr>
<td></td>
<td>BRS 602&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Supervised College Teaching</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>7</strong></td>
</tr>
</tbody>
</table>

| Overall Total Course Credits | 49 |

1<sup>New courses</sup>  
2<sup>Requirement waived if previously completed</sup>

Research credits (BRS 600) are in addition to coursework credits. The Advisory Committee will determine the minimum research credits. Once the doctoral student has passed the comprehensive examination, s/he should register for BRS 601 or BRS 611 (Ph.D. Dissertation, full-time or part-time, for 0 credits) instead of BRS 600 (Thesis Research). All requirements for a Ph.D. degree, whether satisfied on University Park campus or elsewhere, must be completed within eight years after passing the Candidacy Examination.
**Doctoral Committee:** An initial Adviser will be assigned to each entering graduate student by the Department Head, in consultation with the Graduate Program Coordinator and the faculty member agreeing to serve as adviser. To the extent practical and commensurate with potential funding source(s), research interests of the student and assigned Adviser will be compatible. New graduate students are highly encouraged to visit with various faculty members concerning opportunities for dissertation research activities. After the student has decided on the preferred research area, s/he should inform the Graduate Program Coordinator or Department Head—by the middle of the first semester of study—of the preferred faculty member to serve as permanent Adviser. Each student should schedule at least a one-hour meeting each week with the adviser to ensure adequate communications.

At least one regular member of the Doctoral Committee must represent a field outside the candidate’s major field of study in order to provide a broader range of disciplinary perspectives and expertise. This committee member is referred to as the “Outside Field Member.” In cases where the candidate is also pursuing a dual-title field of study, the dual-title representative to the committee may serve as the Outside Field Member.

Additionally, in order to avoid potential conflicts of interest, the primary appointment of at least one regular member of the Doctoral Committee must be in an administrative unit that is outside the unit in which the dissertation adviser’s primary appointment is held (i.e., the adviser's administrative home; in the case of tenure-line faculty, this is the individual's tenure home). This committee member is referred to as the “Outside Unit Member.” In the case of co-advisers, the Outside Unit Member must be from outside the administrative home(s) of both co-advisers. In some cases, an individual may have a primary appointment outside the administrative home of the student’s dissertation adviser and also represent a field outside the student’s major field of study; in such cases, the same individual may serve as both the Outside Field Member and the Outside Unit Member.

Consistent with the two preceding paragraphs, a Doctoral Committee must consist of four or more members of the Graduate Faculty and:

- The chairperson and at least one other member must be BRS Graduate Faculty members.
- At least one member must be from a department other than ABE and s/he should be a graduate faculty member of a program other than BRS.
- At least one member must represent any minor department(s) if the student selects a minor(s).
- The Advisory Committee can be appointed only after the Candidacy Examination has been passed.
Communications or International Language/Culture Course Requirements: The purpose of the communications/language requirement is to strengthen the student’s professional communication skills. The candidate must take a 3-credit course in communications. A grade of B or better is required in the course (note: B- does not meet this requirement). The selected course must be approved by the Adviser prior to registration and must meet the expectations of the Doctoral Committee. A course used to satisfy this requirement cannot be a course taken as remedial for the Candidacy Examination and must include the substantial practice of writing and/or speaking. Examples of courses to consider are:

AEE 450  Program Design and Delivery (3)
530  Teaching and Learning in Agricultural Science (3)
CAS 450W  Group Communication Theory and Research (3)
452W  Organizational Communication Theory and Research (3)
471  Intercultural Communication Theory and Research (3)
ENGL 417  The Editorial Process (3)
418  Advanced Technical Writing and Editing (3)
474  Issues in Rhetoric and Composition (3)
511  Thesis Workshop and Professional Writing (3)
HI ED 546  College Teaching (3)

Any 3-credit 4XX foreign language course (Excluding 49X; and must not be candidate’s native language).

Program/Instructor Approval Response in Appendix II

Candidacy Examination: Ph.D. Candidacy Examination Committee – This committee will consist of four BRS graduate faculty members, including the Adviser, the ABE Department Head (or annually appointed designee), the BRS Graduate Program Coordinator and one faculty member selected by the student. In cases where a member serves two roles on the committee, an additional member will be appointed by the Graduate Program Coordinator.

The Candidacy Examination will consist of developing a Ph.D. research proposal following the completion of BRS 500, presenting the proposal, and defending/discussing the proposed research with the Committee. The Candidacy Examination will be completed by the student soon after s/he has completed at least 18 credits but before the end of the third semester. Successful completion of the Candidacy Examination does not mean that the student’s Ph.D. research proposal is approved. Rather, final approval of the candidate’s research proposal will be the responsibility of the Doctoral Committee.

Each Ph.D. student will submit to each Candidacy Committee member a detailed proposal for the Ph.D. research a minimum of seven days prior to the exam. This proposal should contain justification, objectives, related literature, methodology,
practical significance, resources required, bibliography, proposed program of study and a statement of possible funding sources to which the proposal could be submitted.

The student will present a seminar to the Candidacy Committee. The seminar is open to all in the Department and participants may ask questions of the potential Ph.D. candidate concerning the proposed study, science and technical aspects, business, leadership, and entrepreneurial implications, and other related items. Upon completion of this seminar, the graduate faculty members and members of the Committee will hold a discussion period regarding the student, the proposed research and the seminar. The student will not be present during this discussion period. Following this discussion, the Candidacy Committee and the student will proceed with the remainder of the exam.

The Candidacy Committee will review the written proposal and discuss in detail with the student the proposed research and related topics. The Candidacy Committee will assess the student’s understanding of the research process, the student’s technical expertise related to biorenewable systems and the proposed research, suitability of the proposed research relative to the BRS graduate program expectations of Ph.D. candidates, the student’s understanding of needed resources and other pertinent topics. The Candidacy Committee will also judge the ability of the student to communicate and will complete a “Report on Departmental Assessment of English Competency” (see “English Competency Requirements” section below). The Committee will select, based on the student’s performance, one of the following: 1) recommendation that the student become a Ph.D. Candidate, 2) recommendation that the student become a Ph.D. candidate but must undertake additional activities as prescribed by the Candidacy Committee, 3) recommendation that the student undertake additional activities as prescribed by the Candidacy Committee and retake the Candidacy Examination, or 4) rejection of the student as a Ph.D. Candidate. A student will not be allowed to take the Candidacy Examination more than twice.

**English Competency Assessment:** The Graduate Council and the BRS graduate program of study require candidates for the Ph.D. degree to demonstrate high-level competence in the use of the English language; including reading, writing, listening, and speaking. To fulfill this requirement, the BRS graduate program requires that all Ph.D. students undergo an assessment of English competency. The assessment will include the student’s ability to read and comprehend, write, speak, and give presentations so as to effectively participate in scientific and technical discussions. The assessment will be conducted during the Ph.D. Candidacy Examination by the Ph.D. Candidacy Examination Committee and will consist of three parts:

**Writing**—As part of the Ph.D. Candidacy Examination, the student will prepare a detailed research proposal on the topic chosen for his/her Ph.D. dissertation (see “Candidacy Examination” for further details about proposal). The written document will be judged for its organization, logical arguments in support of the hypotheses, inclusion of relevant details, and appropriate style in the use of language, grammar, punctuation and spelling. The “Literature Section” of the written proposal containing analysis of pertinent literature will be used to evaluate the student’s reading comprehension of the technical literature.
**Presentation**—As part of the Ph.D. Candidacy Examination, the student will present a seminar to the Committee. The seminar is open to all in the Department. The presentation will be judged for its organization, clarity, appropriateness to the audience, appropriate use of visual aids, and effectiveness of delivery. The quality of the formal presentation should be comparable to papers presented at technical sessions of professional society meetings.

**Oral Discussion**—The main purpose of the Oral Discussion part of the English Competency Test is to evaluate the oral skills of the student to participate in scientific and technical discussions with other technical professionals. The Oral Discussion will follow the formal presentation of the research proposal by the student. The examination committee will conduct a discussion with the student on various aspects of the research proposal and also on the scientific and technical issues surrounding the research area.

At the end of the Candidacy Examination, each member of the Committee will present an assessment of the student's English competency in the three categories: writing, presentation, and oral discussion. These assessments will be used to certify attainment of English competency or to recommend measures for improving English competency. A “Report on Departmental Assessment of English Competency” form will be completed by the Committee, shared with the student, and placed in the student’s Departmental records.

**Improving English Competency of Students with Deficiencies**—If the expected level of English Competence is not demonstrated, the student must enroll in course(s) to improve English competency. The committee will recommend suitable course(s) which may include selections from the following or additional remedial courses noted in the Report on Departmental Assessment of English Competency (i.e., these courses do not count toward fulfillment of the requirements for the graduate degree):

- **Writing Skills**
  - ESL 116G – ESL/Composition for Academic Disciplines

- **Presentational Skills**
  - CAS 100A – Effective Speech
  - CAS 211 – Informative Speaking

- **Oral Language Skills**
  - ESL 114G – American Oral English for Academic Purposes
  - ESL 115G – American Oral English for ITAs

If the student completes and passes the recommended course(s) with a grade of B or higher, then the student will be certified as having attained English competency. Otherwise, the student will have to retake the course (or another comparable course). Students judged as not making sufficient progress towards achieving competency in English will have their funding terminated.

**Comprehensive Examination:** When a Ph.D. candidate has substantially completed the coursework, including the communication requirements, s/he is required to take a Comprehensive Examination covering the major, minor, and related areas of study. The Comprehensive Examination should be scheduled through the Graduate Program
Coordinator and the Graduate School at least three weeks prior to the selected date. All candidates are required to have a minimum grade point average of 3.00 for graduate work completed at the University at the time the Comprehensive Examination is given, and may not have deferred or missing grades. The student must be registered as a full-time or part-time student for the semester in which the Comprehensive Exam is taken. The Comprehensive Examination must be taken at least three months before the Final Oral Examination. If a period of six years has elapsed between the passing of the Comprehensive Examination and the completion of the program, the student is required to pass a second Comprehensive Examination before the Final Oral Examination can be scheduled.

The Comprehensive Examination will be both written and oral. The nature and details of the Comprehensive Examination will be determined by the student’s Advisory Committee. In general, the student will be required to demonstrate ability to synthesize information acquired through formal coursework and to use technical literature to find information required for solving biorenewable systems problems. A favorable vote of at least two-thirds of the committee is required for passing. If a candidate fails, the committee will determine whether another examination may be taken. Results of the examination are reported directly to the Office of Graduate Enrollment Services.

**Final Oral Examination:** Upon recommendation of the Adviser, a Ph.D. candidate who has satisfied all other requirements for the degree will be scheduled by the Dean of the Graduate School to take a Final Oral Examination. The scheduling form can be obtained from the Graduate Program Coordinator or Staff Assistant and must be submitted at least three weeks prior to the scheduled examination date. The student must be a registered full-time or part-time degree student for the semester in which the Final Oral Examination is taken. This examination is open to the public and the student should notify all departmental faculty and graduate students. The examination is related largely to the dissertation, but may cover the candidate’s entire field of study without regard to courses that have been taken either at Penn State University or elsewhere. The defense of the dissertation should be well-prepared including any appropriate visual aids. One of the aims of the preparation should be to synthesize the important conclusions in a time-efficient presentation, leaving ample time for questions and discussion. A favorable vote of at least two-thirds of the committee is required for passing. If a candidate fails, the committee will determine whether another examination may be taken. Results of the exam are reported directly to the Office of Graduate Enrollment Services.

**Schedule for Ph.D. Requirements:** Many of the Ph.D. degree requirements are listed in approximate chronological order on the following page. It is the student’s responsibility to ensure that these and all other requirements are met in a timely manner. It is expected that Ph.D. students should complete the degree in a timely manner consistent with the research and funding program developed.
**SUGGESTED SCHEDULE FOR Ph.D. DEGREE**

<table>
<thead>
<tr>
<th>Requirement (responsibility of Ph.D. student to ensure completion)</th>
<th>Suggested Completion Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommend permanent Adviser.</td>
<td>Middle of first semester.</td>
</tr>
<tr>
<td>Submit to Adviser a list of courses to comprise graduate plan of study.</td>
<td>End of first semester.</td>
</tr>
<tr>
<td>Recommend to Graduate Coordinator faculty members to serve on Doctoral Committee.</td>
<td>End of first semester.</td>
</tr>
<tr>
<td>Transfer credit from undergraduate or post-baccalaureate program, if appropriate.</td>
<td>End of first semester.</td>
</tr>
<tr>
<td>Prepare dissertation research project proposal for Adviser.</td>
<td>End of first semester, following BRS 500*.</td>
</tr>
<tr>
<td>Complete semiannual progress report form.</td>
<td>Each January and July.</td>
</tr>
<tr>
<td>Schedule and complete Ph.D. Candidacy Examination.</td>
<td>Completed immediately following at least 18 credits but before the end of the third semester (target date: first semester following BRS 500).</td>
</tr>
<tr>
<td>Submit plan of study and dissertation project proposal to Doctoral Committee for approval (copy to Graduate Program Coordinator).</td>
<td>End of first semester, following BRS 500*.</td>
</tr>
<tr>
<td>Schedule and complete Comprehensive Examination.</td>
<td>Upon substantial completion of the coursework and at least 3 months prior to Final Oral Exam.</td>
</tr>
<tr>
<td>Inform Graduate Recorder of the intention to graduate.</td>
<td>Beginning of semester or summer session in which degree is expected.</td>
</tr>
<tr>
<td>Pay dissertation fee.</td>
<td>Beginning of semester or summer session in which degree is expected.</td>
</tr>
<tr>
<td>Submit draft dissertation to Adviser.</td>
<td>Early in last semester.</td>
</tr>
<tr>
<td>Submit draft dissertation to the Graduate School’s Office of Theses and Dissertations for review.</td>
<td>Within published deadlines.</td>
</tr>
<tr>
<td>Schedule Final Oral Examination and distribute copies of dissertation to Advisory Committee members and Graduate Program Coordinator.</td>
<td>Distribute dissertation only AFTER the dissertation has been approved by Adviser for distribution and at least one week prior to dissertation defense date.</td>
</tr>
<tr>
<td>Present departmental seminar based on results of dissertation research; schedule through the Seminar Chair</td>
<td>After Final Oral Exam if practical; otherwise, as close to it as is practical.</td>
</tr>
<tr>
<td>Submit original copy of dissertation to Department Head for signature, then to Graduate School’s Office of Theses and Dissertations.</td>
<td>After Advisory Committee signs and prior to Graduate School deadline.</td>
</tr>
<tr>
<td>Departure meeting with Department Head.</td>
<td>Two weeks prior to departure.</td>
</tr>
<tr>
<td>Prepare manuscript(s) for publication based on dissertation research activity.</td>
<td>Prior to departure.</td>
</tr>
<tr>
<td>Disassemble research apparatus and clean as necessary; return equipment and supplies to designated areas. Clean office, desk and file space; empty all drawers and shelves and remove posters.</td>
<td>Prior to departure.</td>
</tr>
<tr>
<td>Return departmental keys, books, software, supplies, etc. to Administrative Assistant.</td>
<td>Prior to departure.</td>
</tr>
<tr>
<td>Provide one electronic copy of dissertation to Adviser.</td>
<td>Prior to departure.</td>
</tr>
</tbody>
</table>

*Not all students will be prepared to complete the research proposal for BRS 500 during their first semester; Advisers have the discretion of delaying BRS 500 and completion of the research proposal until the end of the 3rd semester. In these cases, the student (1) should submit a plan of study to their committee at the end of the first semester and (2) work closely with the Adviser to ensure timely completion of the program of study.
D. Admission Requirements

D.1 M.S. Program of Study

In general, for admission to the Graduate School, an applicant must hold either (1) a baccalaureate degree from a regionally accredited U.S. institution or (2) a tertiary (postsecondary) degree that is deemed comparable to a four-year bachelor's degree from a regionally accredited U.S. institution. This degree must be from an officially recognized degree-granting institution in the country in which it operates. Specific to the BRS program, completion of a relevant undergraduate Bachelor degree program is required for admission to the M.S. degree program; relevant programs span a diverse set of academic disciplines, including but not limited to: Agricultural Sciences, Biology, Chemistry, Business, Engineering, and Environmental Sciences. Students with junior-senior GPA of at least 3.00 (4.00 base) will be competitive in the admission process.

*Graduate Record Examination (GRE).* All students must submit GRE general aptitude test scores (i.e., verbal, quantitative, and analytical) to be considered for admission.

To qualify for admission, all international applicants must take and submit scores for the TOEFL (*Test of English as a Foreign Language*) or the IELTS (*International English Language Testing System*), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, 213 for the computer-based test, or a total score of 80 with a 19 on the speaking section for the internet-based test. The minimum composite score for the IELTS is 6.5.

International applicants exempt from the TOEFL/IELTS requirement include those who have received a baccalaureate or a graduate degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, and Wales.

D.2 Ph.D. Program of Study

In general, for admission to the Graduate School, an applicant must hold either (1) a baccalaureate degree from a regionally accredited U.S. institution or (2) a tertiary (postsecondary) degree that is deemed comparable to a four-year bachelor's degree from a regionally accredited U.S. institution. This degree must be from an officially recognized degree-granting institution in the country in which it operates.

The program requirement for acceptance to graduate study toward a Ph.D. degree in BRS is typically an M.S. degree with research thesis in BRS or related discipline such as Agricultural Sciences, Biology, Chemistry, Business, Engineering, and Environmental Sciences, or with a B.S. degree in Agricultural Systems Management (ASM) or BRS or equivalent. Outstanding students interested in direct admission from a B.S., B.A., or M.B.A. program to the Ph.D. Program should contact the Graduate Program Coordinator for further clarification and details. Direct admission will be based on critical evaluation of the student's: potential to conduct publishable research, academic record, an
additional language (other than the student’s mother tongue), performance on standardized tests, statement of purpose, and reference letters.

Students who apply directly to the Ph.D. program with a B.S. degree and are deemed by the admissions committee not to meet the standards for admission to the Ph.D. program may be considered either for admission into the M.S. program or for admission to the Ph.D. program on a provisional basis. The student will remain in provisional status in the Ph.D. program until completing the following specific courses: BRS 500 (3 credits), BRS 501 (3 credits), BRS 502 (1 credit), BRS 550 (3 credits), BRS 511 (3 credits), BRS 551 (2 credits), and ABE 559 (3 credits), with a minimum grade-point average of 3.00. For provisional status to change, the specific courses must be completed within the first two semesters of study.

*Graduate Record Examination (GRE).* All students must submit GRE general aptitude test scores (i.e., verbal, quantitative, and analytical) to be considered for admission.

To qualify for admission, all international applicants must take and submit scores for the TOEFL (*Test of English as a Foreign Language*) or the IELTS (*International English Language Testing System*), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, 213 for the computer-based test, or a total score of 80 with a 19 on the speaking section for the internet-based test. The minimum composite score for the IELTS is 6.5.

International applicants exempt from the TOEFL/IELTS requirement include those who have received a baccalaureate or a graduate degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, and Wales.

**E. Justification for the Program**

Developed economies, such as in the U.S. and Europe, are continually transforming as production and processing shifts from non-renewable based materials to more sustainable and renewable biologically-based systems. Toward that end, the agricultural/biological enterprise is uniquely positioned to play a pivotal role as the producer and supplier of resources and personnel to maintain the competitiveness of emerging biobased industries. At the national level, prestigious National Academy of Sciences and major funding agencies such as the U.S. Department of Agriculture, Department of Energy, National Science Foundation and other agencies, envision biobased materials, processes, and energy production as significant components of this biobased economic transformation.

Concurrently, research universities across the country are realigning or shifting resources at a rapid pace to develop and offer research-oriented graduate programs in the emerging areas of biobased education, outreach, and research. To satisfy the increasing demand for skilled leaders and trained employees in the biobased enterprise, some universities have forged new graduate programs targeted toward this area. A comprehensive review of
graduate degree programs of the top 28 universities offering biological and agricultural
based non-engineering degree programs revealed only four comparable programs to that
proposed here. These include:

(1) Texas A&M. Professional Program in Biotechnology
(2) Iowa State University. Biorenewable Resources and Technology Graduate Program in
Business and Technology (M.S. and Ph.D.)
(3) University of Georgia. Bioprocessing and Biomanufacturing (M.S.)
(4) University of Arizona. Industrial Microbial Biotechnology Professional Masters

Only Iowa State University offers a Ph.D., making the proposed program attractive for those
students who wish to continue their graduate education to the Ph.D. level.

The College of Agricultural Sciences (CAS) at Penn State has recently restructured to
become more agile and responsive to the needs of current and future clientele and
stakeholders, including those related to the 21st century bioeconomy. Consequently,
undergraduate and graduate programs are transitioning to embrace these opportunities.
One of the shifts is the merging of the science-, technology-, business- and management
expertise of several former Wood Products (WP) faculty with the science, systems, and
engineering expertise of the Agricultural and Biological Engineering (ABE) faculty. This
unique science-technology-business-management nexus has nucleated a new bio-based
materials and bioproducts-based undergraduate program entitled BioRenewable Systems
(BRS, which is under review; documentation available upon request) and a corresponding
BRS graduate program. The proposed BRS graduate program provides an advanced research
degree program that the WP faculty who have joined the ABE Department can offer to
prospective graduate students. Also, it is a viable pathway for ABE faculty who wish to
advise non-engineering graduate students in the science, technology, and business-related
aspects of Agricultural and Biological Engineering. The vision of an integrated WP-ABE
faculty is to establish an internationally leading research-oriented BRS graduate program
that integrates business management, leadership, and entrepreneurship with an advanced
science and technology program as its foundation. This will help to fulfill objectives of the
ABE and CAS strategic plans by providing a new graduate program in the emerging areas of
biobased materials and products, bioenergy, sustainable biological systems, industrial
packaging/processing systems, and technology-driven product-market development.

The proposed new BRS graduate degree program will be a logical extension of the BRS
undergraduate program; importantly, it will address an existing gap in the ABE graduate
program for non-engineering applicants (estimated at 25-30 percent of all prospective ABE
graduate students based on past three-year data). In BRS, graduate students will pursue
academic degrees (M.S. and Ph.D.) focused on research in the advanced sciences,
technologies, and business applications of bio-based materials and bioproducts, bioenergy,
sustainable biological systems, and industrial packaging/processing systems. Building on
the balanced science and application-oriented coursework (see Tables 1) with the research
methods principles as the foundation, each M.S. student is required to complete a thesis in
their research field of study as the culminating experience. It is expected that the student’s
research is publishable in high impact journals – a strong indicator of creation of knowledge;
which meets the strongest criterion of academic degrees. Additionally, the discoveries during the M.S. research could pave the way for new investigations and grant funding opportunities. Most important, the M.S. program will serve to provide a supply of qualified, research-trained, and proven low-risk outstanding scientists to be considered for the Ph.D. program of study in BRS. With research experiences, the M.S. graduates would rapidly ramp to full performance becoming highly productive during their Ph.D. program of study. The rigorous thesis and knowledge creation criteria sets apart the proposed M.S. degree from those of the Master of Professional Study (M.P.S.) degree at the University of Arizona (coursework and industrial internship based; no academic thesis) and Texas A&M University (coursework based; no academic thesis), as mentioned above and elsewhere.

Similar to the M.S. but with a much higher performance level expectation, each Ph.D. student must write and defend a dissertation that is at the leading edge of science-business nexus in the field of specialization. The knowledge-based outcomes include (1) publication of most-citable, long half-life articles in high impact journals, (2) generation of seed ideas for future grant proposals to prestigious Federal agencies such as the National Science Foundation, U.S. Department of Energy, U.S. Department of Agriculture, and National Institutes of Health and private Foundations, and (3) most important, propelling of the BRS program to the forefront of National Research Council rankings.

The proposed BRS graduate program would leverage existing science and engineering and wood products expertise of the faculty and allow expansion into a growing biologically-based area. It would also allow students with CAS undergraduate degrees to participate in a graduate program focusing on the science and business sides of the emerging bioeconomy. The new graduate program will facilitate economic growth by developing well-educated and well-qualified graduates who, in turn, will help traditional forest- and agriculturally-anchored industries transition into production, processing, and recovery systems based on emerging biobased products. The projected size of BRS graduate program is approximately eight to ten full time M.S. and approximately ten to fifteen full time Ph.D. students.

Development of the new BRS degree program will considerably augment, broaden, and strengthen the ABE Department’s and the College’s research enterprise through enhanced collaborations in bioproducts, bioenergy, biofuels supply chains, nanotechnology, and green products while adding complementary components in bioproducts packaging and pallets, green adhesives, biobased composites, chemistry and structure of bio-based materials, biofuels supply chains, marketing/management, entrepreneurship, etc. With respect to research funding in the targeted fields of BRS, federal solicitations previously dedicated to agricultural and wood-related research have generally been reallocated to larger pools of funds targeting the broader disciplines of bio-based materials, bioenergy, and biofuels. These solicitations typically mandate multilateral efforts and multidisciplinary teams, with attention directed to improved outreach/marketing of research-based outcomes. Noting the support of Departmental and College resources, and leveraging the breadth of abilities and expertise of an integrated ABE-WP faculty, it is believed that our integrated faculty would be exceptionally competitive in grant funding opportunities.
Therefore, there is an immediate need for developing a new research-oriented graduate program in this key niche area to meet student demand and to take advantage of the transition, transformation, and sustainable biobased economy by ensuring and assuring continuous growth and development. We are at a critical juncture for initiation of such a program and we must seize the opportunity.

F. **Justification for the Degree Title Used**

For reasons and criteria mentioned in Section E, the academic degree titles are M.S. and Ph.D. in BioRenewable Systems. Only four universities (Section E) in the U. S. offer an M.S. degree of which two are professional master's degrees. Only one of the four universities currently offers also a Ph.D. degree. Given the importance and potential, Penn State has the opportunity to become a leader and a model graduate research program worthy of emulation in this field of study.

G. **Accreditation**

Not applicable

H. **Written Responses from Departments/Programs Affected**

- Bioengineering
- Ecosystem Science and Management
- Engineering Science and Mechanics
- Food Science
- Materials Science and Engineering
- Renewable Energy and Sustainability Systems
Bioengineering

From: Cheng Dong <cdong@engr.psu.edu>
Date: October 22, 2012 2:07:39 PM EDT
To: Paul Heinemann <paul@engr.psu.edu>
Subject: Bio Graduate program proposal in BioRenewable Systems

Hi Paul,

We are fine with your proposal.

Best,
Cheng

Cheng Dong, Ph.D.
Distinguished Professor
Head, Department of Bioengineering
233 Hollins Hall Building
Pennsylvania State University
University Park, PA 16802
Tel: (814) 865-5901
Fax: (814) 863-0469
Email: ccdong@psu.edu
URL: http://bioeng.psu.edu/Faculty/Dong.html

From: COE-DEPT ABE Paul Heinemann <paul@engr.psu.edu>
Date: Thursday, October 11, 2012 4:35 PM
To: Cheng Dong <cdong@engr.psu.edu>
Subject: Graduate program proposal in BioRenewable Systems

Dear Cheng,

Please find attached a new graduate program proposal being put forth by the Department of Agricultural and Biological Engineering entitled BioRenewable Systems. This is a non-engineering, technology and management-based program offering degrees at the M.S. and Ph.D. levels, which would be administered by the College of Agricultural Sciences. We are contacting you because we believe that your department may have interest in the program content. While it does not significantly overlap with your department's activities, there may be potential collaborations and synergies with what you do.

I would appreciate a response (suggestions, feedback, concerns, etc.) by Friday, October 26, 2012. Please note that Graduate School requirements state that we must get a response from you, even if it is simply to say that you are okay with the program. If you have any questions, please let me know.

Thanks very much.

Paul

Paul Heinemann, Professor and Head
Department of Agricultural and Biological Engineering
Penn State
(814) 865-2633
From: Mike Massina <emgms@psu.edu>
Date: October 10, 2012 2:43:15 PM EDT
To: Paul Heinemann <tech@eng.psu.edu>
Subject: Re: Graduate program proposal in BioRenewable Systems

On Oct 10, 2012, at 2:04 PM, Mike Massina wrote:

Paul,

The Department of Ecosystem Science and Management approves of this program.

WGM

On 10/11/2012 4:35 PM, Paul Heinemann wrote:

Dear Mike,

Please find attached a new graduate program proposal being put forth by the Department of Agricultural and Biological Engineering entitled BioRenewable Systems. This is a non-engineering, technology and management-based program offering degrees at the M.S. and Ph.D. levels, which would be administrated by the College of Agricultural Sciences. We are contacting you because we believe that your department may have interest in the program content. While it does not significantly overlap with your department’s activities, there may be potential collaborations and synergies with what you do.

I would appreciate a response (suggestions, feedback, concerns, etc.) by Friday, October 19, 2012. Please note that Graduate School requirements state that we must get a response from you, even if it is simply to say that you are okay with the program. If you have any questions, please let me know.

Thanks very much.

Paul

Paul Heinemann, Professor and Head
Department of Agricultural and Biological Engineering
Penn State
814-865-2609

Michael G. Massina, Head and Professor
Department of Ecosystem Science and Management
Penn State University
121 Forest Resources Building
University Park, PA 16802
Phone: 814-865-7893
Fax: 814-863-9725
mm219@psu.edu

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Dear Paul:

The ESM Department supports the proposed Graduate Program in BioRenewable Systems. We hope that there will be an opportunity for students in this program to take graduate E MCH courses related to composite materials as electives, where appropriate.

Judy

Judy A. Todd
Department head and F. B. Dameron Chair
Department of Engineering Science and Mechanics
110 Floyd and Engineering Science Building
Fayetteville, University of Arkansas
Fayetteville, AR 72701
479-575-2272
479-575-6262
jtodd@uark.edu

Frame: Event: September 9, 2013
From: Judy Todd
To: Paul Heilmann
Subject: Graduate program proposal in BioRenewable Systems

Dear Judy,

Please find attached a new graduate program proposal being put forth by the Department of Agricultural and Biological Engineering entitled BioRenewable Systems. This is a new engineering technology and management-oriented program offering degrees at the M.S. and Ph.D. levels, which would be administered by the College of Agricultural Science. We are contacting you because we believe that your department may have interest in the program content. While it does not significantly overlap with your departments' activities, there may be potential collaborations and synergies with what you do.

I would appreciate your program suggestions, feedback, concerns, etc. by Friday, October 25, 2013. Please note that Graduate School requirements must that we must get a response from you, even if it is simply to say that you are okay with the program. If you have any questions, please feel free to ask.

Thanks very much,

Paul

Paul Heilmann, Professor and Head
Department of Agricultural and Biological Engineering
Fayetteville, AR 72701
479-575-9033
INTEROFFICE CORRESPONDENCE

Date: October 31, 2012
From: Greg Ziegler
To: Robert Roberts
Re: GPC comments on Biorenewable Systems graduate program proposal of ABE

The Graduate Program Committee (GPC) met this past Monday, October 29, and among our agenda items discussed the proposal for a new graduate program tentatively titled "Biorenewable Systems" to be offered by ABE. The GPC generally supported the concept as a way to effectively integrate the wood products faculty into the ABE department. However, we did have several comments and concerns that are enumerated below.

To avoid confusion, the word "biomaterials" should be replaced with "bio-based materials" throughout the proposal. The following definition is given for biomaterial science, "the study of the application of materials to problems in biology and medicine," where the "common thread is the interaction between biological systems and synthetic (or modified natural) materials" (Biomaterials Science, BD Ratner et al.). The Society for Biomaterials has been in existence since 1975, and this definition is well entrenched (see http://en.wikipedia.org/wiki/Biomaterials).

We were most concerned about the lack of courses that would make the program truly "world renowned." Specifically, there should be a 500-level course on the topic of biorefineries for the production of bio-based fuels and chemical feedstocks (this may be covered to some extent in ABE 884 and 888). This course might include the production of bio-based polymers (e.g. PLA, PHA), but if not, then there should be a separate 500-level offering in this area. While not as cheap or plentiful as plant-based polymers, animal-based polymers (e.g. chitin, collagen, keratin) and adhesives might be a good special topics course, as would some consideration of polymers derived from aquatic plants (agarates, carrageenans, agar), as these don’t seem to be addressed in the proposed Plant-based Polymers course (BRS 501). The program should have a course that encompasses biodegradation, recycling and life cycle analysis, which would interface nicely with the College's effort in plasticulture.
A course specifically in biorenewable packaging materials, both paper- and plastic-based, could really set the program apart, as a significant portion of landfill waste comprises packaging. This course could interface with the Department of Food Science and include some topics of particular concern to food packaging applications. It is laudable that the proposed curriculum includes a significant proportion of business and management coursework, but the foundation should be in science and technology.

While the proposal makes the case that there are “only four comparable programs” at the “top 28 universities offering biological and agricultural based non-engineering degree programs,” in the US? the proposal could be strengthened by looking at what is being offered at comparable international institutions and even at the advanced undergraduate level in the US [see below]. It is not clear to the GPC why the Department of Agricultural and Biological Engineering is trying to attract non-engineering applicants.

Bio-Based Products Engineering Minor

Bioproducts and Biosystems Engineering

College of Food, Agricultural and Natural Resource Sciences

University of Minnesota

Minor Courses

Take 14 or more credits(s) from the following:

- BBE 4001 - Chemistry of Biomass and Biomass Conversion to Fuels and Products (EN) (4.0 cr)
- BBE 4301 - Applied Surface and Colloid Science (3.0 cr)
- BBE 4302 - Biodegradation of Bioproducts (3.0 cr)
- BBE 4303 - Introduction to Bio-based Materials Science (3.0 cr)
- BBE 4505 - Pulp and Paper Technology (3.0 cr)
- BBE 4401 - Bioproducts Engineering (3.0 cr)
- BBE 4404 - Biopolymers and Biocomposite Engineering (3.0 cr)
- BBE 4502 - BBE Capstone Design (1.0) (4.0 cr)
Response to the recommendations and comments from the Food Science Department Graduate Program Committee

We appreciate the suggestions from the Food Science department. There are many opportunities to grow the proposed BRS program and we feel it will be synergistic with efforts in Food Science. Some of the suggestions are aligned with our future goals but currently we do not have the resources to implement all of them.

- **Suggestion:** the word “biomaterials” should be replaced with “bio-based materials” in the proposal.
  
  **Response:** Changed as suggested.

- **Suggestion:** There should be a 500-level course on the topic of biorefineries for the production of bio-based fuels and chemical feedstocks.
  
  **Response:** We have developed a 400-level design course related to this subject (BE 464 – Bioenergy Systems Engineering). The course is currently being reviewed by the Engineering Faculty Council Undergraduate Review Committee. Dr. Tom Richard is the instructor of this course. We believe that it would be redundant to implement at graduate level course on the same topic, especially since graduate students can take BE 464 for credit. This course is in our list of electives for M.S. and Ph.D. programs.

- **Suggestion:** Animal-based polymers and adhesives might be a good special topics course, as would some consideration of polymers derived from aquatic plants, as these don’t seem to be addressed in the proposed Plant-based Polymers course (BRS 501).
  
  **Response:** this is a good suggestion and may be added in the future as resources become available, but is not possible to be included in the proposed course BRS 501 at the present time. Special topics courses (X97) cannot be included in a program proposal.

- **Suggestion:** The program should have a course that encompasses biodegradation, recycling and life cycle analysis, which would interface nicely with the College’s effort in plasticulture.
  
  **Response:** We concur that this would be reasonable subject matter for a new course. In our proposed undergraduate BRS major we envision adding additional options, one of which would focus on “recycling/reuse/full life cycle considerations” and at such a time as faculty resources are available a course along the line suggested here would likely be developed and added to the BRS curriculum, most likely at the 4XX level initially and eventually expanded to the 5XX level.

- **Suggestion:** A course specifically in biorenewable packaging materials, both paper- and plastic-based, could really set the program apart, as a significant portion of landfill waste comprises packaging.
  
  **Response:** Again this would be a reasonable addition as faculty resources become available and as the BRS program matures.

- **Suggestion:** The proposal could be strengthened by looking at what is being offered at comparable international institutions and even at the advanced undergraduate level in the US.
Response: This would be laudable, but not necessary at this point, i.e., there is ample evidence of a demand for such a program in the U.S. Particularly if there are only 4 programs that exist and only 1 that offers a Ph.D., then the evidence of need is sufficient to warrant our going forward.

• Question: Why the Department of Agricultural and Biological Engineering is trying to attract non-engineering applicants.
Response: There is a high level of technology and management that does not require an engineering degree, and the addition of the wood products faculty to the department enables us to create this technology and management-based curriculum. It provides an opportunity for our non-engineering undergraduate degree students (the proposed BioRenewable Systems undergraduate major, which combines ASM and Wood Products) to continue into graduate school, and we believe it will attract students from outside the university as well. Certainly, engineering students would be welcome in this program. Please note that in the proposal it states that 25-30% of the students applying to our ABE graduate program do not have the prerequisite engineering undergraduate degrees.
Dear Paul,

I fully support with the creation of the new BioRenewable Systems Graduate program proposal. It's a great example of modernization of the curriculum and creation of a degree program that is consistent with recent trends in sustainability and the burgeoning interest in entrepreneurship. A couple of the courses outlined in the program may be of particular interest to some of our students especially BRS 553 Bio-Based Polyesters (3). The chemistry, structure-property relationships, and industrial applications of bio-based polyesters are a joint and agricultural disciplines, and BR 553 Advanced Structural BioComposites (3). Manufacture and processes related to the production of engineered bio-composites produced from renewable materials.

Thank you for the opportunity to review your new program.

Sincerely,
Gary L. Messing

At 04:35 PM 9/21/2012, you wrote:

Dear Dr. Messing;

Please find attached a new graduate program proposal being put forward by the Department of Agricultural and Biological Engineering concerning BioRenewable Systems. If this is a new engineering, technology, and management-based program offering a unique program content. While it would not significantly overlap with your department's activities, there may be potential collaborations and synergies with what you do.

I would appreciate a response (suggestions, feedback, concerns, etc.) by Friday, October 12, 2012. Please refer the Graduate School requirements state that we must get a response from you, even if it is simply to say that you are okay with the program. If you have any questions, please let me know.

Thanks very much.

Paul

Paul Kofron - Professor and Head
Department of Agricultural and Biological Engineering
Purdue State
314-495-9502

Head, Department of Materials Science and Engineering
Distinguished Professor of Materials Science and Engineering
Editor in Chief, Journal of Materials Research
1271 Beadle Bldg.
Pennsylvania State University
University Park, PA 16802
Tel: 814-865-3662
February 28, 2013

Dr. Paul Heinemann, Head
Dr. Virendra Puri, Graduate Program Coordinator
Department of Agricultural and Biological Engineering

Dear Drs. Heinemann and Puri:

I am writing to express my support for the proposed graduate program in BioRenewable Systems (BRS). I have been aware of this initiative since it was first discussed in the Agricultural and Biological Engineering department nearly a year ago. Since I am a faculty in the same Department, I had a chance to review and comment on it during the department level review process. I believe proposed BRS program will contribute significantly to the Penn State’s mission in graduate studies as the bioeconomy continues to develop throughout the world.

As you are well aware, we are also currently proposing the Master of Professional Studies (M.P.S.) degree program in Renewable Energy and Sustainability Systems (iMPS-RESS), an intercollege program academically housed in the College of Agricultural Sciences. I believe both proposed programs are distinctly different in terms of structure, mission, and modes of delivery, and will complement one another, rather than compete. The proposed BRS graduate program is a residential program that covers a wide range of biorenewable application areas, whereas iMPS-RESS is an online, non-thesis, professional master’s degree program in that covers different forms of renewable energy areas such as bio-, wind-, and solar-energy. Therefore, they are different from each other in terms of the structure (thesis vs non-thesis) and mode of delivery of the courses (residential vs online).

During the development of BRS program, I also have had several opportunities to review the new BRS courses internally within the Department and was also requested to comment during the University review and consultation process on CSCS. I see little-to-no overlap between BRS and iMPS-RESS courses. Moreover, I believe both programs can complement each other. For example, bioenergy related courses of iMPS-RESS can be taken as elective courses by BRS students (as is proposed for the BRS program).

In conclusion, I am fully supportive of the proposed BRS graduate program and confirm that both BRS and iMPS-RESS are distinctly different in many aspects, but can complement each other to some extent — a desirable synergy that improves efficiency at the University without sacrificing quality.

I hope this support letter will help BRS proposal’s review process. Please do not hesitate to contact me if you have any questions. I am looking forward to working together with the BRS program for the mutual benefit of both programs.

Sincerely,

Ali Demirci
iMPS-RESS Program Chair
The Graduate Faculty

of

BioRenewable Systems (BRS)
• Nicole R. Brown, Ph.D. (Virginia Tech), Associate Professor of Agricultural and Biological Engineering
  The chemistry and chemical modifications of biomaterials, especially lignocellulosic feedstocks, are Dr. Brown’s key interests. She has expertise in the chemistry of biobased fibers, and in modifying biobased materials for select applications; her training originated in wood and polymer chemistry. Now she commonly explores correlations between chemical structure and observed performance via various chemical and spectroscopic techniques, including solution and solid state NMR, FTIR, XPS, and others. The relaxation behavior of polymers explored via DMA, DSC, TGA and rheological studies. Dr. Brown will be developing and offering a graduate course entitled “Bio-based polymers”.

• Jeffrey M. Catchmark, Ph.D. (Lehigh University), Associate Professor of Agricultural and Biological Engineering
  Dr. Catchmark’s interest areas include the structure, biosynthesis and interactions of polysaccharides with a focus on cellulose. Applications of his research range from compostable packaging and building materials to biomedical materials. He has over 20 years of experience in nanomaterials synthesis and processing. His expertise includes microbial fermentation of polysaccharides, purification and binding analysis of polysaccharides and biopolymers, and many nanocharacterization techniques. Dr. Catchmark teaches undergraduate courses in agricultural structural engineering and biological engineering design.

• Daniel E. Ciolkosz, Ph.D. (Cornell), P.E., Extension Associate
  Dr. Ciolkosz’ interests include physical and thermochemical conversion of biomass for energy production, facility energy use characterization, and controlled environment systems. His background includes experience as an energy consultant as well as a faculty position at the University of KwaZulu-Natal in South Africa. He is the biomass lead for the DOE Mid Atlantic Clean Energy Application Center, and coordinates the “On-Farm Bio-Based Energy Production and Use” initiative for Penn State Extension. He serves as academic program coordinator for the Inter-College MPS in Renewable Energy and Sustainability Systems (under development). He is also the education program lead for a USDA AFRI Northeast Bioenergy regional project.

• Ali Demirci, Ph.D. (Iowa State University), Professor of Agricultural and Biological Engineering
  Dr. Demirci’s teaching and research focus on Microbiological Engineering, which has two directions: i) Bioprocessing/fermentation processes for productions of value-added products such as biofuels, organic acids, enzymes, antibiotics; ii) Inactivation/control of pathogenic microorganisms in foods and environment by novel non-thermal processing. He offers regularly a graduate course on Food Safety Engineering. He is currently serving as Professor-in-Charge for the Penn State’s Shared Fermentation Facility. Dr. Demirci is the Associate Editor of Transactions of the ASABE and Applied Engineering in Agriculture. He also served on editorial boards of Food Protection and Food Biotechnology Journals.
• Herschel A. Elliott, Ph.D. (University of Delaware), P.E., Professor of Agricultural and Biological Engineering
Dr. Elliott has been involved in teaching, researching, and consulting in the areas of fate and transport of pollutants in aquatic and soil systems, and the evaluation and design of land-based waste disposal systems. His teaching experience includes water quality chemistry, soil pollution processes, and design of land-based systems for disposal and recycling of wastes. He specializes in researching land application of residuals, by-products, and effluents from municipal, agricultural, and industrial facilities, and the interfacing of wastewater treatment with the ultimate disposal and recycling of effluent and residuals. He has provided technical and expert advice on projects involving sites contaminated with, or designed for disposal of, petroleum, municipal solid wastes, pharmaceuticals, biosolids, water treatment residuals, septage, oil and gas drilling fluids, metal-plating and battery recycling byproducts, and photographic wastes. He serves on the Environmental Engineering Committee for the USEPA Science Advisory Board.

• James M. Hamlett, Ph.D. (Iowa State University), Associate Professor of Agricultural Engineering
Dr. Hamlett’s recent research focuses on modeling nonpoint source constituents from agricultural lands, selection and effectiveness of best management practices, and urban stormwater modeling/monitoring. He has extensive experience with graduate teaching and research, has served on committees of nearly 100 graduate students (chair for nearly a third of these), has served as Graduate Program Coordinator in Agricultural and Biological Engineering, and has been an active member of the Dept. Graduate Committee for over two decades. He is involved in teaching at the undergraduate and graduate levels for students primarily in environmental resources management, biological engineering, and agricultural and biological engineering. Courses include hydrologic measurements, principles of soil and water engineering, water quality modeling, pollutant transport from agricultural lands, and research methods. Dr. Hamlett has been on faculty at Penn State University since 1987 and previously was employed with the Iowa Natural Resources Council and the Iowa Department of Soil Conservation.

• Paul H. Heinemann, Ph.D. (University of Florida), Professor and Head of Agricultural and Biological Engineering.
Dr. Heinemann has focused his research on tree and small fruit production mechanization and automation, mushroom production, odor and emission analysis and reduction, sensor applications for produce quality evaluation, and plant tissue culture production and mechanization. His current research is primarily focused on innovative technologies for fruit thinning and harvest assist technologies. Dr. Heinemann teaches a graduate course in biological and agricultural systems simulation in the Agricultural and Biological Engineering graduate program, which he has taught continuously since 1989. Dr. Heinemann is a member engineer in the American Society of Agricultural and Biological Engineers, and has
served as editor and associate editor for Transactions of ASABE and Applied Engineering in Agriculture.

- John J. Janowiak, Ph.D. (Washington State University), Professor Wood Products Engineering. Dr. Janowiak’s interest areas include the processing and manufacture of both solid lumber and engineered wood composites along with mechanical performance relative to their structural end-use applications. Dr. Janowiak in recent years has also worked extensively to investigate and research alternative approaches the phytosanitation treatment of solid wood packaging materials (SWPM) applying both microwave and radio-frequency electromagnetic frequency irradiation to eradicate invasive pest organisms. He is also active the development of international standards for SWPM and other commercial traded wood product commodities. His expertise includes the test performance evaluation, engineering mechanics, and advanced manufacture processing technology the wood products industries. He has served in various professional societies including regional and national officer the Forest Products Society.

- Jude Liu, Ph.D. (University of Manitoba), Assistant Professor of Agricultural and Biological Engineering
  Dr. Liu’s interest areas include biomass feedstock logistics, management and selection of field machine systems, and analysis of biomass processing and production systems. His expertise is field performance test and analysis of machine systems for herbaceous biomass. Dr. Liu offers machinery courses for senior undergraduate students.

- Judd H. Michael, PhD (Penn State), Professor of Sustainable Enterprises
  Dr. Michael’s interests are related to business management and sustainable business practices. His recent research has focused on why firms adopt sustainable practices, and the impact of management beliefs on those practices. From a materials perspective, Dr. Michael has recently begun working more at the intersection of packaging and bio-materials, but has more than 10 years’ experience working with the transportation packaging and pallet industry. Previous research foci have been related to various organizational optimization issues, including safety, human resources best practices, and employee behavior. Judd has taught a graduate course in Sustainable Business Strategies for more than 7 years, and has recently begun teaching an undergrad version of that course. He has also taught numerous management education programs for various industry clientele. He recently served as co-chair of the College of Ag’s Entrepreneurship Strategic Initiative, and continues research related to entrepreneurship. He is currently a faculty advisor for Penn State’s Minor in Sustainability Leadership, and was named a Harbaugh Scholar for 2012-13. Judd also holds a joint appointment in the Ecosystems Science and Management Department.

- Dennis J. Murphy, PhD (Penn State University), Distinguished Professor of Agricultural and Biological Engineering
  Dr. Murphy’s interests include applied research and education for tractor and machinery safety issues, youth safety; classification of agricultural deaths and injuries; methods of
modifying farm worker safety behavior, evaluating safety interventions; and responding
to farm injury emergencies. He has over 30 years of experience as an agricultural safety
researcher and educator. He authored the first professional reference and textbook on
agricultural safety and health, in 1992. An in-depth review of problematic issues and
research-based theory and principles to guide effective agricultural safety and health
interventions resulted in a second book in 2003. Dr. Murphy is the founding editor of the
Journal of Agricultural Safety and Health and is on the editorial boards of three additional
peer-reviewed journals.

• Virendra M. Puri, Ph.D. (University of Delaware), Distinguished Professor of Agricultural and
  Biological Engineering
  Dr. Puri’s interest areas include all aspects of mechanics of biorenewable materials in
  particulate form. He has over three decades of experience in graduate teaching and
  research related to particles and particle systems. His expertise includes measurement of
  mechanical properties for and computational modeling of particulate processes such as
  storage, handling, flow, deposition, segregation, and compaction. Dr. Puri regularly offers a
  graduate course in mechanics and properties of particulate materials and systems and one
  on numerical methods. He is the Co-Editor-in-Chief of Particulate Science and Technology.
  Dr. Puri served as the Editor of Transactions of the ASABE and Applied Engineering in
  Agriculture; flagship publications of the American Society of Agricultural and Biological
  Engineers. Professor Puri has served on and is serving on several Editorial Boards.

• Thomas L. Richard, Ph.D. (Cornell University), Professor of Biological Engineering
  Tom Richard is a Professor of Biological Engineering and the Director of Penn State’s
  Institutes for Energy and the Environment. Dr. Richard’s teaching and research applies
  microbial bioconversion technologies for energy production and value-added
  manufacturing, with a particular focus on sustainable strategies for bioenergy production
  and use. He is the author or co-author of over 140 research and technical publications and
  serves on the editorial boards of three scientific journals. He is active in several
  professional societies and a Fellow of the Institute of Biological Engineering.

• C. Alan Rotz, Ph.D. (The Pennsylvania State University), Adjunct Professor of Agricultural and
  Biological Engineering
  Dr. Rotz’s work involves evaluation of the environmental and economic sustainability of
  farm production systems. He has developed a process level farm simulation model
  (Integrated Farm System Model) that is used to simulate the performance, environmental
  impacts and economics of crop, dairy and beef farming systems. This tool is used in research
  and teaching programs to study the benefits and costs of alternative production strategies.
  His current work emphasizes the measurement and modeling of gaseous emissions from
  farms. Dr. Rotz is employed by the Agricultural Research Service of the USDA where he
  serves as the lead scientist of the integrated farming systems project at the Pasture Systems
  and Watershed Management Research Unit in University Park. He is a Fellow of the
  American Society of Agricultural and Biological Engineers and a registered Professional
Robert D. Shannon, Ph.D. (Indiana University), Associate Professor of Agricultural and Biological Engineering
Dr. Shannon’s interest areas include nutrient cycling and biogeochemical transformations in aquatic and wetland systems, and he has advised both undergraduate and graduate students in research related to natural resources management and engineering. He currently is Program Coordinator for the Environmental Resource Management major, and has taught courses related to pollutant impacts on aquatic systems, and natural and constructed wetlands. Dr. Shannon is active in the Society of Wetland Scientists (SWS), currently serving on the Board of Directors of the SWS Professional Certification Program, and as the chair of the SWS Professional Wetland Scientist certification review panel.

Paul M. Smith, Ph.D. (Virginia Tech), Professor of Agricultural and Biological Engineering. Dr. Smith’s research interests include: global competitiveness, international trade shows, technology driven product-market development, bio-refinery value chains, social capital, content analysis of advertising, and Pennsylvania’s hardwood industries. He has taught graduate courses in international wood industries marketing and applied B2B marketing research for over 25 years. He has served as President of the Society of Wood Science & Technology (SWST), chaired the National (US) Planning Committee for Forest Products Research and currently serves as the NE representative of the Forest Products Society Executive Board. He was elected an SWST Fellow in 2011. Dr. Smith has made over 40 international trips to conduct research, present papers, and consult.

Eileen Fabian Wheeler, Ph.D. (Cornell University), Professor of Agricultural and Biological Engineering
Dr. Wheeler combines Extension education with an applied research program in air quality, or more specifically environmental bio-physics within agricultural structures. The focus is for commercial agriculture when it is moved indoors. Priority areas include impact of facilities on animal welfare and plant production; ventilation system performance of barns and greenhouse structures; and reduction of air emissions from animal feeding operations. Dr. Wheeler has published across a broad array of indoor-agriculture sectors including laying hen, broiler chicken, turkey, veal calf, swine, dairy, equine, greenhouse and mushroom production. Additional Extension effort has improved engineering design of horse stables and riding arenas while recent research efforts have focused on odor evaluations of intensive livestock production. She serves on the U.S. Department of Agriculture’s National Air Quality Task Force among other national level advisory groups.
University Graduate Degree Programs
Bulletin Listing

BioRenewable Systems (BRS)

Program Home Page

PAUL H. HEINEMANN, Head of the Department of Agricultural and Biological Engineering
250 Agricultural Engineering Building
814-865-7792

Degrees Conferred:
Ph.D., M.S.

The Graduate Faculty

- Nicole R. Brown, Ph.D. (Virginia Tech) Associate Professor of Agricultural and Biological Engineering
- Jeffrey Catchmark, Ph.D. (Lehigh) Assistant Professor of Agricultural and Biological Engineering
- Daniel E. Ciolkosz, Ph.D. (Cornell) P.E. Extension Associate
- Ali Demirci, Ph.D. (Iowa State) Professor of Agricultural and Biological Engineering
- Herschel A. Elliott, Ph.D. (Delaware) P.E. Professor of Agricultural and Biological Engineering
- James M. Hamlett, Ph.D. (Iowa State) P.E. Associate Professor of Agricultural and Biological Engineering
- Paul H. Heinemann, Ph.D. (Florida) Professor of Agricultural and Biological Engineering
- John J. Janowiak, Ph.D. (Washington State) Professor Wood Products Engineering
- Jude Liu, Ph.D. (Manitoba, Canada) Assistant Professor of Agricultural and Biological Engineering
- Judd H. Michael, Ph.D. (Penn State) Professor of Sustainable Enterprises
- Dennis J. Murphy, Ph.D. (Penn State) C.S.P. Distinguished Professor of Agricultural and Biological Engineering
- Virendra M. Puri, Ph.D. (Delaware) Distinguished Professor of Agricultural and Biological Engineering
- Thomas L. Richard, Ph.D. (Cornell) Professor of Agricultural and Biological Engineering
- C. Alan Rotz, Ph.D. (Penn State) Adjunct Professor of Agricultural and Biological Engineering
- Robert D. Shannon, Ph.D. (Indiana) Associate Professor of Agricultural and Biological Engineering
• Paul M. Smith, Ph.D. (Virginia Tech) Professor of Agricultural and Biological Engineering
• Eileen F. Wheeler, Ph.D. (Cornell) Professor of Agricultural and Biological Engineering

Biorenewable Systems are the structures and processes that create and support biologically-based products capable of being continuously replaced through sound technology and management. The BioRenewable Systems (BRS) degree is offered as a resident instruction, research-based M.S. and Ph.D. program. The degree requires a thesis at both levels. BRS is positioned to be a world-renowned graduate program in renewable biologically-based materials, products, and processes that fully integrates scientific research with the principles of systems technology, business, management, marketing, leadership development, and entrepreneurship for biorenewable systems. Toward that end, the academic requirements for BRS are closely related to the disciplinary focus of agricultural and biological sciences, technological innovation and application, and business, management, and leadership within the continually evolving biobased sectors. This makes BRS unique from other fields of science and management. To promote and fulfill this uniqueness, continuation of courses in science, business, management, and technology at the graduate level is encouraged and expected. Excellent facilities, including equipment and instrumentation, are available for research in the designated areas. Collaborative arrangements allow access to a large variety of other resources: Materials Research Institute; Penn State Institutes of the Energy and Environment; Housing Research Center; USDA Pasture Systems and Watershed Management Research Lab; a mushroom research and demonstration facility and a 1,500-acre agricultural research center for cooperative work with agronomic and horticultural production systems as well as animal production systems.

Admission Requirements

Requirements listed here are in addition to general Graduate School requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin.

In general, for admission to the Graduate School, an applicant must hold either (1) a baccalaureate degree from a regionally accredited U.S. institution or (2) a tertiary (postsecondary) degree that is deemed comparable to a four-year bachelor's degree from a regionally accredited U.S. institution. This degree must be from an officially recognized degree-granting institution in the country in which it operates.

Graduate Record Examination (GRE). All students must submit GRE general aptitude test scores (i.e., verbal, quantitative, and analytical) to be considered for admission.

To qualify for admission, all international applicants must take and submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, 213 for the computer-based test, or a total score of 80 with a 19 on the speaking section for the internet-based test. The minimum composite score for the IELTS is 6.5.
International applicants exempt from the TOEFL/IELTS requirement include those who have received a baccalaureate or a graduate degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, and Wales.

All applicants must provide the official transcripts of all their previous course work, a statement of purpose written by the applicant, and at least three letters of recommendation. Admission into the BRS Graduate Program is based upon a thorough review of all applicant qualifications, and the best-qualified applicants will be accepted up to the number of students for which program resources are available.

**Entrance to Master of Science Program**

Completion of a relevant undergraduate Bachelor degree program is required for admission to the M.S. degree program; relevant programs span a diverse set of academic disciplines, including but not limited to: Agricultural Sciences, Biology, Chemistry, Business, Engineering, and Environmental Sciences. Students with junior-senior GPA of at least 3.00 (4.00 base) will be competitive in the admission process.

**Entrance to Doctor of Philosophy Program**

The program requirement for acceptance to graduate study toward a Ph.D. degree in BRS is typically an M.S. degree with research thesis in BRS or related discipline such as Agricultural Sciences, Biology, Chemistry, Business, Engineering, and Environmental Sciences, or with a B.S. degree in Agricultural Systems Management (ASM) or BRS or equivalent. Outstanding students interested in direct admission from a B.S., B.A., or M.B.A. program to the Ph.D. Program should contact the Graduate Program Coordinator for further clarification and details. Direct admission will be based on critical evaluation of the student’s: potential to conduct publishable research, academic record, an additional language (other than the student’s mother tongue), performance on standardized tests, statement of purpose, and reference letters.

Students who apply directly to the Ph.D. program with a B.S. degree and are deemed by the admissions committee not to meet the standards for admission to the Ph.D. program may be considered either for admission into the M.S. program or for admission to the Ph.D. program on a provisional basis. The student will remain in provisional status in the Ph.D. program until completing the following specific courses: BRS 500 (3 credits), BRS 501 (3 credits), BRS 502 (1 credit), BRS 550 (3 credits), BRS 511 (3 credits), BRS 551 (2 credits), and ABE 559 (3 credits), with a minimum grade-point average of 3.00. For provisional status to change, the specific courses must be completed within the first two semesters of study.

**Master's Degree Requirements**

All candidates for the M.S. degree must prepare and complete a thesis, complete a minimum of 30 credits at the 400-level or higher (including a minimum of 18 credits at 500-level or higher
and a minimum of 6 credits of research), and obtain a minimum grade-point average of 3.00. Only courses in which grades of C or better are earned may be counted toward the requirements of the master’s degree. Each program must include BRS 500 Research Methods, BRS 501 Biobased Polymers, and BRS 502 Human Behavior in Management and Technology, two courses from the list of electives in graduate syllabus and at least one statistics course. A total of at least 18 credits must be from 500-level or above courses. All requirements for a master of science degree, whether satisfied at Penn State or elsewhere, must be met within eight years from the first semester of graduate study.

Additional program details are contained in a graduate syllabus, available from the department.

**Doctoral Degree Requirements**

Official entrance into a Ph.D. program occurs upon successful completion of the Ph.D. Candidacy Examination. Ph.D. degree requirements include successful completion of the following: approved graduate course work, Ph.D. language and communication requirements, a comprehensive examination, and defense, approval, and submission of a dissertation.

No University-level (Graduate Council) minimum number of courses completed or credits earned are specified for the Ph.D.; the student’s doctoral advisory committee will recommend the minimum requirements as appropriate for each individual student’s program of study and dissertation research. Unless previously taken for the M.S., each Ph.D. student must complete BRS 500 Research Methods, BRS 501 Biobased Polymers, BRS 502 Human Behavior in Management and Technology, and at least 1 credit of BRS 602 Supervised College Teaching. In addition, the candidate must complete 6 credits of BRS 5XX (excluding BRS 500 and 590-596) or select from the list in graduate syllabus. The candidate is expected to develop a program of study and submit it to the appointed doctoral committee for consideration and approval. All requirements for a Ph.D. degree, whether satisfied on this campus or elsewhere, must be completed within eight years after passing the candidacy examination.

**CANDIDACY EXAMINATION** -- The Ph.D. Candidacy Examination Committee will administer the Candidacy Examination. This committee will consist of four BRS graduate faculty members, including the Adviser, the ABE Department Head (or annually appointed designee), the BRS Graduate Program Coordinator, and one faculty member selected by the student. In cases where a member serves two roles on the committee, an additional member will be appointed by the Graduate Program Coordinator. The Candidacy Examination will consist of developing a Ph.D. research proposal following the completion of BRS 500 Research Methods, presenting the proposal, and defending/discussing the proposed research with the Committee. The Candidacy Examination will be completed by the student soon after s/he has completed at least 18 credits but before the end of the third semester. Successful completion of the Candidacy Examination does not mean that the student's Ph.D. research proposal is approved. Rather, final approval of the candidate's research proposal will be the responsibility of the Doctoral Committee.

**DOCTORAL COMMITTEE** -- At least one regular member of the Doctoral Committee must represent a field outside the candidate’s major field of study in order to provide a broader range of disciplinary perspectives and expertise. This committee member is referred to as the “Outside
Field Member.” In cases where the candidate is also pursuing a dual-title field of study, the dual-title representative to the committee may serve as the Outside Field Member.

Additionally, in order to avoid potential conflicts of interest, the primary appointment of at least one regular member of the Doctoral Committee must be in an administrative unit that is outside the unit in which the dissertation adviser's primary appointment is held (i.e., the adviser's administrative home; in the case of tenure-line faculty, this is the individual's tenure home). This committee member is referred to as the “Outside Unit Member.” In the case of co-advisers, the Outside Unit Member must be from outside the administrative home(s) of both co-advisers. In some cases, an individual may have a primary appointment outside the administrative home of the student’s dissertation adviser and also represent a field outside the student’s major field of study; in such cases, the same individual may serve as both the Outside Field Member and the Outside Unit Member.

Consistent with the two preceding paragraphs, a Doctoral Committee must consist of four or more members of the Graduate Faculty and (1) the chairperson and at least one other member must be BRS Graduate Faculty members, (2) at least one member must be from a department other than ABE and s/he should be a graduate faculty member of a program other than BRS, (3) at least one member must represent any minor department(s) if the student selects a minor(s), and (4) the Advisory Committee can be appointed only after the Candidacy Examination has been passed.

PH.D. LANGUAGE AND COMMUNICATION REQUIREMENT--The purpose of the communication requirement is to strengthen the student's professional communication skills. The candidate must take a minimum of one three-credit course and receive a grade of B or better. Course selections must be approved by the academic adviser prior to registration. Courses used to satisfy this requirement must include the substantial practice of writing and/or speaking.

COMPREHENSIVE EXAMINATION -- When a Ph.D. candidate has substantially completed the coursework, including the communication requirements, s/he is required to take a Comprehensive Examination covering the major, minor, and related areas of study. The Comprehensive Examination will be both written and oral. The nature and details of the Comprehensive Examination will be determined by the student’s Advisory Committee. In general, the student will be required to demonstrate ability to synthesize information acquired through formal coursework and to use technical literature to find information required for solving biorenewable systems problems. A favorable vote of at least two-thirds of the committee is required for passing. If a candidate fails, the committee will determine whether another examination may be taken.

FINAL ORAL EXAMINATION -- Upon recommendation of the Adviser, a Ph.D. candidate who has satisfied all other requirements for the degree will be scheduled by the Dean of the Graduate School to take a Final Oral Examination. The student must be a registered full-time or part-time degree student for the semester in which the Final Oral Examination is taken. This examination is open to the public and the student should notify all departmental faculty and graduate students. The examination is related largely to the dissertation, but may cover the candidate’s entire field of study without regard to courses that have been taken either at Penn State University or elsewhere. The defense of the dissertation should be well-prepared including
any appropriate visual aids. One of the aims of the preparation should be to synthesize the important conclusions in a time-efficient presentation, leaving ample time for questions and discussion. A favorable vote of at least two-thirds of the committee is required for passing. If a candidate fails, the committee will determine whether another examination may be taken.

**Other Relevant Information**

Continuous fall and spring registration is required for all graduate students until the thesis is approved.

**Student Aid**

Graduate assistantships and other forms of student aid are described in the [STUDENT AID](#) section of the *Graduate Bulletin*.

**Courses**

Graduate courses carry numbers from 500 to 699 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.
Appendix I – Program/Instructor Approval Responses for Elective Courses
Hi Nicole, Paul,

The Bioenergy Feedstocks course has not been taught before, so there is not an on-campus equivalent. The course will be offered first time Spring 2013. I am the course organizer, and we are still in the process of developing all of the on-line modules for the course. Two of the course instructors (Greg and Marvin) do not have a teaching appointment, so I do not anticipate offering the course on-campus any time soon. However if you want to list our Bioenergy Feedstocks course as a non-core required class or as elective in your BSM Graduate Program proposal that would be fine with me. The more students registered for our on-line course the better. I had the Bioenergy Feedstocks course given a FOR designation and my proposal was prepared in such a way that on-campus students not in the RESS WC program could enroll. The syllabus is attached. Each module will have it's own homework assignment(s).

I've only had two weeks in town so far this summer. So it both seems like summer has not yet started but is already nearly over at the same time. Got a lot of work done though, including new willow bioenergy field trials planted. Maybe we can enlist your BSM students to help us with our next poplar or willow biomass harvest! Good practical hands-on BioSystems Management experience.

Cheers,

John
Subject: RE: including ABE 888 as an elective within BSM Grad Program

Date: Monday, September 24, 2012 11:16:01 AM Eastern Daylight Time

From: Ali Demirci <axd29@engr.psu.edu>
To: Nicole Brown <nrb10@engr.psu.edu>

Dear Dr. Brown:

Thanks for contacting me. I am willing to offer my course, ABE 888 "Conversion Technologies for Bioenergy Production" as an elective within the proposed Biorenewable Systems (BRS) program. However, ABE 888 is not officially approved, yet. It is currently going through the University's review process. Once it is approved, it will be part of Intercollege Professional Master's program in Renewable Energy and Sustainability Systems (IMPS-RESS) under the World Campus, and as such, must first be offered to students participating in that program. However, if seats remain, resident graduate students including those in the BSM program are welcome to participate.

I look forward to teaching students within the BSM graduate program.

Sincerely,

Dr. Ali Demirci

************************************************
Ali Demirci, Ph.D.
Professor
231 Agricultural Engineering Building
Dept. of Agricultural and Biological Eng.
The Pennsylvania State University
University Park, Pennsylvania 16802
(814) 863-1098 (Office)
(814) 470-0624 (Mobile)
(814) 863-1031 (Fax)
e-mail: demirci@psu.edu
http://abe.psu.edu/demirci

Professor-in-Charge of the Shared Fermentation Facility
http://www.hack.psu.edu/facilities/fermentation-up
Subject: documenting my willingness to offer ABE 885 within the new BRS grad program
Date: Sunday, September 23, 2012 12:33:53 PM Eastern Daylight Time
From: Jude Liu <jliu@engr.psu.edu>
To: Nicole Brown <nrnb10@engr.psu.edu>

September 27, 2012
Dear Dr. Brown,
I am writing to document my willingness to offer my course, ABE 885 "Biomass Harvesting and Logistics" as an elective within the proposed Biorenewable Systems (BRS) program. This course is part of the World Campus program, and as such, must first be offered to students participating in that venue. However, if seats remain, resident graduate students including those in the BRS program would be welcome to participate.

Sincerely,
Jude Liu

Jude Liu, Ph.D., P.E.
Assistant Professor
Agricultural Systems Management Program Coordinator
227 Agricultural Engineering Building
Department of Agricultural and Biological Engineering
The Pennsylvania State University
University Park, PA 16802
Fax: (814) 863-1031
Phone: (814) 863-6844
Subject: Biorenewable Systems program  
Date: Thursday, September 27, 2012 3:58:21 PM Eastern Daylight Time  
From: Richard, Tom <trichard@psu.edu>  
To: Virendra Puri <vmpuri@engr.psu.edu>  
CC: Nicole Brown <nrb10hokie@gmail.com>  

September 27, 2012

Dear Dr. Puri,

My course, ABE 884 "Biomass Energy Systems" may be listed as an elective within the proposed Biorenewable Systems (BRS) program. Please note this course is part of the World Campus program, and as such, must first be offered to students participating in that venue. However, if seats remain, resident graduate students including those in the BSM program would be welcome to participate.

I look forward to the successful launch of the BSM graduate program.

Sincerely,

Dr. Tom Richard  
Director, Penn State Institutes of Energy and the Environment  
Professor of Biological Engineering  
Penn State University

trichard@psu.edu  
(814) 863-0291

http://www.psiee.psu.edu/  
http://www.bioenergy.psu.edu/
Subject: Use of EME 801 as an elective
Date: Thursday, September 27, 2012 8:48:59 AM Eastern Daylight Time
From: Mark Klima <msk4@psu.edu>
To: Nicole Brown <nrb10@engr.psu.edu>
CC: Seth Blumsack (sethb@psu.edu) <sethb@psu.edu>, Ann Taylor (atb3@psu.edu) <atb3@psu.edu>, Larry Grayson <lrg19@psu.edu>, Andrew N. Kleit <ank1@psu.edu>

Dear Virendra,

The John and Willie Leone Family Department of Energy and Mineral Engineering is willing to offer EME 801, "Energy Markets, Policy and Regulation," as an elective within the proposed Biorenewable Systems (BRS) program. This course is part of the World Campus program, and as such, must first be offered to students participating in that venue. However, if seats remain, resident graduate students including those in the BRS program would be welcome to participate.

Sincerely,

Mark

Mark S. Klima, Ph.D., P.E.
Associate Professor and Interim Head
John and Willie Leone Family Department of
Energy and Mineral Engineering
The Pennsylvania State University
115 Hoose Building
University Park, PA 16802
tel: 814-863-7942
text: 814-865-3248
e-mail: msk4@psu.edu
From: Nicole Brown  
Sent: Tuesday, October 30, 2012 4:53 PM  
To: Virendra Puri  
Subject: Fwd: ENVSE 450; need a response today or Monday, please

Virendra,
I was planning to depart State College today, but had to leave town Sunday to beat the storm. Hope everyone there is ok. What a massive storm!

Below is the response from Dr. Groves, regarding the ENVSE course. I believe this completes the task. I'm sure you are as happy as I am!

Best regards,  
-Nikki

-Sent from my phone

--- Begin forwarded message:

From: Bill Groves <wag10@psu.edu>  
Date: October 26, 2012 11:29:26 AM EDT  
To: Nicole Brown <nbr10@engr.psu.edu>  
Subject: RE: ENVSE 450; need a response today or Monday, please

October 26, 2012

Dear Dr. Brown,

Graduate students in the proposed Biorenewable Systems graduate program are welcome to take my course, ENVSE 450 "Environmental Health and Safety", as an elective within your proposed degree program.

Sincerely,
Dr. William Groves  
Associate Professor, Industrial Health and Safety
Appendix II – Program/Instructor Approval Responses for Communications Courses
Subject: RE: letter of support for new graduate program
Date: Wednesday, October 17, 2012 1:49:46 PM Eastern Daylight Time
From: Roger Geiger <rg9@psu.edu>
To: Nicole Brown <nrb10@ engr.psu.edu>, Gerald Le Tendre <gkl103@psu.edu>

Dear Professor Brown,

Students in the proposed Biorenewable Systems graduate program would be welcome to take HI ED 546, “College Teaching” whenever it is offered in order to fulfill the requirement for Communications and Language.

Sincerely,
Roger Geiger
Head, Higher Education Program

Subject: RE: email of support for new Grad Program in ABE
Date: Tuesday, October 23, 2012 10:34:16 AM Eastern Daylight Time
From: Ann Tickamyer <art14@psu.edu>
To: Nicole Brown <nrb10@ engr.psu.edu>

Dear Dr. Puri,

Graduate students in the proposed Biorenewable Systems graduate program are welcome to enroll in AEE 450 and AEE 530 whenever these courses are offered and space is available in order to fulfill their three credit Communications or International Language/Culture Requirement.

Sincerely, Ann
Ann R. Tickamyer, PhD
Professor and Head
Department of Agricultural Economics, Sociology, and Education
The Pennsylvania State University
103 Armsby Bldg.
University Park, PA 16802

phone: 814.865.5461
fax: 814.865.3746
email: art14@psu.edu
http://www.aees.psu.edu/
From: Nicole Brown
Sent: Tuesday, October 30, 2012 1:49 PM
To: Peter Miraldi
Cc: John Gastil; Virendra Puri
Subject: Re: letter of support for new graduate program

Peter,

My sincerest thanks. I have CC'd Virendra Puri who is coordinating our proposal, on this message so he can be in touch if anything further is necessary. Thank you so much for your help; sorry to impose on your time!

-Nikki Brown

-Sent from my phone

On Oct 30, 2012, at 12:24 PM, "Peter Miraldi" <pm10@psu.edu> wrote:

Hi Nikki,

Just an update on my last e-mail:

The supervisor of CAS 452W said he does not see any major reason not to approve your request to allow your graduate students to enroll in this course.

The other supervisor of CAS 471 deferred to the wishes of the instructor (i.e., allow enrollment on a case-by-case basis). He also suggested that an ALS course may satisfy your culture requirement better than the CAS 450/550 or 452/552 courses. This supervisor also suggested that I ask John Gastil about offering CAS 571 (a graduate seminar on Intercultural Communication) in the future, which may be appropriate for your graduate students.

Therefore, you have approval to include CAS 450W and 452W as part of your curriculum if you choose to do so, but enrollment in CAS 471 would need to be on a case-by-case basis at the discretion of the course instructor.

Let me know if you need anything further from me and I will do what I can to help you.

Best of luck,

Peter
From: ROBERT E BURKHOLDER <reb5@psu.edu>
Sent: Tuesday, October 30, 2012 4:20 PM
To: Nicole Brown
Cc: kaw1@psu.edu; Virendra Puri
Subject: Re: letter of support for new graduate program

October 30, 2012

Dear Dr. Puri:

Graduate students in the proposed Biorenewable Systems graduate program are welcome to enroll in ENGL 417, ENGL 418, ENGL 474, or ENGL 511 whenever these courses are offered in order to fulfill their three-credit Communications or International Language/Culture Requirement. We understand that the total number of students in this graduate program taking these courses will not exceed five total in an academic year and that students enrolling in the courses will be required by you to present to us evidence that they have completed the equivalent of the prerequisites for these courses. Finally, we recommend that students needing specific help with English as a Second Language (ESL) look to the courses in Applied Linguistics that are specifically designed to address ESL needs.

Sincerely,
Robert E. Burkholder
Associate Head
Department of English
109 Burrowes Building
University Park, PA 16802

On Tue, Oct 30, 2012 01:52 PM, Nicole Brown <nrh10@engr.psu.edu> wrote:

Hello Bob,

We have come to the deadline for submitting our program proposal. I am CCing Virendra Puri, who is coordinating the proposal. If possible, could you please provide the support email to him today? I am traveling.

Thank you so very much for your assistance! It has been a pleasure corresponding with you. I am sorry this matter has been such an imposition on your time.

-Nikki Brown

-Sent from my phone
GRADUATE COUNCIL COMMITTEE ON PROGRAMS AND COURSES
SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES PROGRAM,
OPTION, OR MINOR PROPOSAL FORM

Submit 1 copy of the proposal form and 25 copies of the supporting documentation as outlined below to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building. The proposals will be transmitted to the Dean of the Graduate School for consideration by the Graduate School's Subcommittee on New and Revised Programs and Courses, and the Committee on Programs and Courses. For a detailed explanation of the form, see the Guide to Curricular Procedures.

College Department or Instructional Area
Education/Learning & Performance Systems Workforce Education and Development

NEW PROGRAM, OPTION OR MINOR

Designation of program Master of Professional Studies
Classification of Organization Development and Change Instructional Programs
Code (CIP)
Designation of option Designation of minor

Indicate effective date The first semester following approval

OLD PROGRAM, OPTION, OR MINOR: Change _____ Drop _____

Old designation of program
Old designation of option
Old designation of minor

New designation of program (if changed) New designation of option (if changed) New designation of minor (if changed)

Indicate effective date

SUBMITTED BY Date 1/12/13

In Charge of Graduate Program

NOTED BY Date 1/10/13

College Representative to Graduate Council Subcommittee on New and Revised Programs and Courses

APPROVED BY Date 10/21/12

Dean of College
SUPPORTING DOCUMENTATION REQUIRED FOR PROGRAMS, OPTIONS, OR MINORS (Adds, Changes, or Drops)

All proposals must include a justification statement for action being taken. Submit 1 copy of the proposal form and 25 copies of the supporting documents to the University Curriculum Coordinator at the University Faculty Senate Office. It is important that the proposal include a copy of the program in a format suitable for inclusion in the Graduate Degree Programs Bulletin. Prepare documentation in the outline format as shown below. The proposer is reminded that the Subcommittee and Committee reviewing the proposed program may not have knowledge of the field and is encouraged to provide as much documentation as possible for the reviewers. All proposals, whether a new program or a program change, must be consecutively paginated or the proposal will be returned to the proposing unit. In addition, a table of contents needs to be included in the proposal.

NEW PROGRAMS, OPTIONS* AND MINORS**

A. The objectives of the program: an explanation of how the proposal meets the new educational objectives and/or strengthens existing programs of the college(s) and the University; what students may expect to accomplish through the new program; and a statement of how the new offering does not duplicate other degree programs within the department/college/University.

B. A list of new courses to be established as a part of the new offering.

C. A complete program statement. This should be an arrangement of courses in accordance with degree requirements and with identification of the pattern of scheduling. A list of the required courses, typical electives, etc. that will logically be taken by a student enrolling in the new program should be included. Courses that are new courses should be distinguished from existing courses. Any statement must be submitted in a format for bulletin copy with additional material if necessary (provide both a hard copy and on diskette).

D. A statement of admission requirements should be included, i.e., required test scores, minimum junior/senior GPA, as deemed appropriate by the proposer.

E. A justification for the program. The proposal should include a statement regarding the necessity for the program, i.e., why the program should be offered; and information on the ability of the department to offer a quality program. Included in the section should be the projected size of the program and its impact on current course offerings and faculty load as well as additional faculty advising duties.

F. A justification for the degree title used*. The academic degree titles (M.S., M.A., Ph.D.) are to be used only for degree programs that are research-oriented. A professional degree title will be more appropriate for programs that, for example, emphasize practical application of knowledge; programs that emphasize professional development for advancement in specific careers but with a more practitioner orientation; programs that prepare students for licensure in a given field; and masters programs that are not intended to prepare students for doctoral study. If a professional master's degree is being proposed, the title Master of Professional Studies in X should be used, unless a different degree title is well established nationally. If a professional degree title other than M.P.S. is proposed, evidence must be provided that the degree title is nationally established. This
Proposal for New Graduate Program, Organization Development and Change
Offered as a Master of Professional Studies
Via Off-Campus and Online Delivery
(MPS-OD&C)

Dr. William J. Rothwell
Professor of Workforce Education and Development
College of Education

May 9, 2013
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Graduate Bulletin Copy

Organization Development and Change (ODC)

Program Chair
Dr. William J. Rothwell, Professor  
310B Keller Building  
University Park, PA 16802  
814-863-2581  
wjr9@psu.edu

Degree Conferred
Master of Professional Studies (M.P.S.)

Graduate Faculty
- Rose M. Baker, Ph.D. (The Pennsylvania State University), Assistant Professor/Research Associate, Education Outreach (Workforce Education & Development)
- Susan E. Cromwell, Ph.D. (The Pennsylvania State University), Director Workplace Learning and Affiliate Assistant Professor of Education (Workforce Education & Development)
- Wesley E. Donahue, Ph.D. (The Pennsylvania State University), Director of Technology and Workforce Development Portfolio and Associate Professor of Management Development (Workforce Education & Development)
- Judith A. Kolb, Ph.D. (University of Denver), Associate Professor of Education (Workforce Education & Development)
- William J. Rothwell, Ph.D. (University of Illinois, Urbana-Champaign), Professor of Education (Workforce Education & Development)
- Jo Tyler, Ed.D. (Columbia University) Associate Professor of Training and Development, Penn State Harrisburg
- Richard A. Walter, Ph.D. (The Pennsylvania State University), Associate Professor of Education (Workforce Education & Development)

Program Description
The MPS in Organization Development and Change (MPS-OD&C) is an online 33-credit program of study designed for professionals working primarily in organization change and workforce development related careers.

The program will highlight the changing nature of the field of Organization Development, including the impact of the globalization of private and public organizations and the growing importance of organization change and development in the workforce. It will culminate in a field-based project course in which students will demonstrate their understanding of the curriculum and apply it to their professional areas of interest. Students will be expected to complete an organization development-related project and are encouraged to solicit project ideas from a work-related environment to ensure that the problems or opportunities they identify are grounded in the reality of organization development. Upon completion of the MPS-OD&C degree, students will be equipped to work as professionals in corporate development, talent management, workforce development, performance improvement, training and development, and with private employers, government agencies, and non-profit organizations.

Proposal for MPS-OD&C (Updated May 9, 2013)
Thirty-three (33) credits are required to complete the MPS-OD&C degree program. The coursework includes nine prescribed 3-credit courses (27 credit hours), which provide a strategic body of knowledge in assessment, diagnosis, feedback, and marketing of organization development, process consultation, appreciative inquiry, and facilitation of groups and teams; one elective course (3 credit hours) designed to allow students to develop additional expertise in related areas of professional interest and in consultation with their advisors; and one capstone course (3 credit hours), which provides a culminating experience for students to demonstrate their knowledge, understanding, theoretical framework, and practical application of Organization Development and Change, building upon their knowledge acquired from the curriculum.

Admissions Requirements
Requirements listed here are in addition to the Graduate Council requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin. The language of instruction at Penn State is English. All international applicants must take and submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, or a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). Applicants with iBT speaking scores between 15 and 18 may be considered for provisional admission, which requires completion of specified remedial English courses. The minimum composite score for the IELTS is 6.5. International applicants are exempt from the TOEFL/IELTS requirement who have received a baccalaureate or a graduate degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, and Wales.

Applicants must hold either (1) a baccalaureate degree from a regionally accredited U.S. institution or (2) a tertiary (postsecondary) degree that is deemed comparable to a four-year bachelor's degree from a regionally accredited U.S. institution. This degree must be from an officially recognized degree-granting institution in the country in which it operates.

Applicants to the MPS-OD&C must submit the following materials:

- Penn State graduate degree application form and application fee;
- World Campus program application;
- A statement of career and educational goals including documentation of a minimum of two years of related full-time work. The statement should be an essay (2-3 pages in length) that demonstrates the applicant’s written communication skills. A resume should be attached as a supplement;
- Three letters of recommendation that attest to the applicant’s readiness for graduate study and that he or she has the requisite minimum of two years of work experience;
- Official transcript(s) of all institutions attended; and
- TOEFL score, if applicable.

Admissions decisions for the program are based on the quality of the applicant's credentials. The decisions are based on a review of the complete application portfolio. During the admission process, students who appear to be better suited for another graduate level program will be encouraged to apply to the appropriate program. Graduate Record Examination (GRE) scores are not required.

Degree Requirements
The MPS in OD&C is conferred upon students who earn a minimum of 33 credits of coursework while maintaining a grade-point average of 3.0 or better in all coursework, including at least 18 credits at the 500-level or above (with at least six credits at the 500-level), and who complete a quality culminating field-based project course in consultation with a graduate adviser. The program curriculum includes nine
prescribed courses (27 credits), which provide a strategic body of knowledge in assessment, diagnosis, feedback, and marketing of organization development, process consultation, appreciative inquiry, and facilitation of groups and teams; one elective course (3 credit hours) designed to allow students to develop additional expertise in related areas of professional interest and in consultation with their graduate advisers; and one required field-based project course (3 credit hours), which provides a culminating experience for students to demonstrate their knowledge, understanding, theoretical framework, and practical application of Organization Development and Change, building upon their knowledge acquired from the curriculum.

**Required Courses**

- WF ED 572 Organization Development for Trainers
- TRDEV 565 Implementing Training and Development Programs
- WF ED 582 Assessing and Feeding Back Data: Organizational Diagnosis
- WF ED 578 Process Consultation
- WF ED 884 Appreciative Inquiry
- WF ED 585 Appraising Organization Development and Consulting
- WF ED 881 Marketing Organization Development and Consulting
- WF ED 880 Facilitating Groups and Teams
- WF ED 405 Project Management for Professionals
- WF ED 595A Field Based Project in Industrial Training

Substitutions for the above required courses, either with resident-instruction courses, alternate online courses, or courses from other institutions, will be considered on a case-by-case basis, and must be petitioned and approved by the Program Chair, with input from the student’s graduate adviser.

**Electives**

Elective courses can be taken at any time during degree progression. Students will need to obtain prior approval from their academic adviser before taking any 400- or 500-level graduate courses to fulfill the elective requirements. Students may also be able to transfer credits into the program, in consultation with their academic adviser. An extensive variety of elective courses are available; the most current list is maintained on the program’s website.

**Culminating Experience**

Students will take WF ED 595A, Field Based Project in Industrial Training, and complete an organization development and change related capstone project as a culminating experience.

**Program Justification Statement**

The WF ED program has been offering courses in Organization Development on a resident instruction basis at Penn State University Park’s College of Education since 1993.

Organization development and change is about group and organizational learning to anticipate, create, or adapt to organizational change; this is in contrast to training and development that focuses primarily on individual change initiatives. The basis of this OD approach is the well-known Action Research Model (ARM) of the Organization Development field. Not to be confused with an approach to conducting practical research in educational classroom settings, the Action Research Model is a bottom-up approach to organization change and development. It involves several key steps, described in terms of what a change agent does:

1. Enter the organizational setting in which change is desired;
2. Start up the change effort;
3. Assess how leaders and workers feel about the change and how ready the setting is for change;
4. Feedback results of the assessment and gain agreement on the change objectives and direction;
5. Plan for action by involving all affected stakeholders;
6. Intervene with the organization or group to implement the change desired by all those affected by it;
7. Evaluate results against the change objectives agreed upon by all key stakeholders on a continuing basis;
8. Ensure institutionalization of the change; and
9. Separate from the client organization.

This model has been the basis for over 21 years of research on the specialized competencies required of OD change agents, described at length in “Competencies of OD Practitioners” (Worley, Rothwell & Sullivan, 2009, pp. 107-135). In recent years the ARM has been reinvented by the so-called Appreciative Inquiry Model (AIM), which is similar to the ARM except for one major difference—while the ARM requires a problem to be solved, the AIM focuses on strengths to be leveraged to improve an organization’s competitive advantage, group strengths and individual talents.

Research from the Penn State Outreach Marketing Research & Communication office (May 2011) indicates that there is an online student market for a graduate-level program in Organization Development and Change to be delivered through the Penn State University World Campus. Because of the size of the job sector, the anticipated growth in jobs, and the educational level of professionals in the organization and workforce development field, an online Master of Professional Studies in Organization Development and Change (MPS-OD&C) offered by the College of Education would complement other online degrees offered by Penn State delivered through the World Campus and these degrees would likely benefit from synergistic marketing approaches targeted at enrolling new adult students.

While there is no accrediting body for a degree in Organization Development & Change, professional associations such as the American Society of Training and Development (ASTD), and the International Organization Development (OD) Network have large memberships and are extensive and efficient channels for reaching OD and T&D professionals.

According to Outreach’s Market Research group, there were approximately 925,000 employees in workforce development related occupations in 2010 and 2012 Bureau of Labor statistics indicates the overall market is now 1.26 million with the size of the OD&C target market approximately 506,000 workers. These market research numbers do not include potential international students who represent another attractive and potentially larger market. In addition to jobs that are classified in the workforce occupations job clusters, other administrative/management jobs require skills that can be acquired through a MPS-OD&C.

There are few online programs in organization and change development that offer programs that are similar in content, format, or structure to the proposed MPS-OD&C. The following is a listing of institutions offering residential and online programs in related areas to organization development and change:

Residential
- American University
- Bowling Green State University
- Carnegie Mellon
- Case Western University
- Columbia University (Teacher’s College)
- Drexel University
- Pepperdine University
Online instruction is an attractive option for adults, military personnel and their families, and working professionals, as it provides access to education while hopefully minimizing disruption to employment, family responsibilities and other professional obligations of working adults who wish to pursue further education. The proposed MPS-OD&C does not have a required residency or on-site campus visit. The MPS-OD&C is designed to attract a high quality student body of working professional adult learners from a wide national and international audience.

Unit’s Ability to Offer Quality Programs in an Off Campus, Online Environment
The Workforce Education and Development (WF ED) program within the Department of Learning and Performance Systems (LPS) is a nationally and internationally recognized unit with a record of offering quality degree programs. Currently the following programs are being offered from this department and being delivered online through the World Campus: Master of Education in Adult Education and Master of Education in Learning, Design, and Technology with the Educational Technology option.

Through its participation in delivering courses online and through the World Campus, the LPS department has gained considerable experience in authoring and conducting learning activities at a distance. LPS’s experience in distance learning is supported by the College of Education’s investment in distance learning through the World Campus. An additional resource of the College is its dedicated WF ED Professional Personnel Development Center with faculty and staff who have considerable experience in distance administration and pedagogy. Toward this end, it is planned that faculty will continue to develop skills in online delivery through pre-service training plus continued faculty development and mentoring.
Table 1: Members of the graduate faculty who will be associated with the initial development and/or delivery of the online MPS in OD&C program courses.

<table>
<thead>
<tr>
<th>MPS – OD&amp;C faculty and initial course development/delivery leads</th>
<th>Title</th>
<th>MPS OD&amp;C Course(s) to be Authored and Taught Online</th>
</tr>
</thead>
</table>
| Rose M. Baker, Ph.D. (The Pennsylvania State University)        | Research Associate & Assistant Professor of Education                 | WF ED 405 Project Management for Professionals  
WF ED 582 Assessing and Feeding Back Data: Organizational Diagnosis  
WF ED 585 Appraising Organization Development and Consulting       |
| Susan E. Cromwell, Ph.D. (The Pennsylvania State University)     | Affiliate Assistant Professor of Education (Workforce Education & Development) | WF ED 573 (elective) Needs Assessment (currently offered online)                                                  |
| Wesley Donahue, Ph.D. (The Pennsylvania State University)        | Associate Professor of Management Development (Workforce Education & Development) | WF ED 410 (elective) Leadership Competencies for Professionals  
WF ED 595A Field Based Project in Industrial Training  
WF ED 881 Marketing Organization Development and Consulting        |
| Judith A. Kolb, Ph.D. (University of Denver)                    | Associate Professor of Education (Workforce Education & Development)   | WF ED 880 Facilitating Groups and Teams                                                                          |
| William J. Rothwell, Ph.D. (University of Illinois, Urbana-Champaign) | Professor of Education (Workforce Education & Development)             | WF ED 572 Organization Development for Trainers  
WF ED 578 Process Consultation  
WF ED 884 Appreciative Inquiry                                      |
| Jo Tyler, Ed.D. (Columbia University)                           | Associate Professor of Training and Development, Penn State Harrisburg | TRDEV 565 Implementing Training and Development Programs                                                           |

Additional LPS faculty who are associated with the existing resident instruction programs in WF ED may be associated with the online MPS-OD&C program. Part-time faculty members who have extensive practical experience in specific Organization Development areas may be assigned to teach in the MPS-OD&C. These faculty members must have extensive experience and expertise in the OD field of practice, hold appropriate academic degrees, and fulfill the requirements for graduate faculty status. An assignment like this would occur on an as needed basis, and would be strategically placed to bridge theory with practice in the curriculum.
In the future, it may be desirable to establish a Strategic Advisory Group for the MPS-OD&C to engage industry experts, faculty, representatives from World Campus, alumni of the WF ED master’s and doctoral programs, alumni of the MPS in the OD&C, and other national and international professionals from across the Organization Development field. This group could meet virtually and serve in an advisory capacity to discuss a variety of topics including: current topics in the profession, changes to the field, research and services projects for students, capstone opportunities for students, and recruitment of students.

Projected Program Size
Benchmarking enrollments in graduate programs delivered through the World Campus enables us to plan a conservative launch and to grow enrollments at manageable levels. For example, the Adult Education program began with 15 students; five years later, there were 185 students enrolled in the Adult Education master’s degree. Pending approval, we would launch the MPS-OD&C program in 2013. We expect that we would begin with 15 to 25 enrollments (similar to the M.Ed. in Adult Education). Within five years, we anticipate an increase in enrollments to approximately 100-150 students.

Impact on Current Offerings and Faculty Load
All of the required and elective WF ED courses in the MPS-OD&C have been previously taught by WF ED faculty and will continue to be offered through residential instruction for other WF ED degrees while also moving instruction online. The TRDEV course has been previously taught by the Harrisburg faculty. Having previously reviewed the curriculum and content, the faculty will continue to develop and monitor the program to ensure quality and relevance. Faculty with the appropriate expertise will develop and/or redesign course content for online delivery. Dr. William Rothwell will serve as the initial Program Chair. Should future enrollments and income generated warrant, faculty capacity and the need for a full-time faculty coordinator will be examined. In addition, part of one of the department’s staff assistant duties will be to support faculty who teach courses on load, for extra compensation, or through course buy-out. As appropriate, a mixture of full-time and part-time faculty with appropriate graduate and professional credentials will teach 800-level courses.

Ready Access to Academic Advising
Faculty members with graduate faculty status will serve as advisers to students enrolled in the program, relative to their involvement in the program. Student advising duties will consist, at a minimum, of:

- An annual virtual meeting and/or communication with each student to review his/her progress and academic plans;
- Guidance and approval of course selection;
- Referral to resources for assistance with academic or coursework related issues that are preventing the student from reaching his/her full potential.

The MPS-OD&C Program Chair and the Faculty Program Coordinator will ensure that all students are assigned to a graduate adviser from within the MPS-OD&C graduate faculty, and will ensure that all students are receiving appropriate academic guidance. The Program Chair/Coordinator will interact closely with the delivery of the capstone course in which MPS-OD&C students articulate topics for their culminating individual projects. During the capstone course, a faculty project adviser will be identified to supervise students’ culminating projects.

Students will be welcome to contact the MPS-OD&C Program Chair/Coordinator with questions about administrative, academic or professional matters. A departmental staff assistant provided by the Department of Learning and Performance Systems will provide administrative support.
Program Learning Objectives
The Program Learning objectives of the MPS-OD&C are to:

- Obtain a critical knowledge base in organization development, appreciative inquiry, and change.
- Strategically lead both small group and large group change initiatives.
- Use various resources for developing, implementing, evaluating, and marketing organization development programs.
- Address ethical issues in practicing organization development activities.
- Become effective OD practitioners through hands-on experience.
- Observe group dynamics and facilitate change efforts.

After completing the MPS-OD&C, students will be prepared to work as professionals in a variety of positions including independent consulting, corporate development, talent management, general management, workforce development, training and development, and with private employers, government agencies, and non-profit organizations, and to pursue more advanced study.

Non-duplication with Other Programs
The Workforce Education and Development Program/Learning and Performance Systems Department is the only unit at the University Park campus that offers graduate degrees at Penn State primarily focused on the area of organization development. The department’s current graduate programs with emphasis in Human Resources/Organization Development are offered via residential instruction. While Penn State Harrisburg offers a residential Master’s of Education in Training and Development that campus and program are partnering with Workforce Education and Development at University Park to offer the online MPS in OD&C. Currently Penn State does not offer an online program with an exclusive focus on Organization Development, so this MPS-OD&C would be a strong viable addition to that market need.

Two graduate degrees currently being delivered online at Penn State University through the World Campus include some coursework related to employment relations and organizational behavior, most notably the Master of Professional Studies in Human Resources and Employee Relations (HRER) and the intercollege Master of Business Administration. The online MPS in HRER offered by the College of the Liberal Arts incorporates one 3-credit online course related to Organization Development: HRER 802 Organizations in the Workplace, and the iMBA offers two online 2-credit courses: iMBA 516 Organizational Behavior and Performance and iMBA 523 Organizational Development, Intervention, and Change.

The MPS-OD&C is different from an MBA for the simple reason that, while an MBA is a generalist degree suitable for business professionals, the MPS in OD&C is intended for specialists in organization development and change who hold such job titles as Director of Organization Development, internal change consultant, internal OD consultant, and group facilitator. MBA degrees typically focus around traditional functions of management—such as marketing, production/operations, finance, and organization behavior. But the MPS in OD&C focuses around the well-known action research model that guides OD&C and thus has courses on assessing and feeding back information as a basis for change, marketing consulting services, and change interventions.

The MPS-OD&C is different from a degree in Human Resources and Employee Relations (HRER) in that the focus is more narrowly on external and internal consultants who specialize in Organization Development. OD is its own field as evidenced by such organizations like the Organization Development Network, the Organization Development Institute, Division 14 of the American Psychological Association, the Change Group in the Academy of Management, and the Facilitating Organization Change Professional Practice Area of the American Society for Training and Development. In short, there are unique professional associations that are distinctly focused on OD, not on Employee Relations.
Sometimes people ask three key questions: (1) What is organization development (OD)? (2) How is organization development different from training? And (3) How is OD different from employee relations? (Included as an appendix are a one-page comparison of the proposed MPS in OD&C and the MPS in HRER; and a one-page comparison of the proposed MPS in OD&C and a proposed MPS in Corporate T&D.)

Training is about changing individuals by equipping them with new knowledge, skills and attitudes to do their jobs better. Employee relations is sometimes called industrial relations. Since every organization has a human resources department, every employer must manage employee relations to maintain order and productivity within its workforce. Ultimately, employee relations analyzes the relationship of employees with their supervisors and with each other. Unlike these other two fields, organization development is about changing groups and organizations and goes beyond training and ER to change corporate culture. Experts might agree that the following definition of OD represents the major focus and thrust of many of today's OD practitioners:


However, no existing World Campus degree or certificate program focuses on Organization Development.

There are other graduate program offerings traditionally delivered in residence that may be tertiary to the area of Organization Development. The College of the Liberal Arts offers a graduate program in a traditional resident instruction format in Industrial and Organizational Psychology with a focus on work psychology, research, personnel selection and organization psychology. The Smeal College of Business offers a Ph.D. in Business Administration with an emphasis in Management and Organization that focuses on developing scholars who will become faculty members at the world’s top business schools; who will contribute to the advancement of knowledge through leading-edge research that changes the way people think about organization management. Penn State Harrisburg offers a master’s degree program in Training and Development designed to prepare training and development professionals for a broad range of responsibilities, including performance analysis, training design and delivery, career development, and program evaluation.

The required courses in the proposed MPS-OD&C are regularly taught in residence in a traditional delivery format as part of the WF ED residential graduate degrees. The online version would take into account that the students will primarily be working professionals. Below is a list of online courses in the MPS-OD&C:

- WF ED 572 Organization Development for Trainers
- TRDEV 565 Implementing Training and Development Programs
- WF ED 582 Assessing and Feeding Back Data: Organizational Diagnosis
- WF ED 578 Process Consultation
- WF ED 884 Appreciative Inquiry
- WF ED 585 Appraising Organization Development and Consulting
- WF ED 881 Marketing Organization Development and Consulting
- WF ED 880 Facilitating Groups and Teams
- WF ED 405 Project Management for Professionals
- WF ED 595A Field Base Project (Capstone)
Essential Elements of Residency

1. Element: Interaction between faculty members and students above and beyond direct instruction

Faculty in the College of Education strive to incorporate the essential elements of residency into all of their programs and courses.

- **Meeting with an academic advisor or student support staff:** Faculty or advisors will conduct individual academic counseling sessions via telephone or electronic mail. General policies and procedures will be posted electronically.

- **Academic integrity:** The MPS-OD&C program will provide an orientation to the course of study and to policies for graduate students including the University’s expectations for academic integrity. Faculty will be encouraged to use software to filter documents for plagiarism.

- **Open Discussion:** Online courses will include a combination of threaded (topic) discussions via the computer and if feasible (given the time difference among students) live chats in chat rooms facilitated by the use of Angel, Moodle, or other platforms. Conferencing software may be utilized for synchronous lectures and office hours that can be recorded and archived for later viewing.

- **Non-class lectures and seminars:** Visiting scholars, professionals from the WF ED alumni program, and WF ED professionals will lead discussions in non-class guest lectures and seminars. We envision using a variety of technology including but not limited to web-casting, threaded discussions, and live chats.

2. Element: Interaction among students

- **Collaborative work groups:** Team projects will be required in some of the MPS-OD&C courses. Teams will use designated discussion threads, chat rooms, or other group communication technology for their team communication.

- **Peer counseling:** We will establish peer-to-peer chat rooms and threaded discussion groups so that students in the program can have informal peer interactions. The e-portfolio, which will be developed by each student, will help students learn about each other and will provide an opportunity for students to contribute constructive interaction.

- **Interdisciplinary student organization:** We will encourage students to form online special interest groups (SIGs) based on their professional goals. Students would be able to communicate via bulletin boards, web conferencing, email, and other electronic media.

- **Access to information and instructional resources:** Penn State’s Libraries provide a wide variety of resources to students enrolled in programs through the World Campus. These resources include full access to the Library’s electronic catalog and databases, research support, and delivery of circulating materials through Library Distance Delivery services.

3. Element: Exposure to socialization in the field of study

- **Seminars:** Small groups of peers will use computer conferencing and/or audio conferencing to discuss seminar topics introduced by outside experts or members of the group.

- **Skill-enhancement workshops:** Faculty or practicing professionals will present skill workshops via audio and/or video conferencing as well as webinars.

- **Research displays:** Students will develop multimedia “poster sessions” of their research for display via the World Wide Web.

- **Discussion with professional peers:** Students will be encouraged to participate in regional and/or national conferences and professional society meetings in their geographic areas. Additionally, faculty members will structure and facilitate online pre- and post-conference discussions.
4. **Element: Ready access to suitable academic advising and support services**
   - **Meeting with an academic advisor or student support staff:** Faculty or advisors will conduct individual academic counseling sessions via telephone or electronic mail. General policies and procedures will be posted electronically.
   - **Meeting with a career counselor:** Career counselors will provide advice related to entry into or advancement in fields related to the student’s course of study via audio and/or videoconferencing. General information will be posted electronically.

5. **Element: Contribution of graduate students to the degree program, the college, and the University:**
   - **Introduction of new students:** Program or department newsletters will be disseminated electronically to faculty and students. The program will also provide opportunities for students to develop web pages that include information about the professional interests of both new and continuing students.
   - **Informal seminars:** Audio and videoconferences will be conducted in both synchronous and asynchronous seminar formats to share professional experiences and promote learning exchanges.

6. **Element: Identification with Penn State:**
   Students will be provided with opportunities to interact with past students and/or alumni mentors as well as attend virtual tours of campus facilities and relevant events.

**Ready Access to Suitable World Campus Student Services**
In addition to the graduate advising services already described in this proposal, students will have access to the World Campus registrar, student service team, and business and finance office for assistance in course registration and billing issues. World Campus will provide bursar and registrar function services including collection of tuition and fees. However, students will register through the University’s eLion system, and invoices will be generated through the University Bursar Office. Faculty will submit grades through eLion. The Outreach Help Desk will provide student and faculty technical support by telephone and/or email.

The World Campus Student Services team will respond to inquiries from prospective and current students, and will process enrollments for students who need assistance in enrolling in courses when they are unable to do so using the University’s eLion system.

**Student Aid**
Graduate assistantships are currently not available. Financial aid opportunities for part-time students with the World Campus are discussed at [http://www.worldcampus.psu.edu/tuition-and-financial-aid/financial-aid](http://www.worldcampus.psu.edu/tuition-and-financial-aid/financial-aid)

**Graduate-Level Courses**
A minimum of 30 credits of coursework at the 400 level or higher is required, of which at least 18 credits must be at the 500-level and above, with a minimum of 6 credits of 500-level course work. A significant culminating or "capstone" experience or other mechanism to demonstrate evidence of analytical ability and synthesis of material is required. These may typically include, but are not limited to, a paper, an internship, an exhibition, a production, a comprehensive examination, or a capstone course. The specific form of the culminating experience is determined by the assigned faculty in the Workforce Education and Development program.

**Fiscal Responsibility for the Program**
The College of Education at University Park and the World Campus will share responsibility for ensuring the development and delivery of a fiscally viable program. The lead faculty, William J. Rothwell, in collaboration with the department head of Learning and Performance Systems, Alison Carr-Chellman, the Associate Dean of the College of Education for Research, Outreach, and Technology, Greg Kelly, and the World Campus Program Manager, Michelle Corby, will be the administrative liaisons in reporting and analyzing the cost-effectiveness of the program. An annual financial review will be conducted by the World Campus, and program viability and sustainability will be determined in conjunction with World Campus. The College of Education at University Park and the World Campus have mutually agreed to deliver this program under Revenue Distribution Category (RDC) 1, as per the University Task Force on Gross Revenue Sharing Models for the World Campus; Final Report, January 31, 2011. Under this RDC level, the World Campus agrees to cover the author compensation and instructional design costs for initial course development as outlined in the program plan. After that, all costs associated with authors for course revisions and additional new courses would be the responsibility of the Learning and Performance Systems Department. World Campus would be responsible for all costs associated with the World Campus Learning Design unit.

Program Development and Rollout Schedule
Below is a tentative program development, rollout and course offering schedule for the MPS-OD&C, which is designed to allow students to enroll in two courses each semester, including summers, and complete the program in two years.

Table 2: MPS-OD&C Rollout for Spring 2013 Opening

<table>
<thead>
<tr>
<th>Course</th>
<th>Author/Lead Instructor (Faculty Assistant)</th>
<th>SP 2013</th>
<th>SU 2013</th>
<th>FA 2013</th>
<th>SP 2014</th>
<th>SU 2014</th>
<th>FA 2014</th>
<th>SP 2015</th>
<th>SU 2015</th>
<th>FA 2015</th>
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<tr>
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<td>TRDEV 565</td>
<td>J. Tyler</td>
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<td>Dev</td>
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<tr>
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<tr>
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<tr>
<td>WF ED 573</td>
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</tbody>
</table>

O = Course will be offered
Dev = Semesters allotted for course development or updates

Path to complete degree in 2 years
Technology Resources Required by Students
The World Campus has specified minimum system and software requirements for students enrolled in online courses offered through the World Campus. These specifications can be found at http://www.worldcampus.psu.edu/general-technical-requirements

Mechanisms for Assuring Program Quality
The Department of Learning and Performance Systems, the Workforce Education and Development Program, and the College of Education in cooperation with the World Campus are dedicated to assuring the quality of the MPS-OD&C.

Online programs must incorporate mechanisms for assessing program quality through student surveys for feedback at critical milestones in the program as well as a student exit questionnaire at the time of graduation. The lead Workforce Education and Development faculty is responsible for the proposed program’s quality assurance plan in cooperation with the World Campus evaluation team.

At the end of each online course in the program, the Student Rating of Teaching Effectiveness (SRTEs) will be administered by the Office of the Vice Provost of Academic Affairs and supplemented by other surveys where appropriate. At the end of the program, students will be asked to complete an online end-of-program survey in order to gain student feedback on the overall program. This survey will be designed by an assigned Workforce Education and Development graduate faculty member in collaboration with the World Campus evaluation team to assess student satisfaction against the program’s objectives. Other areas that might be assessed in this survey include academic support services, capstone course experience, and the program’s impact to date on student careers.

Letters of Support for the Proposal
The following individuals have provided letters of support for this proposal:

- Ali Carr-Chellman, Dept. Head, Learning and Performance Systems, College of Education
- Augustus B. Colangelo, Associate Dean for Undergraduate Education, Smeal College of Business
- Ashutosh Deshmukh, iMBA Program Chair, and Professor of Accounting & MIS
- Gary Kuhne, Co-Professor in Charge, Adult Education Program
- Avis Kunz, Assistant Dean, Outreach and Online Education, College of the Liberal Arts
- James A. Nemes, Interim Director of Academic Affairs, Professor of Mechanical Engineering, School of Graduate Professional Studies, Penn State Great Valley
- Spencer G. Niles, Department Head, Counselor Education, Counseling Psychology, and Rehabilitation Services
- Richard J. Schuhmann, Walter L. Robb Director of Engineering Leadership Development Assistant Professor of Engineering Design and STS
- Wayne Smutz, Executive Director and David Sylvia, DAA for Graduate Programs, World Campus
- Catherine A. Surra, Director, School of Behavioral Sciences and Education, Penn State Harrisburg
- Ellysa Stern Cahoy, Education and Behavioral Sciences Librarian, Penn State University Libraries
### Are you interested in:

**MPS in Organization Development and Change (OD&C)**
- Initiating and leading initiatives in organizations?
- Implementing quality and continuous improvement?
- Improving learning and performance systems?
- Coaching individuals and groups to improve performance?
- Facilitating and developing employees’ careers?

**Curriculum design for:**
- Organization development
- Process / performance improvement
- Workforce development
- Learning performance
- Whole system, strength-based change management
- Career development

**Focus on:**
- Engaging in whole systems for large scale change initiatives
- Initiating, managing, and sustaining workplace change efforts
- Implementing quality and continuous improvement systems.
- Improving learning and performance in organization contexts
- Coaching individuals and groups
- Facilitating and developing employees’ career

**Other Top programs:**
- Master of Positive Organization Development and Change at Case Western Reserve University
- Master program in Change Leadership, Executive Program in Change and Consultation at Columbia University Teachers College
- Master of Organization Development at Bowling Green State University

**Career | Job Titles:**
- Learning and Organization Development Specialist
- Process Improvement Facilitator / Analyst
- Training and Development Specialist
- Project / Program Coordinator
- Career Development Manager

**MPS in Human Resources and Employee Relations (HRER)**
- Human resource management?
- Employment and labor law?
- Labor and collective bargaining?
- Staffing, benefits and compensation?
- Fair and ethical policies and behaviors in the workplace?

**Curriculum design for:**
- Employment relations
- Labor and employment law
- Compensation and benefits
- Staffing and development
- Labor and collective bargaining
- Work rules, policies and procedures

**Focus on:**
- Human resource management
- Employment and labor law
- Labor and collective bargaining
- Benefits and compensation
- Staffing and employee development
- Fair and ethical behavior in the workplace

**Other Top programs:**
- Masters in Human Resource Studies at Cornell University
- Master of Human Resource & Labor Relations at Michigan State University
- Master of Arts in Human Resource and Industrial Relations at University of Minnesota
- Master of Human Resource and Industrial Relations at University of Illinois

**Career | Job Titles:**
- Human Resource Manager
- Industrial and Labor Supervisor
- Benefit and Job Analysis Specialist
- Employment/Recruitment/Placement Specialist
- Labor Negotiator
Appendix B: One page comparison of proposed MPS in OD&C and proposed MPS in Corporate T&D

<table>
<thead>
<tr>
<th>Are you interested in:</th>
<th>Training and adult education?</th>
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<tbody>
<tr>
<td>Initiating and leading change initiatives in organizations?</td>
<td>Designing courses and other instructional events?</td>
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<tr>
<td>Implementing quality and continuous improvement change efforts?</td>
<td>Implementing new instructional and e-learning technologies?</td>
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<td>Improving learning and performance systems?</td>
<td>Planning events to achieve specific learning objectives?</td>
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<tr>
<td>Coaching individuals and groups to improve performance?</td>
<td>Leading and helping with employee development activities?</td>
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<tr>
<td>Facilitating and developing employees’ careers?</td>
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<table>
<thead>
<tr>
<th>MPS in Organization Development and Change (OD&amp;C)</th>
<th>Proposed MPS in Corporate Training and Development (CT&amp;D)</th>
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<tr>
<td><strong>Curriculum design for:</strong></td>
<td><strong>Curriculum design for:</strong></td>
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<tr>
<td>· Organization development</td>
<td>· Professional trainers and adult educators</td>
</tr>
<tr>
<td>· Process / performance improvement</td>
<td>· Human performance improvement</td>
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<tr>
<td>· Workforce development</td>
<td>· Assessment and evaluation of individual learning</td>
</tr>
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<td>· Whole system, strength-based change management</td>
<td>· Acquiring skills to address different learning styles</td>
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<tr>
<td>· Career development</td>
<td>· Applying appropriate curriculum development strategies</td>
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<td>· Incorporating the use of appropriate educational technologies</td>
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<tr>
<td><strong>Focus on:</strong></td>
<td><strong>Focus on:</strong></td>
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<tr>
<td>· Engaging in whole systems for large scale change initiatives</td>
<td>· Individuals and talent groupings</td>
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<td>· Initiating, managing, and sustaining workplace change efforts</td>
<td>· Performance technology and non-training interventions</td>
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<tr>
<td>· Implementing quality and continuous improvement systems.</td>
<td>· Applications of technology to learning contexts</td>
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<tr>
<td>· Improving learning and performance in organization contexts</td>
<td>· Learning theories and individual learning styles</td>
</tr>
<tr>
<td>· Coaching individuals and groups</td>
<td>· Web-based/ Distance Learning</td>
</tr>
<tr>
<td>· Facilitating and developing employees’ career</td>
<td>· Curriculum and instructional design</td>
</tr>
<tr>
<td><strong>Other Top programs:</strong></td>
<td><strong>Other Top programs:</strong></td>
</tr>
<tr>
<td>· Master of Positive Organization Development and Change at Case Western Reserve University</td>
<td>· Master of Education in Training and Development (Distance Learning) at North Carolina State University</td>
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<tr>
<td>· Master program in Change Leadership, Executive Program in Change and Consultation at Columbia University Teachers College</td>
<td>· Master of Science in Training and Development at University of Wisconsin at Stout</td>
</tr>
<tr>
<td>· Master of Organization Development at Bowling Green State University</td>
<td>· Master of Science in Instructional Systems Technology at Indiana University at Bloomington</td>
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<td></td>
<td>· Master of Art in Instructional Technology at San Diego State University</td>
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<tr>
<td></td>
<td>· Master in Instructional Systems at Florida State University</td>
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<table>
<thead>
<tr>
<th>Career</th>
<th>Job Titles:</th>
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<tbody>
<tr>
<td>Learning and Organization Development Specialist</td>
<td>Chief Learning Officer / Chief Education Officer</td>
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<tr>
<td>Process Improvement Facilitator / Analyst</td>
<td>Chief Education Officer / Technical Trainer</td>
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<tr>
<td>Training and Organization Development Specialist</td>
<td>Instructional Designer / Instructional Project manager</td>
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<tr>
<td>Project / Program Coordinator</td>
<td>Performance Technology / Training &amp; Development Specialist</td>
</tr>
<tr>
<td>Career Development Manager</td>
<td>Adult Educator / Instructor</td>
</tr>
</tbody>
</table>
DATE: February 27, 2011

TO: Jacqueline Edmondson
Associate Dean for Teacher Education

FROM: Alison A. Carr-Chellman, Department Head
Learning and Performance Systems

RE: LETTER OF SUPPORT FOR MPS IN ORGANIZATION DEVELOPMENT AND CHANGE

After reviewing the proposal facilitated by the Workforce Education and Development program within the Learning and Performance Systems Department for a Master of Professional Studies in Organization Development and Change, I support this proposal. The rationale and purpose as well as the initiative shown by those who have long worked on this proposal are testament to a clear need for the degree and the promise of a bright future for this proposed program. I am deeply aware of the potential for this program, and feel that it works well within the parameters of LPS and am excited to see this bright future ahead for such a program. I am appreciative of all the long efforts that have gone into this proposal and believe this to be an important and impactful initiative.

I strongly support and endorse this proposal to the Deans of the College of Education and Graduate School, and the Penn State academic community at large.

Please let me know if you need any additional information from my office by calling 814-865-0624 or e-mailing me directly at aac3@psu.edu.

Alison A. Carr-Chellman, Head
Learning and Performance Systems
From: Gus Colangelo <axc31@psu.edu>
To: WESLEY E DONAHUE <wed105@psu.edu>
Subject: RE: Letters of Support for MPS in Organization and Employee Development
Date: Thu, Oct 27, 2011 09:07 AM

Safe View On [Turn Off] What is "Safe View"?

Hi Wes,

I like the proposals and I approve of them moving forward.

gus

Augustus B. Colangelo
Associate Dean for
Undergraduate Education
Smeal College of Business
202 Business Building
Penn State University
University Park, PA 16802
Reply-To: "Dr. Ash Deshmukh" <avdl@psu.edu>
From: "Dr. Ash Deshmukh" <avdl@psu.edu>
To: "William J. Rothwell" <wjr9@psu.edu>
Subject: RE: Request for a Letter of Support for the MPS in ODC
Date: Mon, 27 Feb 2012 14:13:55 -0500 (EST)
X-Mailer: Microsoft Outlook 14.0
X-Mailer: Zimbra 7.1.1_GA_3196 (ZimbraConnectorForOutlook/7.1.4.6348)
Thread-Index: AQGkw+mjFzXgozkgY1YkJOumGeBlDpahf1Fw
X-Originating-IP: [98.103.89.129]
X-Virus-Scanned: by amavisd-new

Dear William:

I have reviewed the proposal for Master of Professional Studies in Organization Development and Change (MPS-OD&C) program. I do not have any objections. I believe that the program will be valuable addition to graduate programs offered by the World Campus. The iMBA program is not affected by this offering.

Good luck.

-Ash

________________________________________________________________________

Ashutosh Deshmukh
iMBA Program Chair, and
Professor of Accounting & MIS
http://www.worldcampus.psu.edu/imba
222, Outreach Building
University Park PA 16802
Ph: 814-898-6712
Fax: 814-898-6528

________________________________________________________________________

Confidentiality Notice: This message is intended for the person or entity to which it is addressed and may contain information that is confidential or privileged. If you are not the intended recipient or the employee or person responsible for delivering it to the intended recipient, you are hereby notified that any dissemination, distribution, copying or use is strictly prohibited. If you have received this communication in error, please notify the sender and destroy or delete this communication immediately.
2/24/11

Cindy Fetters, Administrative Support Coordinator
Learning and Performance Systems
411E Keller Bldg.
University Park, PA 16802
Phone: 814-863-9768
Fax: 814-865-2632

Dear Cindy:

Please include this support letter in the review packet going to the Curriculum Committee of the College of Education. I am writing this letter to express our full support for the proposed Masters of Professional Studies in Organization Change and Development. The proposed program fills a definitely need and the courses provide useful elective choices for our own MED in Adult Education students. The Adult Education program supports this worthwhile initiative and recommends that swift approval be given to this program so the university can begin offering this to the broader community in a timely fashion. Thank you for your consideration.

Sincerely,

Gary Kuhne
Co-Professor in Charge, Adult Education Program
314E Keller Bldg
University Park, PA 16802
814-725-5259
To: "William J. Rothwell" <wjr9@psu.edu>
Cc: DAVID M SYLVIA <dms39@psu.edu>, Wayne Smutz <wds4@mail.outreach.psu.edu>
Subject: Request for a Meeting and a Letter of Support for the MPS in ODC

X-KeepSent: C7580BEC:F54AC6FA-852579B4:0074E1DC;
type=4; name=$KeepSent
X-Mailer: Lotus Notes Release 8.5.2 August 10, 2010
From: Avis Kunz <alm2@psu.edu>
Date: Thu, 1 Mar 2012 16:21:03 -0500
X-MIMETrack: Serialize by Router on PSULA02/PSULA(RcLcase 8.5.2FP2)(March 22, 2011) at 03/01/2012
04:21:00 PM,
Serialize complete at 03/01/2012 04:21:00 PM
X-Greylist: Sender IP whitelisted, not delayed by milter-greylist-3.1.8 (tr10n05.aset.psu.edu [146.186.16.57]); Thu, 01 Mar 2012 16:21:09 -0500 (EST)
X-Virus-Scanned: by amavisd-new
X-PSU-Spam-Flag: NO
X-PSU-Spam-Hits: -98.224

Dear Bill:

This email is in response to your request for a letter of support for the proposed MPS in Organizational Development and Change (MPS OD&C) and reflects consultation with faculty in Psychology, Communication Arts and Sciences, and Labor Studies and Employment Relations in addition to our Associate Dean for Research and Graduate Studies, Denise Solomon, and Dean Welch.

First, let me say that the source of many of the concerns from the Liberal Arts stem from what we consider to be a flawed report from Outreach Marketing. Despite numerous attempts on our part to ask the research team to review more reputable documents, such as the definitive report on human resource curriculum from SHRM, the sources and findings of the report did not alter. Some of confusion in the Outreach Marketing report finds their way to your proposal, and these are assumptions that we would want to clarify with you and David Sylvia before we would give an unconditional support for the MPS OD&C. On page 7 of your proposal, you mention that the marketing report stated that approximately 925,000 employees are in the target occupations. Actually, that number (from page 4 in the report) is for the field of HR generally, not the specific market for OD&C. Because the marketing report demonstrated confusion over the actual areas of practice related to curriculum, it is difficult to discern from the report exactly what specific market the OD&C degree would target. I think that the confusion is also related to the early attempts by staff in Marketing to develop an umbrella graduate program in HR while inadequately consulting with faculty in the appropriate disciplines. That said, we are heartened by the more focused approach you take in the final document.

In your proposal, you are clearer that the market is for professions in "corporate development, talent management, workforce development, performance improvement, training and development, and with private employers, government agencies, and non-profit organizations" (p. 4). The program of study is "for professionals working in organizational"
change and workforce development related careers. (p. 3) On page 12, you state that the MPS OD&C differs from the MPS HRER in that your focus is more narrowly on external and internal consultants in Organizational Development and that OD is its own field.

With the above description of the student population and program, we have no problem with the College of Education moving forward with the MPS OD&C after we clarify with you and David Sylvia that the program will be appropriately targeted and will not compete with the College of the Liberal Arts’ successful MPS in HRER. We want to stress that the existing MPS in HRER deals not only with employee relations but also with human resources (see page 12 of your proposal). It is important to our College that the marketing focus of the OD&C aligns with your stated focus of the curriculum and target market and that it does not target the general HR market. Your degree will only add value to the University’s overall outreach effort if it expands the market that we reach, rather than drawing students away from existing degrees. Although the marketing of our different programs may have synergy, we would want to make sure that the programs are appropriately branded for their respective markets.

The last concern is one of the possible expansion of the MPS OD&C into disciplines within the Liberal Arts. I/O Psychology immediately comes to mind as a possible area. One of the links you provided me was an I/O Psychology program, so we want to be clear from the start that the boundaries between OD&C and I/O Psychology are clearly defined. Liberal Arts, after many years of trying to launch a MPS in Leadership has been given the green light from the Graduate School, and we are currently exploring a joint degree with Great Valley. We would want to be assured that our future efforts in developing master’s degrees in I/O Psychology or Leadership would not be hindered by the degree in OD&C.

In sum, I can offer you qualified support for your proposal and look forward to our resolving the above stated concerns. David Sylvia is copied here and I am confident that we will be able to move forward after setting some parameters with the World Campus and Outreach Marketing.

Best Regards

Avis

Avis Kunz, D.Ed.
Assistant Dean, Outreach and Online Education
College of the Liberal Arts
Affiliate Assistant Professor of Organizational Leadership
Penn State University
13 Sparks Building
814-863-5965
814-865-6489 (fax)
Subject: RE: Request for a Letter of Support for the MPS in ODC
Date: Wed, 29 Feb 2012 09:49:36 -0500
X-MS-Has-Attach:
X-MS-TNEF-Correlator:
Thread-Topic: Request for a Letter of Support for the MPS in ODC
Thread-Index: AczzN5LppUrrUg8ERvCvPNqYFWjv1JCwDuWykQ
From: "Nemes, James" <jan16@gv.psu.edu>
To: "William J. Rothwell" <wjr9@psu.edu>
X-OriginalArrivalTime: 29 Feb 2012 14:49:37.0021 (UTC)
FILETIME=[5B89CAD0:01CCF6F1]
X-Greylist: Sender IP whitelisted, not delayed by milter-greylist-3.1.8 (tr16n04.aset.psu.edu [128.118.142.114]); Wed, 29 Feb 2012 09:49:36 -0500 (EST)
X-Virus-Scanned: by amavisd-new
X-PSU-Spam-Flag: NO
X-PSU-Spam-Hits: -99.8

Dear Bill,

We have reviewed the revised proposal and have no objections. The program should meet an important and growing market. Good luck with the proposal.

Jim

James A. Nemes, D.Sc.
Interim Director of Academic Affairs
Professor of Mechanical Engineering
School of Graduate Professional Studies
Penn State Great Valley
30 East Swedesford Road
Malvern, PA 19355-1443
Phone: 610-648-3335
Fax: 610-648-3377
jan16@psu.edu
From: Spencer Niles [mailto:sgn3@psu.edu]
Sent: Tuesday, March 01, 2011 11:01 AM
To: Avis Kunz
Cc: WESLEY E DONAHUE; aac3@psu.edu; alm2@psu.edu; axc31@psu.edu; caf17@psu.edu; cas87@psu.edu; cdf2@psu.edu; dag4@psu.edu; gwk1@psu.edu; mlohmann@psu.edu; par4@psu.edu; pfc2@psu.edu; raw18@psu.edu; rbc4@psu.edu; rxs34@psu.edu; sbilen@psu.edu; wjg9@psu.edu

Subject: Re: Letters of Support for Masters of Professional Studies in Organization Change and Development

Dear Wes,

I am supportive of this program. Please let me know if you need anything else from our department.

Best,

spencer

Spencer G. Niles
Distinguished Professor
Editor, Journal of Counseling & Development
Department Head
Counselor Education, Counseling Psychology, and Rehabilitation Services
327 Cedar Building
Penn State University
University Park, PA 16802
Cindy Fetters, Administrative Support Coordinator
Learning and Performance Systems
411E Keller Building
University Park, PA 16802

February 28, 2011

Dear Cindy-

Please accept this letter in support of the proposed Masters of Professional Studies in Organization Change and Development.

The tracks for Engineering and Technology Leadership as well as Organization Development rely on courses developed by the Engineering Leadership Development program (e.g. ENGR 407, ENGR 409) and we are pleased to see their proposed application in this professional graduate program.

Sincerely,

Richard J. Schuhmann, Ph.D.
MEMO

To: Dr. William J. Rothwell
   Professor of Workforce Education and Development
   College of Education

Fr: Wayne Swantz, Executive Director

David Sylvia, DAA for Graduate Programs

Da: March 2, 2012

Re: Proposal for MPS in Organizational Development and Change

We are pleased to support the proposal to offer the Master of Professional Studies in Organizational Development and Change off-campus and online to students at a distance via the World Campus. The World Campus is prepared to deliver this degree in partnership with the College of Education, at Revenue Distribution Category (RDC) 1, as per the University Task Force on Gross Revenue sharing Models for the World Campus: Final Report, January 31, 2011.

If during the review process for the proposal by the Graduate School there are questions or concerns to which the World Campus can help respond, please contact either of us. Thank you.

cc: David Monk, Dean, College of Education

An Equal Opportunity University
February 16, 2012

Dr. Alison Carr-Chelman, Chair
Department of Learning and Performance Systems
Pennsylvania State University
0411D Keller Building
University Park

Dear Ali,

This is a letter of support for the proposal for the Master’s in Professional Studies (MPS) in Organizational Development and Change (ODC), to be offered by your program in Workforce Education and Development. This degree is to be offered on the World Campus in collaboration with the Training and Development (T&D) Program located here at Penn State Harrisburg.

The Program in Training and Development, School of Behavioral Sciences and Education, Penn State Harrisburg, in collaboration with the Program in Workforce Education and Development, Department of Learning and Performance Systems, College of Education, agrees to be responsible for one course (TRDEY563 Implementing Training and Development Solutions) in the core requirements of the Organizational Development and Change Option of the proposed MPS degree. In addition, the revenue arrangement generated from this course and shared with the School of Behavioral Sciences and Education at Penn State Harrisburg will be completed prior to the initiation of the program and will be subject to approval by Dr. Mukund Kulkarni, Chancellor, Penn State Harrisburg.

On behalf of all of us from Harrisburg we look forward to working with the faculty of LPS on these proposals and others as we explore ways to further foster inter-campus collaboration.

Sincerely,

[Signature]

Catherine A. Surra, Ph.D.
Director, School of Behavioral Sciences and Education

Cc: William Rothwell and Wes Donahue, Workforce Education and Development
Jo Tyler, Training and Development
Edward Taylor, Health and Professional Studies
Dear Cindy,

Thank you for the opportunity to review this graduate program proposal for a new online Master of Professional Studies in Online Development and Change. The Libraries is happy to support the proposal for this new program.

As the proposal states, "Penn State's Libraries provide a wide variety of resources to students enrolled in programs through the World Campus. These resources include full access to the Library's electronic catalog and databases, research support, and delivery of circulating materials through Library Distance Delivery services." The Libraries are committed to providing these resources for World Campus learners, including those who would enroll in this proposed graduate course.

While online journal prices are always on the increase and collections budgets are tighter each year, this proposed program fits well within our collection development plans for affiliated Learning and Performance Systems classes with a workforce education and organization development focus. We plan to continue collecting materials, both print and electronic, in this area of focus and I encourage the faculty affiliated with this proposed program to directly contact me if there are resources that would benefit and enrich their curriculum and students.

With thanks again,

Ellysa Cahoy

Ellysa Stern Cahoy
Education & Behavioral Sciences Librarian
Assistant Director, The Pennsylvania Center for the Book
Instruction Coordinator, Department of Reference, Collections, & Research

Penn State University Libraries
502-C Paterno Library
University Park, PA 16802
814-865-9696
ellysa@psu.edu

On Mon, Dec 10, 2012 at 6:23 PM, Steven Herb <stevenherb@gmail.com> wrote:

Sent from my iPad

Begin forwarded message:

From: "Cindy Fetters" <cdf2@psu.edu>
Date: December 10, 2012, 12:54:19 PM EST
To: <slh18@psu.edu>
Dear Bill:

This note is in response to the Graduate Council Committee on Programs and Courses request that the College of the Liberal Arts review the latest version of the New Program Proposal for a MPS Organizational Development and Change.

For the most part, the College’s concerns have been addressed. A few minor outstanding issues, however, remain:

1. The proposal states that non-native English students who do not meet the requirements for English proficiency could enroll in ESL 1146 and ESL 116G. Note, we do not offer these courses through the World Campus. After consulting with Dr. Robert Scruff in Applied Linguistics, I can offer that potentially the College would develop these courses through the World Campus given adequate enrollments and support from the World Campus.

2. Our concerns remain with the statement on page 8 about approximately 925,000 employees are in the target occupations. As stated in my earlier response, this number is not the target market for OD&C but for all of HR. We would like to see some fine tuning of the language regarding the size of the general HR population compared to the target population for the OD&C.

3. Related to above, we had asked for assurances that the marketing for the MPS OD&C clearly distinguished it from the MPS HRER. My statement in the original consultation was that "Your degree will only add value to the University’s overall outreach effort if it expands the market that we reach, rather than drawing students away from existing degrees. Although the marketing of our different programs may have synergy, we would want to make sure that the programs are appropriately branded for their respective markets." 

Because we realize that marketing is not your concern, we would like assurance from Outreach Marketing that the programs would be differentiated. Because the letter of support from the World Campus
stated that questions or concerns could be directed to them, I have copied Wayne Smutz and David Sylvia here for further comment.

Bill, thank you for the opportunity to review the program proposal again.

Best Regards,
Avis Kunz
Re: Liberal Arts response to MPS OD&C proposal

From: Avis Kunz <alm2@psu.edu>  
Subject: Re: Liberal Arts response to MPS OD&C proposal  
To: DAVID M SYLVIA <dms39@psu.edu>  
Cc: Elizabeth R. Price <erc2@psu.edu>, Wayne Smutz <wds4@psu.edu>, PAUL CLARK <pfc2@psu.edu>, Greg Kelly <gkelly@psu.edu>, Jackie Edmondson <jxe117@psu.edu>, Wes Donahue <wed105@psu.edu>, Bill Rothwell <wjr9@psu.edu>

Hello David:

This email addresses our concerns.

Best,
Avis

----- Original Message -----  
From: "DAVID M SYLVIA" <dms39@psu.edu>  
To: "Bill Rothwell" <wjr9@psu.edu>  
Cc: "Elizabeth R. Price" <erc2@psu.edu>, "Wayne Smutz" <wds4@psu.edu>, "PAUL CLARK" <pfc2@psu.edu>, "Avis Kunz" <alm2@psu.edu>, "Greg Kelly" <gkelly@psu.edu>, "Jackie Edmondson" <jxe117@psu.edu>, "Wes Donahue" <wed105@psu.edu>  
Sent: Tuesday, April 9, 2013 4:27:12 PM  
Subject: RE: Liberal Arts response to MPS OD&C proposal

Bill,

Below is the response from Outreach Market Research that I believe provides an adequate response to items 2 and 3. I recommend that you remove the reference to ESL114G and ESL 116G because there are no near-term plans to offer these courses online.
Please let me know if we can be of further assistance in this process.

Best regards,

David Sylvia

----------------------------------------

Regarding #2. In the market research report that was completed in 2011, the size of the overall HR market was determined to be 925,000 workers. This number was based on 2010 Bureau of Labor Statistics data. Since that time, the BLS has changed some of their job classifications so our market research team has pulled updated numbers for your reference. Based on 2012 BLS data, the size of the overall HR market is 1.26 million workers. A subset of individuals in this market would also be considered a target market for the proposed Organization Development & Change degree. This overlap would likely occur within job classifications such as Training & Development Specialists and Managers and Other Unclassified HR Specialists. However, individuals within job classifications such as Compensation & Benefits Specialists and Managers and HR Managers would be considered a target audience for the Human Resources and Employment Relations degree only. As a result, the overall HR market is approximately 1.26 million workers and the size of the OD&C market is approximately 506,000 workers. It is important to note that while there is certainly overlap in these audiences, and despite our efforts to market to these two different audiences, the individual career goals of prospective students will ultimately determine which degree they choose to pursue, regardless of their job title or occupational classification or how they originally heard about the World Campus.

Regarding #3. Outreach Marketing has consistently held the position that it would be most efficient and cost effective to leverage the overlap in these audiences by targeting prospective students and then helping them to determine which degree program would be best suited to their needs. However, the College of the
Liberal Arts and the College of Education have indicated their desire for distinctive marketing strategies that promote their respective programs individually. In July 2012 we presented our proposed strategy for differentiating these two programs to these target audiences. Our strategy was developed from information that was provided by the Department of Workforce Education regarding the focus of each degree.

Organization Development and Change:
- Engaging in whole systems for large scale change initiatives
- Initiating, managing, and sustaining workplace change efforts
- Implementing quality and continuous improvement systems
- Improving learning and performance in organization contexts
- Coaching individuals and groups
- Facilitating and developing employees' career

Human Resources and Employment Relations:
- Human resource management
- Employment and labor law
- Labor and collective bargaining
- Benefits and compensation
- Staffing and employee development
- Fair and ethical behavior in the workplace

A list of organizations and professional associations that are distinctly focused on the field of OD&C were identified, and we discussed differentiating the two programs in our marketing efforts through messaging (including a focus on career goals),
search keywords, and separate media outlets. Additionally, each program will have a separate website presence, separate brochures for fulfillment, separate program videos, etc. Attached is a document that summarizes the focus of each respective degree. It is our intention to write marketing plans and develop strategies for each degree that adhere to the agreed upon approach from our July 2012 meeting.

From: Avis Kunz [mailto:alm2@psu.edu]
Sent: Monday, April 08, 2013 4:18 PM
To: Bill Rothwell
Cc: Elizabeth R. Price; Wayne Smutz; DAVID M SYLVIA; PAUL CLARK
Subject: Liberal Arts response to MPS OD&C proposal

Dear Bill:

This note is in response to the Graduate Council Committee on Programs and Courses request that the College of the Liberal Arts review the latest version of the New Program Proposal for a MPS Organizational Development and Change.

For the most part, the College’s concerns have been addressed. A few minor outstanding issues, however, remain:

1. The proposal states that non-native English students who do not meet the requirements for English proficiency could enroll in ESL114G and ESL 116G. Note, we do not offer these courses through the World Campus. After consulting with Dr. Robert Scruff in Applied Linguistics, I can offer that potentially the College would develop these courses through the World Campus given adequate enrollments and support from the World Campus.
2. Our concerns remain with the statement on page 8 about approximately 925,000 employees are in the target occupations. As stated in my earlier response, this number is not the target market for OD&D but for all of HR. We would like to see some fine tuning of the language regarding the size of the general HR population compared to the target population for the OD&C.

3. Related to above, we had asked for assurances that the marketing for the MPS OD&C clearly distinguished it from the MPS HRER. My statement in the original consultation was that “Your degree will only add value to the University’s overall outreach effort if it expands the market that we reach, rather than drawing students away from existing degrees. Although the marketing of our different programs may have synergy, we would want to make sure that the programs are appropriately branded for their respective markets.”

Because we realize that marketing is not your concern, we would like assurance from Outreach Marketing that the programs would be differentiated. Because the letter of support from the World Campus stated that questions or concerns could be directed to them, I have copied Wayne Smutz and David Sylvia here for further comment.

Bill, thank you for the opportunity to review the program proposal again.

Best Regards,

Avis Kunz
RE: Liberal Arts response to MPS OD&C proposal

From: DAVID M SYLVIA <dms39@psu.edu>  Tue, Apr 09, 2013 04:27 PM
Subject: RE: Liberal Arts response to MPS OD&C proposal  @1 attachment
To: 'Bill Rothwell' <wjr9@psu.edu>
Cc: 'Elizabeth R. Price' <erc2@psu.edu>, 'Wayne Smutz' <wds4@psu.edu>, 'PAUL CLARK' <pfc2@psu.edu>, 'Avis Kunz' <almz@psu.edu>, Greg Kelly <gkelly@psu.edu>, Jackie Edmondson <jxe117@psu.edu>, Wes Donahue <wed105@psu.edu>

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Best regards,
David Sylvia
---------------------------------------------------------------

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Sent: Monday, April 08, 2013 4:18 PM
To: Bill Rothwell
Cc: Elizabeth R. Price; Wayne Smutz; DAVID M SYLVIA; PAUL CLARK
Subject: Liberal Arts response to MPS OD&C proposal

Dear Bill:
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1. The proposal states that non-native English students who do not meet the requirements for English proficiency could enroll in ESL114G and ESL 116G. Note, we do not offer these courses through the World Campus. After consulting with Dr. Robert Scruff in Applied Linguistics, I can offer that potentially the College would develop these courses through the World Campus given adequate enrollments and support from the World Campus.

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Bill, thank you for the opportunity to review the program proposal again.

Best Regards,
Avis Kunz
Summary

**Human Resources and Employment Relations**
Day-to-day tactics and strategies focused on supporting personnel and reaching organizational goals

**Organization Development and Change**
Medium to long-term strategies focused on change and improvement

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**MAIN DIFFERENCES**

- different main topics and courses
- different expected male vs. female student ratio
- different search keywords will be used in paid search campaigns
- different marketing messaging will be used in online and print advertising
- different organizations and media outlets will be used for promotion
- different expected job opportunities and job markets
- different prospect backgrounds and skills

---

**TRAINING**

...for motivation and professional development

...for efficiency and cost-reduction purposes
GRADUATE COUNCIL COMMITTEE ON PROGRAMS AND COURSES  
SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES PROGRAM,  
OPTION, OR MINOR PROPOSAL FORM

Submit 1 copy of the proposal form and 25 copies of the supporting documentation as outlined below to the Curriculum Coordinator, University Faculty Senate, 101 Kem Graduate Building. The proposals will be transmitted to the Dean of the Graduate School for consideration by the Graduate School's Subcommittee on New and Revised Programs and Courses, and the Committee on Programs and Courses. For a detailed explanation of the form, see the Guide to Curricular Procedures.

<table>
<thead>
<tr>
<th>College</th>
<th>College of Health and Human Development and Medicine</th>
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<tr>
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<td>Designation of minor</td>
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Indicate effective date The first semester following approval

OLD PROGRAM, OPTION, OR MINOR: Change _____ Drop _____

Old designation of program
Old designation of option
Old designation of minor
New designation of program (if changed)
New designation of option (if changed)
New designation of minor (if changed)

Indicate effective date

<table>
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<tr>
<th>SUBMITTED BY</th>
<th>Douglas Leslie</th>
<th>Date 3/1/13</th>
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<tr>
<td>NOTED BY</td>
<td>Sarah Bronson</td>
<td>Date 2-28-2013</td>
</tr>
<tr>
<td>APPROVED BY</td>
<td>Daniel A. Nottermann</td>
<td>Date 2-27-13</td>
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<tr>
<td>RECOMMENDED BY</td>
<td>Andrew C.</td>
<td>Date 4-12-2013</td>
</tr>
<tr>
<td></td>
<td>Bronson</td>
<td>Date 9-15-2013</td>
</tr>
</tbody>
</table>

SUPPORTING DOCUMENTATION REQUIRED FOR PROGRAMS, OPTIONS, OR MINORS (Adds, Changes, or Drops)

All proposals must include a justification statement for action being taken. Submit 1 copy of the proposal form and 25 copies of the supporting documents to the University Curriculum Coordinator at the University Faculty Senate Office. It is important that the proposal include a copy of the program in a format suitable for inclusion in the Graduate Degree Programs Bulletin. Prepare documentation in the outline format as shown below. The proposer is reminded that the Subcommittee and Committee reviewing the proposed program may not have knowledge of the field and is encouraged to provide as much documentation as possible for the reviewers. All proposals, whether a new program or a program change, must be consecutively paginated or the proposal will be returned to the proposing unit. In addition, a table of contents needs to be included in the proposal.

NEW PROGRAMS, OPTIONS* AND MINORS**

A. The objectives of the program: an explanation of how the proposal meets the new educational objectives and/or strengthens existing programs of the college(s) and the University; what students may expect to accomplish through the new program; and a statement of how the new offering does not duplicate other degree programs within the department/college/University.
B. A list of new courses to be established as a part of the new offering.
C. A complete program statement. This should be an arrangement of courses in accordance with degree requirements and with identification of the pattern of scheduling. A list of the required courses, typical electives, etc., that will logically be taken by a student enrolling in the new program should be included. Courses that are new courses should be distinguished from existing courses. Any statement must be submitted in a format for bulletin copy with additional material if necessary (provide both a hard copy and on diskette).
D. A statement of admission requirements should be included, i.e., required test scores, minimum junior/senior GPA, as deemed appropriate by the proposer.
E. A justification for the program. The proposal should include a statement regarding the necessity for the program, i.e., why the program should be offered; and information on the ability of the department to offer a quality program. Included in the section should be the projected size of the program and its impact on current course offerings and faculty load as well as additional faculty advising duties.
F. A justification for the degree title used*. The academic degree titles (M.S., M.A., Ph.D.) are to be used only for degree programs that are research-oriented. A professional degree title will be more appropriate for programs that, for example, emphasize practical application of knowledge; programs that emphasize professional development for advancement in specific careers but with a more practitioner orientation; programs that prepare students for licensure in a given field; and masters programs that are not intended to prepare students for doctoral study. If a professional master's degree is being proposed, the title Master of Professional Studies in X should be used, unless a different degree title is well established nationally. If a professional degree title other than M.P.S. is proposed, evidence must be provided that the degree title is nationally established. This evidence could include existence of an accrediting body or a list of existing programs already using the degree title.
G. Accreditation: The proposal should include information regarding any accrediting body for the
Dual-title Graduate Degree Program in Clinical & Translational Sciences

Sponsored by:

The College of Health and Human Development

and

The Penn State College of Medicine

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Professor of Public Health
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University Park Campus Coordinator:
Jim Pawelczyk, PhD
Co-Director of Educational and Training Programs, Penn State Clinical Translational Science Institute
Associate Professor of Kinesiology, Physiology and Medicine
107 Noll Lab
814 865 3453
jap18@psu.edu

Submitted February 2013

Revised August 2013
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I. Program overview

a. Objective of the Program

The objective of this program is to expand the University’s role in training life, biomedical and behavioral scientists who translate fundamental (e.g., “bench top”) research findings to improve clinical practice and human health. This is an operational response to the National Institutes of Health (NIH) effort to establish a network of federally sponsored centers funded through Clinical and Translational Science Awards. Initiated in 2006, Penn State is among the most recent group of institutions to have received this award, completing the consortium of 60 institutions.

Clinical and translational sciences have been recognized as a discipline in their own right for approximately one decade. Prior to this time, students were trained through a variety of formal and informal mechanisms. Professional students typically sought joint MD/PhD or MD/MS degrees. However, outside of a few clinical specialties (e.g., psychology, pharmacology) doctoral students who were interested in clinical trials or other patient-oriented research techniques typically received training via random opportunities to participate directly in clinical research programs. The NIH “Blue Skies” roadmap recognizes the haphazard nature of this approach as an impediment to increasing the throughput of biomedical and behavioral research to improve clinical practice and health.

Figure 1 illustrates the elements of clinical/translational sciences. It includes skill sets ranging from molecular biology to epidemiology, with emphasis on patient-oriented, epidemiological, behavioral, outcomes and health services research that transitions scientific findings from the laboratory to the clinical setting to best practices in the community. Penn State has strengths in many of these areas distributed throughout the University, based predominately in the Colleges of Health and Human Development (CHHD), Medicine (CoM), and the Eberly College of Science. However, without a formal training program(s) in clinical and translational sciences these disconnected elements typically cluster in either academic programs or medical practice and are unlikely to be adequate to fulfill training across the translational spectrum.

**Approaches Contemplated to Graduate Training.** Clinical and translational sciences are a rapidly emerging degree specialization. Whereas the MS in Public Health Sciences based at the College of Medicine has proven to be an effective program for advanced clinical trainees (typically clinical fellows or junior clinical faculty), there is no campus-wide graduate training program at Penn State for graduate students who aim to pursue careers in clinical and translational sciences. As a corollary, there is a large need for such a program because Penn State has substantial investment in biomedical and behavioral graduate training that pertains to human health.

The existing Graduate Credit Certificate Program in Clinical Research offered through the Department of Public Health Sciences at the College of Medicine provides limited exposure to the field of clinical and translational sciences. It is an important adjunct for a limited pool of professionals, most of whom have completed their doctoral program. However, it cannot offer the same integrated training and research experiences found in a degree-granting graduate program. Anecdotal feedback from members of the national CTSA consortium who have offered similar certificate programs has been negative, in part because trainees and employers perceived little additional value of the certificate when entering the job market.

When designing Penn State’s response to the growing need for clinical and translational sciences we reviewed other approaches that had been implemented at peer institutions. We found varying results. Some institutions offered no formal training. Many added a post-baccalaureate certificate program, while still others added a dual-degree MS or PhD. The following institutions offer a standalone PhD degree in clinical and translational sciences. A similar number of institutions offer a Master’s level degree.

- Marquette University/University of Wisconsin at Milwaukee (Clinical and Translational Rehabilitation Health Science)
- Mayo Clinic

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3 These categories comprise the NIH definition of clinical research [http://grants.nih.gov/grants/glossary.htm](http://grants.nih.gov/grants/glossary.htm)

4 Google search, “clinical translational science PhD” January 2012
• Ohio State University (Interdisciplinary Specialization in Biomedical Clinical and Translational Science)
• Rockefeller University
• Scripps Research Institute
• Tufts University
• University of Arkansas (track in Interdisciplinary Biomedical Sciences)
• University of California – Davis
• University of California – San Francisco (Epidemiology and Translational Science)
• University of Colorado
• University of Florida (interdisciplinary concentration in Clinical and Translational Science)
• University of Kentucky
• University of Pittsburgh
• University of Rochester
• University of Texas Health Science Center at San Antonio/University of Texas at Austin
• University of Texas Medical Branch (Human Pathophysiology and Translational Medicine)
• University of Texas Southwestern Medical Center (Mechanisms of Disease and Translational Science)
• University of Utah
• University of Vermont

Few institutions possess the dual-title (or comparable) mechanism; however, two peer institutions (UC Davis and Michigan) created dual-title degree programs that included both didactic elements and expanded clinical exposure. After careful reflection, we concluded that a dual-title graduate degree program holds some distinct advantages to other degree models:

1. A clearly specified second field disciplinary scientific paradigm that is carefully articulated with the research scholarship of the primary field creates a whole that is greater than the sum of its parts.
2. Training in the secondary area adds valuable course work and skills not currently prescribed for the already existing (primary) graduate degree program. Graduate students retain identification and affiliation with the primary degree program – not a forced choice or zero-sum-game program option. This “value-added scholarship” should enhance the interest of potential students in the primary program, rather than create competition between graduate programs for an applicant pool.
3. Dual-title programs are programmatically efficient. Enhanced methodological/analytical skills and training become integrated in the training into dissertation work in the primary area (e.g. candidacy, comprehensives, research), rather than being supplementary or part of a second degree.
4. Theoretically, any existing program can affiliate the secondary program, which could improve multidisciplinary collaboration in health-related fields across the University.

5. In general, there is less graduate training administration (i.e. less responsibility for admissions, funding, candidacy, comps, etc.) with a dual-title program.

6. Anecdotal feedback from students suggests that employment and career opportunities are expanded through dual-title degrees. A dual-titled candidate “stands out.”

Since translation encompasses a set of knowledge, skills and competencies that complements many existing disciplines, it is our contention that a dual-title graduate degree is an optimal mechanism to accelerate and focus training. **We therefore propose the formation of a dual-title graduate degree program in Clinical and Translational Sciences (CTS).**

**Governance Structure of the Proposed CTS Dual-Title Graduate Degree Program.** The proposed CTS dual-title graduate degree program would affiliate with Penn State’s Clinical and Translational Science Institute (CTSI), similar to the 10 graduate programs that affiliate with the Huck Institutes. Figure 2 provides a schematic of CTSI governance structure and its proposed articulation with CTS educational program. The CTSI is under the overall direction of Lawrence Sinoway, MD. Two associate directors (Urs Leuenberger, MD and Susan McHale, PhD) provide operational leadership at the Hershey and UP campuses, respectively. The following key function areas (KFA) are represented within the CTSI:

<table>
<thead>
<tr>
<th>CTSI Key Function Areas</th>
<th>CTSI KFA Leads</th>
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<tr>
<td>College of Medicine</td>
<td>University Park</td>
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<tr>
<td>Biomedical Informatics</td>
<td>Arthur Berg, PhD</td>
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<td>Rongling Wu, PhD</td>
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<td>Biostatistics, Epidemiology and Research Design (BERD)</td>
<td>Vernon Chincilli, PhD</td>
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<td>Lan Kong, PhD</td>
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<td>Community Engagement</td>
<td>Roger Anderson, MD</td>
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<td></td>
<td>Carol Weisman, MD</td>
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<td>Education and Career Development</td>
<td>Diane Thiboutot, MD</td>
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<td></td>
<td>Jim Pawelczyk, PhD</td>
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<tr>
<td>Pilot Projects</td>
<td>Leslie Parent, MD</td>
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<tr>
<td>Regulatory Support and Ethics</td>
<td>Joshua Crites, PhD</td>
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<td>Tracking and Evaluation</td>
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<tr>
<td>Translational Technologies</td>
<td>Bruce Stanley, PhD</td>
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</table>
Within the CTSI, the Education and Career Development KFA would become the academic “home” for the proposed CTS dual-title graduate degree program. This KFA includes both a NIH-funded KL2 program for junior faculty led by Diane Thiboutot, MD and Gordon Jensen, MD, PhD and a TL1 program for predoctoral (both PhD and MD) trainees headed by Doug Leslie, PhD and Jim Pawelczyk, PhD. CTSI PhD predoctoral trainees would become part of the proposed CTS dual-title graduate degree program along with trainees funded through other mechanisms.

The academic structure of the proposed CTS dual-title graduate degree program mirrors aspects of the administrative structure of the CTSI. The submitting college to the Graduate School is the College of Medicine. Furthermore, we propose parallel sponsoring colleges (CoM and CHHD) with reporting lines of authority to the respective Associate Deans for Graduate Education (Michael Verderame, PhD and Kathryn Drager, PhD, respectively). CoM will serve as the academic home of the program and the administrative liaison to the Graduate School. Day-to-day division of student responsibilities (e.g., academic integrity and scheduling) will depend on the locus of an individual trainee’s primary program; i.e., students whose primary program is based at the Hershey campus (initially, Biomedical Sciences) will report through CoM, and students whose primary program is based at University Park (initially, Nutritional Sciences) will report through CHHD.

All CTSI education and training programs are guided by an Education and Training Internal Advisory Committee (ETIAC). The responsibilities of the committee and a complete roster are summarized in Appendix b. The ETIAC includes representatives from colleges and departments participating in the CTSI. Members are selected by the program heads based on their experience with CTS relevant graduate training programs. Germane to this proposal, the ETIAC will act as the steering committee for the CTS dual-title graduate degree program, maintaining the program’s definition and goals, identifying and approving faculty and courses relevant to the program, and recommending policies and procedures for the program’s operation.

To summarize, the CTSA effort seeks to change the culture of health-related research in the United States via:

- reducing program compartmentalization, and
- encouraging interdisciplinary team-based science.

By utilizing the dual-title mechanism and maintaining a high level of horizontal (cross-campus) and vertical communication, the proposed governance structure represents Penn State’s response to these challenges. The expectations for this degree of coordination and communication already exist within the CTSI and are realized on a daily basis.

**Potential Students and Opportunities for Engagement.** At this time, only affiliations with the Biomedical Sciences program at Hershey and the Nutritional Sciences program at UP are proposed, with a total of approximately 20-30 students matriculating in the two programs. However, the CTS dual-title degree appeals to any science and engineering discipline where
improved human health is a desired outcome. As the CTS dual-title graduate degree program grows, potential students for the dual-title degree could be recruited from most undergraduate majors located within the College of Health and Human Development and the Eberly College of Science as well as some programs in the Colleges of Agriculture, Engineering, and Liberal Arts and the School of Nursing. More than 50 graduate programs at the University Park and Hershey campuses would be relevant, with well over 1000 graduate students in residence. Already, interest in future affiliations has been expressed by graduate programs in Human Development and Family Studies, Health Policy Administration, Kinesiology and Physiology.

In addition to Penn State’s established reputation in social and behavioral science, areas of synergy in bioinformatics are particularly strong, including computational biology, genomics, proteomics, systems biology, medical informatics, epidemiology and personalized medicine. The proposed dual-title program will require some training in these areas of growing importance.

Interdisciplinary training in CTS prepares students well for future careers. Students will possess skill sets appropriate for successful careers in the pharmaceutical industry (ranging from drug design to clinical trials), community and public health, as well as more traditional academic and clinical venues. Of particular interest is the explosive growth of clinical research sponsoring organizations, who now employ more than 66,000 people worldwide
and accounting for $20 billion of industry revenue in 2010; approximately one-third of total pharma and biotech research and development expenditures.5

Professional Associations and Journals. Several organizations provide specific associations for CTS scholars. In January 2012 the National Institutes of Health formed its newest center, the National Center for Advancing Translational Sciences (NCATS), to consolidate expertise in this area. Organizations such as the Association of Clinical Research Professionals provide a venue to form professional relationships among scholars participating in clinical trials and related health research.

In addition to more than 1000 journals currently indexed in the National Library of Medicine6, 36 journals related to translational sciences are now available, including Translational Behavioral Medicine (Society of Behavioral Medicine), Science Translational Medicine (AAAS), and Translational Research (Central Society for Clinical Research).

Description of the Clinical and Translational Sciences Curriculum. The program has four general features:

- Basic and clinical science didactic coursework in each of the following areas:
  - Statistics (3 credits)
  - Epidemiology (3 credits)
  - Bioinformatics (3 credits)
  - Experimental design and interpretation (3 credits)
  - The regulatory environment (3 credits)
  - Scientific communication (3 credits)
- Co-mentoring by basic and clinical scientists during students’ dissertation research
- Structured experiences in health care and clinical research
- Exposure to the opportunities afforded by focusing basic sciences, clinical sciences and community engagement on both treatment and prevention to enhance human health.

Potential CTS graduate students will first be admitted to the program in their primary area of study in accordance with the requirements set forth by the Graduate Council and the major program. They will then be considered for admission to the CTS dual-title graduate degree program by a committee consisting of the program co-directors and faculty affiliated with the program. Because the dual-title mechanism allows an additional semester of study before the candidacy exam, it is theoretically possible that applications for admission to the program could be accepted during the first or second year of study in the student’s primary major. We expect that the majority of students recruited into the CTS dual-title graduate degree program will have identified their interest either when applying to the primary area of study or during their first year of study; this allows the candidacy examination to cover both the primary field of study as well as CTS content evaluated by CTS faculty who

5  http://www.acrohealth.org/fact-sheet.html
6  Pubmed search of journal titles referenced by the NCBI database that contain, “clinical” or “translational,” July 2012.
contribute directly to the student’s candidacy. We do anticipate that on rare occasion there may be students who recognize their interest in CTS during their second year of study (for example, after they have chosen their dissertation adviser). When such students are considered for acceptance into the CTS dual-title graduate degree program and have already successfully completed their candidacy examination, a second candidacy examination focused on CTS content will be given to ensure that the student is prepared for study in both areas. In these exceptional cases the administration of the second candidacy will be coordinated with the primary program to retain integration of program content to the fullest extent possible.

Requirements for the dual-title PhD in CTS include 18 credits from a list of approved courses in the following areas:

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<tr>
<th>Statistics (3 credits)</th>
<th>Epidemiology (3 credits)</th>
<th>Bioinformatics (3 credits)</th>
<th>Experimental design and interpretation (3 credits)</th>
<th>The regulatory environment (3 credits)</th>
<th>Scientific communication (3 credits)</th>
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<td>EBM 713 (1) Evidence-based medicine I</td>
<td>BBH/HPA 440 (3) Principles of epidemiology</td>
<td>BIOL 598A/ CSE 598F/ STAT 598F⁷ (3) Bioinformatics I</td>
<td>BB H 502 (PSY 502) (3) Health: biobehavioral perspectives</td>
<td>BBH 551 (3) World health promotion</td>
<td>BMS 504 (1) Art of scientific communication I</td>
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<td>EBM 723 (1) Evidence-based medicine II</td>
<td>HDFS 527 (3) Social epidemiology</td>
<td>BIOL 597A/ CSE 598F/ STAT 597A⁷ (3) Bioinformatics II</td>
<td>BB H 505 (3) Behavioral health research strategies</td>
<td>BIOET 501 (3) Perspectives and methods in bioethics</td>
<td>BMS 505 (1) Art of scientific communication II</td>
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<tr>
<td>HDFS 516 (3) Methods of Research in Human Development</td>
<td>HPA 540 (3) Epidemiological applications in health services research</td>
<td>H P A 528 (3) Health data analysis for research</td>
<td>BMS 581 (3) Molecular and translational approaches to human disease</td>
<td>BIOET 502 (3) Macroeconomics in bioethics</td>
<td>KINES 588 (3) Scientific writing</td>
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<tr>
<td>HDFS 518 (1) Applied Statistics Laboratory</td>
<td>PHS 550 (3) Principles of epidemiology</td>
<td>IBIOS 551 (BMMB 551) (3) Genomics</td>
<td>HDFS 506 (3) Design and evaluation of prevention programs across the lifespan</td>
<td>BIOET 503 (PHIL 573) (3) Ethics and the responsible conduct of biomedical research</td>
<td>PHS 518 (2) Scientific communication</td>
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<td>HDFS 519 (3) Methods of Statistical Analysis in Human Development</td>
<td>PHS 551 (3) Advanced epidemiological methods</td>
<td>PHS 516 (3) Statistical Genetics</td>
<td>HDFS 508 (1-6) Best practices in preventative interpretation</td>
<td>IBIOS 591 (1) Ethics in the life sciences</td>
<td>PSIO 501 (1) Scientific analysis and presentation</td>
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<td>H P A 564 (3) Research methods in health services research</td>
<td>PHS 552 (3) Molecular biology of chronic disease</td>
<td>HPA 561 (3) Introduction to research design in health services</td>
<td>HLTHL 961 (3) Biometrics and public health law</td>
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<td>H P A 566 (3) Advanced methods in health services research I</td>
<td>PHS 553 (3) Infectious disease epidemiology</td>
<td>PHARM 520 (2) Principles of Drug Action</td>
<td>HLTHL 971 (3) Law and medicine</td>
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⁷ A request for a permanent course number has been submitted. Personal communication with Cooduvalli Shashikant, 11/13/2012.
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<th>Experimental design and interpretation (3 credits)</th>
<th>The regulatory environment (3 credits)</th>
<th>Scientific communication (3 credits)</th>
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<td>PHS 520 (3) Principles of biostatistics</td>
<td>STAT 507 (3) Epidemiologic research methods</td>
<td>PHS 504 (3) Behavioral health intervention strategies</td>
<td>HPA 520 (3) Intro to health service organizations and delivery</td>
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<td>PHS 521 (3) Applied biostatistics</td>
<td>VBSC 444 (3) Epidemiology of infectious disease</td>
<td>PHS 505 (3) Behavioral health intervention strategies II</td>
<td>HPA 551 (3) Quality improvement in healthcare</td>
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<td>PHS 522 (3) Multivariate biostatistics</td>
<td>VBSC 445 (3) Molecular epidemiology of infectious disease</td>
<td>PHS 511 (1) Methods used in translational research</td>
<td>PHS 500 (1) Research ethics for clinical investigators</td>
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<td>PHS 505 (3) Public health program planning and evaluation</td>
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<td>PHS 524 (3) Longitudinal data analysis</td>
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<td>PHS 527 (3) Survival analysis</td>
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<td>PHS 580 (3) Clinical trials: design and analysis</td>
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<tr>
<td>STAT 502 (3) Analysis of variance and design of experiments</td>
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<td>PSY 583 (3) Designing research in social psychology</td>
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<tr>
<td>STAT 504 (3) Analysis of discrete data</td>
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<td>STAT 503 (3) Design of experiments</td>
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<td>STAT 505 (3) Applied multivariate statistical analysis</td>
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<td>STAT 509 (3) Design and analysis of clinical trials</td>
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<td>STAT 506 (3) Sampling theory and methods</td>
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<td>STAT 525 (3) Survival analysis I</td>
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</table>

The list of courses is maintained by the Directors of the CTS Dual-title graduate degree program in consultation with the CTSI ETIAC and will be reviewed biennially. Students may petition the Directors of the CTS dual-title graduate degree program to fulfill these
requirements with courses not currently listed. These courses are offered in a number of departments, programs, and colleges, including BBH, BIOL, BMS, HDFS, HLTHL, HPA, KINES, PHS, PSIO, PSY, and STAT. They encompass a wide range of courses in the elective subject areas. The program offers flexibility to select courses ranging from basic to clinical/applied to social and prevention sciences.

In addition to mandatory Scholarship and Research Integrity (SARI) and Institutional Review Board (IRB) or Institutional Animal Care and Use Committee (IACUC) training (as appropriate), CTS seminar (two semesters), and six credits of clinical rotation or practicum that is approved by the Directors of the CTS dual-title graduate degree program (CTS 595 or BMS 571), complete the curriculum.

Graduate trainees accepted to the CTS dual-title graduate degree program will be served by the CTSI’s Mentoring and Career Advisory and Development Panel (MCDAP). The responsibilities of the panel and a complete roster are provided in Appendix b. The MCDAP approves the elective courses that a student selects and provides mentoring and guidance beyond that offered by the primary research mentor. MCDAP members are selected by the CTSI Education and Training Co-Directors because of their experience with mentoring and training junior faculty and graduate students in clinical, behavioral and applied sciences. High priority is given to experience with cross-campus training. As trainees are accepted, they identify a lead mentor from the MCDAP roster. Together the trainee and lead mentor identify a three-person mentoring team that monitors student progress and identifies areas for development that are aligned with the core competencies listed in Appendix a. Areas for development may include “soft skills” such as leadership, diversity and teamwork that are expected competencies for successful translational scientists but are not formally evaluated in the candidacy exam, comprehensive exam, or other required elements of the primary or dual-title degree. Ideally, the lead MCDAP mentor would serve on the student’s doctoral committee to maximize coordination between the primary and secondary areas of study.

Looking forward: Evolution of the CTS Dual-Title Graduate Degree Program. As the CTS dual-title graduate degree program evolves, we see several areas for expansion:

1. Adding new affiliating programs with the CTS: Already we have received inquiries from the graduate programs in Biobehavioral Health, Health Policy Administration, Human Development and Family Studies, Kinesiology, and Immunology and Infectious Diseases.
2. Adding new sources of graduate student support: The flexibility created in the CTS dual-title graduate degree program provides opportunities to fund graduate students with training grants or foundation money in research areas that pertain to human health and disease.
3. Adding core courses: The CTSI ETIAC will be engaged to monitor the program aggressively during the first two years of operation with a specific charge to recommend core courses that might help expand the cultural identity of the program.
4. Adding elective courses: Preparing translational scientists for the 21st century will require an expansion of course offerings in areas such as bioinformatics and medical informatics, clinical trials, and comparative effectiveness (“T4” translation). Besides the existing bioinformatics courses (BIOL 598A/CSE 598F/STAT 597A and BIOL 597A/CSE 598F/STAT 597A) we are aware of a number of experimental courses that would be logical additions to the CTS dual-title graduate degree program once a permanent course number is obtained. The sheer number underscores the timeliness of the proposed CTS dual-title graduate degree program. The list includes, but is not limited to:

- BBH 597A Advanced behavioral health research strategies
- BMS 597B Current topics in translational cancer research
- CSE 598C Algorithms and data structures in bioinformatics
- CSE 598E Data mining driven design
- HDFS 597B Applied longitudinal data analysis
- HPA 597 Evaluation of school and community based treatment for youth
- IBIOS 598B Professional development
- NUTR 597I Nutritional immunology

b. New Courses to be Established as a Part of the Program

Few new courses are necessary to establish the program. Those that have been added will be required of all students in the program.

CTS 590 SEMINAR IN CLINICAL AND TRANSLATIONAL SCIENCES (1) This course provides graduate students opportunities to present and discuss methodologies in clinical research and apply them to a selection of current topics.

CTS 595 CLINICAL INTERNSHIP (1-6) This course provides students opportunities to complete clinical rotations in an area of interest. It will be the functional equivalent of BMS 571 on the Hershey campus.

c. Program Statement

A complete program (aka “white book”) statement is presented in section II of this document.

d. Admission Requirements

Potential CTS graduate students must first be admitted to their major programs as specified by requirements of the Graduate Council and the major program. They become eligible for the dual-title program during the first year of study in the major area of study. Admission to the dual-title graduate degree program will be made prior to completing the candidacy exam in the major area. Typically, application will be made in spring of the first year of study in the primary area. In unusual circumstances, admission may be considered during
the second year of study, either before or, depending on the timing, within one semester of the candidacy exam in the primary area of study. In these cases a supplemental candidacy emphasizing clinical and translational sciences will be administered in consultation with the student’s primary graduate program head and/or primary graduate program doctoral committee.

An admissions committee comprised of faculty affiliated with the CTS dual-title graduate degree program will evaluate students. Applicants must have a graduate GPA of at least 3.5 and a research area related to human health. Prospective CTS dual-title graduate degree program students will write a statement of purpose that addresses the ways in which their research and professional goals will be enhanced by an interdisciplinary course of study in clinical and translational sciences.

e. Justification for the Program in Clinical and Translational Sciences

Because there is no existing academic program in CTS at Penn State, the proposed dual-title graduate degree program will complement elements of Penn State’s life, biomedical, and social/behavioral science research training programs in any academic college at the Hershey and University Park campuses. A parallel translational educational program has been established for medical students to complement their professional doctorate with research training and an accelerated MS degree in Public Health Sciences. Together, these programs will expand research training for MD students with 15 months (four semesters) of education after the first year of medical school and provide new opportunities for other clinical and pre-doctoral students.

Training of the PhD students in the CTS dual-title graduate degree program and medical students in the MS-PHS program will overlap considerably. This approach holds the distinct advantage of increasing communication and translation within the population of future clinical researchers. It represents our philosophical belief that training in clinical and translational research is a value-added component of traditional graduate and medical education, transcending discipline-based study to focus on team-based solutions to health-related problems in diverse contexts.

The seminar format (CTS 590) is a culmination of these beliefs. Modeled on the program developed for Building Interdisciplinary Research Careers in Women’s Health (BIRCWH) for junior faculty, the seminar comprises an active learning format with internal speakers, external speakers, and student presenters. The content emphasizes four developmental areas included in the CTSA core competencies (appendix a) that are essential for successful translational scientists:

- A multidisciplinary perspective that incorporates theoretical models, clinical interventions and prevention strategies;
- A distinct focus on translation, which requires trainees to work beyond the boundaries of their discipline and level(s) of inquiry;
The formation and application of scientific teams, including basic scientists, clinicians, patients/clients and industry partners;

Grantsmanship, especially formulation of translational research questions.

Speakers work collaboratively with trainees to help them develop a broader context for their research projects; an essential skill to develop successful translational scientists.

The national CTSA network strives to accelerate medical discovery and translation to practice and health. The skill set is indeed multi-factorial, including entrepreneurship, quantitative and qualitative analysis, and a working understanding of informatics that ranges from “-omics” analyses to data intensive queries of the electronic patient medical record. We address the challenge through Penn State’s CTSI. The Education and Training Key Function Area within the CTSI includes the ETIAC, an internal team of advisers who maintain program goals and help forge articulations on the University Park and Hershey campuses. Furthermore, MCDAP mentors, senior faculty with proven track records mentoring graduate students, work directly with trainees to supplement, rather than supplant, the traditional committee structure.

Both panels meet at least semi-annually to consider successes and challenges for the proposed program and trainees.

The combination of cross-campus advisory committees, courses and other mechanisms helps establish a culture that spans the Hershey and University Park campuses. We have extensive experience with administering interdisciplinary training between the two that has been developed with more than ten years of experience with cross-campus teaching in the Physiology IGDP. We include regular face-to-face and virtual experiences to help reduce the 90 mile distance.

Projected Size of the Program and Impact. The degree will be offered as a new, intercollege program administered by the CoM. Because it draws largely on existing courses, the impact on faculty load is minimal. When fully operational we anticipate the program will matriculate 20-30 students at various phases of their graduate training (either receiving funding or having received funding). Between four and eight students per year should graduate with the CTS dual-title graduate degree.

Fiscal Resources and Extramural Support. The program is supported through the Penn State Clinical and Translational Science Institute, sponsored by the University and the National Institutes of Health. Currently, CTSI support is available for 12 semesters per year. Each student will be provided 12 months of graduate stipend support. Up to six trainees per year (four grant funded and two institutional matches) are supported. Although no other extramural support exists at this point in time, the program has been designed to accommodate students supported by other training grants, such as the USDA supported Childhood Obesity Prevention Training (COPT) Program that is cosponsored by the Departments of Nutritional Sciences and Human Development and Family Studies in the College of Health and Human Development.
f. **Justification for use of the Dual-title Degree**

The expected benefits of the dual-title graduate degree include:

- Value-added training and scholarship for current students rather than competition between graduate programs for an applicant pool;
- Addition of novel course work and training not proscribed in an existing (primary) graduate degree program;
- Integration of clinical/translational research training into dissertation work (e.g. candidacy, comprehensives, research);
- Enhanced methodological/analytical skills and training;
- Expanded employment and career opportunities within the health sciences arena.

The CTS dual-title graduate degree program will encourage interdisciplinary scholarly work at the interface between many domains by focusing on human health. Using practicums, course work and research, the proposed program of study is designed to extend students’ knowledge beyond their primary area of study to foster a greater understanding and competence in clinical and health-related research. Ultimately, this approach should enable a new breed of scientists capable of targeting their research programs to address the unmet preventative, therapeutic and diagnostic needs of the future.

g. **Accreditation**

Currently there is no accrediting body for clinical and translational sciences training programs in the United States. However, programs are commonly affiliated with the National Center for the Advancement of Translational Sciences (NCATS), a new NIH Institute and the administrative home for NIH Clinical and Translational Science Awards (CTSA). Penn State is among the most recent recipients of a CTSA award. Accordingly, the proposed curriculum aligns with competencies that have been articulated by the national CTSI consortium (Appendix a).

h. **Responses from Sponsoring Departments**

The graduate programs that will be affiliating with the proposed program include Nutritional Sciences at University Park and Biomedical Sciences at the College of Medicine. Companion proposals for program changes are provided.

Additional letters of support are provided from the following areas in Appendix c:

- Colleges and Schools (Agricultural Sciences, Health and Human Development, Liberal Arts, Eberly College of Science, Nursing)
- Institute directors (CTSI and Social Science Research Institutes)
- Department heads whose courses are listed in the CTSI curriculum
- Programs with an interest in a future affiliation with the CTS (Health Policy Administration, Human Development and Family Studies and Kinesiology)
- Affiliating faculty (affirmation is summarized in table format)
II. Proposed Bulletin Listing

Clinical and Translational Sciences (CTS)
Program Homepage: ctsi.psu.edu

Heads:
Douglas Leslie, PhD
A210 Public Health Sciences, Hershey Medical Center
717 531 1259

James Pawelczyk, PhD
107 Noll Lab, University Park
814 865 3453

A. Degree conferred

Students electing to pursue this program through participating departments will earn a
degree with a dual-title at the PhD level, i.e., PhD in [major program name] and Clinical and
Translational Sciences.

B. Graduate Faculty

James H. Adair, PhD (Florida) Professor of Materials Science and Engineering, and
Bioengineering

Lacy Alexander, PhD (Penn State) Assistant Professor of Kinesiology

Roger T. Anderson, PhD (Johns Hopkins) Professor of Public Health Sciences, Chief, Health
Services Research Division

Arthur S. Berg, PhD (California, San Diego) Assistant Professor of Public Health Sciences

Leann Birch, PhD (Michigan) Distinguished Professor of Human Development and Family
Studies and Nutritional Sciences

Sarah K. Bronson, PhD (Washington) Associate Professor of Cellular and Molecular
Physiology

Doug Cavener, PhD (Georgia) Professor and Head of Biology

Vernon M. Chinchilli, PhD (North Carolina) Professor of Biostatistics; Department Chair

James Connor, PhD (California, Berkley) Distinguished Professor and Vice Chair, Department
of Neurosurgery

Mosuk Chow, PhD (Cornell) Associate Professor of Statistics; Senior Research Associate

Cynthia Chuang, MD (New York) Associate Professor of Internal Medicine

Joshua Crites, PhD (Vanderbilt) Assistant Professor of Humanities

Mary Jane De Souza, PhD (Connecticut) Professor of Kinesiology
Henry (Hank) Donohue, PhD (California, Santa Barbara) Professor of Orthopedics and Rehabilitation, and Cellular and Molecular Physiology; Director, Musculoskeletal Research
Donna Fick, RN, PhD (California) Professor of Nursing
Danielle Symons Downs, Ph.D. (Florida) Associate Professor of Kinesiology
Joanna Floros, PhD (Temple) Evan Pugh Professor of Cellular and Molecular Physiology, Pediatrics, and Obstetrics and Gynecology
Alan J. Gelenberg, MD (Pennsylvania) Shively/Tan Professor and Chair of Psychiatry
Mark T. Greenberg, PhD (Virginia) Professor of Human Development and Family Studies and Bennett Chair of Prevention Research
Patricia S. Grigson, PhD (Rutgers) Associate Professor of Neural and Behavioral Sciences
Frank G. Hillary, PhD (Drexel) Assistant Professor of Psychology
Xuemei Huang, MD, PhD (Beijing), Associate Professor of Neurology and Pharmacology
Leonard S. Jefferson, PhD (Vanderbilt) Evan Pugh Professor of Physiology and Chair, Cellular and Molecular Physiology
Gordon Jensen, MD, PhD (Cornell) Professor and Department Head of Nutritional Sciences; Professor of Medicine
Ralph L. Keil, PhD (Cornell) Associate Professor of Biochemistry and Molecular Biology
Shannon L. Kelleher, PhD (California, Davis) Associate Professor of Nutritional Sciences
Larry Kenney, PhD (Penn State) Professor of Physiology and Kinesiology
Kristen Kjerulff, PhD (Illinois) Professor of Public Health Sciences
Ann Kolanowski, RN, PhD (New York) Elouise Ross Eberly Professor of the School of Nursing
Lan Kong, PhD (North Carolina) Associate Professor of Public Health Sciences
Penni Kris-Etherton, PhD, Distinguished Professor of Nutritional Sciences
Rick Legro, MD (Mt. Sinai) Professor of Obstetrics and Gynecology
Douglas Leslie, PhD (Yale) Professor of Public Health Sciences
Robert G. Levenson, PhD (SUNY Stonybrook) Distinguished Professor of Pharmacology
Urs Leuenberger, MD (University of Bern Medical School) Professor of Medicine
Thomas Lloyd, MD (Harvard) Professor of Public Health Sciences, Pharmacology, Obstetrics & Gynecology
Chris Lynch, PhD (Northeastern) Professor of Cellular and Molecular Physiology
Susan McHale, PhD (North Carolina) Professor of Human Development and Family Studies; Director, Social Science Research Institute
Barbara Miller, MD (Penn State) Professor of Pediatrics and Biochemistry & Molecular Biology

Daniel Notterman, MD (New York) Professor of Pediatrics and Biochemistry and Molecular Biology, Vice Dean for Research and Graduate Studies, College of Medicine

Leslie Parent, MD (Duke) Professor of Medicine

Joy Pate, PhD (New Hampshire) Professor of Reproductive Physiology; C. Lee Rumberger and Family Chair in Agricultural Sciences

James Pawelczyk, PhD (North Texas) Associate Professor of Physiology and Kinesiology

Janice L. Penrod, PhD (Penn State) Professor of Nursing

Stephen J. Piazza, PhD (Northwestern) Associate Professor of Kinesiology

David Proctor, PhD (Kent State) Professor of Kinesiology and Physiology

Padma Raghavan, PhD, (Penn State) Professor of Computer Science and Engineering

W. Brian Reeves, MD (Jefferson) Professor of Medicine

Connie J. Rogers, Ph.D. (Pittsburgh) Assistant Professor of Nutritional Sciences

Catherine Ross, PhD (Cornell) Professor of Nutritional Sciences

Robert L. Sainburg, Ph.D. (Rutgers) Professor of Kinesiology

Dennis Scanlon, PhD (Michigan) Associate Professor of Health Policy and Administration

Christopher N. Sciamanna, MD (Jefferson) Professor of Medicine

Erich Schienke, PhD, (Rensselaer) Assistant Professor of Bioethics

Scott Selleck, MD, PhD (Washington U School of Medicine) Professor and Head of Biochemistry and Molecular Biology

Neil Sharkey, PhD, Professor of Kinesiology & Interim Vice-President for Research

Dennis G. Shea, PhD (Rutgers) Professor of Health Policy and Administration and Economics; Department Head

Pamela Farley Short, PhD (Yale) Professor of Health Policy Administration, Demography, and Health Evaluation Sciences

Larry Sinoway, MD (New Jersey Medical School) Distinguished Professor of Medicine; Director, Penn State Heart and Vascular Institute; Director, Clinical and Translational Science Institute

Edward Smith, Ph.D. (North Carolina) Senior Research Associate in the College of Health and Human Development

Diane Thiboutot, MD (Penn State College of Medicine) Professor of Dermatology

Neal Thomas, MD (Temple) Professor of Pediatrics
Akif Ündar, PhD (Texas, Austin) Associate Professor of Pediatrics, Surgery, and Bioengineering

Jack Vanden Heuvel, PhD (Wisconsin) Professor of Molecular Toxicology

Michael Verderame, PhD (Columbia) Professor of Medicine, and Professor of Microbiology and Immunology

Kent Vrana, PhD (Louisiana State) Professor and Chair of Pharmacology

Carol S. Weisman, Ph.D. (Johns Hopkins) Distinguished Professor of Public Health Sciences and OB/GYN

Sheila G. West, PhD (North Carolina, Chapel Hill) Associate Professor of Biobehavioral Health

Nancy Williams, ScD (Boston University) Professor of Kinesiology

Rongling Wu, PhD (Washington) Professor of Public Health Sciences and Statistics

Steven H. Zarit, PhD (Chicago) Professor of Human Development

The College of Medicine provides academic leadership of the CTS dual-title graduate degree program. It is administered jointly on the University Park and Hershey campuses through the College of Health and Human Development and the College of Medicine, respectively, in conjunction with Penn State’s Clinical and Translational Science Institute (CTSI) and in coordination with the student’s primary graduate program. The CTSI Education and Training Internal Advisory Committee, which includes representatives from colleges and departments participating in the CTSI, maintains the program’s definition and goals, identifies faculty and courses relevant to the CTS dual-title graduate degree program, and recommends policies and procedures for the program’s operation.

C. Program Objectives of the Dual-title Graduate Degree Program in Clinical and Translational Sciences

The dual-title graduate degree program in CTS is designed to provide students with the aptitudes and skills necessary to expand research in their major field of study to impact clinical medicine and public health. The dual-title graduate degree program will provide opportunities to synthesize expertise across disciplinary boundaries and to evaluate the effectiveness of research to create improved clinical and/or health outcomes.

This program enhances the training in the major field of study by providing value-added skill sets in patient-oriented, epidemiological, behavioral, outcomes and health services research that transitions scientific findings from the laboratory to the clinical setting to best practices in the community. Clinical and translational sciences are expanding, with career paths in academic, medical and industrial settings. Because the dual-title PhD complements the primary program of study, CTS program representation must be included at all phases of graduate study, including the candidacy exam, comprehensive exam, and dissertation defense.
D. Admission Requirements

Dual-title CTS program graduate students must first be admitted to their major program as specified by requirements of the Graduate Council and the major program. They become eligible for the dual-title graduate degree program during their first year of study in the major area of study. Admission to the dual-title graduate degree program should be made prior to completing the candidacy exam in the major area.

An admissions committee comprised of faculty affiliated with the CTS dual-title graduate degree program will evaluate students. Applicants must have a graduate GPA of at least 3.5 in an area that relates to clinical and translational sciences. Applicants will be required to provide a statement of purpose that addresses the ways their research and professional goals will be enhanced by interdisciplinary research.

E. Degree Requirements

General requirements for the dual-title PhD in [major program name] and Clinical and Translational Sciences are listed below:

- CTS 590 (1) Seminar in Clinical and Translational Sciences (two semesters)
- CTS 595 (1-6) Clinical Research Internship or BMS 571 (1-3) Graduate Clinical Rotation (6 credits)
- 18 additional credits from a list of approved electives in the following areas:
  - Statistics (3 credits)
  - Epidemiology (3 credits)
  - Bioinformatics (3 credits)
  - Experimental design and interpretation (3 credits)
  - The regulatory environment (3 credits)
  - Scientific communication (3 credits)

The choice of CTS electives may be proposed by the student, subject to approval by the student’s academic advisers from the primary and CTS programs. They should complement the student’s work in the primary program. A list of approved electives is available on the CTS program home page.

- Successful completion of candidacy and comprehensive examinations in clinical and translational sciences and the related field. The specific format and content is determined in consultation with the primary program.
- Successful defense of a dissertation in the major field with a substantial component that is clinical or translational in nature.
- Scholarship and Research Integrity (SARI) training (required of all Penn State graduate students)
- Institutional Review Board and/or Institutional Animal Care and Use Committee training (as appropriate)
Language competency requirement

Students will fulfill any language requirement specified by the major department through which the student is admitted. There is no additional language requirement for the CTS dual-title graduate degree program.

Candidacy requirement

Typically, candidates to the program will be accepted during their first year of study. In some circumstances candidates may be considered during the second year. To be admitted to the CTS dual-title graduate degree program students must meet the PhD candidacy requirements in both their major area of study and the dual-title area. The candidacy exam will include both elements. Because students must first be admitted to a major program of study before they may apply to and be considered for admission into a dual-title degree program, dual-title PhD students may require an additional semester to fulfill requirements of both areas of study and, therefore, the candidacy examination may be delayed one semester beyond the normal period, which is defined as “after at least 18 credits have been earned in graduate courses beyond the baccalaureate and within three semesters of entry into the doctoral program.” At least one member of the candidacy committee will be a member of the CTS dual-title degree program faculty. Faculty members who hold appointments in both programs may serve in a combined role.

Committee composition

In accordance with Graduate Council requirements, the doctoral committee shall contain at least four members of the Graduate Faculty, including the student’s dissertation adviser. Students shall be encouraged to include clinical faculty on the graduate committee. The committee shall include at least two individuals who are faculty members in the major program area, at least one faculty member who is affiliated with the CTS dual-title PhD program, and at least one member whose field of study is different from the candidate’s major field of study. This committee member is referred to as the “Outside Field Member.” A member of the student’s committee who is affiliated with the CTS graduate program and who is outside of the major program area may serve in a combined role as an Outside Field Member.

To avoid potential conflicts of interest, the primary appointment of at least one regular member of the doctoral committee must be in an administrative unit that is outside the unit in which the dissertation adviser’s primary appointment is held. This committee member is referred to as the “Outside Unit Member.” A member of the student’s committee who is outside the student’s major field of study and has a primary appointment outside the administrative home of the dissertation adviser(s) may serve as both the Outside Field Member and Outside Unit Member.

The doctoral committee shall be chaired by a member of the Graduate Faculty in the primary area of study and a faculty member of the CTS dual-title graduate degree program. In most cases, the same individual (e.g., dissertation adviser) is a member of the Graduate
Faculty in both the major and dual-title fields, and in such cases may serve as sole chair. If the committee chair does not serve in this combined role, a faculty member representing the CTS dual-title graduate degree program must be designated a co-chair of the committee. A retired or emeritus faculty member may chair the doctoral committee if he/she was officially appointed and began (co)chairing the committee prior to retirement, and has the continuing approval of the department head or program chair in the primary area and dual-title field.

Comprehensive exam

Faculty member(s) affiliated with the CTS dual-title graduate degree program will be fully integrated in the student’s comprehensive exam, as well as the final oral examination (dissertation defense). They will participate in constructing and evaluating comprehensive examination questions that cover the secondary area of study.

The comprehensive exam will require the student to demonstrate an understanding of the methods of translational sciences and an ability to apply them to problems in the student’s major field of study. When appropriate, the student will be expected to demonstrate a working knowledge of methods to evaluate and compare the outcomes of his/her research to related approaches already in existence.

Dissertation

A dissertation in the primary field with a substantial component of clinical and translational research is required of all students in the CTS dual-title graduate degree program. This component will be approved in advance by the student’s committee.

F. Student Aid

When available, graduate research assistantships will be available to students in this program.

G. Course Listing

Required Courses

CTS 590 SEMINAR IN CLINICAL AND TRANSLATIONAL SCIENCES (1) This course provides graduate students opportunities to present and discuss methodologies in clinical in research and apply them to a selection of current topics.

CTS 595 CLINICAL INTERNSHIP (1-6) This course provides students the opportunity to complete clinical rotations in an area of interest.

Elective Courses

The list of elective courses is maintained by the Directors of the Clinical & Translational Sciences Graduate Program in consultation with the CTSI Education and Training Internal Advisory Committee. Students may petition the Directors of the CTS Graduate Program. The elective courses that a student selects must be approved by the CTSI Mentoring and
Career Development Advisory Panel (MCDAP). These courses are offered by graduate programs that reside in many colleges at both the Hershey and University Park campuses, including BBH, BIOL, BMS, HDFS, HLTHL, HPA, KINES, PHS, PSIO, PSY and STAT. They span the areas of statistics, epidemiology, bioinformatics, clinical and experimental design, the regulatory environment and scientific communication.

*Internship or practicum*

All students will be required to complete a clinical rotation or practicum (CTS 595 or BMS 571) that is approved by the Directors of the CTS dual-title graduate degree program.

DATE APPROVED BY GRADUATE COUNCIL:
Clinical and Translational Sciences (CTS) Dual-title Graduate Degree Elective Course List

Students must select three credits in each of the following areas from the currently approved list of courses:

**Statistics (3 credits)**
- EBM 713 (1) Evidence-based medicine I
- EBM 723 (1) Evidence-based medicine II
- HDFS 516 (3) Methods of Research in Human Development
- HDFS 518 (1) Applied Statistics Laboratory
- HDFS 519 (3) Methods of Statistical Analysis in Human Development
- HPA 564 (3) Research methods in health services research
- HPA 566 (3) Advanced methods in health services research I
- PHS 520 (3) Principles of biostatistics
- PHS 521 (3) Applied biostatistics
- PHS 522 (3) Multivariate biostatistics
- PHS 523 (3) Multivariate analysis
- PHS 524 (3) Longitudinal data analysis
- PHS 525 (3) Biostatistics for lab scientists
- PHS 527 (3) Survival analysis
- PHS 528 (3) Bayesian methods
- STAT 500 (3) Applied statistics
- STAT 501 (3) Regression methods
- STAT 502 (3) Analysis of variance and design of experiments
- STAT 504 (3) Analysis of discrete data
- STAT 505 (3) Applied multivariate statistical analysis
- STAT 506 (3) Sampling theory and methods
- STAT 525 (3) Survival analysis I

**Epidemiology (3 credits)**
- BBH/HPA 440 (3) Principles of epidemiology
- HDFS 527 (3) Social epidemiology
- HPA 540 (3) Epidemiological applications in health services research
- PHS 550 (3) Principles of epidemiology
- PHS 551 (3) Advanced epidemiological methods
- PHS 552 (3) Molecular biology of chronic disease
- PHS 553 (3) Infections disease epidemiology
- STAT 507 (3) Epidemiologic research methods
- VBSC 444 (3) Epidemiology of infectious disease
- VBSC 445 (3) Molecular epidemiology of infectious disease

**Bioinformatics (3 credits)**
- HPA 528 (3) Health data analysis for research
BIOL598B/CSE 598B/STAT 597F\(^8\) (3) Bioinformatics I Basic analysis of DNA and protein sequences
BIOL 597A/CSE 598F/STAT 597A\(^8\) (3) Bioinformatics II Statistical methods in genomics
IBIOS 551 (BMMP 551) (3) Genomics
PHS 516 (3) Statistical Genetics

**Experimental design and interpretation (3 credits)**
- BB H 502 (PSY 502) (3) Health: biobehavioral perspectives
- BB H 505 (3) Behavioral health research strategies
- BMS 581 (3) Molecular and translational approaches to human disease
- HDFS 506 (3) Design and evaluation of prevention programs across the lifespan
- HDFS 508 (1-6) Best practices in preventive intervention
- HPA 561 (3) Introduction to research design in health services
- PHARM 520 (2) Principles of drug action
- PHS 504 (3) Behavioral health intervention strategies
- PHS 505 (3) Behavioral health intervention strategies II
- PHS 511 (1) Methods used in translational research
- PHS 519 (2) Patient-oriented research
- PHS 535 (3) Quality of care measurement
- PHS 536 (3) Health survey research methods
- PHS 540 (1) Decision analysis I
- PHS 580 (3) Clinical trials: design and analysis
- PSY 583 (3) Designing research in social psychology
- STAT 503 (3) Design of experiments
- STAT 509 (3) Design and analysis of clinical trials

**The regulatory environment (3 credits)**
- BBH 551 (3) World health promotion
- BIOET 501 (3) Perspectives and methods in bioethics
- BIOET 502 (3) Macro-perspectives in bioethics
- BIOET 503 (PHIL 573) (3) Ethics and the responsible conduct of biomedical research
- BMS 591 (1) Biomedical research ethics
- IBIOS 591 (1) Ethics in the life sciences
- HLTHL 961 (3) Bioethics and public health law
- HLTHL 971 (3) Law and medicine
- HPA 520 (3) Intro to health service organizations and delivery
- HPA 551 (3) Quality improvement in healthcare
- PHS 500 (1) Research ethics for clinical investigators
- PHS 505 (3) Public health program planning and evaluation

**Scientific communication (3 credits)**

\(^8\) N.B. A request for a permanent course number has been submitted; the permanent course number will be added as soon as it receives approval.
BMS 504 (1) Art of scientific communication I
BMS 505 (1) Art of scientific communication II
KINES 588 (3) Scientific writing
PHS 518 (2) Scientific communication
PSIO 501 (1) Scientific analysis and presentation
III. Appendices

a. Core Competencies in Clinical and Translational Research

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# Appendix a. Core Competencies in Clinical and Translational Research

<table>
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<th>Core Thematic Areas</th>
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| I. **CLINICAL AND TRANSLATIONAL RESEARCH QUESTIONS** | 1. Identify basic and preclinical studies that are potential testable clinical research hypotheses.  
2. Identify research observations that could be the bases of large clinical trials.  
3. Define the data that formulate research hypotheses.  
4. Derive translational questions from clinical research data.  
5. Prepare the background and significance sections of a research proposal.  
6. Critique clinical and translational research questions using data-based literature searches.  
7. Extract information from the scientific literature that yields scientific insight for research innovation. |
| II. **LITERATURE CRITIQUE** | 1. Conduct a comprehensive and systematic search of the literature using informatics techniques.  
2. Summarize evidence from the literature on a clinical problem.  
3. Describe the mechanism of a clinical problem reviewed in a manuscript.  
4. Use evidence as the basis of the critique and interpretation of results of published studies.  
5. Identify potential sources of bias and variations in published studies.  
7. Identify gaps in knowledge within a research problem. |
| III. **STUDY DESIGN** | 1. Formulate a well-defined clinical or translational research question to be studied in human or animal models.  
2. Propose study designs for addressing a clinical or translational research question.  
3. Assess the strengths and weaknesses of possible study designs for a given clinical or translational research question.  
4. Design a research study protocol.  
5. Identify a target population for a clinical or translational research project.  
6. Identify measures to be applied to a clinical or translational research project.  
7. Design a research data analysis plan.  
8. Determine resources needed to implement a clinical or translational research plan.  
9. Prepare an application to an IRB. |

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9 https://www.ctsacentral.org/core-competencies-clinical-and-translational-research
IV. RESEARCH IMPLEMENTATION

1. Compare the feasibility, efficiency, and ability to derive unbiased inferences from different clinical and translational research study designs.
2. Assess threats to internal validity in any planned or completed clinical or translational study, including selection bias, misclassification, and confounding.
3. Incorporate regulatory precepts into the design of any clinical or translational study.
4. Integrate elements of translational research into given study designs that could provide the bases for future research, such as the collection of biological specimens nested studies and the development of community-based interventions.

V. SOURCES OF ERROR

1. Describe the concepts and implications of reliability and validity of study measurements.
2. Evaluate the reliability and validity of measures.
3. Assess threats to study validity (bias) including problems with sampling, recruitment, randomization, and comparability of study groups.
4. Differentiate between the analytic problems that can be addressed with standard methods and those requiring input from biostatisticians and other scientific experts.
5. Implement quality assurance systems with control procedures for data intake, management, and monitoring for different study designs.
6. Assess data sources and data quality to answer specific clinical or translational research questions.
7. Implement quality assurance and control procedures for different study designs and analysis.

VI. STATISTICAL APPROACHES

1. Describe the role that biostatistics serves in biomedical and public health research.
2. Describe the basic principles and practical importance of random variation, systematic error, sampling error, measurement error, hypothesis testing, type I and type II errors, and confidence limits.
3. Scrutinize the assumptions behind different statistical methods and their corresponding limitations.
4. Generate simple descriptive and inferential statistics that fit the study design chosen and answer research question.
5. Compute sample size, power, and precision for comparisons of two independent samples with respect to continuous and binary outcomes.
6. Describe the uses of meta-analytic methods.
7. Defend the significance of data and safety monitoring plans.
8. Collaborate with biostatisticians in the design, conduct, and analyses of clinical and translational research.
9. Evaluate computer output containing the results of statistical procedures and graphics.
10. Explain the uses, importance, and limitations of early stopping rules in clinical trials.
VII. BIOMEDICAL INFORMATICS

1. Describe trends and best practices in informatics for the organization of biomedical and health information.
2. Develop protocols utilizing management of information using computer technology.
3. Describe the effects of technology on medical research, education, and patient care.
4. Describe the essential functions of the electronic health record (EHR) and the barriers to its use.
5. Explain the role that health information technology standards have on the interoperability of clinical systems, including health IT messaging.
7. Retrieve medical knowledge through literature searches using advanced electronic techniques.
8. Discuss the role of bioinformatics in the study design and analyses of high dimensional data in areas, such as genotypic and phenotypic genomics.
9. Collaborate with bioinformatics specialists in the design, development, and implementation of research projects.

A. REGULATORY SUPPORT AND KNOWLEDGE COMPETENCIES

1. Describe the fundamental principles of the protection of human subjects, the main authoritative bodies, key codes, and scope of enforcement.
2. Describe the Food and Drug Administration requirements for drug biologic products.
3. Prepare an application for IRB approval.
4. Critique a proposal for risks to human subjects and protections of vulnerable populations.
5. Describe the essential elements of voluntary informed consent.
6. Describe the principles of research documentation, validation and audit.

B. RESPONSIBLE CONDUCT OF RESEARCH COMPETENCIES

1. Explain the ways in which the principles of research ethics are integrated into the design, conduct, oversight and dissemination of research.
2. Describe the authority for and professional standards for the responsible conduct of research.
3. Explain the procedures for reporting and investigating misconduct in research.
4. Explain conflict of interest management in research.
5. Outline criteria for determination of authorship.
6. Describe the role of peer review in funding and publication.
7. Explain the purpose, policies and procedures to ensure ethical use, care, and animal safety in research.

VIII. CLINICAL RESEARCH INTERACTIONS

A. REGULATORY SUPPORT AND KNOWLEDGE COMPETENCIES

1. Describe the fundamental principles of the protection of human subjects, the main authoritative bodies, key codes, and scope of enforcement.
2. Describe the Food and Drug Administration requirements for drug biologic products.
3. Prepare an application for IRB approval.
4. Critique a proposal for risks to human subjects and protections of vulnerable populations.
5. Describe the essential elements of voluntary informed consent.
6. Describe the principles of research documentation, validation and audit.

B. RESPONSIBLE CONDUCT OF RESEARCH COMPETENCIES

1. Explain the ways in which the principles of research ethics are integrated into the design, conduct, oversight and dissemination of research.
2. Describe the authority for and professional standards for the responsible conduct of research.
3. Explain the procedures for reporting and investigating misconduct in research.
4. Explain conflict of interest management in research.
5. Outline criteria for determination of authorship.
6. Describe the role of peer review in funding and publication.
7. Explain the purpose, policies and procedures to ensure ethical use, care, and animal safety in research.
IX. SCIENTIFIC COMMUNICATION

1. Communicate clinical and translational research findings to different groups of individuals, including colleagues, students, the lay public, and the media.
2. Translate the implications of clinical and translational research findings for clinical practice, advocacy, and governmental groups.
3. Write summaries of scientific information for use in the development of clinical health care policy.
4. Translate clinical and translational research findings into national health strategies or guidelines for use by the general public.
5. Explain the utility and mechanism of commercialization for clinical and translational research findings, the patent process, and technology transfer.

X. CULTURAL DIVERSITY

1. Differentiate between cultural competency and cultural sensitivity principles.
2. Recognize the demographic, geographic, and ethnographic features within communities and populations when designing a clinical study.
3. Describe the relevance of cultural and population diversity in clinical research design.
4. Describe cultural and social variation in standards of research integrity.
5. Critique studies for evidence of health disparities, such as disproportional health effects on select populations (e.g., gender, age, ethnicity, race).

XI. TRANSLATIONAL TEAMWORK

1. Build an interdisciplinary/ intradisciplinary/ multidisciplinary team that matches the objectives of the research problem.
2. Manage an interdisciplinary team of scientists.
3. Advocate for multiple points of view.
5. Demonstrate group decision-making techniques.
7. Manage a clinical and/or translational research study.

XII. LEADERSHIP

1. Work as a leader of a multidisciplinary research team.
2. Manage a multidisciplinary team across its fiscal, personnel, regulatory compliance and problem solving requirements.
3. Maintain skills as mentor and mentee.
4. Validate others as a mentor.
5. Foster innovation and creativity.

XIII. CROSS DISCIPLINARY TRAINING

1. Apply principles of adult learning and competency-based instruction to educational activities.
2. Provide clinical and translational science instruction to beginning scientists.
3. Incorporate adult learning principles and mentoring strategies into interactions with beginning scientists and scholars in order to engage them in clinical and translational research.
4. Develop strategies for overcoming the unique curricular challenges associated with merging scholars from diverse backgrounds.
XIV. COMMUNITY ENGAGEMENT

1. Examine the characteristics that bind people together as a community, including social ties, common perspectives or interests, and geography.

2. Appraise the role of community engagement as a strategy for identifying community health issues, translating health research to communities and reducing health disparities.

3. Summarize the principles and practices of the spectrum of community-engaged research.

4. Analyze the ethical complexities of conducting community-engaged research.

5. Specify how cultural and linguistic competence and health literacy have an impact on the conduct of community engaged research.
Appendix b. Organizational Structure of Education and Training Functions in the Penn State Clinical and Translational Sciences Institute

1. Clinical and Translational Sciences Dual-title Graduate Degree Program Coordination
2. CTSI Education and Training Internal Advisory Committee
3. CTSI Mentorship and Career Development Advisory Panel
2. CTSI Education and Training Internal Advisory Committee (ETIAC)

The ETIAC acts as the internal advisers of the CTSI Education and Training Key Function Area (KFA). It is comprised of Co-Directors of each of the educational programs and other senior, mid-level and junior researchers involved in graduate and medical education who are devoted to training future clinical and translational researchers. The ETIAC is responsible for overseeing all phases of training for junior faculty and pre-doctoral students, providing guidance and recommendations to the respective Education and Training KFA Co-Directors.

The Education and Training KFA sponsors practicums, course work, research and training programs that foster a greater understanding and practice of patient-oriented, epidemiological, behavioral, outcomes and health services research that transitions scientific findings from the laboratory to the clinical setting to best practices in the community.

As part of its responsibilities, the ETIAC acts as the steering committee for the Clinical and Translational Sciences dual-title graduate degree program, maintaining the program’s definition and goals, identifying and approving faculty and courses relevant to the program, and recommending policies and procedures for the program’s operation.

ETIAC members are selected by the Education and Training KFA Co-Directors with input from the CTSI Executive Committee.
Current membership

James Adair, PhD  Professor of Materials Science  
Sarah Bronson, PhD  Associate Professor of Cellular and Molecular Physiology  
Vernon Chinchilli, PhD  Distinguished Professor and Chair, Public Health Sciences  
Mark Greenberg, PhD  Professor of Human Development and Family Studies  
Gordon Jensen, MD, PhD  Professor of Nutritional Sciences; Head of the Department  
Cynthia Chuang, MD  Associate Professor of Medicine  
Doug Leslie, PhD  Professor of Public Health Sciences  
Tom Lloyd, PhD  Professor of Public Health Sciences  
Andrea Mastro, PhD  Professor of Microbiology and Cell Biology  
Leslie Parent, MD  Associate Professor of Medicine, Microbiology and Immunology  
Ian Paul, MD  Professor of Pediatrics  
Jim Pawelczyk, PhD  Associate Professor Physiology and Kinesiology  
Janice Penrod, PhD  Professor of Nursing  
Scott Selleck, MD, PhD  Professor of Biochemistry and Molecular Biology  
Diane Thiboutot, MD  Professor of Medicine  
Michael Verderame, PhD  Professor of Medicine  
Carol Whitfield, PhD  Associate Dean for Medical Education

3. CTSI Mentorship and Career Development Advisory Panel (MCDAP)

The MCDAP is comprised of senior faculty members from the CoM and UP campuses with proven track records in graduate and junior faculty training; who provide evidence of excellent mentorship; who are excellent scientists as judged by continued grant support and strong publication record; whose research is in an area of potential interest to CTSI trainees; who are knowledgeable of opportunities and mechanisms to enhance research and training in clinical, behavioral and applied sciences; and who demonstrate enthusiasm for the program. High priority is given to experience with cross-campus training. New members are selected by the MCDAP or the Co-directors of the CTSI Education and Training Key Function Area.

The MCDAP approves the elective courses that trainees select and provides mentoring and guidance beyond that offered by the primary research mentor. Furthermore, the MCDAP encourages a comprehensive approach to professional development, expanding understanding of mentor-mentee relationships, negotiation and conflict resolution, characteristics of excellent teachers. Mentorship includes formal and informal teaching and learning, small group facilitation and other topics useful in developing a quality training environment.

When trainees are accepted, they identify a lead mentor from the MCDAP roster. Together the trainee and lead mentor identify a three-person mentoring team that monitors trainee progress and identifies areas for development that are aligned with the CTSA Education and Training Core Competencies. Areas for development may include “soft skills” such as leadership, diversity and teamwork that are expected competencies for successful translational scientists.
but are neither formally developed through coursework nor evaluated. Furthermore, the mentoring team or the MCDAP may recommend workshops or seminars to develop specialized skills.

Current membership

Leann Birch, PhD, Distinguished Professor of Human Development and Family Studies
Frank Hillary, PhD, Associate Professor of Psychology
Gordon Jensen, MD, PhD, Professor and Department Head of Nutritional Sciences; Professor of Medicine, Penn State College of Medicine
Ann Kolanowski, RN, PhD, Elouise Ross Eberly Professor of the School of Nursing
Rick Legro, MD, Professor of Obstetrics and Gynecology
Douglas Leslie, PhD, Professor of Public Health Sciences
Robert G. Levenson, PhD, Distinguished Professor of Pharmacology
Thomas Lloyd, MD, Professor of Public Health Sciences, Pharmacology, Obstetrics and Gynecology
Barbara Miller, MD, Professor of Pediatrics
Daniel Notterman, MD, Associate Vice-President for Research, Vice Dean for Research and Graduate Studies, Penn State College of Medicine
Ann Ouyang, MD, Associate Professor of Medicine
Jim Pawelczyk, PhD, Associate Professor of Physiology and Kinesiology
Mary Poss, PhD, Professor of Biology and Veterinary Biomedical Sciences
David Proctor, PhD, Professor of Kinesiology and Physiology
Robert Sainburg, Professor of Kinesiology and Neuroscience
Neil Sharkey, PhD, Professor of Kinesiology & Interim Vice-President for Research
Edward Smith, PhD, Professor of Human Development and Family Studies
Diane Thiboutot, MD, Professor of Dermatology
Neal Thomas, MD, Professor of Pediatrics
Rob Turrisi, PhD, Professor of Biobehavioral Health
Kent Vrana, PhD, Professor and Chair of Pharmacology
Carol Weisman, PhD, Distinguished Professor of Public Health Sciences and Obstetrics and Gynecology
Appendix c. Letters of Support

1. Administrative Units
   a. Deans
      i. College of Agricultural Sciences
      ii. College of Health and Human Development
      iii. College of Liberal Arts
      iv. Eberly College of Science
      v. Nursing
   b. Center Directors
      i. Clinical and Translational Sciences Institute
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   c. Department and Program Heads Responses to CTS Elective Course Offerings
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      ii. Bioethics
      iii. Biology
      iv. Biomedical Sciences
      v. Cellular and Molecular Physiology
      vi. College of Medicine
      vii. Dickinson School of Law
      viii. Health Policy Administration
      ix. Human Development and Family Studies
      x. Kinesiology
      xi. Public Health Sciences
      xii. Psychology
      xiii. Statistics
      xiv. Veterinary Biomedical Sciences

2. Affirmative Responses to Faculty Requests for Affiliation
November 27, 2012

Dr. Jim Pawelezyk
Associate Professor Kinesiology, Physiology and Medicine
Co-director of Education and Training Programs, CTSI
Co-director TLI Pre-doctoral Training, CTSI

Dear Jim:

Thank you for informing us of the proposed Clinical and Translational Science (CTS) dual-title curriculum. This represents an exciting educational opportunity for students to expand their research training and develop their competence with skills related to the design, execution, analysis and presentation of experiments that will improve human health.

Professor Daniel Perkins of the Department of Agricultural Economics, Sociology and Education stated that “Applied and Translational research is what Land Grant Universities are doing in many ways and it is our strength. However, no University, that I am aware of, is putting efforts in training future scholars in Translational Research.” Dr. Mary Kennett, the interim department head of Veterinary and Biomedical Sciences speaking on behalf of her faculty stated “We think this is a great program and a couple of our epidemiology courses are cross listed for it.”

The proposed program is consistent with best practices for interdisciplinary graduate education. We would be interested in exploring a formal affiliation with the proposed dual-title program when the opportunity arises.

We wish you success with your endeavors.

Sincerely,

Gary A. Thompson
February 19, 2013

As reiterated to Dr. Pawelczyk, the proposal for a Dual Title Graduate Degree Program in Clinical and Translational Science has the support of the College of Health and Human Development.

Neil A. Sharkey, Ph.D.

Associate Dean for Research and Graduate Education
College of Health and Human Development
The Pennsylvania State University
201 Henderson Building
University Park, PA 16802-6501
December 10, 2012

Jim Pawelczak
0119 Noll Lab
University Park, PA 16802

Dear Jim,

Thank you for informing us of the proposed Clinical and Translational Science (CTS) dual-title curriculum. This represents an exciting educational opportunity for students to expand their research training and develop their competence with skills related to the design, execution, analysis and presentation of experiments that will improve human health.

Please let me know if you require anything further as you move along in this process.

All the best,

[Signature]

Denise Solomon
Association Dean for Research and Graduate Studies
February 19, 2013

Dear Jim:

Thank you for informing us of the proposed Clinical and Translational Science (CTS) dual-title curriculum. This represents an exciting educational opportunity for students to expand their research training and develop their competence with skills related to the design, execution, analysis and presentation of experiments that will improve human health.

The proposed program is consistent with best practices for interdisciplinary graduate education. We would be interested in exploring a formal affiliation with the proposed dual-title program when the opportunity arises.

We wish you success with your endeavors.

Sincerely,

Andrew G Stephenson

Distinguished Professor of Biology
Associate Dean for Research and Grad Education
Eberly College of Science
Penn State University
517 Thomas Building
University Park, PA 16802
(814) 865-9591
March 24, 2013

Dear Jim:

Thank you for informing us of the proposed Clinical and Translational Science (CTS) dual-title PhD curriculum. This represents an exciting educational opportunity for students to expand their research training and develop their competence with skills related to the design, execution, analysis and presentation of experiments that will improve human health.

The proposed program is consistent with best practices for interdisciplinary graduate education in clinical disciplines. We would be interested in exploring a formal affiliation with the proposed dual-title program when the opportunity arises.

We wish you success with your endeavors.

Sincerely,

Paula Milone-Nuzzo RN,PhD,FHHC,FAAN
Dean and Professor
The Pennsylvania State University
School of Nursing
University Park, PA 16802
Tel: 814.863.0245
Fax: 814.865.3779
E-mail: pxm36@psu.edu
November 15, 2012

Dear Jim:

Thank you for the opportunity to review the proposed Clinical and Translational Science (CTS) dual-title curriculum. This represents an exciting educational opportunity for students at the Hershey and University Park campuses to expand their research training and improve their competence with skills related to the design, execution, analysis and presentation of experiments that will improve human health.

During the duration of the Clinical and Translational Science Award, the CTSI is pleased to provide support for the Co-Directors of the proposed program, as well as stipend and tuition support for up to four trainees per year. In addition, the CTSI will host a website for recruiting and host telepresence activities that may be useful for the training program.

We wish you success with your endeavors. Please don’t hesitate to contact us if the CTSI can provide further assistance.

With best wishes,

Lawrence I. Sinoway, MD
Program Director, CTSI

LIS/ls
February 19, 2013

James Pawelczyk, Ph.D.
Department of Kinesiology
Penn State University
119 Noll Laboratory
University Park, PA 16802

Dear Jim,

Thank you for giving me the opportunity to review the proposed Clinical and Translational Science (CTS) dual-title curriculum. This is an exciting educational opportunity for students at both the Hershey and University Park campuses to broaden their research training and enhance their knowledge, skills and competencies related to the design, execution, analysis and presentation of experiments that will improve human health.

In conjunction with the CTSI, the Social Science Research Institute (SSRI) is pleased to provide logistical support for the proposed program. In addition, the SSRI will facilitate any communications that may be useful for the training program.

We are excited to be part of this endeavor and wish you every success. Please don’t hesitate to contact me if the SSRI can be of any assistance.

Sincerely,

Susan M. McHale
Director, Social Science Research Institute
Director, Children, Youth and Families Consortium
Professor of Human Development
November 14, 2012

Dear Jim,

Yes, you have my permission to include the 4 courses as electives - BBH, 440, 502, 505, and 551. Please note that BBH 440 is cross listed with Health Policy. To that end, I have copied Dennis Shea, head of health policy, so he is aware of my approval of your request on behalf of BBH. Good luck with the program and please let me know if there is any way we can be of further assistance. Take care.

Collins Airhihenbuwa

Head, Department of Biobehavioral Health
aou@psu.edu
Bioethics Program

From: "Jonathan H. Marks" <marks@psu.edu>

Sent: Tuesday, November 20, 2012 12:04:26 AM

Subject: Re: Dual-title Degree Clinical & Translational Science

Hi, Jim:

We'd be happy to have you list BIOET 503 as an elective. This is a new course in our new dual-title PhD bioethics program. We anticipate offering this once every two years, but the frequency of offering will depend on the outcome of our current hiring process.

You might also consider offering BIOET 501 PERSPECTIVES AND METHODS IN BIOETHICS and BIOET 502 MACRO-PERSPECTIVES IN BIOETHICS as electives for your dual-title. These are both required courses for the bioethics dual-title and we plan to offer them more frequently—once every year. BIOET 590 Bioethics Colloquium could be offered as well. This is also offered at least one semester every year (when possible both semesters), and we'd be delighted to have that listed as an elective. The colloquium is attended by faculty and post-docs as well as graduate students—so you and any post-docs are also most welcome to attend.

Best wishes,

Jonathan Marks

Director, Bioethics Program
Hi Jim

We currently aren't offering Biol 439, Practical Bioinformatics due to loss of the faculty member who was previously teaching this. We will probably teach it in the future but can't make any promises. Regarding grad courses in bioinformatics, I recommend that you contact Shashi Cooduvalli, chair of the Genomics and Bioinformatics grad program.

Best wishes

Doug Cavener, Professor and Head

Department of Biology

From: "Cooduvalli Shashikant" <css13@psu.edu>
To: "Pamela Mitchell" <pjm23@psu.edu>
Cc: jap18@psu.edu, "Peter J. Hudson" <pjh18@psu.edu>, "Megan Matthews" <mam75@psu.edu>, css7@psu.edu, "ELEANOR R. WITHERITE" <erw130@psu.edu>

Sent: Tuesday, November 13, 2012 10:56:42 AM

Subject: Re: Dual-title Degree Clinical & Translational Science

Two Bioinformatics courses will hopefully get a permanent number and changed titles once we get approval from the graduate school. I have requested IBIOS designations for these courses.

Shashi
Biomedical Sciences (BMS) Graduate Program

February 16, 2013

With the noted exception about my knowledge about IBIOS 591/BMS591, I endorse listing them as electives.

If you need additional information, let me know.

Ralph

From: "Ralph L. Keil" <rlk9@psu.edu>

Sent: Monday, November 12, 2012 4:23:13 PM

Subject: Re: Dual-title Degree Clinical & Translational Science

Thanks for the update regarding this dual-title program. We are discussing this proposal at our Advisory Committee meeting tomorrow.

To specifically answer your question about courses:

BMS 504, 505, and 591 are currently offered courses presented at least once a year

BMS 581 is a new course that will initially be presented Spring 2013. It is anticipated that it will be presented annually.

I do not know anything about "IBIOS/BMS 591 (3)". This appears to be a re-listing of BMS 591, which is a 1 credit course. It seems you are indicating it is for 3 credits in this listing, but I am not aware of a 3 credit version of this course. If you have more information that indicates this is a different course than BMS 591 for 1 credit, please let me know.

Ralph

Ralph L. Keil, PhD
Associate Professor
Chair, Biomedical Sciences Graduate Program
Chair, Biosafety & Recombinant DNA Committee
Dept of Biochemistry & Molecular Biology H171
500 University Dr. Rm. C5715
Penn State College of Medicine
Hershey, PA 17033
In response to the email request from Dr. Pawelczyk, only PSIO 501 is offered on a regular basis.

Leonard S. (Jim) Jefferson, Ph.D.
Evan Pugh Professor and Chair
Pennsylvania State University College of Medicine
Department of Cellular & Molecular Physiology, H166
500 University Drive, Room C4706
Hershey, PA 17033
Dear Dr. Pawelczyk,

Both of the indicated courses below are offered annually and I do endorse listing them as electives in the graduate program.

EBM 713 (1) Evidence-based medicine I
EBM 723 (1) Evidence-based medicine II

Best,

Eileen M. Moser, MD, MHPE, FACP
Interim Vice Dean for Educational Affairs
Associate Professor of Medicine
Penn State College of Medicine
Penn State Milton S. Hershey Medical Center
500 University Drive
Hershey, PA 17033
(717) 531-3876
Dickinson School of Law

From: "Marie Reilly" <mtr12@dsl.psu.edu>
Sent: Monday, November 12, 2012 9:10:52 AM
Subject: RE: Dual-title Degree Clinical & Translational Science

Dear Jim:

The two courses listed below are a regular part of the law school curriculum. We are not able to offer either course in this academic year but are looking for a faculty member to teach them in AY 2013-14. You have my permission to list them as electives in the Grad School program you describe below. For information about when these courses will next be offered, please contact Assistant Dean Cheri Gallagher.

HLTHL 961 (3) Bioethics and public health law
HLTHL 971 (3) Law and medicine

Marie T. Reilly
Senior Associate Dean for Academic Affairs
Professor of Law
Penn State University
Dickinson School of Law
252D Katz Building
University Park, PA 16802
814 863 7033
January 2, 2013

Dear Jim:

Our HPA graduate program committees reviewed the CTSI request to list HPA courses as electives and approved the list you provided:

BBH/HPA 440 (3) Principles of epidemiology
HPA 520 (3) Intro to health service organizations and delivery
HPA 528 (3) Health data analysis for research
HPA 540 (3) Epidemiological applications in health services research
HPA 551 (3) Quality improvement in healthcare
HPA 564 (3) Research methods in health services research
HPA 566 (3) Advanced methods in health services research I
HPA 561 (3) Introduction to research design in health services
HPA 597 (3) Evaluation of school and community based treatment for youth

The following relevant comments and suggestions were passed on by the committees:

HPA 597 is a temporary course number, but HPA is working with HDFS to create a permanent cross-listed class HDFS/HPA 506 that will include this content.

Members of both committees stressed the need for students to have pre-requisite classes, some of which are not on the electives list.

Members of the doctoral committee noted that it is surprising that a program focused on translational science has no courses in knowledge translation; that is a gap in their understanding of what translational science really is. The equivalent would be a medical degree with no courses on patient assessment.

Members of both committees noted that it is unfortunate that the program's required courses rely heavily on courses available only at Hershey, and expressed hopes that you and others would work to identify equivalent courses available at UP that would enable
students on both campuses to take full advantage of the CTSI certificates and dual title programs.

HPA faculty look forward to working with you and others on this exciting new project.

Sincerely,

Dennis

Dennis G. Shea, Ph.D.
Department Head and Professor of Health Policy and Administration
Hi Jim,

We would in fact like to affiliate and see the option of a dual title program as an advantage for our students. We could include two courses, 506 and 508. I would be happy to list the methods courses, but they would be available on a very limited basis to non-HDFS students.

Steve Zarit

Department Head and Distinguished Professor
Human Development and Family Studies
November 14, 2012

Dear Jim,

I am writing to convey my endorsement of Kines 588(3) Scientific Writing being listed as an elective in the CTS graduate program. The course is generally taught once every two years by a Kinesiology faculty member, but it’s being offered is dependent on the availability of an instructor and other workload issues. The course also must meet the minimum enrollment required for it to be offered. Of note, our department also offers Kines 530, Experimental Design and Methodology in Kinesiology, which might be considered as an elective. Should this course be considered by the CTS graduate program Director to be included as an elective, please let me know and I will approach the instructor of the course for input.

Sincerely,

Nancy Williams Sc.D., FACSM

Professor and Head, Department of Kinesiology
Co-Director, Women’s Health and Exercise Laboratory
Room 276 Recreation Building
Penn State University
November 9, 2012

Jim:

Yes, I am very supportive of this proposal. I will comment on the PHS courses that you listed, but I would ask the others I copied on this message to respond in case they have comments.

PHS 500 (1) Research ethics for clinical investigators
PHS 504 (3) Behavioral health intervention strategies
PHS 504 (3) Behavioral health intervention strategies II
PHS 505 (3) Public health program planning and evaluation
PHS 510 (3) Clinical Research Methods (Per Mardi Sawyer: was rolled into a newly designed PHS 550 Principles of Epidemiology course and then eliminated)
PHS 511 (1) Methods used in translational research
PHS 516 (3) Statistical Genetics
PHS 518 (2) Scientific communication
PHS 519 (2) Patient-oriented research
PHS 520 (3) Principles of biostatistics
PHS 521 (3) Applied biostatistics
PHS 522 (3) Multivariate biostatistics
PHS 523 (3) Multivariate analysis – required course for the Biostatistics PhD program
PHS 524 (3) Longitudinal data analysis – required course for the Biostatistics PhD program
PHS 525 (3) Multivariate analysis – required course for the Biostatistics PhD program
PHS 527 (3) Survival analysis – required course for the Biostatistics PhD program
PHS 528 (3) Bayesian methods – required course for the Biostatistics PhD program
PHS 535 (3) Quality of care measurement
PHS 536 (3) Health survey research methods
PHS 540 (1) Decision analysis I – not sure if this course still is offered (Per Mardi Sawyer: PHS 540 will start being offered again in Spring 2012)
PHS 541 (1) Decision analysis II – Per Mardi Sawyer: PHS 541 is no longer offered
PHS 550 (3) Principles of epidemiology
PHS 551 (3) Advanced epidemiological methods
PHS 552 (3) Molecular biology of chronic disease
PHS 553 (3) Infectious disease epidemiology
PHS 580 (3) Clinical trials: design and analysis
PHS 581 (1) Clinical trials: case studies - this course will be eliminated

Sincerely,

Vernon M. Chinchilli, PhD

Distinguished Professor and Chair
Department of Public Health Sciences, A210
Penn State Hershey College of Medicine

From: "Doug Leslie" <Dleslie@phs.psu.edu>

Sent: Thursday, November 15, 2012 2:13:16 PM

Subject: Re: Dual-title Degree Clinical & Translational Science

Hi Jim,

This list looks fine to me.

Best,

Doug
Department of Psychology

From: "Mel Mark" <m5m@psu.edu>

Sent: Friday, November 16, 2012 2:34:20 PM

Subject: RE: Dual-title Degree Clinical & Translational Science

We are happy to have PSY 583 listed as an elective in the new dual-title degree program, with one caveat. We presume the course would be listed among a set of many other courses in the same category (electives?), so that the likely impact on enrollment is small and the students who sign up are likely to be interested in the specific course. If this assumption is incorrect, please let us know.

Thanks,

Mel Mark, Professor and Head

Department of Psychology
Dear Jim,

Sorry for the late reply. I sent your proposal to a couple of faculty members involved with our graduate program and our comments are as follows:

STAT 897A and 897D are not regularly offered and are not appropriate to list. STAT 598B may change its course number and thus it's not clear that it would be appropriate. STAT 512 is geared toward our PhD students and it is thus probably not appropriate; STAT 502 and 503 are much better. Finally, STAT 540 is a bit questionable; it is typically a fairly advanced theoretical course in statistical computing.

With these modifications, we would endorse the listing in the graduate program.

Best wishes,

Dave Hunter
Professor and Head
Department of Statistics
Penn State University
Dear Jim,

We would be happy to have VBSC 444 and VBSC 445 included as CTS electives. We have several excellent clinical veterinarians and epidemiologists with extensive experience in animal models and diagnostics in our department and we are always happy to collaborate in areas like this.

Regards,

Mary J. Kennett, DVM, PhD, DACLAM
Director, Animal Resource Program
Professor and Interim Head, Department of Veterinary & Biomedical Sciences
The Pennsylvania State University
101 Centralized Biological Laboratory
University Park, PA 16802
Appendix c.2. Affirmative Responses to Faculty Requests for Affiliation

N.B. The following table summarizes the affirmative response of each faculty member participating in the proposed CTS dual-title program. Original responses are not shown for reasons of brevity and redundancy but are available upon request.

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<td>Eberly College of Science</td>
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<td>Mosuk Chow</td>
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<td>Rongling Wu</td>
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GRADUATE COUNCIL COMMITTEE ON PROGRAMS AND COURSES

SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES
PROGRAM, OPTION, OR MINOR PROPOSAL FORM

Submit 1 copy of the proposal form and 25 copies of the supporting documentation as outlined below to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building. The proposals will be transmitted to the Dean of the Graduate School for consideration by the Graduate School’s Subcommittee on New and Revised Programs and Courses, and the Committee on Programs and Courses. For a detailed explanation of the form, see the Guide to Curricular Procedures.

College Department or Instructional Area: College of Health and Human Development
                                               Department of Nutritional Sciences

NEW PROGRAM, OPTION OR MINOR

Designation of Program
Classification of Instructional Programs
Code (CIP)
Designation of option
Designation of minor

Indicate effective date ____________________

OLD PROGRAM, OPTION, OR MINOR: Change X Drop _____

Old designation of program
Old designation of option
Old designation of minor

New designation of program (if changed)
New designation of option (if changed) New designation of minor (if changed)

Adoption by the graduate program in Nutritional Sciences of the proposed dual-title graduate degree program in Clinical and Translational Sciences for the Ph.D.

Indicate effective date The first semester following approval

SUBMITTED BY Shelly Nickols-Richardson, Ph.D.  Date 04/11/13
In Charge of Graduate Program
SUPPORTING DOCUMENTATION REQUIRED FOR PROGRAMS,
OPTIONS, OR MINORS (Adds, Changes, or Drops)

All proposals must include a justification statement for action being taken. Submit 1 copy of the proposal form and 25 copies of the supporting documents to the University Curriculum Coordinator at the University Faculty Senate Office. It is important that the proposal include a copy of the program in a format suitable for inclusion in the Graduate Degree Programs Bulletin. Prepare documentation in the outline format as shown below. The proposer is reminded that the Subcommittee and Committee reviewing the proposed program may not have knowledge of the field and is encouraged to provide as much documentation as possible for the reviewers. All proposals, whether a new program or a program change, must be consecutively paginated or the proposal will be returned to the proposing unit. In addition, a table of contents needs to be included in the proposal.

NEW PROGRAMS, OPTIONS* AND MINORS**

A. The objectives of the program: an explanation of how the proposal meets the new educational objectives and/or strengthens existing programs of the college(s) and the University; what students may expect to accomplish through the new program; and a statement of how the new offering does not duplicate other degree programs within the department/college/University.

B. A list of new courses to be established as a part of the new offering.

C. A complete program statement. This should be an arrangement of courses in accordance with degree requirements and with identification of the pattern of scheduling. A list of the required courses, typical electives, etc., that will logically be taken by a student enrolling in the new program should be included. Courses that are new courses should be distinguished from existing courses. Any statement must be submitted in a format for bulletin copy with additional material if necessary (provide both a hard copy and on diskette).

D. A statement of admission requirements should be included, i.e., required test scores, minimum junior/senior GPA, as deemed appropriate by the proposer.

E. A justification for the program. The proposal should include a statement regarding the necessity for the program, i.e., why the program should be offered; and information on the ability of the department to offer a quality program. Included in the section should be
Nutritional Sciences program change proposal:
Adoption of the dual-title graduate degree program in Clinical and Translational Sciences

Contents

1. Objectives of the Program Change ................................................. 1
2. Proposed Bulletin Listing ............................................................... 8

1. Objectives of Program Change

The objective of this document is to propose a Dual-Title PhD Degree in Nutritional Sciences (Nutr) and Clinical and Translational Sciences (CTS). A dual-title PhD in Nutr and CTS will expand the educational experience of students studying in the Graduate Program in Nutritional Sciences (GPN) to include training, via a unique curriculum and research focus, aimed at preparing students for career paths that involve clinical trials or clinical research programs. The Nutr component of the dual-title provides pre-doctoral students curricular training with a unique focus on human health and disease and the opportunity to concentrate in one or more disciplinary approaches including molecular and cellular nutritional sciences, nutritional biochemistry, applied human nutrition, applied animal nutrition, nutrition education, and nutrition in public health. The CTS component of the dual-title provides an emphasis on epidemiological, behavioral, outcomes and health services research that transitions scientific findings from the laboratory to the clinical setting to best practices in the community. Pairing of the two training experiences in the Dual-Title PhD in Nutr and CTS, yields opportunities for interdisciplinary scholarship at the interface of basic science, clinical science and human health. This new offering does not duplicate other degree programs within the Department of Nutritional Sciences, College of Health and Human Development or the University.

2. Justification for Program Change

The existing Graduate Certificate Program in Clinical Research offered through the Department of Public Health Sciences at the College of Medicine provides limited exposure to the field of CTS. It is an important adjunct for a limited pool of professionals, most of whom have completed their doctoral program. However, it cannot offer the same integrated training and research experiences offered by a dual-title PhD degree. The Dual-Title PhD in Nutr and CTS is part of a national effort, led by the National Institutes of Health (NIH) Roadmap, to change the culture of health-related research by reducing program compartmentalization and encouraging interdisciplinary team-based science.
Interdisciplinary training in CTS prepares students for successful careers in pharmaceutical and nutrition industries (ranging from drug/nutrient supplement design to clinical trials), community and public health, as well as more traditional academic and clinical venues. Of particular interest is the explosive growth of clinical research sponsoring organizations, who now employ more than 66,000 people worldwide and account for $20 billion of industry revenue in 2010, or approximately one-third of total pharma and biotech research and development expenditures.¹

The expected benefits of the Dual-Title PhD in Nutr and CTS include:

- Value-added training and scholarship for current students rather than competition between graduate programs for an applicant pool;
- Addition of novel course work and training not proscribed in an existing (primary) graduate degree program;
- Integration of clinical/translational research training into thesis and dissertation work (e.g., Candidacy and Comprehensive Examinations, original research);
- Enhanced methodological/analytical skills and training;
- Expanded employment and career opportunities within the health sciences arena.

The Dual-Title PhD Degree in Nutr and CTS will encourage interdisciplinary scholarly work at the interface between many domains by focusing on human health. Using practicum, course work and research, the proposed program of study is designed to extend students’ knowledge beyond their primary area of study to foster a greater understanding and competence in clinical and health-related research. Ultimately, this approach should enable a new breed of scientists capable of targeting their research programs to address the unmet preventative, therapeutic and diagnostic needs of the future.

¹ [http://www.acrohealth.org/fact-sheet.html](http://www.acrohealth.org/fact-sheet.html)
Below is the proposed organization and integration of the GPN (i.e., graduate program in Nutr) with the CTS Graduate Program.

**Clinical & Translational Sciences Graduate Program Coordination**

The Dual-Title PhD Degree in Nutr and CTS curriculum has four general features.

1. Basic and clinical science didactic coursework in each of the following areas:
   - Statistics (3 credits);
   - Epidemiology (3 credits);
   - Bioinformatics (3 credits);
   - Experimental design and interpretation (3 credits);
   - The regulatory environment (3 credits);
   - Scientific communication (3 credits).

2. Co-mentoring by basic and clinical scientists during students’ dissertation research.

3. Structured experiences in health care and clinical research.

4. Exposure to opportunities afforded by focusing basic sciences, clinical sciences and community engagement on both treatment and prevention to enhance human health.

The GPN requires 12 credits of electives, some of which could be accrued toward requirements of both (i.e., Nutr and CTS) programs. Thus, the minimum number of additional credits that would be added to the curricular experience of students in the GPN accepted to the dual-title program would be six. Additional coursework would be reasonably achievable by the end of the third year of graduate studies. Students will select these additional courses from a list of...
pre-existing courses (see chart below). No new courses in the GPN are required to support the Dual-Title PhD Degree in Nutr and CTS.

Prospective dual-title trainees will express an interest in the program as early as during the recruitment process for the GPN and will apply to the dual-title program no later than the end of the spring semester of the first year of study in the GPN. Students interested in the dual-title program will be considered for admission to the CTS Program by a committee consisting of the CTS Program co-directors and faculty affiliated with the Dual-Title PhD Degree in Nutr and CTS program. Typically, students in the GPN complete the Candidacy Examination at the end of the first year of graduate training. Graduate students in nutritional sciences accepted to the Dual-Title PhD Degree in Nutr and CTS will take the Candidacy Examination at the end of the third semester of graduate training to allow exposure to the CTS Curriculum and to assure commitment of an appropriate dissertation mentor.

Requirements for the Dual-Title PhD Degree in Nutr and CTS include 18 credits from the list of approved electives in the following areas.

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<th>Bioinformatics (3 credits)</th>
<th>Experimental design and interpretation (3 credits)</th>
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<td>BB H 502 (PSY 502) (3) Health: biobehavioral perspectives</td>
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<td>HDFS 516 (3) Methods of Research in Human Development</td>
<td>HPA 540 (3) Epidemiological applications in health services research</td>
<td>H P A 528 (3) Health data analysis for research</td>
<td>BMS 581 (3) Molecular and translational approaches to human disease</td>
<td>BIOET 502 (3) Macro-perspectives in bioethics</td>
<td>KINES 588 (3) Scientific writing</td>
</tr>
<tr>
<td>HDFS 518 (1) Applied Statistics Laboratory</td>
<td>PHS 550 (3) Principles of epidemiology</td>
<td>BIOL 598A/ CSE 598F/ STAT 598F (3) Bioinformatics I</td>
<td>HDFS 506 (3) Design and evaluation of prevention programs across the lifespan</td>
<td>BIOET 503 (PHIL 573) (3) Ethics and the responsible conduct of biomedical research</td>
<td>PHS 518 (2) Scientific communication</td>
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<tr>
<td>HDFS 519 (3) Methods of Statistical Analysis in Human Development</td>
<td>PHS 551 (3) Advanced epidemiological methods</td>
<td>BIOL 597A/ CSE 598F/ STAT 597A (3) Bioinformatics II</td>
<td>HDFS 508 (1-6) Best practices in preventative interpretation</td>
<td>IBIOS 591 (1) Ethics in the life sciences</td>
<td>PSIO 501 (1) Scientific analysis and presentation</td>
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<td>H P A 564 (3) Research methods in health services research</td>
<td>PHS 552 (3) Molecular biology of chronic disease</td>
<td>PHS 516 (3) Statistical Genetics</td>
<td>HPA 561 (3) Introduction to research design in health services</td>
<td>HLTHL 961 (3) Bioethics and public health law</td>
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<tr>
<td>Statistics (3 credits)</td>
<td>Epidemiology (3 credits)</td>
<td>Bioinformatics (3 credits)</td>
<td>Experimental design and interpretation (3 credits)</td>
<td>The regulatory environment (3 credits)</td>
<td>Scientific communication (3 credits)</td>
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<td>HPA 566 (3)</td>
<td>PHS 553 (3)</td>
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<td>PHARM 520 (2) Principles of Drug Action</td>
<td>HTHL 971 (3) Law and medicine</td>
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<td>PHS 520 (3) Principles of biostatistics</td>
<td>STAT 507 (3) Epidemiologic research methods</td>
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<td>PHS 504 (3) Behavioral health intervention strategies</td>
<td>HPA 520 (3) Intro to health service organizations and delivery</td>
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<td>PHS 521 (3) Applied biostatistics</td>
<td>VBSC 444 (3) Epidemiology of infectious disease</td>
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<td>PHS 505 (3) Behavioral health intervention strategies II</td>
<td>HPA 551 (3) Quality improvement in healthcare</td>
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<td>PHS 522 (3) Multivariate biostatistics</td>
<td>VBSC 445 (3) Molecular epidemiology of infectious disease</td>
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<td>PHS 511 (1) Methods used in translational research</td>
<td>PHS 500 (1) Research ethics for clinical investigators</td>
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<tr>
<td>PHS 523 (3) Multivariate analysis</td>
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<td>PHS 519 (2) Patient-oriented research</td>
<td>PHS 505 (3) Public health program planning and evaluation</td>
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<td>PHS 524 (3) Longitudinal data analysis</td>
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<td>PHS 535 (3) Quality of care measurement</td>
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<tr>
<td>PHS 525 (3) Biostatistics for lab scientists</td>
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<td>PHS 536 (3) Health survey research methods</td>
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<td>PHS 527 (3) Survival analysis</td>
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<td>PHS 540 (1) Decision analysis I</td>
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<td>PHS 528 (3) Bayesian methods</td>
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<td>PHS 580 (3) Clinical trials: design and analysis</td>
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<td>STAT 500 (3) Applied Statistics</td>
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<td>PSY 583 (3) Designing research in social psychology</td>
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<td>STAT 501 (3) Regression methods</td>
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<td>STAT 503 (3) Design of experiments</td>
<td>HPA 520 (3) Intro to health service organizations and delivery</td>
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<tr>
<td>STAT 502 (3) Analysis of variance and design of experiments</td>
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<td></td>
<td>STAT 509 (3) Design and analysis of clinical trials</td>
<td>HPA 551 (3) Quality improvement in healthcare</td>
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<td>STAT 504 (3) Analysis of discrete data</td>
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<td>PHS 500 (1) Research ethics for clinical investigators</td>
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</table>
Statistics (3 credits) | Epidemiology (3 credits) | Bioinformatics (3 credits) | Experimental design and interpretation (3 credits) | The regulatory environment (3 credits) | Scientific communication (3 credits)
---|---|---|---|---|---
STAT 505 (3) Applied multivariate statistical analysis | | | PHS 505 (3) Public health program planning and evaluation | | |
STAT 506 (3) Sampling theory and methods | | | | | |
STAT 525 (3) Survival analysis I | | | | | |

In addition to mandatory Scholarship and Research Integrity (SARI) and Institutional Review Board (IRB) or Institutional Animal Care and Use Committee (IACUC) training (as appropriate), CTS Seminar (two semesters), and six credits of clinical rotation or practicum that is approved by the Directors of the CTS Graduate Program (CTS 595 or BMS 571), complete the curriculum.

Graduate trainees accepted to the Dual-Title PhD Degree in Nutr and CTS and trainees in the CTS Program will be served by the CTS Institute’s (CTSI) Mentoring and Career Advisory and Development Panel (MCDAP). The MCDAP approves the elective courses that a student selects and provides mentoring and guidance beyond that offered by the primary research mentor. MCDAP members are selected by the CTSI Education and Training Co-Directors, due to their experience with mentoring and training junior faculty and graduate students in clinical, behavioral and applied sciences. High priority is given to experience with cross-campus training. As CTS Program trainees are accepted, they identify a lead mentor from the MCDAP roster. Together, the trainee, Nutr mentor, and MCDAP mentor will identify a three-person mentoring team that will monitor student progress and identify areas for development that are aligned with the core competencies of the Dual-Title PhD Degree in Nutr and CTS. Areas for development may include “soft skills” such as leadership, diversity and teamwork that are expected competencies for successful translational scientists but are not formally evaluated in the Candidacy Examination, Comprehensive Examination, or other required elements of the primary or dual-title degree.

**Fiscal Resources and Extramural Support.** The program is supported through the Penn State CTSI, sponsored by the University and the NIH. Currently, CTSI support is available for eight semesters per year, with an additional four semesters of support matched by the College of Health and Human Development and two semesters by the College of Medicine. Each student will be provided 12 months of graduate stipend support. Up to seven trainees per year (four grant funded and three institutional matches) are supported. Finally, the proposed dual-title program may provide an opportunity for degree recognition of some students enrolled in the University’s Childhood Obesity Prevention Graduate Training Program sponsored by the United States Department of Agriculture.
It is anticipated that one to two students in the GPN will apply to the Dual-Title PhD Degree in Nutr and CTS each year. The College of Health and Human Development is able to provide the second year of stipend and tuition for one GPN student that is accepted into the Dual-Title PhD Degree in Nutr and CTS. The College is also able to provide the additional 40% graduate tuition for the second year should the CTSI be willing to support an additional GPN student to enter the dual-title program the same year.

The proposed program will minimally impact current course offerings, faculty loads and faculty advising duties. Trainees must complete a Final Examination in which the dissertation research is accepted by their mentors and dissertation committee. Thus, a PhD is requested as the degree title for this dual-title program.

There is no accrediting body for the proposed program area.

A proposed sequence of study is presented below.

<table>
<thead>
<tr>
<th>Year 1, Fall</th>
<th>Year 1, Spring</th>
<th>Year 1, Summer</th>
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<tbody>
<tr>
<td>• Nutr 501(581), 4 cr</td>
<td>• Nutr 502, 3 cr</td>
<td>• ENGL 418, 3 cr</td>
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<td>• Nutr 520, 1 cr</td>
<td>• Nutr 520, 1 cr</td>
<td>• CTS 595 or BMS 571, 3-6 cr</td>
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<td>• Nutr 500-level courses, 4 cr (choose from 506, 511, 512, 513, 514, 515, 532, 533, 597X)</td>
<td>• Nutr 500-level courses, 5 cr (choose from 506, 511, 512, 513, 514, 515, 532, 533, 597X)</td>
<td>• Establish mentors</td>
</tr>
<tr>
<td>• Complete SARI training and IRB or IACUC training</td>
<td>• Apply to Dual-Title PhD Degree in Nutr and CTS</td>
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<table>
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<tr>
<th>Year 2, Fall</th>
<th>Year 2, Spring</th>
<th>Year 2, Summer</th>
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<tr>
<td>• Nutr 551, 1 cr</td>
<td>• Statistics Course, 3 cr (choose from list)</td>
<td>• Nutr 600, 3-6 cr</td>
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<tr>
<td>• Nutr 602, 2 cr</td>
<td>• Bioinformatics Course, 3 cr (choose from list)</td>
<td>• CTS 595 or BMS 571, 3-6 cr</td>
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<tr>
<td>• Statistics Course, 3 cr (choose from list)</td>
<td>• Regulatory Environment Course, 3 cr (choose from list)</td>
<td></td>
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<tr>
<td>• Epidemiology Course, 3 cr (choose from list)</td>
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<td></td>
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<tr>
<td>• Complete Candidacy Examination</td>
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</table>

<table>
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<tr>
<th>Year 3, Fall</th>
<th>Year 3, Spring</th>
<th>Year 3, Summer</th>
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</thead>
<tbody>
<tr>
<td>• Nutr 551, 1 cr</td>
<td>• CTS Seminar (CTS 590), 1 cr</td>
<td>• Nutr 600/601, 3-9 cr</td>
</tr>
<tr>
<td>• CTS Seminar (CTS 590), 1 cr</td>
<td>• Additional electives as needed</td>
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<tr>
<td>• Experimental Design and Interpretation Course, 3 cr (choose from list)</td>
<td></td>
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<tr>
<td>• Scientific Communication Course, 3 cr (choose from list)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Complete Comprehensive Examination</td>
<td></td>
</tr>
</tbody>
</table>

Years 4-5
• Conduct and complete research, Nutr 601, X cr as needed
• Defend dissertation research

Nutritional Science (NUTR)

Program Home Page

GORDON JENSEN, Head of the Department of Nutritional Sciences
SHELLY NICKOLS-RICHARDSON, Professor-in-Charge of Graduate Program in Nutrition

323 110 Chandlee Laboratory
814-863-2920 9680

Degrees Conferred:

Ph.D.
M.S.

**Dual-Title Ph.D. (Nutritional Sciences and Clinical and Translational Sciences)**

The Graduate Faculty

- Craig R. Baumrucker, Ph.D. (Purdue) Professor of Animal Nutrition and Physiology
- Cheston M. Berlin, Jr., M.D. (Harvard) University Professor of Pediatrics and Pharmacology
- Leann Lipps Birch, Ph.D. (Michigan) Distinguished Professor of Human Development and Family Studies
- Dorothy A. Blair, Ph.D. (Cornell) Assistant Professor of Nutritional Sciences
- J. Lynne Brown, Ph.D. (MIT) Associate Professor of Food Science
- James R. Connor, Ph.D. (California, Berkeley) Professor of Neuroscience and Anatomy
- Rebecca L. Corwin, Ph.D., R.D. (Chicago) Associate Professor of Nutritional Sciences
- Terry D. Etherton, Ph.D. (Minnesota) Distinguished Professor of Animal Nutrition
- Gary J. Fosmire, Ph.D. (California, Berkeley) Associate Professor Emeritus of Nutritional Sciences
- Michael H. Green, Ph.D. (California, Berkeley) Professor of Nutritional Sciences and Physiology
- Andras Hajnal, M.D., Ph.D. (Univ Medical School Pecs, Hungary) Associate Professor of Neural/Behavioral Sciences
- Okhee Han, Ph.D. (North Carolina) Assistant Professor of Nutritional Sciences
- Terry J. Hartman, Ph.D., R.D. (Minnesota) Professor of Nutritional Sciences
- Kevin J. Harvatine, Ph.D. (Cornell) Assistant Professor of Nutritional Physiology
- John Hayes, Ph.D. (Connecticut) Assistant Professor of Food Science
- Leonard S. Jefferson, Jr., Ph.D. (Vanderbilt) Professor and Head, Department of Cellular and Molecular Physiology; Associate Dean for Research and Graduate Studies
• Gordon L. Jensen, M.D., Ph.D. (Cornell) Professor and Department Head of Nutritional Sciences, Professor of Medicine, Hershey School of Medicine
• Byron C. Jones, Ph.D. (Arizona) Professor of Biobehavioral Health
• Shannon L. Kelleher, Ph.D. (California, Davis) Assistant Associate Professor of Nutritional Sciences
• Kathleen L. Keller, Ph.D. (Rutgers) Assistant Professor of Nutritional Sciences and Food Science
• Katarzyna (Kasia) Kordas, Ph.D. (Johns Hopkins) Assistant Professor of Nutritional Sciences
• Penny M. Kris-Etherton, Ph.D., R.D. (Minnesota) Distinguished Professor of Nutritional Sciences
• Barbara Lohse, Ph.D., R.D. (Wisconsin, Madison) Associate Professor of Nutritional Sciences
• Andrea M. Mastro, Ph.D. (Penn State) Professor of Microbiology and Cell Biology
• Edward W. Mills, Ph.D. (Purdue) Associate Professor of Dairy and Animal Science
• Laura E. Murray-Kolb, Ph.D. (Penn State) Assistant Professor of Nutritional Sciences
• Sharon M. (Shelly) Nickols-Richardson, Ph.D., R.D. (Georgia) Professor of Nutritional Sciences
• Jill Patterson, Ph.D. (Wisconsin, Madison) Assistant Professor of Nutritional Sciences
• Jeffrey Peters, Ph.D. (California, Davis) Associate Professor of Veterinary Science
• Claudia K. Probart, Ph.D. (Oregon) Associate Professor of Nutritional Sciences
• K. Sandeep Prabhu, Ph.D. (Mysore, India) Associate Professor of Veterinary and Biomedical Sciences
• Connie J. Rogers, Ph.D. (Pittsburgh) Assistant Professor of Nutritional Sciences
• Barbara J. Rolls, Ph.D. (Cambridge) Helen A. Guthrie Chair and Professor of Nutritional Sciences
• A. Catharine Ross, Ph.D. (Cornell) Dorothy Foehr Huck Chair and Professor of Nutritional Sciences
• Jennifer Savage Williams, Ph.D. (Penn State) Associate Director, Center for Childhood Obesity Research
• Ian Simpson, Ph.D. (University College, London) Professor of Neuroscience and Anatomy
• David I. Soybel, Ph.D. (Chicago) Professor of Medicine, Hershey School of Medicine
• Donald B. Thompson, Ph.D. (Illinois, Champaign-Urbana) Professor of Food Science
• Jack Vanden Heuvel, Ph.D. (Wisconsin, Madison) Associate Professor of Veterinary Science
• Regina Vasilatos-Younken, Ph.D. (Penn State) Professor of Poultry Science
• Sheila G. West, Ph.D. (North Carolina, Chapel Hill) Associate Professor of Biobehavioral Health
• Nancy I. Williams, Sc.D. (Boston) Associate Professor and Department Head of Kinesiology

Graduates are prepared for careers in basic and applied research in nutrition and in college teaching. The course of study is planned to meet the professional objectives of the individual student. Students may emphasize molecular and cellular nutritional sciences, nutritional biochemistry, applied human nutrition, applied animal nutrition, nutrition education, and nutrition in public health. Supporting courses are available in biochemistry, physiology, genetics, microbiology, biophysics, food science, health policy and administration, human development and family studies, anthropology, sociology, psychology, public health sciences, and statistics.

Current research emphasizes minerals, vitamin A, lipid metabolism, metabolic disorders, nutrition and behavior, nutrition education strategies, evaluation of dietary intake and nutritional status, nutrition policy and health promotion and disease prevention across the life cycle.
Facilities include well-equipped nutrition science laboratories with animal facilities supervised by a University laboratory animal resource staff. The Diet Assessment Center and the metabolic kitchens serve as laboratories for students in community nutrition, nutrition education, and metabolic nutrition.

Admission Requirements

Scores from the Graduate Record Examinations (GRE), or from the Medical College Admission Test (MCAT), are required for admission. At the discretion of a graduate program, the GRE or other test scores may be waived for an individual on a case-by-case basis. A student may be admitted provisionally for graduate study in a program without these scores. Requirements listed here are in addition to general Graduate School Council requirements stated in the GENERAL INFORMATION section of the General Bulletin.

College graduates with an undergraduate degree in nutrition, animal sciences, food science, dietetics, or a related biological or social science will be considered for admission. For admission to the Graduate School, an applicant must hold either (1) a baccalaureate degree from a regionally accredited U.S. institution or (2) a tertiary (postsecondary) degree that is deemed comparable to a four-year bachelor's degree from a regionally accredited U.S. institution. This degree must be from an officially recognized degree-granting institution in the country in which it operates. Applicants should have a minimum grade-point average of 3.00 (on a 4.00 scale), an acceptable score on the GRE (an average quantitative and verbal score above the fiftieth percentile) or MCAT, and three supporting recommendations. Exceptions may be made for students with special backgrounds, abilities, and interests. When openings are limited, the best-qualified candidates are given priority.

The basic expectations for admission from undergraduate studies include 6 credits in chemistry (organic and inorganic); 3 credits each in physiology, biochemistry, and nutrition; and physics, calculus, and analytical chemistry for some research areas in nutrition science and social science for public health and community nutrition. Students with more than 9 credits of deficiency and a superior record may be admitted to the graduate degree program as provisional students until they qualify for consideration for regular degree status. Deficiencies are expected to be made up with a 3.00 grade-point average or better within the first two semesters.

The language of instruction at Penn State is English. All international applicants must take and submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, or a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). Applicants with iBT speaking scores between 15 and 18 may be considered for provisional admission, which requires completion of specified remedial English courses ESL 114G (American Oral English for Academic Purposes) and/or ESL 116G (ESL/Composition for Academic Disciplines) and
attainment of a grade of B or higher. The minimum acceptable composite score for the IELTS is 6.5.

International applicants are exempt from the TOEFL/IELTS requirement who have received a baccalaureate or a graduate degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, and Wales.

Master's Degree Requirements

The graduate program in Nutritional Sciences offers the M.S. degree with an emphasis in basic nutritional sciences, applied human nutrition, or nutrition in public health.

The M.S. degree requires 30 credits of course work, including 6 credits in research (NUTR 600). The M.S. degree with an emphasis on nutrition in public health includes a 4-credit field experience (NUTR 555).

Doctoral Degree Requirements

Students must pass a comprehensive examination, the specific format and content of which is determined in consultation with the comprehensive examination committee. Each student will have a doctoral committee comprised of graduate faculty internal and external to the Graduate Program in Nutritional Sciences. Successful defense of a research project and written dissertation, along with a final oral examination in Nutritional Sciences is required.

Communication and Language Requirement: Doctoral students must demonstrate competency in spoken English as judged by the program faculty and in technical writing by completion of ENGL 418 with a grade of B or better. Students also must complete satisfactorily 2 to 3 credits at the 400 or 500 level from any one of the following areas: (1) college teaching; (2) logic or philosophy of science; (3) foreign language; or (4) computer science. There are no specific course requirements; however, the academic program is developed by the student in consultation with his or her adviser to develop doctoral-level competence in nutrition and one or more supporting areas. Students are expected to participate in a colloquium each semester and enroll in a seminar on a regular basis.
Nutritional Sciences Option within the IBIOS program: This option in Nutritional Sciences is proposed to promote excellence in graduate education in nutritional sciences by capitalizing on the expertise existing within the biological, biomedical, behavioral, and social sciences at Penn State. Students can choose an area of focus within this option that emphasizes biomolecular nutrition, human nutrient requirements, or ingestive behavior and nutrition intervention. The educational goal of this option is to create a stimulating and diverse environment in which students will develop the critical thinking skills needed to tackle complex issues in nutrition. Students will be expected to develop a foundation of basic knowledge in molecular biology, cell biology, biochemistry and computational methodology. In addition, students are required to complete 2 credits of IBIOS 590. Students are required to complete a course in professional developmental ethics. All students are required to assist in teaching/resident instruction for at least two semesters during their degree program.

Dual-Title PhD Degree in Nutritional Sciences and Clinical and Translational Sciences: Doctoral students with research and educational interests in clinical and translational science may apply for the Dual-Title PhD Degree in Nutritional Sciences and Clinical and Translational Sciences following admission to the Graduate School and Nutritional Sciences and prior to taking the candidacy examination in Nutritional Sciences. An admissions committee comprised of faculty affiliated with the dual-title program will evaluate applicants. Applicants must have a graduate GPA of at least 3.5 in a research area related to human health. Prospective dual-title program students will write a statement of purpose that addresses the ways in which their research and professional goals will be enhanced by an interdisciplinary course of study in clinical and translational sciences.

This dual-title degree program emphasizes interdisciplinary scholarship at the interface of basic sciences, clinical sciences and human health. Students in the dual-title program are required to have two advisers from separate disciplines: one individual serving as the primary mentor in the Graduate Program in Nutritional Sciences and another individual serving as the secondary mentor in an area covered by the dual-title program who is a member of the Clinical and Translational Sciences faculty. The Dual-Title PhD Degree in Nutritional Sciences and Clinical and Translational Sciences requires the completion of 18 credits of coursework. Coursework from an approved list of courses is required and covers the areas of epidemiology, bioinformatics, experimental design and interpretation, statistics, regulatory environment and scientific communication. Approximately 12 credits of coursework may overlap with required elective courses of the Graduate Program in Nutritional Sciences. A required foundational course (CTS 500, Principles of Translational Sciences) is required of students in the dual-title degree program. For students in the dual-title program, the candidacy examination will include content from both the Graduate Program in Nutritional Sciences and the Clinical and Translational Sciences programs and will be completed before the end of the second year of graduate study. The student’s doctoral committee will include faculty from the major program of study and faculty with expertise in clinical and translational science. The fields of nutritional sciences and clinical and translational sciences will be integrated in the student’s
comprehensive examination. All students are required to conduct dissertation research that contributes fundamentally to the fields of nutritional science and clinical/translational sciences.

Student Aid

Fellowships, traineeships, graduate assistantships, and other forms of financial aid are described in the STUDENT AID section of the Graduate Bulletin.

Courses

Graduate courses carry numbers from 500 to 6599 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

FOOD SCIENCE (FD-SC) course list

NUTRITION (NUTR) course list
GRADUATE COUNCIL COMMITTEE ON PROGRAMS AND COURSES

SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES
PROGRAM, OPTION, OR MINOR PROPOSAL FORM

Submit 1 copy of the proposal form and 25 copies of the supporting documentation as outlined below to the Curriculum Coordinator, University Faculty Senate, 101 Kem Graduate Building. The proposals will be transmitted to the Dean of the Graduate School for consideration by the Graduate School’s Subcommittee on New and Revised Programs and Courses, and the Committee on Programs and Courses. For a detailed explanation of the form see the Guide to Curricular Procedures.

<table>
<thead>
<tr>
<th>College</th>
<th>Medicine</th>
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<tr>
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<td>Graduate Studies</td>
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NEW PROGRAM, OPTION OR MINOR

Designation of Program
Classification of Instructional Programs
Code (CIP)
Designation of option
Designation of minor

Indicate effective date

OLD PROGRAM, OPTION, OR MINOR: Change X Drop _____

Old designation of program
Old designation of option
Old designation of minor

New designation of program (if changed)
New designation of option (if changed) New designation of minor (if changed)

Adoption by the graduate program in Biomedical Sciences of the proposed dual-title graduate degree program in Clinical and Translational Sciences for the Ph.D.

Indicate effective date: The first semester following approval
SUPPORTING DOCUMENTATION REQUIRED FOR PROGRAMS, OPTIONS, OR MINORS (Adds, Changes, or Drops)

All proposals must include a justification statement for action being taken. Submit 1 copy of the proposal form and 25 copies of the supporting documents to the University Curriculum Coordinator at the University Faculty Senate Office. It is important that the proposal include a copy of the program in a format suitable for inclusion in the Graduate Degree Programs Bulletin. Prepare documentation in the outline format as shown below. The proposer is reminded that the Subcommittee and Committee reviewing the proposed program may not have knowledge of the field and is encouraged to provide as much documentation as possible for the reviewers. All proposals, whether a new program or a program change, must be consecutively paginated or the proposal will be returned to the proposing unit. In addition, a table of contents needs to be included in the proposal.

NEW PROGRAMS, OPTIONS* AND MINORS**

A. The objectives of the program: an explanation of how the proposal meets the new educational objectives and/or strengthens existing programs of the college(s) and the University; what students may expect to accomplish through the new program; and a statement of how the new offering does not duplicate other degree programs within the department/college/University.

B. A list of new courses to be established as a part of the new offering.

C. A complete program statement. This should be an arrangement of courses in accordance with degree requirements and with identification of the pattern of scheduling. A list of the required courses, typical electives, etc. that will logically be taken by a student enrolling in the new program should be included. Courses that are new courses should be distinguished from existing courses. Any statement must be submitted in a format for bulletin copy with additional material if necessary (provide both a hard copy and on diskette).

D. A statement of admission requirements should be included, i.e., required test scores, minimum junior/senior GPA, as deemed appropriate by the proposer.
Biomedical Sciences program change proposal:

Adoption of the dual-title graduate degree program in Clinical and Translational Sciences

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2. Justification for the Program Change  p. 2
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7. Appendix 1: Table III – Typical Coursework Schedule for Ph.D. Degree for the Four Curricular Tracks – Years 1 and 2  p. 28
1. Objectives of Program Change

The objective of this document is to propose a Dual-Title PhD Degree in Biomedical Sciences and Clinical and Translational Science. A dual-title PhD in Biomedical Sciences and Clinical and Translational Science will expand the educational experience of students training in biomedical science to include training, via a unique curriculum and research focus, aimed at preparing students for career paths that involve clinical trials or clinical research programs. The Biomedical Sciences component of the dual-title with its Options in Biochemistry and Molecular Genetics, Translational Therapeutics, and Virology and Immunology provides pre-doctoral students curricular training with a unique focus on human health and disease and the opportunity to concentrate in one or more disciplinary approaches including biochemistry, biophysics, cell biology, genetics, immunology, pharmacology, physiology, structural biology, and virology. The Clinical and Translational Sciences component of the dual-title provides an emphasis on epidemiological, behavioral, outcomes and health services research that transitions scientific findings from the laboratory to the clinical setting to best practices in the community. Pairing of the two training experiences in the Dual-Title PhD in Biomedical Sciences and Clinical and Translational Sciences, yields opportunities for interdisciplinary scholarship at the interface of basic science, clinical science and human health.

2. Justification for Program Change

The existing Graduate Certificate Program in Clinical Research offered through the Department of Public Health Sciences at the College of Medicine provides limited exposure to the field of Clinical and Translational Sciences (CTS). It is an important adjunct for a limited pool of professionals, most of whom have completed their doctoral program. However, it cannot offer the same integrated training and research experiences offered by a dual-title PhD degree. The Dual-Title PhD in Biomedical Sciences and Clinical and Translational Sciences is part of a national effort, led by the NIH Roadmap, to change the culture of health-related research by reducing program compartmentalization and encouraging interdisciplinary team-based science.

Interdisciplinary training in CTS prepares students for successful careers in the pharmaceutical industry (ranging from drug design to clinical trials), community and public health, as well as more traditional academic and clinical venues. Of particular interest is the explosive growth of clinical research sponsoring organizations, that now employ more than 66,000 people worldwide and accounted for $20 billion of industry revenue in 2010; approximately one-third of total pharma and biotech research and development expenditures. The Biomedical Sciences Graduate Program considers adoption of the Dual-Title PhD in Clinical and Translational Sciences to be responsive to the NIH’s recent statements on the importance for graduate degree programs to embrace the need for innovation in workforce development.

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2 [http://acd.od.nih.gov/Biomedical_research_wgreport.pdf](http://acd.od.nih.gov/Biomedical_research_wgreport.pdf)
The expected benefits of the dual-title graduate degree include:

- Value-added training and scholarship for current students rather than competition between graduate programs for an applicant pool;
- Addition of novel course work and training not proscribed in an existing (primary) graduate degree program;
- Integration of clinical/translational research training into thesis and dissertation work (e.g. candidacy, comprehensives, research);
- Enhanced methodological/analytical skills and training;
- Expanded employment and career opportunities within the health sciences arena.

This dual-title degree will encourage interdisciplinary scholarly work at the interface between many domains by focusing on human health. Using practicums, course work and research, the proposed program of study is designed to extend students’ knowledge beyond their primary area of study to foster a greater understanding and competence in clinical and health-related research. Ultimately, this approach should enable a new breed of scientists capable of targeting their research programs to address the unmet preventative, therapeutic and diagnostic needs of the future.

3. Proposed organization and integration of the Biomedical Sciences Graduate Program with the Clinical and Translation Sciences Graduate Program (Figure 2).

Clinical & Translational Sciences Graduate Program Coordination

[Diagram showing the coordination between University Park and College of Medicine, detailing the responsibilities and affiliations of various programs and positions.]

Figure 2
4. Recruitment, Exams, Curriculum, Mentoring

Recruitment of Dual-Title Trainees

Potential Dual-Title trainees will express an interest in the Dual-Title Degree as early as during the recruitment process for the Biomedical Sciences Graduate Program and may apply for the dual-title Ph.D. in Biomedical Sciences and Clinical and Translational Sciences following admission to the Graduate School and Biomedical Sciences and prior to taking the candidacy exam in Biomedical Sciences, no later than the middle of the second year of graduate study in Biomedical Sciences. Students interested in the Dual-Title Degree will be considered for admission to the Clinical and Translational Sciences Program by a committee consisting of the Clinical and Translational Sciences Program co-directors and faculty affiliated with the Clinical and Translational Sciences Dual-Title Program.

Candidacy Exam for Dual-Title Trainees

Typically Biomedical Sciences graduate students take the candidacy exam at the end of the first year of graduate training. Biomedical Sciences graduate students accepted to the Clinical and Translational Sciences Dual-Title Program will take the candidacy exam at the end of the third semester of graduate training: 1) to allow exposure to the Clinical and Translational Sciences Curriculum in the Fall semester of the second year, which will better prepare the students for the integrated content of the dual-title candidacy exam; and 2) to allow enough time to identify and assure commitment of an appropriate dissertation mentor who embraces the dual-title program of the student. During the candidacy process, the student will also be assessed for candidacy to the dual-title program, and at least one member of the candidacy committee must come from the dual-title program. Faculty members who hold appointments in both programs may serve in a combined role.

Doctoral Committee for Dual-Title Trainees

In accordance with Graduate Council requirements, the doctoral committee shall contain at least four members. At least one regular member of the doctoral committee must represent a field outside the candidate’s major field of study in order to provide a broader range of disciplinary perspectives and expertise. This committee member is referred to as the “Outside Field Member.” In cases where the candidate is also pursuing a dual-title field of study, the dual-title representative to the committee may serve as the Outside Field Member. Additionally, in order to avoid potential conflicts of interest, the primary appointment of at least one regular member of the doctoral committee must be in an administrative unit that is outside the unit in which the dissertation adviser’s primary appointment is held (i.e., the adviser’s administrative home; in the case of tenure-line faculty, this is the individual’s tenure home). This committee member is referred to as the “Outside Unit Member.” In the case of co-advisers, the Outside Unit Member must be from outside the administrative home(s) of both co-advisers. In some cases, an individual may have a primary appointment outside the administrative home of the student’s dissertation adviser and also represent a field outside the
student’s major field of study; in such cases, the same individual may serve as both the Outside Field Member and the Outside Unit Member.

The committee chair will be a member of the Graduate Faculty in the primary area of study or the dual-title program. Faculty members who hold appointments in both the primary area of study and the CTS program may serve in a combined role.

If the committee chair does not serve in this combined role, the faculty member representing the CTS program must be designated co-chair of the committee. The CTS representative(s) will be expected to assist in constructing and evaluating comprehensive examination questions that cover the secondary area of study.

Curriculum for Dual-Title Trainees and Reciprocity in Curricular Requirements

The Clinical and Translational Sciences Dual-Title PhD curriculum has four general features:

- Basic and clinical science didactic coursework in each of the following areas:
  - Statistics (3 credits)
  - Epidemiology (3 credits)
  - Bioinformatics (3 credits)
  - Experimental design and interpretation (3 credits)
  - The regulatory environment (3 credits)
  - Scientific communication (3 credits)
- Co-mentoring by basic and clinical scientists during the student’s dissertation research
- Structured experiences in health care and clinical research
- Exposure to the opportunities afforded by focusing basic sciences, clinical sciences and community engagement on both treatment and prevention to enhance human health.

Common to the Biomedical Sciences and Clinical and Translational Sciences curricula are mandatory Scholarship and Research Integrity (SARI) and Institutional Review Board (IRB) or Institutional Animal Care and Use Committee (IACUC) training (as appropriate). Specific to the Clinical and Translational Sciences curriculum are two semesters of the Clinical and Translational Sciences Seminar (1 credit each semester), and 6 credits of clinical rotation or practicum as approved by the Directors of the Clinical and Translational Sciences Graduate Program (CTS 595 Internship or BMS 571 Graduate Clinical Rotation). BMS 571 (up to 3 credits) is an approved elective in the Biomedical Sciences curriculum. Additional requirements for the dual-title PhD in Clinical and Translational Sciences include 18 credits from the list of electives presented in Table I, with the number of credits from specific areas indicated, e.g., 3 credits of statistics. Biomedical Sciences courses approved as electives for Clinical and Translational Sciences are indicated in red (Core requirement), blue (Track-specific requirements), or green (other common electives).
As seen below, reciprocity between the Dual-Title PhD Program and the Biomedical Sciences Graduate Program allows for up to 6 of the elective credits required for the Clinical and Translational Science degree to be met simultaneously by curricular requirements for the Biomedical Sciences degree. In addition, three of the four curricular tracks for the Biomedical Sciences Program require 7 credits of electives (the other track requires 2 credits of elective) permitting another up to 7 credits to be accrued toward the requirements of both programs. These 7 credits of electives could be satisfied by BMS 571, a course that counts toward the required 6 credits of clinical rotation/practicum for the Clinical and Translational Sciences degree and/or by remaining required electives in the Clinical and Translational Sciences Emphasis Areas. Thus, the minimum number of additional credits that would be added to the curricular experience of Biomedical Sciences Graduate Program student accepted to the Dual-Title Program in Clinical and Translational Science would be 13 credits. The additional coursework should be reasonably achievable by the end of the fifth semester of the graduate program.

Table I: Clinical and Translational Sciences Elective Emphasis Areas

<table>
<thead>
<tr>
<th>Statistics (3 credits)</th>
<th>Epidemiology (3 credits)</th>
<th>Bioinformatics (3 credits)</th>
<th>Experimental design and interpretation (3 credits)</th>
<th>The regulatory environment (3 credits)</th>
<th>Scientific communication (3 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBM 713 (1) Evidence-based medicine I</td>
<td>BBH/HPA 440 (3) Principles of epidemiology</td>
<td>BIOL 598A/ CSE 598F/ STAT 598F (3) Bioinformatics I</td>
<td>BBH 502 (PSY 502) (3) Health: biobehavioral perspectives</td>
<td>BBH 551 (3) World health promotion</td>
<td>BMS 504 (1) Art of scientific communication I</td>
</tr>
<tr>
<td>EBM 723 (1) Evidence-based medicine II</td>
<td>HDFS 527 (3) Social epidemiology</td>
<td>BIOL 597A/ CSE 598F/ STAT 597A (3) Bioinformatics II</td>
<td>BB H 505 (3) Behavioral health research strategies</td>
<td>BIOET 501 (3) Perspectives and methods in bioethics</td>
<td>BMS 505 (1) Art of scientific communication II</td>
</tr>
<tr>
<td>HDFS 516 (3) Methods of research in human development</td>
<td>HDFS 527 (3) Epidemiological applications in health services research</td>
<td>HDFS 518 (3) Health data analysis for research</td>
<td>BMS 581 (3) Molecular and translational approaches to human disease</td>
<td>BIOET 502 (3) Macro-perspectives in bioethics</td>
<td>KINES 588 (3) Scientific writing</td>
</tr>
<tr>
<td>HDFS 518 (1) Applied statistics laboratory</td>
<td>PHS 550 (3) Principles of epidemiology</td>
<td>IBIOS 551 (BM/BB 551) (3) Genomics</td>
<td>HDFS 506 (3) Design and evaluation of prevention programs across the lifespan</td>
<td>BIOET 503 (PHIL 573) (3) Ethics and the responsible conduct of biomedical research</td>
<td>PHS 518 (2) Scientific communication</td>
</tr>
<tr>
<td>HDFS 519 (3) Methods of statistical analysis in human development</td>
<td>PHS 551 (3) Advanced epidemiological methods</td>
<td>PHS 516 (3) Statistical Genetics</td>
<td>HDFS 508 (1-6) Best practices in preventative interpretation</td>
<td>BMS 591 (1) Biomedical research ethics</td>
<td>PSIO 501 (1) Scientific analysis and presentation</td>
</tr>
<tr>
<td>HPA 564 (3) Research methods in health services research</td>
<td>PHS 552 (3) Molecular biology of chronic disease</td>
<td>HPA 561 (3) Introduction to research design in health services</td>
<td>IBIOS 591 (1) Ethics in the life sciences</td>
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<tr>
<td>HPA 566 (3) Advanced methods in health services research I</td>
<td>PHS 553 (3) Infections disease epidemiology</td>
<td>PHARM 520 (2) Principles of Drug Action</td>
<td>HTHL 961 (3) Bioethics and public health law</td>
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<tr>
<td>Statistics (3 credits)</td>
<td>Epidemiology (3 credits)</td>
<td>Bioinformatics (3 credits)</td>
<td>Experimental design and interpretation (3 credits)</td>
<td>The regulatory environment (3 credits)</td>
<td>Scientific communication (3 credits)</td>
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<tr>
<td>PHS 520 (3) Principles of biostatistics</td>
<td>STAT 507 (3) Epidemiologic research methods</td>
<td>PHS 504 (3) Behavioral health intervention strategies</td>
<td>HLT 971 (3) Law and medicine</td>
<td>HPA 520 (3) Intro to health service organizations and delivery</td>
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<tr>
<td>PHS 527 (3) Applied biostatistics</td>
<td>VBSC 444 (3) Epidemiology of infectious disease</td>
<td>PHS 505 (3) Behavioral health intervention strategies II</td>
<td>HPA 551 (3) Quality improvement in healthcare</td>
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<tr>
<td>PHS 522 (3) Multivariate biostatistics</td>
<td>VBSC 445 (3) Molecular epidemiology of infectious disease</td>
<td>PHS 511 (1) Methods used in translational research</td>
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<tr>
<td>PHS 523 (3) Multivariate analysis</td>
<td>PHS 519 (2) Patient-oriented research</td>
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<td>PHS 500 (1) Research ethics for clinical investigators</td>
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<td>PHS 524 (3) Longitudinal data analysis</td>
<td>PHS 535 (3) Quality of care measurement</td>
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<td>PHS 505 (3) Public health program planning and evaluation</td>
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<tr>
<td>PHS 525 (3) Biostatistics for lab scientists</td>
<td>PHS 536 (3) Health survey research methods</td>
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<tr>
<td>PHS 527 (3) Survival analysis</td>
<td>PHS 540 (1) Decision analysis I</td>
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<td>PHS 528 (3) Bayesian methods</td>
<td>PHS 580 (3) Clinical trials: design and analysis</td>
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<tr>
<td>STAT 500 (3) Applied statistics</td>
<td>PSY 583 (3) Designing research in social psychology</td>
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<tr>
<td>STAT 501 (3) Regression methods</td>
<td>STAT 503 (3) Design of experiments</td>
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<tr>
<td>STAT 502 (3) Analysis of variance and design of experiments</td>
<td>STAT 509 (3) Design and analysis of clinical trials</td>
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<tr>
<td>STAT 504 (3) Analysis of discrete data</td>
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<tr>
<td>STAT 505 (3) Applied multivariate statistical analysis</td>
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<tr>
<td>STAT 506 (3) Sampling theory and methods</td>
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<tr>
<td>STAT 525 (3) Survival analysis I</td>
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</table>
Comprehensive Exam for Dual-Title Trainees

Faculty member(s) affiliated with the Clinical and Translational Sciences Program will be fully integrated in the student’s comprehensive exam. The exam will require the student to demonstrate an understanding of the methods of translational sciences and an ability to apply them to problems in the student’s major field of study. When appropriate, the student will be expected to demonstrate a working knowledge of methods to evaluate and compare the outcomes of his/her research to related approaches already in existence.

Dissertation and Final Oral Exam

A dissertation in the primary field with a substantial component of clinical and translational research is required of all students in the dual-title program. This component will be approved in advance by the student’s committee.

Mentoring and Career Development for Dual-Title Trainees

Graduate trainees accepted to the Clinical and Translational Sciences Program will be served by the CTSI’s Mentoring and Career Advisory and Development Panel (MCDAP). The MCDAP approves the elective courses that a student selects and provides mentoring and guidance beyond that offered by the primary research mentor. MCDAP members are selected by the CTSI Education and Training Co-Directors because of their experience with mentoring and training junior faculty and graduate students in clinical, behavioral and applied sciences. High priority is given to experience with cross-campus training. As trainees are accepted, they identify a lead mentor from the MCDAP roster. Together the trainee and lead mentor identify a three-person mentoring team that monitors student progress and identifies areas for development that are aligned with the core competencies of the Dual-Title PhD in Clinical and Translational Sciences. Areas for development may include “soft skills” such as leadership, diversity and teamwork that are expected competencies for successful translational scientists but are not formally evaluated in the candidacy exam, comprehensive exam, or other required elements of the primary or dual-title degree.

Fiscal Resources and Extramural Support

The program is supported through the Penn State Clinical and Translational Science Institute, sponsored by the University and the National Institutes of Health. Currently, CTSI support is available for 12 semesters per year, expanding to 16 semesters per year in 2013-2015. Each student will be provided 15 months of graduate stipend support. Up to eight trainees per year (six grant funded and two institutional matches) are supported.

It is anticipated that up to two of the 15-20 Biomedical Sciences Graduate Program students that matriculate each year would apply to the Dual-Title PhD in Clinical and Translational Sciences. The Biomedical Sciences Graduate Program is able to provide the second year of stipend and tuition for up to two Biomedical Sciences Graduate Program students that are accepted into the Dual-Title PhD in Clinical and Translational Science. The Biomedical Sciences Graduate Program is also able to provide the additional 40% graduate tuition for
the second year should the Clinical and Translational Science institute be willing to support an additional Biomedical Sciences Graduate Student to enter the Dual-Title PhD Program in Clinical and Translational Sciences the same year. Dual-title predoctoral students in Biomedical Sciences and Clinical and Translational Sciences in the third year of training and beyond will be supported by extramural or institutional funds awarded to the dissertation mentor. Documents detailing the commitment of this support are signed by the dissertation mentor and the respective department chair, typically sometime in the second year of training.

**Impact of Proposed Program Change for Departments Affected**

The proposed program will minimally impact current course offerings, faculty loads and faculty advising duties at the College of Medicine.

**Accreditation**

There is no accrediting body for the proposed Dual-title in Biomedical Sciences and Clinical and Translational Sciences.

**Table II – Typical Coursework Schedule for Dual-Title Trainees: Years 1-3**

<table>
<thead>
<tr>
<th>Year 1 – Fall</th>
<th>Year 1 – Spring</th>
<th>Year 1 – Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMS Core Curriculum – 9 cr</td>
<td>BMS Core Curriculum – 1 cr</td>
<td>Research Rotations/Identify Research Mentor</td>
</tr>
<tr>
<td>Research Rotations</td>
<td>Option Requirements/Electives – 1-8 cr</td>
<td>BMS 571(Clinical Rotation) – 3 cr</td>
</tr>
<tr>
<td>SARI Training</td>
<td>Research Rotations</td>
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</tr>
<tr>
<td></td>
<td>Apply to Dual-Title Program</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2 – Fall</td>
<td>Year 2 – Spring</td>
<td>Year 2 – Summer</td>
</tr>
<tr>
<td>Option/CTS Requirements/Electives 1-9 cr Candidacy Exam</td>
<td>Option/CTS Requirements/Electives 1-8 credits CTS Seminar – 1 cr</td>
<td>BMS 571(Clinical Rotation) – 3 cr</td>
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</tr>
<tr>
<td>Year 3 – Fall</td>
<td>Year 3 – Spring</td>
<td>Year 3 – Summer</td>
</tr>
<tr>
<td>Option/CTS Requirements/Electives 1-8 cr CTS Seminar – 1 credit</td>
<td>Comprehensive Exam</td>
<td>Dissertation Research</td>
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<tr>
<td>Year 4/5 – Fall</td>
<td>Year 4/5 – Spring</td>
<td>Year 4/5 – Summer</td>
</tr>
<tr>
<td>Dissertation Research</td>
<td>Dissertation Research</td>
<td>Dissertation Research</td>
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</table>
6. Current Bulletin Listing with Tracked Changes

Biomedical Sciences (BMS)

Program Home Page

PROFESSOR RALPH KEIL, Chair, Biomedical Sciences Graduate Program
C1712 College of Medicine, Mail Code H170
Hershey, PA 17033
1-717-531-1045
1-717-531-0786 (FAX)
rkeil@psu.edu

Degrees conferred:

<table>
<thead>
<tr>
<th>Degree</th>
</tr>
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<tbody>
<tr>
<td>Ph.D.</td>
</tr>
<tr>
<td>M.D./Ph.D.</td>
</tr>
<tr>
<td>M.S.</td>
</tr>
<tr>
<td>Dual-Title Ph.D. in (Biomedical Sciences and Clinical and Translational Sciences)</td>
</tr>
</tbody>
</table>

The Graduate Faculty

Shantu G. Amin, Ph.D. (Stevens Institute of Technology) Professor of Pharmacology
Alaa S. Awad, M.D., MSc., FASN (Cairo, Egypt) Assistant Professor of Medicine, and Cellular and Molecular Physiology
Alistair J. Barber, Ph.D. (Open University, Milton Keynes, UK) Assistant Professor of Ophthalmology, and Cellular and Molecular Physiology
Cheston M. Berlin, Jr., M.D. (Harvard) University Professor of Pediatrics, and Professor of Pharmacology
Maria C. Bewley, Ph.D. (U of Leeds, UK) Associate Professor of Biochemistry and Molecular Biology
Melvin L. Billingsley, Ph.D. (George Washington) Professor of Pharmacology, and Biotechnology and Entrepreneurship
Robert H. Bonneau, Ph.D. (Penn State) Professor of Microbiology and Immunology
Sarah K. Bronson, Ph.D. (Washington) Associate Professor of Cellular and Molecular Physiology
Kirsteen Browning, Ph.D. (University of Aberdeen, Scotland) Assistant Professor of Neural and Behavioral Science
Victor A. Canfield, Ph.D. (California, Berkeley) Assistant Professor of Pharmacology
Laura Carrel, Ph.D. (Stanford) Associate Professor of Biochemistry and Molecular Biology
Vincent Chau, Ph.D. (Virginia) Professor of Cellular and Molecular Physiology
Keith C. Cheng, M.D., Ph.D. (NYU; Washington) Professor of Pathology, and Biochemistry and Molecular Biology
Hui-Ling Chiang, Ph.D. (Harvard) Professor of Cellular and Molecular Physiology
Michael J. Chorney, Ph.D. (Cornell) Professor of Microbiology and Immunology, and Pediatrics
Neil D. Christensen, Ph.D. (Auckland, New Zealand) Professor of Pathology, and Microbiology
and Immunology
Gary A. Clawson, M.D., Ph.D. (Miami; Michigan State) Professor of Pathology, and
Biochemistry and Molecular Biology
James R. Connor, Ph.D. (California, Berkeley) Distinguished Professor and Vice Chair,
Department of Neurosurgery
Rebecca C. Craven, Ph.D. (Tennessee) Professor of Microbiology and Immunology
Arunangshu Das, Ph.D. (Jadavpur, India) Assistant Professor of Biochemistry and Molecular
Biology
Dhimant Desai, Ph.D. (Bombay) Associate Professor of Pharmacology
Henry J. Donahue, Ph.D. (California, Santa Barbara) Professor of Orthopaedics and
Rehabilitation, and Cellular and Molecular Physiology; Director, Musculoskeletal Research
Kristin A. Eckert, Ph.D. (Wisconsin) Professor of Pathology, and Biochemistry and Molecular
Biology
Karam El-Bayoumy, Ph.D. (NYU) Professor of Biochemistry and Molecular Biology; Associate
Director of Basic Research, Penn State Cancer Institute
Wafik S. El-Deiry, M.D., Ph.D. (Miami School of Medicine) Professor of Medicine
John Ellis, Ph.D. (Rochester) Associate Professor of Pharmacology, and Psychiatry
David J. Feith, Ph.D. (Penn State) Assistant Professor of Cellular and Molecular Physiology
Leo Fitzpatrick, Ph.D. (Texas) Associate Professor of Pharmacology
John M. Flanagan, Ph.D. (Tennessee) Professor of Biochemistry and Molecular Biology
Joanna Floros, Ph.D. (Temple) Evan Pugh Professor of Cellular and Molecular Physiology,
Pediatrics, and Obstetrics and Gynecology
Willard M. Freeman, Ph.D. (Wake Forest) Associate Professor of Pharmacology
Robert A. Frost, Ph.D. (SUNY, Stony Brook) Associate Professor of Cellular and Molecular
Physiology
Carla J. Gallagher, Ph.D. (Wake Forest School of Medicine) Assistant Professor of Public Health
Sciences and Pharmacology
D. Channe Gowda, Ph.D. (Mysore, India) Professor of Biochemistry and Molecular Biology
Claudia Gragnoli, M.D., Ph.D. (Univ Tor Vergata, Italy) Assistant Professor of Medicine, and
Cellular and Molecular Physiology
Sergei A. Grigoryev, Ph.D. (Lomonosov, Moscow) Professor of Biochemistry and Molecular
Biology
Patricia S. Grigson, Ph.D. (Rutgers) Associate Professor of Neural and Behavioral Sciences
Edward J. Gunther, Ph.D. (Yale) Assistant Professor of Medicine
Susan Hafenstein, Ph.D. (Arizona) Assistant Professor of Medicine, and Microbiology and
Immunology
Andras Hajnal, M.D., Ph.D. (Pécs U Medical School, Hungary) Assistant Professor of Neural
and Behavioral Sciences
Phillipe A. Haouzi, M.D., Ph.D. (l'Universite H. Poincare, France) Professor of Medicine,
Chairman, Penn State Heart and Vascular Institute
Gregory M. Holmes, Ph.D. (Connecticut) Associate Professor of Anatomy
Jianming Hu, M.D., Ph.D. (Wuhan, China; Penn State) Associate Professor of Microbiology and
Immunology
Rosalyn B. Irby, Ph.D. (South Florida) Assistant Professor of Medicine
Faoud T. Ishmael, M.D., Ph.D. (Penn State) Assistant Professor of Medicine, and Biochemistry
and Molecular Biology
Harriet C. Isom, Ph.D. (Illinois) Distinguished Professor of Microbiology and Immunology, and Pathology
Leonard S. Jefferson, Jr., Ph.D. (Vanderbilt) Evan Pugh Professor and Chair, Cellular and Molecular Physiology
Byron C. Jones, Ph.D. (Arizona) Associate Professor of Biobehavioral Health and Pharmacology
Kelly Karpa, Ph.D. (Penn State) Associate Professor of Pharmacology
Michael Katzman, M.D. (Columbia) Professor of Medicine, and Microbiology and Immunology
Marc P. Kaufman, Ph.D. (Miami) Professor of Medicine
Gordon L. Kauffmann, M.D. (Michigan) Professor of Surgery, and Cellular and Molecular Physiology
Ralph L. Keil, Ph.D. (Cornell) Associate Professor of Biochemistry and Molecular Biology
Mark Kester, Ph.D. (SUNY, Buffalo) G. Thomas Passananti Professor of Pharmacology
Scot R. Kimball, Ph.D. (Vermont) Professor of Cellular and Molecular Physiology
Charles H. Lang, Ph.D. (Hahnemann) Distinguished Professor and Vice Chair of Cellular and Molecular Physiology, and Surgery
Edward Lankford, M.D., Ph.D. (Johns Hopkins) Associate Professor of Medicine
Sang Lee, Ph.D. (Kyungpook National, Korea) Assistant Professor of Neurosurgery
Richard S. Legro, M.D. (Mount Sinai) Professor of Obstetrics and Gynecology
Robert G. Levenson, Ph.D. (SUNY, Stony Brook) Professor of Pharmacology
David Liu, Ph.D. (CUNY) Assistant Professor of Neural and Behavioral Science
Thomas A. Lloyd, Ph.D. (Harvard) Professor of Public Health Sciences, Pharmacology, and Obstetrics and Gynecology
Thomas P. Loughran, Jr., M.D. (Hahnemann), Professor of Medicine, Director of Penn State Cancer Institute
Christopher J. Lynch, Ph.D. (Northeastern) Professor of Cellular and Molecular Physiology
Richard B. Mailman, Ph.D. (North Carolina) Professor of Pharmacology; Distinguished Senior Scholar in Pharmacology and Neurology
Andrea Manni, M.D. (Florence, Italy) Professor of Medicine
Gail L. Matters, Ph.D. (North Carolina) Assistant Professor of Biochemistry and Molecular Biology
Jan M. McAllister, Ph.D. (California, San Diego) Professor of Cellular and Molecular Physiology
Patricia J. McLaughlin, D.Ed. (Penn State) Professor of Neural and Behavioral Sciences
Craig Meyers, Ph.D. (California, Los Angeles) Professor of Microbiology and Immunology
Barbara A. Miller, M.D. (Penn State) Professor of Pediatrics
Kathleen M. Mulder, Ph.D. (SUNY, Buffalo) Professor of Biochemistry and Molecular Biology
Joshua Muscat, Ph.D. (NYU) Professor of Public Health Science
Christopher Niyibizi, Ph.D. (McGill, Canada) Associate Professor of Orthopaedics and Rehabilitation
Christopher C. Norbury, Ph.D. (Dundee, Scotland) Professor of Microbiology and Immunology
Ralph Norgren, Ph.D. (Michigan) Professor of Neural and Behavioral Sciences
Leslie J. Parent, M.D. (Duke) Professor of Medicine, and Microbiology and Immunology
Blaise Peterson, Ph.D. (Washington) Associate Professor of Cellular and Molecular Physiology
David S. Phelps, Ph.D. (Temple) Professor of Pediatrics
Lisa S. Poritz, M.D. (Northwestern) Assistant Professor of Surgery, and Cellular and Molecular Physiology
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Bogdan Prokopczyk, Ph.D. (Warsaw, Poland) Associate Professor of Pharmacology
Chester A. Ray, Ph.D. (Georgia) Professor of Medicine, and Cellular and Molecular Physiology
W. Brian Reeves (Jefferson) Professor of Medicine
John P. Richie, Jr., Ph.D. (Louisville) Professor of Public Health Sciences
Gavin P. Robertson, Ph.D. (California, Riverside) Professor of Pharmacology, Dermatology, Pathology, and Surgery
Ira J. Ropson, Ph.D. (Johns Hopkins) Associate Professor of Biochemistry and Molecular Biology
Gerson Rosenberg, Ph.D. (Penn State) Jane A. Fetter Professor of Surgery and Bioengineering
Clare Sample, Ph.D. (South Florida) Professor of Microbiology and Immunology
Jeffery T. Sample, Ph.D. (South Florida) Professor of Microbiology and Immunology
Todd D. Schell, Ph.D. (West Virginia) Associate Professor of Microbiology and Immunology
Cara-Lynne Schengrund, Ph.D. (Seton Hall) Professor of Biochemistry and Molecular Biology
Christopher Siedecki, Ph.D. (Case Western Reserve) Associate Professor of Surgery and Bioengineering
Lisa M. Shantz, Ph.D. (Johns Hopkins) Associate Professor of Cellular and Molecular Physiology
Arun K. Sharma, Ph.D. (North Eastern Institution, India) Associate Professor of Pharmacology
Jeffrey S. Shenberger, M.D. (Penn State) Associate Professor of Pediatrics, and Cellular and Molecular Physiology
Yuguang (Roger) Shi, Ph.D. (Australian National University, California, Davis) Associate Professor of Cellular and Molecular Physiology
Ian Simpson, Ph.D. (London) Professor of Neural and Behavioral Sciences, and Cellular and Molecular Physiology
Raghu Sinha, Ph.D. (Chandigarh, India) Associate Professor of Biochemistry and Molecular Biology
Lawrence I. Sinoway, M.D. (Robert Wood Johnson) Professor of Medicine
Jianxun (Jim) Song, Ph.D. (Third Military Medical, China) Assistant Professor of Microbiology and Immunology
David Soybel, M.D. (Chicago) Professor of Surgery and Cellular and Molecular Physiology
David J. Spector, Ph.D. (Pennsylvania) Professor of Microbiology and Immunology
Thomas Spratt, Ph.D. (Chicago) Associate Professor of Biochemistry and Molecular Biology
Kevin Staveley-O'Carroll, M.D., Ph.D. (Johns Hopkins) Professor of Surgery, and Microbiology and Immunology
Sean D. Stocker, Ph.D. (Pittsburgh) Associate Professor of Cellular and Molecular Physiology
Jose A. Stoute, M.D. (Miami) Associate Professor of Medicine, and Microbiology and Immunology
Diane M. Thiboutot, M.D. (Penn State) Professor of Dermatology
Fang Tian, Ph.D. (Florida State) Assistant Professor of Biochemistry and Molecular Biology
R. Alberto Travaglì, Ph.D. (Georgetown) Professor of Neuroscience
Mary Ellen Truckenmiller, Ph.D. (Georgetown, California) Assistant Professor of Microbiology and Immunology
Akif Undar, Ph.D. (Texas, Austin) Associate Professor of Pediatrics, Surgery, and Bioengineering
Michael F. Verderame, Ph.D. (Columbia) Professor of Medicine, and Microbiology and Immunology; Associate Dean for Graduate Studies
The Biomedical Sciences (BMS) Graduate Program with its Options in Biochemistry and Molecular Genetics, Translational Therapeutics, and Virology and Immunology provides predoctoral students curricular training with a unique focus on human health and disease and the opportunity to concentrate in one or more disciplinary approaches including biochemistry, biophysics, cell biology, genetics, immunology, pharmacology, physiology, structural biology, and virology. Students receive rigorous training that provides the skills necessary to be leaders in biomedical research and other endeavors that benefit from a rigorous scientific background, including education, law, journalism, and public policy. A dual-title degree in Biomedical Sciences and Clinical and Translational Sciences expands the educational experience of students training in biomedical science to include training, via a unique curriculum and research focus, for career paths that involve clinical trials or clinical research programs.

The first-year Fall curriculum provides the student an understanding of basic cellular processes through a common curriculum that includes three parallel and integrated three-credit BMS courses arranged around the theme 'Life Requires': 1) BMS 501 Regulation of Cellular and Systemic Energy Metabolism, 2) BMS 502 Cell and Systems Biology, and 3) BMS 503 Flow of Cellular Information. The Fall curriculum also includes the one-credit Art of Scientific Communication I course that reinforces the 'Life Requires' components and aids students in the transition from textbooks to primary literature as a source of information. The first-year Spring curriculum offers an opportunity to explore one or more curricular paths that lead to entry into one of the Options and/or to utilize Integrative Physiology as a stepping-stone to an individualized curricular pathway within the BMS Graduate Program. The Spring curriculum also includes the one-credit Art of Scientific Communication II course that further develops the student's knowledge acquisition from the primary literature and assists improvement of presentation and writing skills necessary for subsequent journal clubs, literature-based courses, and scientific discourse throughout their career. In addition, during the first year, students complete three research rotations that expose them to the wide range of research interests of The Pennsylvania State University graduate faculty from both basic and clinical science departments.
at the College of Medicine in Hershey. These rotations serve to inform the students with regard to choosing a dissertation adviser and doctoral committee.

Curriculum in the second year is determined by the choice to participate in one of the Options, or an individualized curricular pathway designed by the interaction of the student with the dissertation adviser and doctoral committee.

Successful completion of the Program results in conferral of the Ph.D. Degree in Biomedical Sciences.

The BMS Graduate Program is an interdepartmental program that engages faculty from at least seven basic science and eleven clinical science departments. This broad-reaching Program provides students a wide ranging understanding of multiple disciplines with specific expertise in a chosen area, and encourages interdisciplinary research that is the hallmark of biomedical sciences in the 21st century.

ADMISSION REQUIREMENTS

1. Completed official Penn State Graduate School Application for Admission; Master's or Doctoral Degree
2. Graduate Record Examinations (GRE) general test
3. Three letters of recommendation
4. Statement of goals including a) your reasons for applying to the Biomedical Sciences Graduate Program, b) particular areas of research interests if known, and c) long-term career goals
5. Applicants must hold either (1) a baccalaureate degree from a regionally accredited U.S. institution or (2) a tertiary (postsecondary) degree that is deemed comparable to a four-year bachelor’s degree from a regionally accredited U.S. institution. This degree must be from an officially recognized degree-granting institution in the country in which it operates. All applicants must have received from a regionally accredited institution a baccalaureate degree earned under residence and credit conditions substantially equivalent to those required by Penn State. International applicants must hold the equivalent of an American four-year baccalaureate degree. Post-secondary course work must include biochemistry and molecular biology or genetics.
6. The language of instruction at Penn State is English. All international applicants must take and submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, or a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). Applicants with iBT speaking scores between 15 and 18 may be considered for provisional admission, which requires completion of specified remedial English courses: ESL 114G (American Oral English for Academic Purposes) and/or ESL 116G (ESL/Composition for Academic Disciplines) and attainment of a grade of B or higher. The minimum acceptable composite score for the IELTS is 6.5.
International applicants are exempt from the TOEFL/IELTS requirement who have received a baccalaureate or a graduate degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, and Wales. The minimum acceptable score for the TOEFL is 550 for the paper-based test, or a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). Applicants with iBT speaking scores between 15 and 18 may be considered for provisional admission, which requires completion of specified remedial English courses ESL114G (American Oral English for Academic Purposes) and/or ESL116G (ESL/Composition for Academic Disciplines) and attainment of a grade of B or higher. The minimum composite score for the IELTS is 6.5. Graduate programs may have more stringent requirements.

**Dual-Title Ph.D. in Biomedical Sciences and Clinical and Translational Sciences Admission Requirements**

Potential Dual-Title trainees will express an interest in the Dual-Title Degree as early as during the recruitment process for the Biomedical Sciences Graduate Program and may apply for the dual-title Ph.D. in Biomedical Sciences and Clinical and Translational Sciences following admission to the Graduate School and Biomedical Sciences and prior to taking the candidacy exam in Biomedical Sciences, no later than the middle of the second year of graduate study in Biomedical Sciences, and will apply no later than the middle of the second year of graduate study in the Biomedical Sciences Graduate Program. Students interested in the Dual-Title Degree will be considered for admission to the Clinical and Translational Sciences Program by a committee consisting of the Clinical and Translational Sciences Program co-directors and faculty affiliated with the Clinical and Translational Sciences Dual-Title Program.

**Master's Degree Requirements**

The Biomedical Sciences Program does not actively recruit students to earn an M.S. degree. To receive an M.S. degree in Biomedical Sciences, at least 36 credits from courses at the 500- or 600-level are required.

1. **Required Core Courses**: BMS 501 Regulation of Cellular and Systemic Energy Metabolism, BMS 502 Cell and Systems Biology, BMS 503 Flow of Cellular Information, BMS 504 Art of Scientific Communication I, BMS 505 Art of Scientific Communication II, BMS 591 Ethics in the Life Sciences, BMS 596 Individual Studies: Research Rotation, and BMS 600 Thesis Research (no more than 6 credits of BMS 600 Thesis Research may be counted toward the 36 credit minimum).

2. **Required Program Courses**: BMS 520 Integrative Physiology, BMS 581 Molecular & Translational Approaches to Human Disease, BMS 590 Colloquium and at least 7 credits of elective courses selected in consultation with the student's thesis adviser and thesis committee.

Students must complete original laboratory research that culminates in a thesis. Additionally, all requirements listed in the University Bulletin for the M.S. degree must be fulfilled.
Doctoral Degree Requirements

During the Fall semester of the first year of study, Ph.D. candidates are required to take BMS 501 Regulation of Cellular and Systemic Energy Metabolism, BMS 502 Cell and Systems Biology, BMS 503 Flow of Cellular Information, BMS 504 Art of Scientific Communication I, and BMS 596 Individual Studies: Research Rotation. In the Spring semester, students are required to take BMS 520 Integrative Physiology, BMS 505 Art of Scientific Communication II, BCHEM 596 Individual Studies: Research Rotation and elective courses selected in consultation with the BMS Graduate Program Student Advisory Committee. Each candidate for the Ph.D. degree must fulfill written and spoken English communication requirements that are satisfied by preparing written and oral reports describing the laboratory rotations during the first year.

At the end of the first year, admission to Ph.D. candidacy is determined by performance in course work, laboratory rotations, and the BMS Graduate Program Candidacy examination. Students join their research laboratory by the end of the summer of the first year.

The doctoral committee of a Ph.D. student is formed upon entry into the dissertation laboratory. The committee must include at least two faculty members in the major field. In addition, at least one regular member of the doctoral committee must represent a field outside the candidate’s major field of study in order to provide a broader range of disciplinary perspectives and expertise. This committee member is referred to as the “Outside Field Member.” In cases where the candidate is also pursuing a dual-title field of study, the dual-title representative to the committee may serve as the Outside Field Member.

Also, to avoid potential conflicts of interest, the primary appointment of at least one regular member of the doctoral committee must be in an administrative unit that is outside the unit in which the dissertation adviser's primary appointment is held (i.e., the adviser's administrative home; in the case of tenure-line faculty, this is the individual's tenure home). This committee member is referred to as the “Outside Unit Member.” In the case of co-advisers, the Outside Unit Member must be from outside the administrative home(s) of both co-advisers. In some cases, an individual may have a primary appointment outside the administrative home of the student’s dissertation adviser and also represent a field outside the student’s major field of study; in such cases, the same individual may serve as both the Outside Field Member and the Outside Unit Member.

During the second year, students take BMS 581 Molecular & Translational Approaches to Human Disease, BMS 590 Colloquium, and elective courses that are selected in consultation with the student's dissertation adviser and doctoral committee.

Ph.D. candidates prepare a written comprehensive examination in the format of a grant application prior to the end of the fifth semester of enrollment. As part of this examination, the candidate also gives an oral presentation of this proposal to their doctoral committee.

It is expected that the Ph.D. candidate will have at least one paper submitted for publication in a major peer-reviewed scientific journal prior to the doctoral examination. A dissertation must be prepared and defended by each Ph.D. candidate.
**Dual-Title Doctoral Degree Requirements**

Biomedical Sciences graduate students accepted to the Clinical and Translational Sciences Dual-Title Program will take the candidacy exam at the end of the third semester of graduate training: 1) to allow exposure to the Clinical and Translational Sciences Curriculum in the Fall semester of the second year, which will better prepare the students for the integrated content of the dual-title candidacy exam; and 2) to allow enough time to identify and assure commitment of an appropriate dissertation mentor who embraces the dual-title program of the student. During the candidacy process, the student will also be assessed for candidacy to the dual-title program, and at least one member of the candidacy committee must come from the dual-title program. Faculty members who hold appointments in both programs may serve in a combined role.

In accordance with Graduate Council requirements, the doctoral committee shall contain at least four members. At least one regular member of the doctoral committee must represent a field outside the candidate’s major field of study in order to provide a broader range of disciplinary perspectives and expertise. This committee member is referred to as the “Outside Field Member.” In cases where the candidate is also pursuing a dual-title field of study, the dual-title representative to the committee may serve as the Outside Field Member.

Additionally, in order to avoid potential conflicts of interest, the primary appointment of at least one regular member of the doctoral committee must be in an administrative unit that is outside the unit in which the dissertation adviser’s primary appointment is held (i.e., the adviser’s administrative home; in the case of tenure-line faculty, this is the individual’s tenure home). This committee member is referred to as the “Outside Unit Member.” In the case of co-advisers, the Outside Unit Member must be from outside the administrative home(s) of both co-advisers. In some cases, an individual may have a primary appointment outside the administrative home of the student’s dissertation adviser and also represent a field outside the student’s major field of study; in such cases, the same individual may serve as both the Outside Field Member and the Outside Unit Member.

The committee chair will be a member of the Graduate Faculty in the primary area of study or the dual-title program. Faculty members who hold appointments in both the primary area of study and the CTS program may serve in a combined role.

If the committee chair does not serve in this combined role, the faculty member representing the CTS program must be designated co-chair of the committee. The CTS representative(s) will be expected to assist in constructing and evaluating comprehensive examination questions that cover the secondary area of study.

**M.D./Ph.D. Admissions Requirements**

In addition to the basic college level premedical school requirements for the Penn State College of Medicine (one each year of biology, chemistry, physics, math, and organic chemistry), the MD/PhD program has the following requirements: Applicants must hold either (1) a
baccalaureate degree from a regionally accredited U.S. institution or (2) a tertiary (postsecondary) degree that is deemed comparable to a four-year bachelor’s degree from a regionally accredited U.S. institution. This degree must be from an officially recognized degree-granting institution in the country in which it operates.

• **Academic Achievement**
  Applicants to our program generally have very strong grades and MCAT scores. In recent years, successful applicants have an average GPA of 3.75 and MCAT scores of 33-34. Applicants are not required to take the GREs.

• **Research Experience**
  We are especially interested in candidates with a strong and sustained background in research. Candidates who have spent 1-2 years after graduation conducting research are strongly encouraged to apply.

• **Recommendations**
  We are especially interested in receiving letters of recommendation from faculty with whom you conducted research and who can comment on your passion and potential for research.

• **Goals**
  Applicants must be able to clearly articulate the reasons for pursuing the joint degree.

• **International Students**
  All qualified candidates are eligible to apply regardless of citizenship.
  (http://www.pennstatehershey.org/web/md/admissions/overview/requirements)

**OTHER RELEVANT INFORMATION**

The BMS Graduate Program Student Advisory Committee, which includes representation from the Program and each Option of the Program, advises students about academic and related matters until the student has a dissertation adviser. First-year students carry out a series of rotation projects in at least three different faculty laboratories before deciding on a research laboratory. If desired, students formally make a decision to join an Option by the end of the Spring semester of their first year and must satisfy all admission requirements of the Option.

Students must have a dissertation adviser by the end of the summer of the first year. The student and dissertation adviser then plan additional course work and develop a research plan in consultation with the doctoral committee.

**STUDENT AID**

Graduate assistantships available to students in this Program and other forms of student aid are described in the [STUDENT AID](#) section of the [Graduate Bulletin](#).
COURSES

Graduate courses carry numbers from 500 to 699 and 800 to 899.

Biochemistry and Molecular Genetics (BMG) Option

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The objective of the Option in Biochemistry and Molecular Genetics is to provide students in the Biomedical Sciences (BMS) Graduate Program the opportunity to specialize their graduate curriculum and laboratory training to focus on the principles and application of biochemical and molecular genetic analysis. These approaches play key roles in identifying and characterizing cellular processes and elucidating the structure and function of key macromolecules including DNA, RNA, protein, lipid, and carbohydrates. The Option also stresses the biological intersections of these classes of macromolecules. The combination of didactic courses, colloquia, seminars, and laboratory research provides students with an integrated approach for applying biochemical and molecular genetic analysis to interrogate and manipulate basic cellular processes and macromolecules of biomedical significance. The training afforded by this Option exposes graduates to the fundamentals needed to experimentally address scientific questions in areas such as epigenetic control of gene expression, structure/function, biomolecular engineering, and systems analysis using genetic and biochemical approaches.

ADMISSION REQUIREMENTS
To be admitted to the Option in Biochemistry and Molecular Genetics, Ph.D. candidates must successfully complete 1) the first year of the BMS Graduate Program, 2) three research rotations, at least two with faculty in the Biochemistry and Molecular Genetics Option, and 3) the BMS Graduate Program Candidacy examination.

Master’s Degree Requirements
The Biochemistry and Molecular Genetics Option does not actively recruit students to earn an M.S. degree. To receive an M.S. degree in The Biochemistry and Molecular Genetics Option at least 36 credits from courses at the 500- or 600-level are required.

1. Required Core Courses: BMS 501 Regulation of Cellular and Systemic Energy Metabolism, BMS 502 Cell and Systems Biology, BMS 503 Flow of Cellular Information, BMS 504 Art of Scientific Communication I, BMS 505 Art of Scientific Communication II, BMS 591 Ethics in the Life Sciences, BMS 596 Individual Studies: Research Rotation, and BMS 600 Thesis Research (no more than 6 credits of BMS 600 Thesis Research may be counted toward the 36 credit limit).

2. Required Option Courses: BCHEM 521 Structure, Function, and Regulation of Biological Molecules, BCHEM 522 Molecular Genetics: Genes to Genomes, BCHEM 590 Colloquium, BCHEM 596 Individual Studies: Research Rotation, and at least 7
credits of elective courses selected in consultation with the student's thesis adviser and thesis committee.

Students must complete original laboratory research that culminates in a thesis. Additionally, all requirements listed in the University Bulletin for the M.S. degree must be fulfilled.

**Doctoral Degree Requirements**

During the Fall semester of the first year of study, Ph.D. candidates take BMS 501 Regulation of Cellular and Systemic Energy Metabolism, BMS 502 Cell and Systems Biology, BMS 503 Flow of Cellular Information, BMS 504 Art of Scientific Communication I, and BMS 596 Individual Studies: Research Rotation. In the Spring semester, students considering joining the Option in Biochemistry and Molecular Genetics take BCHEM 521 Structure, Function, and Regulation of Biological Molecules, BCHEM 522 Molecular Genetics: Genes to Genomes, BMS 505 Art of Scientific Communication II, and BCHEM 596 Individual Studies: Research Rotation. Each candidate for the Ph.D. degree must fulfill written and spoken English communication requirements that are satisfied by preparing written and oral reports describing laboratory rotations done during the first year.

At the end of the first year, admission to Ph.D. candidacy and the Option in Biochemistry and Molecular Genetics is determined by performance in course work, laboratory rotations, and the BMS Graduate Program Candidacy examination. Students join their research laboratory by the end of the summer of the first year.

During the second year, students take BCHEM 590 Colloquium and at least 7 credits of 500-level didactic elective courses selected in consultation with the student's dissertation adviser and doctoral committee.

Ph.D. candidates prepare a written comprehensive examination in the format of a grant application prior to the end of the fifth semester of enrollment. As part of this examination, the candidate also gives an oral presentation of this proposal to their doctoral committee.

It is expected that the Ph.D. candidate will have at least one paper submitted for publication in a major peer-reviewed scientific journal prior to the doctoral examination. A dissertation must be prepared and defended by each Ph.D. candidate.

**Translational Therapeutics Option**

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The Option in Translational Therapeutics of the Biomedical Sciences (BMS) Graduate Program is designed to give qualified students a combination of didactic instruction, informal interaction, and laboratory experience that enables them to obtain a firm foundation in the principles,
methods, and contributions of pharmacology, defined broadly as the science of the interaction of chemical agents with biological systems. Of primary importance, this Option focuses on identification of disease targets, development of therapeutic strategies, and refinement of drug delivery approaches. With this preparation, graduates of the Translational Therapeutics Option will be capable of designing and executing high-quality independent research, and of assuming positions of responsibility within the therapeutic community.

This Option offers studies in the general areas of drug discovery and development, molecular pathophysiology, drug metabolism, molecular pharmacology, endocrine pharmacology, neuropharmacology, cardiovascular-renal pharmacology, pharmacogenetics, and clinical pharmacology. Primary emphasis is placed on the molecular mechanism by which drugs act in the body and by which the body transforms drugs.

ADMISSION REQUIREMENTS
To be admitted to the Option in Translational Therapeutics, Ph.D. candidates must successfully complete 1) the first year of the BMS Graduate Program, 2) three research rotations, at least two with faculty in the Translational Therapeutics Option, and 3) the Candidacy exam.

Master's Degree Requirements
The Translational Therapeutics Option does not actively recruit students to earn an M.S. degree. To receive an M.S. degree in The Translational Therapeutics Option at least 36 credits from courses at the 500- or 600-level are required

1. Required Core Courses: BMS 501 Regulation of Cellular and Systemic Energy Metabolism, BMS 502 Cell and Systems Biology, BMS 503 Flow of Cellular Information, BMS 504 Art of Scientific Communication I, BMS 505 Art of Scientific Communication II, BMS 591 Ethics in the Life Sciences, BMS 596 Individual Studies: Research Rotation, and BMS 600 Thesis Research (no more than 6 credits of BMS 600 Thesis Research may be counted toward the 36 credit minimum).

2. Required Option Courses: PHARM 520 Principles of Drug Action, PHARM 551 Anti-infective Therapeutics, PHARM 552 Integrated Systems Pharmacology, PHARM 553 Gastrointestinal and Immunomodulatory Therapeutics, PHARM 554 Anticancer Therapeutics, PHARM 561 Neuropharmacology, PHARM 562 Endocrine Pharmacology, and at least 7 credits of elective courses selected in consultation with the student's thesis adviser and thesis committee.

Students must complete original laboratory research that culminates in a thesis. Additionally, all requirements listed in the University Bulletin for the M.S. degree must be fulfilled.

Doctoral Degree Requirements
During the Fall semester of the first year of study, Ph.D. candidates take BMS 501 Regulation of Cellular and Systemic Energy Metabolism, BMS 502 Cell and Systems Biology, BMS 503 Flow of Cellular Information, BMS 504 Art of Scientific Communication I, and BMS 596 Individual Studies: Research Rotation. In the Spring semester, students considering joining the Option in Translational Therapeutics take PHARM 520 Principles of Drug Action, BMS 505 Art of Scientific Communication II, PHARM 596 Individual Studies: Research Rotation, and elective
courses selected in consultation with the BMS Graduate Program Student Advisory Committee. Each candidate for the Ph.D. degree must fulfill written and spoken English communication requirements that are satisfied by preparing written and oral reports describing laboratory rotations done during the first year.

At the end of the first year, admission to Ph.D. candidacy and the Option in Translational Therapeutics is determined by performance in course work, laboratory rotations, and the BMS Graduate Program Candidacy examination. Candidates join their research laboratory by the end of the summer of the first year.

During the second year, students take PHARM 551 Anti-infective Therapeutics, PHARM 552 Integrated Systems Pharmacology, PHARM 553 Gastrointestinal and Immunomodulatory Therapeutics, PHARM 554 Anticancer Therapeutics, PHARM 561 Neuropharmacology, PHARM 562 Endocrine Pharmacology, and elective courses selected in consultation with the candidate's dissertation adviser and doctoral committee.

Ph.D. candidates prepare a written comprehensive examination in the format of a grant application prior to the end of the fifth semester of enrollment. As part of this examination, the candidate also gives an oral presentation of this proposal to their doctoral committee.

It is expected that the Ph.D. candidate will have at least one paper submitted for publication in a major peer-reviewed scientific journal prior to the doctoral examination. A dissertation must be prepared and defended by each Ph.D. candidate.

Virology and Immunology Option

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The objective of the Option in Virology and Immunology is to provide graduate students in the Biomedical Sciences (BMS) Graduate Program the opportunity to focus their graduate-level coursework and laboratory research in areas related to virology and immunology. The areas of research within virology include viral oncology, virus-cell interactions, the structure and assembly of viruses, functional role of viral gene products, the molecular biology of virus replication, and viral induced latency. The areas of research within immunology include adaptive and innate immunity, cellular and humoral immunity, antigen presentation, tumor immunology, vaccine development, and neuroimmunology. The Option in Virology and Immunology allows students to develop an integrative research approach using aspects of biochemistry, molecular and cellular biology, and genetics to approach scientific questions associated with areas of virology and immunology.

This Option is offered only through the BMS Graduate Program at the Penn State College of Medicine in Hershey.
ADMISSION REQUIREMENTS

To be admitted to the Option in Virology and Immunology, Ph.D. candidates must successfully complete: (1) the first year of the BMS Graduate Program; (2) three research rotations, at least two with faculty members in the Virology and Immunology Option; and (3) the Candidacy examination.

**Master’s Degree Requirements**

The Virology and Immunology Option does not actively recruit students to earn an M.S. degree. To receive an M.S. degree in The Virology and Immunology Option at least 41 credits from courses at the 500- or 600-level are required.

1. **Required Core Courses:** BMS 501 Regulation of Cellular and Systemic Energy Metabolism, BMS 502 Cell and Systems Biology, BMS 503 Flow of Cellular Information, BMS 504 Art of Scientific Communication I, BMS 505 Art of Scientific Communication II, BMS 591 Ethics in the Life Sciences, BMS 596 Individual Studies: Research Rotation, and BMS 600 Thesis Research (no more than 6 credits of BMS 600 Thesis Research may be counted toward the 41 credit minimum).


Students must complete original laboratory research that culminates in a thesis. Additionally, all requirements listed in the University Bulletin for the M.S. degree must be fulfilled.

**Doctoral Degree Requirements**

During the fall semester of the first year of study, Ph.D. candidates take BMS 501 (Regulation of Cellular and Systemic Energy Metabolism), BMS 502 (Cell and Systems Biology), BMS 503 (Flow of Cellular Information), BMS 504 (Art of Scientific Communication I), and BMS 596 (Individual Studies: Research Rotation).

In the Spring semester, students who are considering joining the Option in Virology and Immunology should take MICRO 550 (Medical Microbiology-Topics in Molecular Pathogenesis), MICRO 581 (Immunology A: Basic Concepts in Innate and Adaptive Immunity), MICRO 582 (Immunology B: Adaptive Immunity), MICRO 596 (Individual Studies: Research Rotation), MICRO 602 (Supervised Experience in College Teaching) and BMS 505 (Art of Scientific Communication II). Each candidate for the Ph.D. degree must fulfill written and spoken English communication requirements that are satisfied by preparing written and oral reports describing the laboratory rotations that were performed during the first year of the program.
At the end of the first year, admission to Ph.D. candidacy and the Option in Virology and Immunology is determined by successful performance in course work, laboratory rotations, and the BMS Graduate Program Candidacy examination. Students join their research laboratory by the end of the summer of the first year.

During the second year, students take MICRO 553 (Science of Virology), MICRO 560 (Concepts in Immunology), MICRO 602 (Supervised Experience in College Teaching), MICRO 572 (Literature Reports), MICRO 583 (Viral Vectors), MICRO 590 (Colloquium), GENET 581 (Genetics of Model Organisms A: Bacterial and Viral Pathogenesis), and IBIOS 580 (Critical Reading in Immunology).

Ph.D. candidates prepare a written comprehensive examination in the format of a grant application usually prior to the end of the sixth semester of enrollment. As a part of this examination, the candidate also participates in an oral defense of this proposal with the candidate's doctoral committee.

It is expected that the Ph.D. candidate will have at least one paper submitted for publication in a major peer-reviewed scientific journal prior to the doctoral examination. A dissertation must be prepared and defended for the successful completion of the Ph.D. degree.

**M.D./Ph.D. Degree Requirements**

Prospective students interested in simultaneously pursuing an M.D. and Ph.D. degree must apply to the College of Medicine M.D. program using the national American Medical College Application Service (AMCAS) application system and indicate their intent to pursue the joint degree program. The College of Medicine M.D./Ph.D. Admissions Committee reviews applications and evaluates candidates for acceptance into both the MD and PhD program. Candidates not accepted into the joint degree program can be referred to either the M.D. or Ph.D. program, depending on their qualifications.

During the first two years of medical school, the student conducts at least three research rotations. After successful completion of the first two years of medical school the candidate enters the BMS Graduate Program or one of its three options, each of which may have different credit requirements.

During the summer after the second year of medical school M.D./Ph.D. students take Step 1 of the United States Medical Licensing Examination (USMLE), which serves as the Candidacy Examination for the BMS program and its Options.

**Biomedical Sciences Program Requirements**

The doctoral committee of an M.D./Ph.D. student in the BMS program is formed upon entry into the thesis laboratory. The committee must include a minimum of four faculty members, i.e., the chair and at least three additional members, all of whom must be members of the Graduate Faculty. The committee must include at least two members of the BMS program graduate faculty. At least one member of the doctoral committee must represent a field outside the
candidate's major field of study in order to provide a broader range of disciplinary perspectives and expertise. This committee member is referred to as the 'Outside Field Member.'

M.D./Ph.D. students in the BMS program are required to take BMS 581 Molecular & Translational Approaches to Human Disease. Additional courses are selected in consultation with the student’s dissertation adviser and doctoral committee.

The M.D./Ph.D. candidate prepares a written comprehensive examination in the format of a grant application and gives an oral presentation of this proposal to their doctoral committee.

It is expected that the M.D./Ph.D. candidate will have at least one paper submitted for publication in a major peer-reviewed scientific journal prior to the final doctoral examination. A dissertation must be prepared and defended by each MD/PhD candidate.

**Biochemistry and Molecular Genetics Option Requirements**

The doctoral committee of a M.D./Ph.D. student in the Biochemistry and Molecular Genetics Option is formed upon entry into the thesis laboratory. The committee must include a minimum of four faculty members, i.e., the chair and at least three additional members, all of whom must be members of the Graduate Faculty. The committee must include at least two members of the major program graduate faculty and at least two members of the faculty of the Biochemistry and Molecular Genetics Option. If the dissertation adviser is not a member of this Option, a co-adviser who is a member of the Option must be appointed to the committee. At least one member of the doctoral committee must represent a field outside the candidate's major field of study in order to provide a broader range of disciplinary perspectives and expertise. This committee member is referred to as the 'Outside Field Member.'

M.D./Ph.D. students in the BMG Option are required to take BCHEM 521 Structure, Function, and Regulation of Biological Molecules and BCHEM 522 Molecular Genetics: Genes to Genomes. Additional courses are selected in consultation with the student’s dissertation adviser and doctoral committee.

The M.D./Ph.D. candidate prepares a written comprehensive examination in the format of a grant application and gives an oral presentation of this proposal to their doctoral committee.

It is expected that the MD/PhD candidate will have at least one paper submitted for publication in a major peer-reviewed scientific journal prior to the final doctoral examination. A dissertation must be prepared and defended by each MD/PhD candidate.

**Translational Therapeutic Option Requirements**

The doctoral committee of a M.D./Ph.D. student in the Translational Therapeutic Option is formed upon entry into the thesis laboratory. The committee must include a minimum of four faculty members, i.e., the chair and at least three additional members, all of whom must be members of the Graduate Faculty. The committee must include at least one member of the major program graduate faculty and at least two members who are faculty of the Translational
Therapeutics Option. If the dissertation adviser is not a member of this Option, a co-adviser who is a member of the Option must be appointed to the committee. At least one member of the doctoral committee must represent a field outside the candidate's major field of study in order to provide a broader range of disciplinary perspectives and expertise. This committee member is referred to as the 'Outside Field Member.'

M.D./Ph.D. students in the Translational Therapeutics Option are required to take PHARM 520 Principles of Drug Action. Additionally, the candidate takes elective courses selected in consultation with the candidate’s dissertation adviser and doctoral committee.

The candidate prepares a written comprehensive examination in the format of a grant application and gives an oral presentation of this proposal to the doctoral committee.

It is expected that the M.D./Ph.D. candidate will have at least one paper submitted for publication in a major peer-reviewed scientific journal prior to the final doctoral examination. A dissertation must be prepared and defended by each MD/PhD candidate.

Virology and Immunology Option Requirements

The doctoral committee of a M.D./Ph.D. student in the Virology and Immunology Option is formed upon entry into the thesis laboratory. The committee must include a minimum of four faculty members, i.e., the chair and at least three additional members, all of whom must be members of the Graduate Faculty. The committee must include at least two members of the major program graduate faculty. If the dissertation adviser is not a member of this Option, a co-adviser who is a member of the Option must be appointed to the committee. At least one member of the doctoral committee must represent a field outside the candidate's major field of study in order to provide a broader range of disciplinary perspectives and expertise. This committee member is referred to as the 'Outside Field Member.'

M.D./Ph.D. students in the Virology and Immunology Option are required to take MICRO 553 (Science of Virology), MICRO 560 (Concepts in Immunology), IBIOS 580 (Critical Reading in Immunology), MICRO 572 (Literature Reports), MICRO 590 (Colloquium), MICRO 583 (Viral Vectors), GENET 581 (Genetics of Model Organisms A: Bacterial and Viral Pathogenesis), and MICRO 602 (Supervised Experience in College Teaching).

Comprehensive Examination

The M.D./Ph.D. candidate prepares a written comprehensive examination in the format of a grant application and gives an oral presentation of this proposal to their doctoral committee.

Final Doctoral Examination

It is expected that the M.D./Ph.D. candidate will have at least one paper submitted for publication in a major peer-reviewed scientific journal prior to the final doctoral examination. A dissertation must be prepared and defended by each M.D./Ph.D. candidate.
### Table III: Typical Coursework Schedule for Ph.D. Degree for the Four Curricular Tracks: Years 1 and 2

<table>
<thead>
<tr>
<th>CORE REQUIREMENTS FOR ALL STUDENTS</th>
<th>BMS PROGRAM TRACK</th>
<th>BMG OPTION TRACK</th>
<th>TT OPTION TRACK</th>
<th>VIRIM OPTION TRACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 Credits</td>
<td>13 Core Requirement Credits</td>
<td>13 Core Requirement Credits</td>
<td>13 Core Requirement Credits</td>
<td>13 Core Requirement Credits</td>
</tr>
<tr>
<td></td>
<td>10 Program Required Credits</td>
<td>10 BMG Option Required Credits</td>
<td>10 TT Option Required Credits</td>
<td>17 VIRIM Option Required Credits</td>
</tr>
<tr>
<td></td>
<td>7 Elective Credits</td>
<td>7 Elective Credits</td>
<td>7 Elective Credits</td>
<td>2 Elective Credits</td>
</tr>
</tbody>
</table>

### Fall Year 1 (11 credits)

<table>
<thead>
<tr>
<th>Core Requirement (3)</th>
<th>BMS 501 Regulation of Cellular &amp; Systemic Energy Metabolism (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Requirement (3)</td>
<td>BMS 502 Cell &amp; Systems Biology (3)</td>
</tr>
<tr>
<td>Core Requirement (3)</td>
<td>BMS 503 Flow of Cellular Information (3)</td>
</tr>
<tr>
<td>Core Requirement (1)</td>
<td>BMS 504 Art of Scientific Communication I (1)</td>
</tr>
<tr>
<td>Core Requirement (1)</td>
<td>BMS 596 Individual Studies: Research Rotation (1)</td>
</tr>
</tbody>
</table>

### Spring Year 1 (6 to 9 credits)

<table>
<thead>
<tr>
<th>Core Requirement (1)</th>
<th>BMS 505 Art of Scientific Communication II (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option Specific</td>
<td>BMS 596 Individual Studies; Research Rotation (2)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>BCHEM 596 Individual Studies; Research Rotation (2)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PHARM 520 Principles of Drug Action (2)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>MICRO 596 Individual Studies; Research Rotation (2)</td>
</tr>
</tbody>
</table>

### Decision regarding Program or Option: BMS Graduate Program Candidacy Examination - Enter laboratory for dissertation research

<table>
<thead>
<tr>
<th>Core Requirement (1)</th>
<th>BMS 591 Ethics (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option Specific</td>
<td>BMS 590 Colloquium (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>BCHEM 590 Colloquium (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PHARM 552 Integrated Systems Pharmacology (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>JOURNAL CLUB² (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PHARM 554 Anti-cancer Therapeutics (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PROGRAM ELECTIVE</td>
</tr>
</tbody>
</table>

### Fall Year 2 (2 to 8 credits)

<table>
<thead>
<tr>
<th>Core Requirement (1)</th>
<th>BMS 591 Ethics (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option Specific</td>
<td>BMS 590 Colloquium (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>BCHEM 590 Colloquium (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PHARM 553 Anti-infective Therapeutics (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>MICRO 553 Science of Virology (4)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>BCHEM 521 Structure, Function, &amp; Regulation of Biological Molecules (3)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PHARM 552 Integrated Systems Pharmacology (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>JOURNAL CLUB² (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PHARM 553 Gastrointestinal &amp; Immunomodulatory Therapeutics (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PROGRAM ELECTIVE</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PHARM 554 Anti-cancer Therapeutics (1)</td>
</tr>
</tbody>
</table>

### Spring Year 2 (2 to 8 credits)

<table>
<thead>
<tr>
<th>Option Specific</th>
<th>BMS 590 Colloquium (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option Specific</td>
<td>BCHEM 590 Colloquium (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PHARM 561 Neuropharmacology (2)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>MICRO 560 Concepts in Immunology (4)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>BMS 581 Molecular &amp; Translational Approaches to Human Disease (3)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PHARM 562 Endocrine Pharmacology (2)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>GENET 581 Genetics of Model Organisms A: Bacterial and Viral Pathogenesis (1)</td>
</tr>
<tr>
<td>Option Specific</td>
<td>PROGRAM ELECTIVE</td>
</tr>
</tbody>
</table>

### Comprehensive Exam

1. The minimum number of elective credits required is shown. In consultation with their Dissertation Adviser, students may take additional credits. One potential timing of elective credits for each track is indicated by "PROGRAM ELECTIVE".

2. To complete the Journal Club elective, VIRIM students must register either for IBIOS 580 Critical Readings in Immunology (1) in the Fall semester or MICRO 572 Literature Report (1) in the Spring semester. Numbers in parentheses indicate credit hours for each course.
GRADUATE COUNCIL COMMITTEE ON PROGRAMS AND COURSES

SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES PROGRAM, OPTION, OR MINOR PROPOSAL FORM

Submit 1 copy of the proposal form and 25 copies of the supporting documentation as outlined below to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building. The proposals will be transmitted to the Dean of the Graduate School for consideration by the Graduate School's Subcommittee on New and Revised Programs and Courses, and the Committee on Programs and Courses. For a detailed explanation of the form, see the Guide to Curricular Procedures.

College Department or Instructional Area
Penn State Harrisburg - The Capital College
School of Business Administration

NEW PROGRAM, OPTION OR MINOR
Designation of program
_ MBA Program: Extension Center at Lancaster

Classification of Instructional Programs Code (CIP)
_52.0101

Indicate effective date __ Immediate __

OLD PROGRAM, OPTION, OR MINOR: Change _ X _ Drop ___

Old designation of program
MBA Program

Old designation of option

Old designation of minor

New designation of program
(if changed) New designation of option (if changed) New designation of minor (if changed)

Indicate effective date __________

SUBMITTED BY
Charge of Graduate Program

NOTEED BY
College Representative to Graduate Council Subcommittee on New and Revised Programs and Courses

APPROVED BY
Dean of College

RECOMMENDED BY
Subcommittee on New and Revised Programs and Courses

NOTED BY
Dean of the Graduate School

Date 4/12/13

Date 4/12/13

Date April 10, 2013

Date 9/5/03

Date 9/9/2013
Business Administration (BADMN)

Program Home Page

RICHARD YOUNG, Graduate Program Director
Penn State Harrisburg, School of Business Administration
777 West Harrisburg Pike
E-355 Olmsted Building
Middletown, PA 17057-4898
717-948-6140; mbahbg@psu.edu

Degree Conferred:
M.B.A.

The Graduate Faculty

• Thomas Amlie, Ph.D. (Maryland) Associate Professor of Accounting
• Ozge Aybat, Ph.D. (Baruch), Assistant Professor of Marketing
• Nihal Bayraktar, Ph.D. (Maryland) Associate Professor of Economics
• Marie Blouin, Ph.D. (Buffalo) Assistant Professor of Accounting
• Melvin Blumberg, Ph.D. (Penn State) Professor of Management
• Terence A. Brown, D.B.A. (Maryland) Associate Professor of Transportation and Marketing
• Qiang Bu, Ph.D. (Massachusetts) Assistant Professor of Finance
• David Buehler, Ph.D. (North Carolina) Assistant Professor of Economics
• Thomas Buttross, Ph.D. (Mississippi) Associate Professor of Accounting
• Refik Culpan, Ph.D. (NYU) Professor of Management and International Business
• Patrick Cusatis, Ph.D. (Penn State) Associate Professor of Finance
• Raymond Gibney Jr., Ph.D. (Pittsburgh) Assistant Professor of Management
• Jean E. Harris, Ph.D. (Virginia Tech) Associate Professor of Accounting
• Susan Havranek, Ph.D. (Arizona State) Assistant Professor of Accounting
• Indrit Hoxha, Ph.D. (Houston) Assistant Professor of Economics
• Rhoda Joseph, Ph.D. (Baruch) Associate Professor of Information Systems
• Erdener Kaynak, Ph.D. (Cranfield) Professor of Marketing
• Mukund S. Kulkarni, Ph.D. (Kentucky) Chancellor; Professor of Finance
• Roderick Lee, Ph.D. (Penn State) Assistant Professor of Information Systems
• David A. Morand, Ph.D. (Cornell) Professor of Management
• Dinesh Pai, Ph.D. (Rutgers) Assistant Professor of Supply Chain Management
• Parag C. Pendharkar, D.B.A. (Southern Illinois) Professor of Information Systems
• Robert D. Russell, Ph.D. (Pittsburgh) Assistant Professor of Management
• Stephen P. Schappe, Ph.D. (Ohio State) Director, School of Business Administration; Associate Professor of Management
• Richard Scheib, J.D. (Georgetown) Instructor in Accounting
• Girish Subramanian, Ph.D. (Temple) Professor of Information Systems
• Peter Swan, Ph.D. (Michigan) Associate Professor of Logistics and Operations Management
• Zinaida Taran, Ph.D. (Rutgers) Assistant Professor of Marketing
• Oranee Tawatnuntachai, Ph.D. (New Orleans) Associate Professor of Finance
• Premal P. Vora, Ph.D. (Penn State) Associate Professor of Finance
• Ji Wu, Ph.D. (Drexel) Assistant Professor of Economics
• Richard R. Young, Ph.D. (Penn State) Professor of Supply Chain Management
The Program

Students served by the M.B.A. program are, primarily, nontraditional and reside in south-central Pennsylvania. With the exception of a small percentage of students who are full-time, they are employees of area businesses, state and local governments, and not-for-profit organizations, who study on a part-time basis. In order to accommodate both full- and part-time students, courses are offered primarily in the late afternoon and evening—with occasional offerings on weekends.

The program is intended not only to satisfy current individual needs for professional growth, but also to foster lifelong learning. As an outcome of the program, students may expect to gain participative strengths, problem solving and critical thinking skills, technical expertise, and desirable attitudes and values, particularly ethical values needed in the conduct of business.

To strengthen the educational experience, the Program places high priority on teaching and currency of curriculum, with an emphasis on oral and written communication, research, and cross-functional integration of concepts.

Locations

The degree is offered in its entirety on the Penn State Harrisburg campus located in Middletown, PA. In addition some graduate business courses are offered each semester at the extension center in Lancaster on the campus of the centrally located Franklin and Marshall College. The offerings at Lancaster are limited and potential students will be required to take courses at the Middletown campus in order to complete the degree. Students should contact the program office for information on specific semester course offerings.

Admission Requirements

Applicants must hold either (1) a baccalaureate degree from a regionally accredited U.S. institution or (2) a tertiary (postsecondary) degree that is deemed comparable to a four-year bachelor's degree from a regionally accredited U.S. institution. This degree must be from an officially recognized degree-granting institution in the country in which it operates. Decisions are based primarily on undergraduate junior/senior grade-point average and scores from either the Graduate Management Admission Test (GMAT) or Graduate Record Examination (GRE).

(Please visit www.mba.com/ (Opens New Window) for more information about the GMAT) or www.ets.org/gre for information about the GRE. Postbaccalaureate course work, professional experience, and the statements provided in the application are also taken into account.

Students are also required to submit:

- a completed online Graduate School application form with application fee
- two copies of official transcripts from all colleges or universities attended
- GMAT or GRE test scores (the test must have been taken within the past five years)
- two letters of recommendation

For complete admission information, on-line application, and the latest updates on admission requirements and procedures, please consult the College Web page at www.hbg.psu.edu/ (Opens New Window).
International Students

The language of instruction at Penn State is English. All international applicants must take and submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, or a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). Applicants with iBT speaking scores between 15 and 18 may be considered for provisional admission, which requires completion of specified remedial English courses ESL 114G (American Oral English for Academic Purposes) and/or ESL 116G (ESL/Composition for Academic Disciplines) and attainment of a grade of B or higher. The minimum acceptable composite score for the IELTS is 6.5.

International applicants are exempt from the TOEFL/IELTS requirement who have received a baccalaureate or a graduate degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, and Wales.

All students with international credentials must submit transcripts for a "course by course" academic evaluation of transcripts and degree.

Application Dates

Candidates may enter the program at the beginning of the fall or spring semester, or the summer session. To allow time for applications to be processed, all information, including the GMAT or GRE score, should be received by the admissions office no later than July 18 for admission to the fall semester, November 18 for the spring semester, and April 18 for admission to the summer session.

Applicants from outside the United States must follow the early-admission dates in order to allow the necessary clearances and paperwork to be processed in time. International application deadline dates are:

- Fall Semester--May 31
- Spring Semester--September 30
- Summer Session--February 28

Preparation for the Program

**Analytic Skills Requirement:** Prior to enrolling in their M.B.A. coursework, students must demonstrate competence in analytic skills. This requirement can be satisfied in one of two ways: (1) by satisfactory completion of college-level courses in calculus and statistics such as QUANT 310 or MATH 110, plus STAT 200; or (2) by successful completion of proficiency examinations in calculus and/or statistics approved by the M.B.A. Program. This requirement must be satisfied by the end of the first semester or summer session of the student's matriculation, and completed with a grade of C or higher.

**Credit by examination:** Interested students should obtain a Credit by Examination form from Enrollment Services and consult with the MBA Program to obtain a list of suggested preparatory materials and schedule the exam.

**Computer Skills Requirement:** Students are required to demonstrate proficiency in the use of microcomputer applications. This requirement can be satisfied through of a college-level microcomputer applications course within the past five years with a grade of a B or higher, or by documented, significant, computer-related work experience. If this requirement has not been met prior to admission, a college-level
microcomputer course such as MIS 103 or COMPSC 203 is required. Course work must be completed by the first semester or summer session of the student's matriculation with a grade of B or higher.

*Communications Skills Requirement:* Successful completion of the M.B.A. Program requires the ability to think clearly, and to write and speak persuasively. Part of this requirement can be satisfied by achieving a score of "4" or higher on the Graduate Management Admission Test (GMAT) Analytical Writing Assessment. If this score is not achieved, students must satisfy this requirement through additional course work in writing skills such as ENGL 202D or other work developed in consultation with the M.B.A. Program. This requirement must be satisfied by the first semester or summer session of the student's matriculation. All courses taken must be completed with a grade of B or higher. The speech component of this requirement is satisfied through individual and group presentations in BUS 500 and other courses in the M.B.A. Program.

*Foundation Courses:*
The MBA Program is grounded in the academic disciplines of accounting, finance, economics, marketing, management, and information sciences, among others, in order to provide students with the conceptual foundation required for competent pursuit of more advanced studies in business administration as well as the ethical and legal management of profit and non-profit organizations. This background can be provided by course work taken at the graduate level or as part of a baccalaureate degree from a regionally accredited U.S. institution or a tertiary (post-secondary) degree that is deemed comparable to a taken as part of a comprehensive and integrated, four-year bachelor's degree from program at an regionally accredited U.S. institution. This degree must be from an officially recognized degree-granting institution in the country in which it operates, college-level institution, or through graduate course work. All courses must have been completed with a grade of B or higher, within seven years prior to admission to the M.B.A. Program. Course work not meeting the tests of relevancy, quality, or currency must be taken at the graduate level prior to starting the 30-credit M.B.A. Program. Time limits may be waived by the M.B.A. Program on the basis of post-graduation training or current and relevant work experience. Courses available at Penn State Harrisburg that provide the necessary foundation for graduate business study include: ACCT 501, BUS 500, BUS 505, BUSEC 502, BUSEC 503, MNGMT 511; either MNGMT 522 or MNGMT 523; and MRKT 513.

**Degree Requirements**

The M.B.A. degree requires 30 credits of course work at the graduate level (500-level or higher). These credits are distributed over two clusters of courses: Prescribed Courses and Elective Courses/Tracks.

*Prescribed Courses:* 18 credits, aimed at developing general competence for overall management. ACCT 540, BUS 515, BUS 588, BUS 589, FINAN 521, INFSY 540, MNGMT 514, MKTG 514.

*Elective Courses/Tracks:* 12 credits. Students may elect courses in clusters of "Tracks" organized around a common theme designed to be integrative and cohesive. The Tracks provide competencies and skill sets for decision making in five areas: (1) the E-business Track is intended to provide competencies enabling managers to develop and implement a global marketing strategy using Internet-based technology; (2) the Human Resource Management Track is intended to provide competencies enabling managers to organize and operate high performing work organizations that are both efficient and human; (3) the Financial Analysis Track provides competencies needed to control competitive performance, and to develop improvement and innovation in all parts of the organization; (4) the Accounting Track is designed to offer those additional courses for students having prior academic preparation in accounting to enable them to take the Certified Public Accountant examination; and (5) the General Business Track is provided for students who wish to develop a broad generalist program, or who have a particular personal or professional goals not met by one of the other tracks.

*Tracks:*
E-business: The objective of this Track is to examine and apply concepts, models, and techniques from the
fields of business and information technology for value chain management and support of the domestic and
global strategy of the business enterprise. Internet technologies that enable opportunities in marketing,
sales, research and development, promotion, procurement, inventory control, manufacturing, supply chain
management, order status checking, and payment systems are examined.

Required courses (6 credits):

- INFSY 543 Foundations of E-business (3)
- MRKT 586 Internet Marketing (3)

Select Electives (6 credits):
Select 6 credits from INFSY 544; MRKT 587; or, in consultation with an adviser, from courses in
such areas as supply chain management; research and development; promotion; inventory control;
procurement; international finance; and international management to meet the objectives of the Track.

Human Resource Management: The objective of this track is to examine and apply models and techniques
from human resources management, labor relations, and behavioral science for the planning and
organization of work and work systems to promote cooperation and collaboration, individual and group
initiative, innovation, motivation, and flexibility. Also examined are techniques and mechanisms used to
develop and maintain a work environment and work climate supportive of performance excellence, full
participation, employee well-being and satisfaction, and personal and organizational learning and growth.

Required courses (9 credits):

- MNGMT 505 Managing Human Resources (3)
- MNGMT 515 Labor Management Relations (3)
- MNGMT 545 Employment Law for Business (3)

Select Electives (3 credits):
Select 3 credits from MNGMT 520; MNGMT 570; or, in consultation with an adviser, from courses in
such areas as human resources management; labor relations; behavioral science; and international
management to meet the objectives of the Track.

Accounting: The objective of this track is to provide the student, when combined with an undergraduate
degree in accounting or sufficient additional coursework, with the stipulated number of academic credits to
meet the education requirements of the Pennsylvania Institute of Certified Public Accountants for taking
the C.P.A. examination. Emphasis is placed on advanced level accounting skills including auditing,
financial reporting, and taxation.

In consultation with their adviser, a student shall select 12 credits from the following:

- ACCT 504 Auditing Theory and Practice (3)
- ACCT 510 Business Tax Planning: Theory and Practice (3)
- ACCT 545 Strategic Cost Management (3)
- ACCT 572 Financial Reporting I (3)
- ACCT 573 Financial Reporting II (3)

Financial Analysis: The objective of this Track is to examine and apply models and techniques from
finance and accounting for the planning, analysis, control, and improvement of competitive performance,
organizational health, ethical business practices, performance capabilities, and progress toward key
business results, strategic objectives, and changing organizational goals. Particular emphasis is placed on
approaches for translating those analyses into priorities for improvement and opportunities for innovation at
all levels, and in all parts of the organization.
Required courses (6 credits):

- FINAN 531 Managing Financial Operations (3)
- ACCT 561 Financial Statement Analysis II (3)

Select Electives (6 credits):
Select 6 graduate credits in Accounting and/or Finance, in consultation with an adviser, to meet the objectives of the Track.

General Business: The objective of this Track is to allow students to select graduate courses that meet their personal and professional goals.

Select 12 credits:
Select 12 graduate credits, in consultation with an adviser, to meet the objectives of the Track. With Program approval, a maximum of 6 graduate credits may be selected in courses outside of the School of Business Administration.

Transfer Credit and Course Substitutions

Transfer Credits: Up to 10 transfer credits may be applied toward the degree. However, credits used to complete a previous degree may not be applied. Transfer credits must have been completed within the past five years, appear on a graduate transcript, and have been passed with a B grade or higher and been earned in an equivalent graduate-level program at a regionally accredited, college-level institution. It must be the opinion of the reviewing faculty that these courses are equivalent in quality to those offered at Penn State Harrisburg.

Course substitutions: Some students enter the Program with advanced coursework in one or more subject areas (e.g., a degree in accounting plus a C.P.A.) making some prescribed coursework redundant. Except for BUS 588 and BUS 589, both of which must be taken at Penn State Harrisburg, students may petition or be advised by the Program to replace up to 6 credits in Prescribed Courses with an equivalent number of credits of more advanced graduate courses in the same subject area. Courses must have been completed at a regionally accredited institution within the past five years and have earned a grade of B or higher.

Grade-point Average and Time Limit

A 3.00 (out of 4.00) minimum grade-point average is required for the M.B.A. degree. All course work must be completed within six years, or seven consecutive summers of matriculation.

Financial aid

A limited number of scholarships, fellowships, and research grants are available, as well as several graduate assistantships. For more information on these, contact the School of Business Administration.

Many students work full-time and take classes part-time. In many cases, employers have a tuition-reimbursement plan paying for partial or full tuition. To find other options available to you, contact the Financial Aid Office, 717-948-6307.

Graduate School Assistantships
Full-time graduate students who are interested in an assistantship should contact the graduate program coordinator. Students must be nominated for an assistantship by their program coordinator.

Students applying for an assistantship should submit scores from the Graduate Management Admissions test, or similar examinations by January 30.

**Joint Degree Offering with the Penn State Dickinson School of Law**

Penn State Harrisburg, the Capital College, School of Business Administration  
The Penn State Dickinson School of Law

Degrees Conferred: J.D. (Dickinson)  
M.B.A. (The Capital College)

**Joint Degree Programs**

The Dickinson School of Law and the School of Business Administration of Penn State Harrisburg offer cooperative programs leading to the degrees of Juris Doctor (J.D.) to be granted by the Dickinson School of Law and the Master of Business Administration (M.B.A.) to be granted by Penn State Harrisburg, The Capital College. This joint degree opportunity facilitates the completion of both a law degree and a professional degree in business administration.

**Admission Requirements**

The concurrent joint programs require that the student first be admitted to The Dickinson School of Law. Subsequently, the student is recommended for and applies for admission to the Graduate School for the Penn State Harrisburg M.B.A. Program.

The following are required for applicants:

*The Dickinson School of Law:* Completed Law School application; Law School Admission Test (LSAT) score; Law School Data Assembly Service (LSDAS) report; one page personal statement; employment record since high school; two letters of recommendation.

*M.B.A. Program:* Completed Graduate School application; Graduate Management Admission Test (GMAT) or Graduate Record Examination (GRE); letter of recommendation from the Associate Dean of the Dickinson School of Law; evidence of proficiency in analytic skills through college-level calculus and statistics demonstrated either by completion of courses or successful completion of proficiency examinations approved by the M.B.A. Program; evidence of proficiency in microcomputer applications skills; proficiency in writing evidenced by a score of "4" or higher on the Analytical Writing Assessment portion of the GMAT or GRE; evidence of proficiency in the academic disciplines of accounting, finance, economics, marketing, management and information sciences equivalent to that provided by completion of an integrated four-year business program, or completion of additional course work at the graduate level. Each course must have been completed with a grade of B or higher within seven years prior to admission to the M.B.A. program. The School of Business Administration will review the applicant's transcripts for acceptability of the courses.
No courses from the M.B.A. program may count toward the J.D. program until the student is matriculated at The Dickinson School of Law. However, graduate-level courses taken in the M.B.A. program at Penn State Harrisburg, or at another regionally accredited graduate-level institution may be applied to the M.B.A. in accordance with the transfer policies of Graduate Council.

**Transfer of Credits**

Nine credits of course work at The Dickinson School of Law may be transferred toward the M.B.A. degree, subject to Program approval. Students must obtain a grade satisfactory to the M.B.A. program in order for the credits to be transferable. Nine credits of M.B.A. courses may be transferred for credit toward the J.D. degree at The Dickinson School of Law, subject to the approval of the School of Law.

**Advising of Students**

All students in the joint degree program have two advisers, one in the School of Business Administration and one from the faculty at The Dickinson School of Law. Because the joint degree program is designed to be taken in synchrony with the objective that both degrees will be earned simultaneously, students who do not demonstrate progress toward completion of both degrees may be denied continuation in the joint degree program. Such a decision will rest jointly with the faculties of the M.B.A. program and the J.D. program.

**Tuition**

The Dickinson School of Law and Penn State Harrisburg will each charge their own tuition to students in the joint degree programs.

**Additional Information**

For more information and the latest updates on the joint degree program, call the Law school at 717-240-5207 or 800-840-1122, or visit the Law School and Penn State Harrisburg web sites at:

[Law.psu.edu](http://Law.psu.edu)
[http://harrisburg.psu.edu/programs/master-business-administration](http://harrisburg.psu.edu/programs/master-business-administration)

**Concurrent Degree Offering with the Penn State Hershey College of Medicine Biomedical Sciences Department**

Penn State Harrisburg, The Capital College, School of Business Administration
Penn State Hershey College of Medicine, Biomedical Sciences Program

Degrees Conferred:
- Ph.D. ([Hershey College of Medicine](http://Hershey College of Medicine))
- M.B.A. (The Capital College)

**Concurrent Degree Programs**
The Penn State Hershey College of Medicine, Biomedical Sciences Program, and the School of Business Administration of Penn State Harrisburg, The Capital College offer cooperative programs leading to the degrees of doctor of philosophy (Ph.D.) in Biomedical Sciences to be granted by the Hershey College of Medicine, and the Master of Business Administration (M.B.A.) in Business Administration, to be granted by the Capital College. This concurrent degree opportunity facilitates the completion of both a doctorate in biomedical sciences and a professional master’s degree in business administration. The program is designed primarily for students interested in pursuing a career involving high-quality independent research and positions of management responsibility within the biomedical sciences community.

**Admission Requirements:**
The concurrent programs require that the student first be admitted to The Biomedical Sciences graduate degree program. Subsequently, the student is **recommended for and applies for** admission to the Graduate School for the Penn State Harrisburg M.B.A. program.

The following are required for applicants:

**Biomedical Sciences Program:** Completed application; Graduate Record Examination (GRE) score; a bachelor's degree reflecting a reasonable background in zoology or biology, mathematics and chemistry; a minimum junior/senior grade point average of 3.00 and with appropriate course backgrounds; two letters of recommendation; a curriculum vitae; a description of career goals. Reading knowledge of one or two foreign languages is recommended.

**M.B.A. Program:** Completed Graduate School application; Graduate Management Admission test (GMAT) or Graduate Record Examination (GRE) score; letter of recommendation from the department chair of the Biomedical Sciences Program; evidence of proficiency in analytic skills through college-level calculus and statistics demonstrated either by completion of course or successful completion of a mathematics proficiency examination approved by the program; evidence of proficiency in microcomputer applications skills; proficiency in writing evidenced by a score of "4" or higher on the Writing Assessment portion of the GMAT or GRE; evidence of proficiency in the academic disciplines of accounting, finance, economics, marketing, management and information sciences equivalent to that provided by completion of an integrated four-year business program, or completion of additional course work at the graduate level. Each course must have been completed with a grade of B or higher within seven years prior to admission to the M.B.A. program. The School of Business Administration will review the applicant's transcripts for acceptability of the courses.

No courses from the M.B.A. program may count toward the Ph.D. until the student is admitted to the Biomedical Sciences program. However, graduate-level courses taken in the M.B.A. program at Penn State Harrisburg, or at another graduate-level institution, may be applied to the M.B.A. in accordance with the transfer policies of Graduate Council.

**Transfer of Credits**

Nine credits of course work in biomedical sciences may be transferred toward the M.B.A., subject to program approval. Students must obtain a grade satisfactory to the M.B.A. program in order for the credits to be transferable. Nine credits of M.B.A. coursework may be transferred for credit toward the Ph.D. degree, subject to the approval of the Biomedical Sciences program.

**Advising of Students**

All students in the concurrent program have two advisers, one in the School of Business Administration, and one from the faculty in the Biomedical Sciences program. Because the concurrent program is designed
to be taken in synchrony with the objective that both degrees will be earned simultaneously, students who do not demonstrate progress toward completion of both degrees may be denied continuation in the concurrent program. Such a decision will rest jointly with the faculties of the M.B.A. and the Ph.D. programs.

The Course Matrix

For more information and the latest updates on the concurrent programs, call the Biomedical Sciences program at 717-531-1054 or visit the Web sites at:

http://www2.med.psu.edu/

http://harrisburg.psu.edu/programs/master-business-administration

ACCOUNTING (ACCT) course list
BUSINESS (BUS) course list
FINANCIAL ANALYSIS (FINAN) course list
INFORMATION SYSTEMS (INFSY) course list
MANAGEMENT (MNGMT) course list
MARKETING (MRKT) course list
COMMITTEE ON PROGRAMS AND COURSES
Inter-Office Correspondence

Date: November 29, 2001
To: Terence Brown

The action noted below has been taken on the proposed program submitted by your department. If you have questions this proposal, please contact Mark Wardell, Chair of the Committee on Programs and Courses, at 814-865-5425. Responses should be sent directly to the Dean’s Office, Graduate School, 114 Kern Building.

Program Title:
Proposal to Offer the M.B.A. in Business Administration to the Lancaster Center
(from Penn State Harrisburg)

The Committee asks the proposers to revise page 3 of the proposal (Entrance into the Program) to indicate that students will be admitted as a co-hort (not each fall or spring semester, or summer session). The Committee also indicated that the “Student Aid” section should be deleted if not applicable to the Lancaster graduate students. The Committee also recommends that the program be cautious when crafting recruitment literature to reflect the target audience for the off-site offering so as not to be confused with the on-campus program.

The proposal is tentatively approved pending receipt of the requested revisions.

c: Senate Office
Dean of Sponsoring College
Chair, Subcommittee on New and Revised Programs and Courses
Chair, Committee on Programs and Courses
GRADUATE COUNCIL COMMITTEE ON PROGRAMS AND COURSES
SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES PROGRAM,
OPTION, OR MINOR PROPOSAL FORM

Submit 1 copy of the proposal form and 25 copies of the supporting documentation as outlined on the reverse side of this form to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building. The proposals will be transmitted to the Dean of the Graduate School for consideration by the Graduate School’s Subcommittee on New and Revised Programs and Courses, and the Committee on Programs and Courses. For a detailed explanation of the form, see the Guide to Curricular Procedures.

College Department or Instructional Area

Penn State Harrisburg
School of Business Administration

NEW PROGRAM, OPTION OR MINOR

Designation of program
Designation of option
Designation of minor

Indicate effective date

OLD PROGRAM, OPTION, OR MINOR: Change ☒ Drop ___

Old designation of program Old designation of option Old designation of minor

New designation of program (if changed)
New designation of option (if changed)
New designation of minor (if changed)

Indicate effective date May 02 or earlier

SUBMITTED BY M. S. Kulwarri
In Charge of Graduate Program
Date 11/9/01

NOTED BY Howard Sailer College Representative to Graduate Council Subcommittee on New and Revised Programs and Courses

APPROVED BY Howard Sailer Dean of College

NOTED BY Date
Dean of the Graduate School

RECOMMENDED BY Date
Subcommittee on New and Revised Programs and Courses

Committee on Programs and Courses

SUPPORTING DOCUMENTATION REQUIRED FOR PROGRAMS, OPTIONS, OR MINORS (Adds, Changes, or Drops)
PROPOSAL FOR AN OFF-CAMPUS GRADUATE DEGREE PROGRAM

PROGRAM: MASTER OF BUSINESS ADMINISTRATION (BADM — HARRISBURG)

LOCATION: PENN STATE CENTER, LANCASTER, PENNSYLVANIA

JUSTIFICATION

Penn State has offered graduate business administration courses at the Lancaster location for many years, principally through the Great Valley campus. This academic year Penn State Capital College (Penn State Harrisburg) entered into an agreement with Great Valley to offer three courses in lieu of Great Valley courses. The principal reason for this arrangement was the need for Great Valley to devote time, energy and faculty resources to AACSB accreditation; Harrisburg had already achieved accredited status, and was able to offer equivalent courses at the Lancaster Center. This limited proposal was approved by the Graduate Council Committee on Programs and Courses.

In view of the continuing accreditation candidacy process at Great Valley, that location will be unable to offer MBA coursework at Lancaster for at least two years. In discussions between administrators of the two degree-granting campuses, it became clear that Penn State would cede the Lancaster territory to a variety of MBA-granting programs (e.g. Lebanon Valley College and others) unless we could rapidly deploy a complete MBA program. This proposal represents the outcome of those discussions. It is a proposal for a one-cohort accredited Penn State program in a growing and vital location.

OPERATION OF THE PROGRAM

The academic home of the program will be the School of Business Administration of Capital College, Mukund S. Kulkarni, Director. The administrator in charge of academic matters will be Professor Terry Brown, Director of the MBA Program in the School of Business Administration. The administrator in charge of fiscal matters will be Dr. Dennis Lott, Director of Continuing and Distance Education for the Capital College.

IMPACT OF THE OFF-CAMPUS PROGRAM ON THE CURRENT MBA RESIDENTIAL PROGRAM

The Harrisburg campus MBA has already experienced the additional responsibility of offering courses at the Lancaster location, and has accommodated such a challenge. There will some need for judicious scheduling of courses at both locations, but the proposal is for a single cohort, thus keeping the stress on faculty resources at a controllable level. It is proposed that no more than five courses will be offered in a given year. No other off-campus offerings of the MBA are currently in operation nor anticipated; a previous proposal to offer the MBA (at Harley-Davidson Motor Company in York, PA) was approved, but never put into operation.

The library resources issue is dealt with later in this proposal.

THE PROPOSED OFF-CAMPUS PROGRAM

This text on the next nine pages is taken from the School of Business Administration Website and is identical to that on the Graduate School Website.
RESPONSE TO THE COMMITTEE ON PROGRAMS AND COURSES
PROPOSAL FROM PENN STATE HARRISBURG TO OFFER THE MBA AT
THE PENN STATE LANCASTER CENTER

November 9, 2001

Duration of Approved Program

The request is to offer one cohort of the current MBA program at the Penn State Lancaster Center. It is anticipated that five or six courses will be offered in each year. Thus, approval for the program is sought for three years. This period should allow for students to complete the 18 credit “prerequisite” portion of the program and the 30 credit MBA program. Some students in the cohort will have sufficient undergraduate credits in the appropriate business courses to be waived from some, or all, of the “prerequisite” courses. But students entering the MBA program with an engineering background, for example, may very likely need all 18 credits of “prerequisite” business courses. Until the cohort members educational preparation have been analyzed, the total length of the program cannot be specified as two years.

Admissions Requirements and Advisement

The plan for the program is to conduct one or two “open house” sessions at the Lancaster Center. This is identical to the existing protocol for the Harrisburg location. All prospective students are advised at those meetings as to the adequacy of the student’s prior business study in meeting the “prerequisite” course requirements. All students who are advised in this manner clearly receive materials from the MBA program indicating the courses required to earn the MBA. All “prerequisite” courses which are to be taken as part of the overall program are at the approved graduate MBA tuition rate, since these courses are at the 500-level.

Students who have been attending the Harrisburg orientation (“open house”) are clearly advised of the courses they must take, and the applicable tuition rate.

Elements of Residency: “threaded discussions”

Electronic “threaded” discussions among the class members require that students have a Penn State Access Account. A course-specific discussion group is established in which faculty and students can asynchronously interact in discussing a course topic. The Penn State Harrisburg business faculty are actively engaged in working with the current Penn State software which supports such discussion groups. This college, and several of the business faculty, are beta-testing the new ANGEL software system. This system is to be the Penn State CAC standard to support such activities as “threaded” discussions.
Element: Contribution of graduate students to the degree program, the college, and the university

This is addressed in two ways. First, many of the courses are interactive in nature, so the students help frame the course within the guidelines of the syllabi. Second, the alumni group mentioned above is quite active in involving the current students with alumni at events throughout the year. The Lancaster-based graduate students also will be included in the activities of the Harrisburg Graduate Student Association.

Element: Identification with Penn State

First, the classes are in a Penn State facility. Second, the comment above addresses involvement as graduate students of Penn State and as future alumni.

PROVISION OF ACCESS TO TECHNOLOGY AND LIBRARY RESOURCES

Technology Resources

The Penn State Lancaster Center has adequate computer facilities. Not only has Great Valley offered courses there for many years, but Penn State Harrisburg has offered graduate business courses at that location now for two semesters and certificate (400-level credit) courses from the Master of Education in Training and Development for several years. Faculty have found the computer resources adequate for graduate-level instruction. It is likely that many of the students are going to use laptop computers which they will bring to class, and they will avail themselves of the Penn State software acquisition opportunities.

Library Resources

The Lancaster Center has some rudimentary elements of a library on-site. The computer facilities already noted, provide on-site access to the Penn State Libraries Website, with the multitude of databases. This has proven to be adequate for the Penn State Harrisburg graduate business courses offered to date.

Penn State Harrisburg has had a long relationship with the Harrisburg Area Community College (HACC), dating to the common years of founding of the two institutions. Both institutions are members of a library consortium ACLCP (Association of College Libraries of Central Pennsylvania), which offers reciprocal borrowing privileges and enhanced interlibrary loan access. HACC has recently opened a new campus in Lancaster, with a solid array of databases and reference resources. An analysis of the HACC databases was developed by Glenn McGuigan, the business reference librarian at Penn State Harrisburg; a copy of that document is attached. The HACC librarian, Alice Lubreet, and the Penn State Capital Colleges Librarian, Dr. Hal Shill, have completed a draft agreement enhancing the ACLCP arrangement. In brief, the plan calls for Penn State Capital College to purchase some reference materials for placement in the HACC Lancaster Library; HACC will make available to the Penn State MBA students access to the HACC databases; HACC will make space available when Mr. McGuigan does bibliographic instruction for the MBA students.

In summary, the Lancaster MBA cohort will have both the electronic access to the Penn State holdings and physical access to a library with significant resources located quite close to The Lancaster Center of Penn State.
RESPONSES TO THE COMMITTEE (Incorporated into Proposal)

Duration of Approved Program

This proposal is for one cohort, for a duration of three years. This period should allow those students who require the full 18 credits of "prerequisite courses" as well as the core MBA (30 credits). Students who meet the "prerequisite courses" through a recent undergraduate business degree will only need to take the 30 credits. Those students with another degree, such as engineering, may require all or most of the "prerequisite courses" which must be taken at the graduate level; these students would require the full three years.

Admissions Requirements

Students must supply GMAT scores and undergraduate/graduate transcripts. For those students who have junior/senior grade point averages < 3.0, letters of recommendation often help in the decision, particularly if the prospective student has been out of school for some time.

One or two "open houses" will be conducted for prospective students. This is routinely done for the Harrisburg program. The prospective students are advised of the need for letters as well as the credit for prerequisites which will be allowed. At the end of the preadmission advisement, potential students will clearly understand the courses to be taken, the timeframe of the off-site program, and the applicable tuition rate.

A question was raised concerning letters of recommendation. Students must submit GMAT scores and their transcripts. A system is applied to these elements, and if the algorithm is below the cutoff, students must submit letters of recommendation. The average GMAT for accepted students is 541, and the average GRE is 3.25. Letters are requested for fewer than 10% of applicants.

Elements of Residency and the use of "Threaded Discussions"

The nature of this electronic interaction among students, and with faculty, is discussed in the proposal. It requires that participants have active PSU Access Accounts.

11/19/01
PROPOSAL FOR AN OFF-CAMPUS GRADUATE DEGREE PROGRAM

PROGRAM: MASTER OF BUSINESS ADMINISTRATION (BADM -- HARRISBURG)

LOCATION: PENN STATE CENTER, LANCASTER, PENNSYLVANIA

JUSTIFICATION

Penn State has offered graduate business administration courses at the Lancaster location for many years, principally through the Great Valley campus. This academic year Penn State Capital College (Penn State Harrisburg) entered into an agreement with Great Valley to offer three courses in lieu of Great Valley courses. The principal reason for this arrangement was the need for Great Valley to devote time, energy and faculty resources to AACSB accreditation; Harrisburg had already achieved accredited status, and was able to offer equivalent courses at the Lancaster Center. That limited proposal was approved by the Graduate Council Committee on Programs and Courses.

In view of the continuing accreditation candidacy process at Great Valley, that location will be unable to offer MBA coursework at Lancaster for at least two years. In discussions between administrators of the two degree-granting campuses, it became clear that Penn State would cede the Lancaster territory to a variety of MBA-granting programs (e.g. Lebanon Valley College and others) unless we could rapidly deploy a complete MBA program. This proposal represents the outcome of those discussions. It is a proposal for a one-cohort accredited Penn State program in a growing and vital location.

OPERATION OF THE PROGRAM

The academic home of the program will be the School of Business Administration of Capital College, Mukund S. Kulkarni, Director. The administrator in charge of academic matters will be Professor Terry Brown, Director of the MBA Program in the School of Business Administration. The administrator in charge of fiscal matters will be Dr. Dennis Lott, Director of Continuing and Distance Education for the Capital College.

IMPACT OF THE OFF-CAMPUS PROGRAM ON THE CURRENT MBA RESIDENTIAL PROGRAM

The Harrisburg campus MBA has already experienced the additional responsibility of offering courses at the Lancaster location, and has accommodated such a change. There will some need for judicious scheduling of courses at both locations, but the proposal is for a single cohort, thus keeping the stress on faculty resources at a controllable level. It is proposed that no more than five courses will be offered in a given year. No other off-campus offerings of the MBA are currently in operation nor anticipated; a previous proposal to offer the MBA (at Harley-Davidson Motor Company in York, PA) was approved, but never put into operation.

The library resources issue is dealt with later in this proposal.

THE PROPOSED OFF-CAMPUS PROGRAM

This text on the next four pages is taken from the School of Business Administration Website and is identical to that on the Graduate School Website. The only change is that there will be a single admission period for the cohort, ending at the start of the proposed off-site location. Potential students will be advised of the limited offering of the program.
Terence A. Brown  
Director, MBA Program  
School of Business Administration  
777 West Harrisburg Pike  
E-355  
Olmsted Building  
Middletown, PA 17057-4898  
717-948-6140  
mbalbg@psu.edu  
www.bhg.psu.edu/sbus

Degree Conferred: M.B.A.

The Program  
Students served by the MBA program are, primarily, nontraditional and reside in south-central Pennsylvania. With the exception of a small percentage of students who are full-time, they are employees of area businesses, state and local governments, and not-for-profit organizations, who study on a part-time basis. In order to accommodate both full- and part-time students, courses are offered primarily in the evening.

The program is intended not only to satisfy current individual needs for professional growth, but also to foster lifelong learning. As an outcome of the program, students may expect to gain problem-solving skills as well as technical expertise, critical thinking skills, desirable attitudes and values, and participative strengths.

To strengthen the educational experience, the curriculum places high priority on teaching and currency of curriculum. Oral and written communication, research, integration of concepts throughout the curriculum and cross-functional approaches are emphasized.

Admission Requirements  
Applicants to the program must hold a baccalaureate degree in any field from a regionally accredited, college-level institution. Decisions are based primarily on undergraduate junior-senior grade-point average and the Graduate Management Admission Test (GMAT) scores. Post-baccalaureate course work, professional experience, and the statements provided in the application are also taken into account.

Students are also required to submit:

- a completed application form with application fee  
- two copies of official transcripts from all colleges or universities attended  
- scores from the GMAT test (the test must have been taken within the past five years)  
- letters of recommendation (optional)  
- supplemental application

The (TOEFL), Test of English as a Foreign Language (www.toefl.org), must be taken by applicants for whom English is not their first language or whose language of instruction was not English. The test must be passed with a score of 550 (paper based test) or 213 (computer based test) or higher and must have been taken within the last five years.
Completed International Application materials must be submitted by the following deadlines. Applications received after the deadlines will be processed for the following semester:

Fall Semester June 30
Spring Semester October 31
Summer Semester March 15

* An application is available here or by calling 717-948-6250.

**Entrance into the Program**
Candidates may enter the program at the beginning of the fall or spring semester, or the summer session. To allow time for applications to be processed, all information, including the GMAT score, must be received by the admissions office no later than July 18 for admission to the fall semester, November 18 for the spring semester, and April 18 for admission to the summer session.

**Preparation for the Program**

**Mathematics Requirement:** Prior to enrolling in their MBA course work, students are required to demonstrate competence in quantitative skills. This may be demonstrated by: (1) satisfactory completion of a college-level calculus course, such as QUANT 310 Mathematical Methods in Social and Managerial Sciences or (2) successful completion of a mathematics proficiency examination approved by the MBA program. This requirement must be satisfied either during the first semester or summer session of the student’s matriculation and completed with a grade of C or better. Interested students should obtain a Credit by Examination form from Enrollment Services and should consult with the mathematics faculty in the School of Science, Engineering, and Technology to schedule the exam and obtain a list of suggested preparatory materials.

**Computer Requirement:** Students are required to demonstrate competence through a college-level microcomputer applications course within the past six years (and passed with at least a B) or significant work experience. If this requirement has not been met, a college-level microcomputer course such as INFSY 305 Microcomputers in Business is required. Course work must be taken either during the first semester or summer session of the student’s matriculation and completed with a grade of B or better.

**Proficiency in Writing:** The MBA program requires the ability to think clearly and write effectively. If a score of 4 or more on the Graduate Management Admission Test (GMAT) Analytical Writing Assessment is not achieved, students will need to satisfy this requirement through course work in college-level English and/or other remedial work. This requirement must be satisfied during either the first semester or summer session of the student’s matriculation and completed with a grade of B or better.

**Prerequisite Business Core Requirement (18 credits):** The business prerequisite “core” provides a foundation in theory, tools and techniques required for competent legal and ethical management of profit and/or nonprofit organizations. The prerequisites also provide a basic understanding of the concepts and applications of financial reporting, domestic and global economic environments of organizations, creation and distribution of goods and services and human behavior in organizations.

For holders of an undergraduate degree in a business field from an accredited college-level business program, the 18 credits of required “core” is met if the relevant undergraduate course work in the undergraduate degree program was completed with a grade of B or better in each course within seven
years prior to admission to the MBA program or similar coursework validated by recent work experience. Course work not meeting these tests of relevancy, grade, or currency must be taken at the graduate level as a prerequisite prior to starting course work in the 30-credit MBA program.

An applicant holding a baccalaureate degree in a non-business field from an accredited, college-level institution may satisfy a core requirement through completion of a minimum of 6 credits of advanced undergraduate work in a single area of concentration completed with a grade of B or better within seven years prior to admission to the MBA program (e.g., BUS 501 Statistical Analysis for Business Decisions might be met by holders of an undergraduate degree in statistics) or through credits earned in an equivalent graduate-level program at an accredited college-level institution with a grade of B or better within seven years prior to admission to the MBA program or similar coursework validated by recent work experience. Course work not meeting these tests of relevancy, grade, or currency must be taken at the graduate level as a prerequisite prior to starting course work in the 30-credit MBA program.

PREREQUISITE COURSES: 18 credits: BUS 501; ECNMS 510; MNGMT 510, MNGMT 522; MRKT 520; P ACC 501

Degree Requirements
In addition to the mathematics, computer, and writing proficiency requirements and the prerequisite courses, the MBA degree requires 30 credits of course work at the graduate level (500-level or higher). These are distributed over two groups of courses: Breadth and Electives.

Breadth Courses: 18 credits, aimed at developing general competence for overall management BUS 584, 588; FINAN 521; INFSY 540; P ACC 540; either BUS 502 or BUS 554.

ELECTIVE COURSES: 12 credits
Electives allow students to select additional courses of interest. Six credits of elective courses must be taken from courses offered by the School of Business Administration. Other electives may be selected from courses offered by the School of Business Administration and/or graduate-level courses offered by other academic programs. Electives must be selected in consultation with a faculty adviser and have prior MBA approval.

Transfer Credit and Course Substitutions
Transfer Credits: Up to 10 transfer credits may be applied toward the degree. However, credits used to complete a previous degree may not be applied. These courses must have been completed within the past five years, appear on a graduate transcript, and have been passed with a B grade or better earned in an equivalent graduate-level program at an accredited, college-level institution. It must be the opinion of the reviewing faculty that these courses are equivalent in quality to those offered at Penn State Harrisburg. Credit will not be given for any course used to complete a previous graduate degree.

Course substitutions: Except for BUS 588, which must be taken at Penn State Harrisburg, up to 6 credits of Breadth courses may be replaced with more advanced courses in the same field. Substitutions are based on a minimum of 6 credits of advanced undergraduate course work in an area of concentration or credits earned in an equivalent graduate-level program at an accredited, college-level institution. These courses must have been completed within the past five years and have earned a grade of B or better. Substituted courses must be replaced with other advanced graduate courses in the same field for which the substitute is an important foundation/prerequisite. Students will be informed of this in a letter received from the program office. Substitutions are based on past
academic performance. An examination cannot be used for earned graduate course credit.

Grade-point Average and Time Limit
A 3.00 (out of 4.00) minimum grade-point average is required before a student is awarded an MBA degree. All course work must be completed within six years, or seven consecutive summers of matriculation.

Student Aid
There are a limited number of scholarships, fellowships, and research grants available, as well as several graduate assistantships. For more information on these, contact the School of Business Administration.

Many students work full-time and take classes part-time. In many cases, employers have a tuition-reimbursement plan paying for partial or full tuition. To find other options available to you, contact www.hbg.psu.edu.

BUSINESS (BUS)
BUS 501. STATISTICAL ANALYSIS FOR BUSINESS DECISIONS (3) Application of statistical techniques to the formulation, analysis, interpretation, and solution of business problems. Prerequisite: admission to MBA or MS/IS program.

BUS 502. BUSINESS RESEARCH APPLICATIONS (3) Critical evaluative techniques of business research. Prerequisites: Admission to the graduate program and 3 credit hours in statistics.

BUS 520. ADMINISTRATIVE MODELS (3) Formulation and solution of decision models for administrative problems. Analysis of decision making under certainty, risk, and uncertainty. Prerequisite: BUS 548.

BUS 548. QUANTITATIVE METHODS (3) Advanced topics in quantitative analysis including game theory, integer and dynamic programming, waiting line models, Markov process and simulation. Prerequisite: MNGMT 522.

BUS 550. BUSINESS RESEARCH METHODS (1) Selection of a research topic, construction of a bibliography, literature survey and data collection, and preparation of a research proposal. Prerequisite: This course must be completed successfully (grade of C or better) before registering for the last 6 credits of the MBA program.

BUS 551. MASTER’S PAPER (2) Completion of a professional paper in the student’s major field of interest under supervision of a faculty member. Prerequisite: This course must be completed successfully (grade of C or better) before registering for the last 6 credits of the MBA program.

BUS 552. MULTIVARIATE ANALYSIS FOR BUSINESS (3) Application of multivariate statistical methods for analyzing the relationship between two or more variables. Prerequisite: BUS 501.

BUS 554. MASTER’S PROJECT (3) Development of an original master’s project in the student’s professional field of interest and preparation of a paper. Prerequisite: This course must be completed successfully (grade of C or better) before registering for the last 6 credits of the MBA program.

BUS 556. ECONOMIC AND BUSINESS FORECASTING (3) Application and evaluation of methods for forecasting regional economic change and business activity. Prerequisites: BUS 501,
ECNMS 510.

BUS 584. BUSINESS IN A GLOBAL SOCIETY (3) Business sector and society relations; international and cultural issues; corporate values and ethics; relationship to stakeholders; social, political, legal environments. Prerequisite: admission to MBA or MS/IS program.

BUS 588. STRATEGIC MANAGEMENT (3) Analysis of administrative problems from a total organization viewpoint. Case studies of actual organizations are used for analysis. Prerequisite: All course work or permission of program.

BUS 589. SMALL BUSINESS MANAGEMENT PRACTICUM (1-3) Advanced study and practice in small business management through field assignments with cooperating firms to analyze and solve managerial problems.

BUS 590. COLLOQUIUM (1-3) Continuing seminars which consist of a series of individual lectures by faculty, students, or outside speakers.

BUS 595. INTERNSHIP (1-18) Supervised off-campus, nongroup instruction including field experiences, practicums, or internships. Written and oral critique of activity required.

BUS 596. INDIVIDUAL STUDIES (1-9) Creative projects, including nonthesis research, that are supervised on an individual basis and which fall outside the scope of formal courses.

BUS 597. SPECIAL TOPICS (1-9) Formal courses given on a topical or special interest subject which may be offered infrequently; several different topics may be taught in one year or semester.

ECONOMICS (ECNMS)

ECNMS 510. MANAGERIAL ECONOMICS (3) Economic analysis of demand for the firm’s output and production costs; implications of various market structures; government regulation. Prerequisite: Admission to the MBA or MS/IS program.

ECNMS 560. MACRO-ECONOMIC ANALYSIS (3) Macro-economic theory; international trade and finance; monetary and fiscal policies and their effects on the firm. Prerequisite: ECNMS 510.

FINANCE (FINAN)

FINAN 518. FINANCIAL MARKETS AND THE ECONOMY (3) Operation, regulation, use, and evaluation of principal financial markets and institutions; monetary policy, asset pricing, and their effects on business. Prerequisite: ECNMS 510.

FINAN 521. CORPORATE FINANCE (3) An in-depth analysis of concepts and techniques of corporate financial management. Prerequisites: P ACC 501.

FINAN 522. INVESTMENT AND PORTFOLIO MANAGEMENT (3) Investment analysis and portfolio management theory and applications. Prerequisite: FINAN 521.

FINAN 526. INTERNATIONAL FINANCE (3) Basics of corporate finance extended to the international environment through a special consideration of exchange rate behavior and its management. Prerequisite: FINAN 521.
FINAN 530. FINANCIAL MANAGEMENT (3) An in-depth examination of techniques and models of financial decision making in a business environment. Prerequisite: FINAN 521.

FINAN 531. MANAGING FINANCIAL OPERATIONS (3) A course for financial managers; working capital management; financial planning, financial controls, reporting, financial strategies; theory and practice. Prerequisite: FINAN 521.

FINAN 596. INDIVIDUAL STUDIES (1-9) Creative projects, including rotashon research, that are supervised on an individual basis and which fall outside the scope of formal courses.

FINAN 597. SPECIAL TOPICS (1-9) Formal courses given on a topical or special interest subject which may be offered infrequently; several different topics may be taught in one year or semester.

INFORMATION SYSTEMS (INFSY)
INFSY 535. OBJECT-ORIENTED DESIGN AND PROGRAM DEVELOPMENT IN BUSINESS (3) Overview of key concepts in object design and the application of these concepts in business software development. Prerequisite: Admission to MBA or MSIS Program or Program Approval.

INFSY 540. INFORMATION RESOURCES MANAGEMENT (3) Information systems analysis, design, application, operation, and management; methods for integrating information resources into a decision support framework. Prerequisite: Admission to M.B.A. or MS/IS program or program permission.

INFSY 543. INTRODUCTION TO E-COMMERCE (3) Overview of key aspects of E-Commerce within an organizational context including coverage of managerial issues and supporting technology. Prerequisite: INFSY 540 or permission of program.

INFSY 545. PROGRAM, DATA, AND FILE STRUCTURES (3) Program, data, and file structures are studied as they relate to management of data in information systems. Prerequisite: Admission to MS/IS program or permission of program.

INFSY 547. WEB ENABLED TECHNOLOGIES (3) Integrating design principles and applying technologies that support business related, web-based applications. Prerequisite: INFSY 534 or permission of program.

INFSY 550. STRATEGIC INFORMATION SYSTEMS (3) Comprehensive coverage of concepts, applications, and management of strategic information systems in organizations. Prerequisite: INFSY 540.

INFSY 554. MASTER’S PROJECT (3) Development of an original master’s project in the student’s field of interest and preparation of a paper. Prerequisite: Last 6 credits of Master’s in the Information Systems program.

INFSY 555. DATA MANAGEMENT SYSTEMS (3) Concepts and theory of database management systems explored through data modeling and planning techniques. Prerequisite: Admission to MS/IS program or permission of program.

INFSY 556. DATA WAREHOUSING (3) The study of requirements collection, design, and development of data warehouses. Prerequisite: INFSY 555.
INFSY 560. DATA COMMUNICATIONS SYSTEMS AND NETWORKS (3) Hardware and software concepts relevant to current communications and networking technology. The importance of telecommunications is emphasized. Prerequisite: INFSY 540.

INFSY 565. INTELLIGENT SYSTEMS IN BUSINESS (3) This course will emphasize the analysis, design, and application of intelligent systems within organizational settings. Prerequisites: INFSY 535.

INFSY 566. DATA MINING AND KNOWLEDGE DISCOVERY (3) The study and application of data mining techniques used to mine patterns in large transactional databases. Prerequisite: INFSY 565.

INFSY 570. SOFTWARE ENGINEERING IN THE ANALYSIS AND DESIGN OF INFORMATION SYSTEMS (3) Software engineering concepts, specifically the analysis and design of structured information systems using computer-aided software engineering (CASE). Prerequisite: Admission to MS/IS program or permission of program.

INFSY 575. SEMINAR IN INFORMATION TECHNOLOGY MANAGEMENT (3) Examination of selected topics relevant to current and future managerial and organizational issues of information technology. Prerequisite: INFSY 555 or 570.

INFSY 587. GLOBAL INFORMATION TECHNOLOGY (3) Comprehensive coverage of components, applications, and issues of global information technology management in organizations worldwide. Prerequisite: INFSY 555 or 570.

INFSY 595. INTERNSHIP (1-18) Supervised off-campus, nongroup instruction, including field experience, practicums, or internships. Written and oral critique of activity required.

INFSY 596. INDIVIDUAL STUDIES (1-9) Creative projects, including nonthesis research, that are supervised on an individual basis and which fall outside the scope of formal courses.

INFSY 597. SPECIAL TOPICS (1-9) Formal courses given on a topical or special interest subject which may be offered infrequently; several different topics may be taught in one year or semester.

MANAGEMENT (MNGMT)

MNGMT 505. PERSONNEL MANAGEMENT (3) Problems in effectively selecting, utilizing, and developing human resources from the viewpoint of the total organization—both private and public. Prerequisite: admission to MBA or MS/IS program.

MNGMT 510. ORGANIZATIONAL BEHAVIOR (3) Examination of concepts of human behavior in formal organizations, systems analysis, conceptual models, and decision processes. Prerequisite: admission to graduate degree candidacy.

MNGMT 512. ADMINISTRATIVE THEORY (3) Advanced analysis of selected areas of administrative theory and research, with special emphasis on application to current organizational problems. Prerequisite: MNGMT 510.

MNGMT 515. LABOR MANAGEMENT RELATIONS (3) Labor relations issues; collective bargaining agreement, negotiations, and administration; legal framework of collective bargaining; labor relations in larger social context. Prerequisite: admission to graduate degree candidacy.
MNGMT 520. ORGANIZATIONAL TRANSFORMATION (3) Treats methods, practices, and theory of organizational empowerment, quality management, process redesign, re-engineering, restructuring, and planned change. Prerequisite: MNGMT 510.

MNGMT 522. OPERATIONS MANAGEMENT (3) Integration and application of decision making to operational and policy problems within the business firm. Prerequisite: ECNMS 510.

MNGMT 560. MANUFACTURING METHODS (3) Survey of manufacturing technologies and management techniques for controlling production systems. Prerequisite: MNGMT 522.

MNGMT 565. PROJECT MANAGEMENT (3) Examines the behavioral and quantitative aspects of managing in the project environment. Prerequisite: MNGMT 522.

MNGMT 570. LEADERSHIP DEVELOPMENT (3) This course focuses on the behavioral and interpersonal competencies requisite to the task of leadership and managing. It emphasizes experiential learning through feedback from self-assessment, experiential exercises, simulations, group work, and role play techniques. Thus, the course imparts the conceptual knowledge that is a building block to any educational process, but goes significantly beyond this, in that the format also provides students with vital tools and experiences necessary to reflect upon and assess their own competencies, as well as the ability to strengthen these competencies -- successfully integrating them into their repertoire of behavioral skills.

MNGMT 576. MANAGING FOR TOTAL QUALITY (3) Treats methods and techniques of modern quality improvement, including change management, empowerment, and leadership. Prerequisite: MNGMT 510.

MNGMT 596. INDIVIDUAL STUDIES (1-9) Creative projects, including nonthesis research, that are supervised on an individual basis and which fall outside the scope of formal courses.

MNGMT 597. SPECIAL TOPICS (1-9) Formal courses given on a topical or special interest subject which may be offered infrequently; several different topics may be taught in one year or semester.

MARKETING (MRKT)
MRKT 520. MARKETING MANAGEMENT (3) Consideration of modern marketing concepts, application, and managerial issues. Prerequisites: BUS 501, ECNMS 510.

MRKT 570. MARKETING STRATEGY AND PLANNING (3) Analysis of management’s marketing problems, including marketing analyses, pricing, channels of distribution, promotion, competition, product strategies, and marketing research. Prerequisite: MRKT 520.

MRKT 571. CONSUMER BEHAVIOR (3) Factors influencing buyer behavior; contributions of the behavioral sciences to the study of selected phenomena. Prerequisite: MRKT 520.

MRKT 572. MARKETING RESEARCH (3) Management information needs, evaluation of research proposals and findings, methods of data collection and analysis, integration of research and decisions. Prerequisite: MRKT 520.

MRKT 585. BUSINESS-TO-BUSINESS MARKETING (3) Marketing of products and services to other businesses and organizations including strategy, planning, research, communications, pricing,
distribution, and global issues. Prerequisite: MRKT 520.

MRKT 596. INDIVIDUAL STUDIES (1-9) Creative projects, including nonthesis research, that are supervised on an individual basis and which fall outside the scope of formal courses.

MRKT 597. SPECIAL TOPICS (1-9) Formal courses given on a topical or special interest subject which may be offered infrequently; several different topics may be taught in one year or semester.

PROFESSIONAL ACCOUNTANCY (P ACC)
P ACC 501. FINANCIAL STATEMENT ANALYSIS (3) Study of financial reporting, financial statement analysis, capital markets, asset pricing and impact of ethical, legal, regulatory, and environmental concerns. Prerequisite: admission to MBA or MS/IS Program.

P ACC 540. MANAGERIAL ACCOUNTING (3) Accounting concepts and issues from a managerial perspective. Prerequisite: P ACC 501.

P ACC 545. ADVANCED TOPICS IN MANAGERIAL ACCOUNTING (3) Current managerial accounting topics such as activity-based costing, theory of constraints, performance measures and their use in organizations. Prerequisite: P ACC 540.

P ACC 596. INDIVIDUAL STUDIES (1-9) Creative projects, including research and design, that are supervised on an individual basis and which fall outside the scope of formal courses.

P ACC 597. SPECIAL TOPICS (1-9) Formal courses given infrequently to explore, in depth, a comparatively narrow subject which may be topical or of special interest.

The Graduate Faculty
Parvez Ahmed, Ph.D. (Texas, Arlington) Assistant Professor of Finance
Melvin Blumberg, Ph.D. (Penn State) Professor of Management
Terence A. Brown, D.B.A. (Maryland) Associate Professor of Transportation and Marketing
Refik Culpan, Ph.D. (NYU) Professor of Management and International Business
Jacob De Rooy, Ph.D. (Rutgers) Associate Professor of Managerial Economics and Statistics
Krishna S. Dhir, Ph.D. (Colorado) Professor of Business Administration
Jean Harris, Ph.D. (Virginia Tech) Associate Professor of Professional Accountancy
Erdener Kaynak, Ph.D. (Cranfield) Professor of Marketing
Mukund S. Kulkarni, Ph.D. (Kentucky) Associate Professor of Finance
Ching-Chung Kuo, Ph.D. (Northwestern) Associate Professor of Operations Management
David A. Morand, Ph.D. (Cornell) Associate Professor of Management
Vedula N. Murti, Ph.D. (Pennsylvania) Assistant Professor of Economics and Statistics
Kurt H. Parkum, Ph.D. (Wisconsin) Associate Professor of Management
Parag C. Pendharkar, D.B.A. (Southern Illinois) Assistant Professor of Information Systems
Robert D. Russell, Ph.D. (Pittsburgh) Assistant Professor of Management
Stephen P. Schappe, Ph.D. (Ohio State) Associate Professor of Management
Girish Subramanian, Ph.D. (Temple) Associate Professor of Information Systems
Oranee Tawatnuntachai, Ph.D. (New Orleans) Assistant Professor of Finance
John M. Trussel, Ph.D. (George Washington) Assistant Professor of Professional Accountancy
Gayle J. Yaverbaum, Ph.D. (Temple) Associate Professor of Information Systems
Ugur Yucelt, Ph.D. (New School) Associate Professor of Marketing

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THE PROPOSED COURSE SEQUENCE

Because it is anticipated that a significant number of the applicants for the Off-campus program will come with degrees from fields other than business, such as engineering, the proposal is to offer the sequence of the six "Prerequisite" courses first, followed by the six courses designated as "Breadth." The final four courses, electives, will be offered based on the specific requirements of the cohort group. It is also possible that students will select electives which will require them taking the courses on-campus at Harrisburg. Until the cohort is established, and developed individual educational plans, no specificity can be provided on the electives to be offered at Lancaster. It is also quite possible that some electives may be taken at Great Valley, depending on the desire of individual students.

The precise sequence for the "Prerequisite" courses has not been established, except to note that MNGMT 522 and MRKT 520 have prerequisites themselves. Thus, ECNMS 510 and BUS 501 will be offered first, as they are the prerequisites noted here.

The "Breadth" courses can be offered in any sequence following the "Prerequisites," with the exception of BUS 588, which is designed to be offered late in the program. It is presently assumed that BUS 502 will be offered fairly early in the sequence, and that the stated alternative, BUS 554, will not be offered at Lancaster; students electing to take BUS 554, rather than BUS 502, will take BUS 554 at the Harrisburg campus.

THE DURATION OF THE PROGRAM

This request is for a single cohort of the program for an active program period of three years.

Some students in the cohort will have sufficient undergraduate credits in the appropriate business courses so that they will be waived from some, or all of the six prerequisite courses. But students who have an engineering background, for example, may very likely need all of the six courses. Until the educational background of each prospective member of the cohort has been analyzed (at open houses or orientation sessions), the total length of the program cannot be specified; it might be less than the requested three years.

ADMISSIONS AND ADVISEMENT

The plan is to conduct several open houses at the Lancaster Center. This is an identical practice to that employed for the Harrisburg location. All prospective students are advised at these meetings as to the adequacy of their undergraduate preparation, and the number of "prerequisite" courses that must be taken. All of the prospective MBA students who are advised in this pre-admission session receive materials which clearly indicate all the courses required to earn the MBA.

FULFILLING THE ESSENTIAL ELEMENTS OF RESIDENCY

Element: Interaction between faculty members and students

These students are already employed in related fields, and socialization of students to the profession field is not an issue. The use of threaded discussion groups will provide for interaction of students and faculty outside of the formal class sessions.
Electronic threaded discussions require that the students have a Penn State Access Account, as will the faculty. A course-specific discussion group is established in which faculty and students can asynchronously interact in discussing a course topic. The Penn State Harrisburg faculty are actively engaged in working with the current Penn State software which supports such discussion groups. This college, and several of the Business faculty, are beta-testing the new ANGEL software system, which is to be the Penn State standard in support of such activities.

The School of Business Administration is beginning to work on the inclusion of members of the advisory committee in the class environment; adding relevant members to the threaded on-line groups is feasible. This can also work to be inclusive of the part-time on-campus students at Harrisburg with the off-campus students at Lancaster.

Element: Interaction among students in a given program

The goal will be to establish interaction among the students in the Lancaster cohort through some out-of-class events. This has happened with the Adult Education doctoral students at Harrisburg who have often had pot-luck meals together before an evening class. In addition, every attempt will be to create interaction among the graduate students in all the School of Business Administration programs, adding the Lancaster cohort to on-going activities supported by the Graduate Business Alumni Society group active now at the Harrisburg campus.

The matter of access to research and library facilities will be addressed in a separate section following.

Element: Ready access to suitable academic advising and support service

Since this is a cohort-based program, academic advising will be in the hands of Professor Terry Brown, Director of the MBA Programs for the School of Business Administration. He will meet with students once a semester, but will be accessible via e-mail at any time. In addition, Ms. Tara Swartz, the staff assistant for the graduate programs, is available for advising assistance as she is for all the students.

Element: Contribution of graduate students to the degree program, the college, and the university

This is addressed in two ways. First, many of the courses are interactive in nature, so the students help frame the course within the guidelines of the syllabi. Second, the alumni group mentioned above is quite active in involving the current students with alumni at events throughout the year. The Lancaster-based graduate students also will be included in the activities of the Harrisburg Graduate Student Association.

Element: Identification with Penn State

First, the classes are in a Penn State facility. Second, the comment above addresses involvement as graduate students of Penn State and as future alumni.
PROVISION OF ACCESS TO TECHNOLOGY AND LIBRARY RESOURCES

Technology Resources

The Penn State Lancaster Center has adequate computer facilities. Not only has Great Valley offered courses there for many years, but Penn State Harrisburg has offered graduate business courses at that location now for two semesters and certificate (400-level credit) courses from the Master of Education in Training and Development for several years. Faculty have found the computer resources adequate for graduate-level instruction. It is likely that many of the students are going to use laptop computers which they will bring to class, and they will avail themselves of the Penn State software acquisition opportunities. The use of the Access Accounts has already been noted.

Library Resources

The Lancaster Center has some rudimentary elements of a library on-site. The computer facilities already noted, provide on-site access to the Penn State Libraries Website, with the multitude of databases. This has proven to be adequate for the Penn State Harrisburg graduate business courses offered to date.

Penn State Harrisburg has had a long relationship with the Harrisburg Area Community College (HACC), dating to the common years of founding of the two institutions. Both institutions are members of a library consortium ACLCP (Association of College Libraries of Central Pennsylvania), which offers reciprocal borrowing privileges and enhanced interlibrary loan access. HACC has recently opened a new campus in Lancaster, with a solid array of databases and reference resources. An analysis of the HACC databases was developed by Glenn McGuien, the business reference librarian at Penn State Harrisburg; a copy of that document is attached. The HACC librarian, Alice Lubret, and the Penn State Capital Colleges Librarian, Dr. Hal Shill, have completed a draft agreement enhancing the ACLCP arrangement. In brief, the plan calls for Penn State Capital College to purchase some reference materials for placement in the HACC Lancaster Library; HACC will make available to the Penn State MBA students access to the HACC databases; HACC will make space available when Mr. McGuigan does bibliographic instruction for the MBA students.

In summary, the Lancaster MBA cohort will have both the electronic access to the Penn State holdings and physical access to a library with significant resources located quite close to The Lancaster Center of Penn State.
Availability of Library Resources to Support MBA courses offered at the Lancaster Center through Capital College

This statement regards the availability of library technology and other resources for the Lancaster Center in the Fall of 2001.

Capital College MBA students at the Lancaster Center may use the resources of the Penn State University Libraries to support the coursework within the Penn State Capital College MBA program.

Library resources are available to students attending these courses at the Lancaster Center, either through remote connection via the LIAS databases or through the use of the Capital College Libraries or other libraries within the Penn State University Libraries. Enrolled Penn State students have access to ABI via Proquest, which contains many full text articles. Students may access Proquest remotely from a networked computer at home or at any of the Penn State campuses. As the Penn State Harrisburg – Capital College Business Reference Librarian, I am available for reference consultation by email or phone. In addition, I am available to travel to Lancaster Center to provide course related library instruction.

Resources and services available to MBA students include:

1. University-Wide Borrowing Privileges -- Enrolled students possess library-borrowing privileges from any Penn State campus. This includes the ability to receive books and materials, such as journal articles, through intercampus and interlibrary loan. These materials may be picked up at either the Penn State Harrisburg Library or another Penn State library such as the Penn State York Library.

2. Database Access -- Most of the proprietary business databases are available to Penn State University students from home computers as well as from Penn State University machines located within computer labs or library locations. Reaching an unprecedented level, Penn State University Libraries provides access to over 200 subscription databases. Within this group, the collection of electronic resources supporting research in the subject areas of business administration and information systems is particularly strong and continues to grow. Many new business databases have been added to the Library Information Access System (LIAS) collection of databases. A large number of these databases provide access to full-text articles. At present 68% of the business print journals in the Penn State Harrisburg Library collection are available through databases. Most of these full text articles are those published in recent years.

3. Library Instruction -- Library orientation and instruction may be provided by the Capital College Business Reference Librarian either at the Penn State Harrisburg Library or at the Lancaster Center.
5. Electronic Reference Materials – Many of the standard business reference materials are now available through proprietary databases subscribed through the University Libraries. (Other selected materials are available free on the WWW). These reference materials available electronically include:


Hoover's Online – Includes proprietary company information found in Hoover's Handbooks.

Occupational Outlook Handbook (WWW)

Thomas Register (WWW)

Statistical Universe (Includes Statistical Abstract of the United States)

4. Electronic Reserves – E-reserves are available to teaching faculty to post on a server for course use. The new library management system will make this process easier for faculty to undertake.
Dear Hal,

The HAAC Library provides access to a rich collection of electronic business resources that would serve most of the research needs of the MBA curriculum adequately. Upon examining them, I was very surprised at the depth of the business periodical databases. While HACC does not have the diversity of the business resources that we possess at Penn State, their electronic collections are strong.

The following business databases are available at/through HAAC:

1. Business Source Elite (EBSCOHost) -- The main competitor to ABI Inform (Proquest). A large business database that eclipses ABI in number of titles indexed. While our subscription to ABI provides access to 1,000 journal titles, this resource delivers access to abstracts and articles for "1,570+ business journals with full-text of approximately 1,140 (73%) of the titles indexed." I recently attended a demonstration of this product at UP and was impressed.

2. ABI Inform Select -- A stripped down version of ABI Inform that provides access to 380 business periodicals.

3. Business Module (Proquest) -- "Abstracts and articles from 288 periodicals relating to business and economics" -- 80% of the titles are full-text.

4. Lexis Nexis Business -- Company and Industry Information. A weaker substitute for our company databases like FIS Online, Disclosure and S&P Net Advantate -- but adequate in that it does provide company information from SEC filings (although the information is not formatted well -- it is just screens of ascii text).

In summary, I do not think that it would be necessary to get into negotiations with University Libraries to deliver access to LIAS databases through HAAC considering the scope of their resources. While all of the business databases of Penn State are available remotely to authorized users -- this does not address the issues of library services such as reserve access, librarian services and in addition, on-site database use. The HAAC resources are strong and would serve the research needs of most of the courses within the MBA program adequately.

Glenn

At 09:28 PM 10/1/01 -0400, Harold B. Shill wrote:
October 23, 2001

Dr. Howard G. Sachs
Penn State Harrisburg
777 W. Harrisburg Pike
Middletown, PA 17057

Dear Howard:

Having reviewed the proposal to extend the Harrisburg MBA to the Lancaster Center over the next two years, Great Valley strongly endorses the plan to serve potential graduate students in this service area. Reasons for this support are outlined below.

1. This expansion of the Harrisburg program will protect the long-term investment in time and money that Penn State has made in the Lancaster Center over the past ten years.

2. This program will also serve the potential graduate students in this growing economic region where there is a lack of graduate education opportunities.

3. As Great Valley pursues its AACSB accreditation, we appreciate the collaborative efforts between our two locations and the fact that Harrisburg will be able to serve the students who we are currently unable to serve.

In the long run, we will work with the Harrisburg Campus to determine the needs in Lancaster beyond the two-year extension they are seeking. We would be particularly interested, as described in the proposal, in offering electives toward a full-featured MBA in that area.

Please contact me if you need additional information related to our support of this proposal.

Sincerely,

Eva J. Pell

Eva J. Pell
Date: October 30, 2001
From: Madlyn Hannum, Provost and Dean
To: Graduate Council Programs and Course Committees
Re: Proposed MBA at Lancaster Center

I am pleased to propose the offering of Capital College's accredited MBA at the Lancaster Center. Approving this proposal will keep Penn State in the Lancaster market for post-baccalaureate business education. Our college agreed to work collaboratively with Great Valley in maintaining the University presence. We have proposed a cohort-based program with one cohort. After we have begun this program, and after Great Valley moves closer to accreditation, we anticipate working with Great Valley to continue to meet the region's needs for a Penn State MBA with a joint plan from the two graduate units.
October 23, 2001

Dr. Howard G. Sachs  
Penn State Harrisburg  
777 W. Harrisburg Pike  
Middletown, PA 17057

Dear Howard:

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Please contact me if you need additional information related to our support of this proposal.

Sincerely,

Eva J. Pell
Dear Mary,

The Smeal College has reviewed the proposal to extend the Harrisburg MBA program to the Lancaster Center. We support this extension to the Lancaster area. The proposed cohort program should serve the needs of potential students in that market.

Please don’t hesitate to contact me if you have additional questions.

Sincerely,

Judy Olian

[Attached file: jolian1.vcf]
COMMITTEE ON PROGRAMS AND COURSES
Inter-Office Correspondence

Date: November 1, 2001
To: Terence Brown

The action noted below has been taken on the proposed program submitted by your department. If you have questions this proposal, please contact Mark Wardell, Chair of the Committee on Programs and Courses, at 814-865-5425. Responses should be sent directly to the Dean's Office, Graduate School, 114 Kern Building.

Program Title:
Proposal to Offer the M.B.A. in Business Administration to the Lancaster Center
(from Penn State Harrisburg)

The Committee reviewed the proposal to offer the M.B.A. degree in Lancaster. The Committee asks the proposers to provide some additional clarification of several items:

* A program proposal coversheet needs to be included with the proposal.
* Will only one co-hort be admitted for the two-year program or will the program be admitting a new co-hort each fall semester?
* Are letters of recommendation optional or required? It indicates under the "admissions requirements" that students are "required" to submit the following; however, bullet four indicates that recommendation letters are optional. Please clarify. Most graduate programs required letters.
* Please clarify (for prospective students) that 30 credits are required for the M.B.A. beyond the 18 credits of prerequisite courses. The Committee is concerned that interested students will not be aware of possible hidden costs such as tuition required for the prerequisite courses and possible travel to Penn State Harrisburg, etc.
* The proposal indicates that no more than five courses will be offered in a given year. How will students be able to complete the program in two years if prerequisite courses are needed prior to taking the required core courses?
* Under "Fulfilling the Essential Elements of Residency," provide clarification on how the program plans to implement the "threaded" discussions to include how students will access the on-line groups.
* One minor editorial change is needed on page 12, first paragraph; last sentence: students also will be included in the activities. . . "not "including."

The proposal will be held pending a response.

c: Senate Office
Dean of Sponsoring College
Chair, Subcommittee on New and Revised Programs and Courses
Chair, Committee on Programs and Courses
Proposed Revisions to Graduate Council Policies Related to Extended and Off-Campus Graduate Degree Programs and Graduate Courses

Background and Justification

The increasing popularity of the online education environment requires that Penn State move forward with offerings while remaining focused on quality. Federal student aid offerings are restricted based upon the nature of the courses (e.g., distance education versus correspondence).

The Committee on Academic Standards has reviewed the following policies/procedures and has approved revisions (noted in each document) to existing standards to reflect terms and criteria in the Federal Register, as well as other logical and logistical updates to both language (especially with regard to technology) and process. The proposed revisions ensure that the Graduate Council definitions of 500- and 800-level courses and other policies that pertain to online education at the graduate level comply with Federal financial aid guidelines and current best practices.

Note that the hyperlinks below will lead to the current version of the policy online; the appendix notations refer to the portion of the Graduate Council agenda materials in which the proposed revisions to the policy/form are located (each document contains the current policy with proposed changes tracked).

- Graduate Council definitions of 500- and 800-level Courses—Appendix L1
- Guidelines for Submitting Proposals for Extended and Off-campus Graduate Degree Programs—Appendix L2
- Residency and Related Policies for Off-campus Graduate Programs—Appendix L3
- Expedited Review Process of Limited Off-site Course Offerings—Appendix L4

One additional revision proposed by the Committee on Academic Standards in the “Guidelines for Submitting Proposals for Extended and Off-campus Graduate Degree Programs,” to correct an inconsistency in the process, relates to program change proposals for off-site (including online) delivery (i.e., to a non-Penn State location). In general, these undergo an expedited curricular review (review by the Committee on Programs and Courses only), but historically, program change proposals to extend existing programs to other Penn State locations have been required to undergo full review (review by the Subcommittee on New and Revised Programs and Courses, the Committee on Programs and Courses, and Graduate Council). The Committee believes that proposals to extend existing programs to other Penn State locations also should undergo the expedited, rather than full, review process, and has revised the policy accordingly.
Graduate Council definitions of 500- and 800-level courses

From the Graduate Bulletin:

http://bulletins.psu.edu/graduate/academicprocedures/procedures4

“Graduate Credits

Typically, a candidate for an advanced degree is required to earn a certain minimum number of credits at Penn State. Consequently, there is a limit to the number of credits that may be earned at another approved institution to meet the minimum requirements of the degree. Moreover, the department or committee in charge of a major program may require a student to do more of the work at the University than specified by the limitations set by the Graduate Faculty.

Full-time participation in graduate study involves a wide range of activities. The nature of these activities varies because of the diversity of programs throughout the University. The graduate student is responsible for ascertaining, through the adviser and/or program office, the range of total activity of his or her individual program that constitutes normal progress toward the degree.

A self-supported or fellowship student who is registered for at least 9 credits is considered to be engaged in full-time academic work for that semester. If such a student wishes to register for more than 15 credits, an exception to the normal maximum load must be granted through petition (with adviser’s approval) to the Office of Graduate Enrollment Services.

Credit limits and full-time status for assistants and University employees are described under Assistantships and Credit Loads and Academic Status.

Graduate courses carry numbers from 500 to 599 and 800 to 899.

--A 500-level graduate course builds on advanced undergraduate and/or graduate courses, dealing with the frontiers of knowledge in the field. It is grounded in theories, hypotheses, and methodologies as expounded in current and/or primary literature sources. Synthesis of knowledge and independent analytical work by the student must be demonstrated. Significant and regular instructor-initiated interaction among between students and with the instructor(s) is expectedshould occur in all 500-level courses, whether delivered in residence or at a distance, including online.

--An 800-level graduate course pertains to the most recently established knowledge and methodologies in a field of study, as applied to practice. It emphasizes analytical thinking and application of knowledge by the student in the context of providing pragmatic solutions for professionals. Significant and regular instructor-initiated interaction among between students and with the instructor(s) is expectedshould occur in all 800-level courses, whether delivered in residence or at a distance, including online.
Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. Language courses used to meet foreign language requirements are exceptions, as are the ESL courses for international students.

…”
GUIDELINES FOR SUBMITTING PROPOSALS FOR EXTENDED AND OFF-CAMPUS GRADUATE DEGREE PROGRAMS*

Approved by the Graduate Council, February 2004

Revised by Graduate Council, [date?]

INTRODUCTION

The intent of this document is to establish outline guidelines and procedures by which a department or other academic unit may obtain approval to offer new extended** or new off-campus*** graduate degree programs that are either extended* or off-campus**, or for approval to offer extended or off-campus delivery of existing graduate degree programs to different locations and on different schedules to accommodate local demands. When proposing such extended or off-campus delivery of existing programs*** (with no changes to the program otherwise), the following information must be provided to and will be assessed by the Graduate Council Committee on Programs and Courses of the Graduate Council. For such delivery of new programs, review will be through the full Graduate Council curricular review process (http://www.gradsch.psu.edu/index.cfm/policies/faculty/gccurrrevprocoverviewpdf/).

*Extended graduate degree programs are those that are extended from the University Park campus or other approved graduate center (Behrend College, Great Valley School of Graduate Professional Studies, Capital College, College of Medicine) to another University location.

**Off-campus degree programs are those offered at a non-University location (e.g., World Campus, corporate facility, school district, etc.), which includes both programs delivered in a traditional face-to-face format and those delivered at a distance.

***To determine whether a program change proposal is necessary, consider the following: delivery of any graduate (500- and 800-level) course to students at an off-campus location, either in face-to-face instruction or through distance delivery technologies, requires academic approval as noted below.
Up to three existing graduate courses may be offered to students at an off-campus location with approval from the chair of the Graduate Council Committee on Programs and Courses and the Dean of the Graduate School through an expedited process; see guidelines and request form for the Expedited Review Process of Limited Off-Site Course Offerings and the related form to request approval are available at http://www.gradsch.psu.edu/policies/faculty/poer.html.

Approval to offer four existing graduate courses up to half of the course credits required for completion of the degree to students at an off-campus location requires submission of a program change proposal by the graduate program to offer a hybrid program.

Approval to offer more than half of the course credits required for completion of the degree to students at an off-campus location requires submission of a program change proposal by the graduate program to offer the degree program off-site.

Note - These guidelines document should be used in concert with "Residency and Related Policies for Off-Campus Graduate Programs," available from the Graduate School office in 114 Kern Graduate Building.

1. Common Requirements for New Extended or New Off-Campus Degree Programs and Extended or Off-Campus Delivery of Existing Degree Programs:
   A. A justification statement including: 1) the evidence of need-demand for the program in the new location, with market survey data if appropriate; 2) the projected size of the program and its anticipated duration; 3) evidence concerning the academic unit's ability to offer a quality program in an off-campus environment; duration; 3) evidence concerning the academic unit's ability to offer a quality program in an off-campus environment; 4) a statement demonstrating the impact of the proposed new program or off-campus delivery of an existing program on other existing programs (undergraduate and graduate) offered by the academic unit (and in particular, on faculty load), as well as on programs offered by other units (as well as on faculty load); and 5) a statement indicating fiscal responsibility for the program.
   B. A program description statement in a format for the Graduate Bulletin copy which includes the following: 1) a statement of admission requirements, e.g., standardized test scores, GPA, recommendations, etc. (Note - Admissions criteria for off-campus degree programs must be the same as those for the same degree program offered to students in residence); 2) complete degree requirements; 23) a list of required courses, and 3) a statement of admissions requirements, e.g., test scores, GPA, etc. Admissions criteria for off-campus degree programs must be the same as those for traditional degree programs. In addition, a description of the course sequence and typical scheduling pattern should be provided, but need not be in Bulletin format as part of the Bulletin description. For proposals involving off-campus delivery of existing degree programs, if any
revisions—changes to admission or degree requirements—are being proposed due to as a result of off-campus delivery, a side-by-side comparison of the existing program requirements and the revised requirements must be provided along with a statement justifying all proposed revisions; such proposals will undergo the full Graduate Council curricular review process.

C. A statement demonstrating how the essential elements of residency (as defined in "Residency and Related Policies for Off-Campus Graduate Programs") will be achieved for off-campus programs. Three years after program inception a report must be made to the Graduate Council's Committee on Programs and Courses which provides evidence concerning how the essential elements of residency have actually been incorporated into the program and demonstrates that high-quality graduate education has been delivered in the off-campus program. During this three-year period, the Graduate School is charged with monitoring program delivery and quality. (See Reporting Checklist for Programs Approved to be Offered Off-site/Online.)

D. Program operation and maintenance including: 1) identification of a program coordinator-director who must be a member of the graduate faculty in the academic unit offering the degree; 2) evidence of how academic advising, counseling, and learning support will be provided to students; 3) description of available facilities including research facilities, libraries, technological resources, etc.; and 4) a statement regarding any technological resources and related specifications which students will be expected to have (e.g., access to a computer/laptop and specifications for operating system, camera, etc.; Internet access specifications; VCR, etc.).

E. Written responses indicating consultation with other units affected by or that potentially would have interest in the proposed program. In addition, if the program is to be offered on-line or use technology as the primary delivery method to serve off-campus students, the World Campus should be consulted at the earliest possible stage of program development and a letter of consultation must be provided from the World Campus Director of Academic Affairs for Graduate Programs, the World Campus.

F. Off-campus programs must incorporate a mechanism for assessing program quality through student surveys for feedback at critical milestones in the program as well as a student exit questionnaire at the time of graduation.

2. Additional Requirements for New Extended or New Off-Campus Degree Programs

A. Objectives of the program including: 1) an explanation of how the new program meets the educational objectives and/or strengthens existing programs of the college(s) and the University; 2) an explanation of why this program is appropriate for off-campus delivery; 3) a description of what students may expect to accomplish through the new program; and 4) a statement of how the new offering does not unnecessarily duplicate other degree programs.

B. A list of new courses to be established as a part of the new degree program.
3. Additional Requirements for Online Graduate Courses and Graduate Degree Programs, and Blended Graduate Courses, and Hybrid Graduate Degree Programs

Information technology available in the 21st century has presented higher education with a host of new educational opportunities. Accompanying them, however, has also come a host of potential issues. Key among them is the issue of maintaining a high standard of faculty-instructor-student engagement in graduate education. In determining the standards for faculty-instructor-student engagement, a number of factors need to be taken into account.

- Technology-enhanced graduate education can come in many forms, such as: resident courses supplemented by information technology applications; blended learning formats that involve some resident students and some online students in the same “classroom”; completely online courses.
- Online education does not necessarily mean asynchronous and self-paced learning, or the absence of instructor-student interaction.
- While technology provides a myriad of opportunities to enhance education, it is up to the professor-instructor and standards groups to choose the best way to deploy the technology.

Hence, there are a variety of ways to maintain student engagement.

A. For students enrolled in off-campus degree programs, and eligible for and seeking federal financial aid, the Federal Register requires “significant instructor-initiated interaction” for online courses to qualify as distance education (versus correspondence courses), including online courses. Online course proposals that involve distance-delivery of courses should describe the kinds of instructor-initiated interaction that will occur in each course, including: mode of communication, frequency of communication, and expectations for student responses. Proposals should describe all student course deliverables and graded artifacts for the course. The proposals should also describe any special considerations needed in order to comply with the Americans with Disabilities Act (for example, audio or video content or interactive Web content).

*These guidelines supersede and replace Guidelines and Procedures for the Approval of Extended Degree Graduate Programs (approved by the Graduate Council, December 1997).
**Extended degree programs are those that are extended from the University Park campus or one of the other approved graduate centers (Behrend College, Great Valley School of Graduate Professional Studies, Capital College, College of Medicine) to another University location.
***Off-campus degree programs are those offered at a non-University location (e.g., World Campus, corporate facility, school district, etc.). Delivery of a graduate (500- and 800-level)

students at an off-campus location, either in face-to-face instruction or through distance
delivery technologies. Up to three existing graduate courses to students at an location
through an expedited process for the and the related form to request approval Approval for
existing graduate

The following documents provide further relevant information relevant to Residency and
Related Policies for Extended or Off Campus Degree Programs:
Graduate Degree Programs Bulletin
Articles of Authority, Bylaws, and Standing Rules of the Graduate Council (September 1995)
The Graduate Faculty: Membership Criteria, Responsibilities, and Methods of Appointment
Senate Guide to Curricular Procedures
The Graduate Faculty: Membership Criteria, Responsibilities, and Methods of Appointment
Student Guide to University POLICIES AND RULES 1997-98
Academic and Administrative
Policies and Procedures
Policy AD55 Role of the Department of Distance Education/World Campus
Policy AD20 Computer and Network Security
Policy AD47 – General Standards of Professional Ethics
Policy IP02AD48 – Co-Authorship of Scholarly Reports, Papers, and Publications
Human Resources Policy HR-36 – Educational Privileges for Faculty, Staff and Retirees

FULFILLING THE ESSENTIAL ELEMENTS OF
RESIDENCY IN OFF-CAMPUS GRADUATE DEGREE
PROGRAMS

The intent of this document is to encourage creative ways of addressing student and community
needs in off-campus graduate degree programs, while ensuring that such graduate degree
programs maintain academic standards parallel to those of more traditional programs. For the
seven essential elements of residency, alternative techniques and technologies are suggested as
ways of providing in off-campus graduate degree programs benefits comparable to traditional
residency.

A glossary of terms related to e-learning and distance education is available through the World
Campus web site appended.

Fulfilling Objectives of Residency in Off-Campus Professional
Master's Degree Programs

Element 1: Interaction between faculty members and students above
and beyond direct instruction

The objectives of out-of-class interaction include socializing students to their professional fields,
providing a broad exposure to developments in the disciplines, supporting the students in their
academic programs and career and professional development, and building a community of scholars and professionals. On campus, these objectives are typically met through advising sessions with faculty members and through participation in a variety of informal and formal events in which students and faculty can share ideas and experiences.

Techniques for achieving interaction include

Mentoring, academic counseling, and career counseling. Faculty members can offer one-to-one advice and counsel on a range of academic and professional issues beyond the scope of a specific course. Advisers can provide academic and career-related counseling.

Off-campus example: Mentoring and counseling can be conducted via a variety of means assisted by technology, including telephone, and/or electronic mail, audioconference, or online videoconference. If a course uses interactive video, the faculty member can arrange for the video connection to remain open after class to permit video-based office hours.

Open discussions. Faculty members can arrange for open discussion of ideas and issues related to the professional field but not limited to specific course content. Discussions can be moderated or unmoderated.

Off-campus example: Open discussions can be conducted in a real-time chat areas on-line or as a threaded (topic-specific) discussions using via online a computer conferencing applications or social media or electronic bulletin board. They can also be conducted via audioconference or structured as additions to videoconferences, for example.

Non-class lectures and seminars. Lectures and departmental or interdepartmental seminars presented by other faculty members or visiting scholars offer students opportunities to interact with faculty representing a range of knowledge and perspectives.

Off-campus example: Technology-assisted Computer conferencing via a variety of means (e.g., audiconference, videoconference, podcast) on the World Wide Web in cyberspace allows faculty members to provide off-campus students opportunities to interact with specialists from either the campus or around the world. The guest speaker can provide an advance set of readings for discussion or make an on-line presentation, then be available to answer questions or participate in on-line discussions over a period of several days.

Element 2: Interaction between peers (i.e., among students in a given program)

The primary objective of interaction among students in a given program is to permit students to share and benefit from the diverse social and educational experiences other students bring into the program. In a resident program the students are able to benefit socially and educationally from interaction and shared experiences in classes as well as other activities, including student- and campus-sponsored events and organizations. Resident students also have the advantage of
exposure to interaction with students in other disciplines on campus through classes and campus events.

**Techniques for achieving this type of interaction include**

**Collaborative work groups.** Group or team projects allow students to pool their varied knowledge, skills, and experiences in solving a content-based problem or in developing a course-specific project. Collaborative groups can be monitored or facilitated by a faculty member or graduate teaching assistant.

*Off-campus example:* Computer conference systems can be used to connect and support real-time or delayed-time synchronous or asynchronous group collaboration on case-study preparation, project development, class presentations, etc. Audioconferencing, for example, can connect students at different sites for real-time development and presentation of a variety of collaborative projects including debates and panel presentations.

**Peer counseling.** Senior graduate students can provide advice on academic issues such as preparation for exams and administrative procedures. They can also provide important support for less-experienced students by offering encouragement and advice relating to the challenges of juggling multiple roles and responsibilities.

*Off-campus example:* A variety of technology-assisted media can provide students in a program with real-time or delayed-time synchronous or asynchronous opportunities to interact with other students who have successfully coped with a variety of graduate student experiences. Interactions can also be scheduled via telephone conversations.

**Discipline-based student clubs and inter-disciplinary social organizations.** Student clubs give graduate students in a particular field of study an opportunity to meet and mix with peers who share similar academic interests and goals. Organizations that include graduate students from a range of disciplines offer a chance to socialize or otherwise interact with peers representing a variety of backgrounds and experiences.

*Off-campus example:* Students can use technology to form computer-mediated chat-discussion groups based on mutual interests, whether academic or social. Electronic bulletin boards can support the exchange of information among students interested in a particular area of study or in a particular hobby or pastime.

**Element 3: Access to information and instructional resources (such as libraries, laboratories, and research facilities)**

The objective of providing access to information and instructional resources is to expand the educational experiences afforded to the students beyond what can be provided by instructors. For most resident students, this provision can be assumed since graduate programs are
Generally structured around information resources available on the campus on which the program originates.

**Techniques for achieving this access include**

**Providing access to content experts other than the program's instructors.** Inviting guest lecturers to a class or outside experts to campus to offer seminars or workshops enriches the learning experience by providing other perspectives on or extended knowledge of topics or subject areas.

*Off-campus example:* A variety of means assisted by technology, such as videoconferencing, for example. Video teleconferencing, audioconferencing, and computer conferencing all offer ways to connect students directly to extra-institutional content experts. On-line seminars and workshops with experts around the world, structured and facilitated by the instructor, greatly expand the geographic range from which these experts can be drawn.

**Providing access to a broad range of discipline-specific and interdisciplinary resources.** Libraries and other repositories of information complement the information and knowledge provided in the classroom. From these and other sources students gather the raw materials they need to develop a personal knowledge base and a coherent approach to their field of study.

*Off-campus example:* DVD/CD-ROMs, on-line searches, and electronic connections to library and other data collections offer access to vast collections of data and information. Course Home Pages can offer course-specific resources or direct students to related sources of information. Students can combine these resources with others available on-site and with course content to enhance learning and expand their knowledge base.

**Providing access to research facilities.** Research projects introduce students to the ways in which knowledge in their fields is constructed and validated. The research process gives students a way to participate in the discovery of new knowledge and opportunities to integrate what is learned in the classroom with what is learned empirically.

*Off-campus example:* Often students in off-campus programs are pursuing professional master’s degrees in a field in which they are currently employed. In such cases, their work environment offers opportunities for both conducting original research and for putting the results of that research into practice. Such "situated" research and practice provides an excellent way for students to integrate classroom knowledge with new knowledge gained from research and practice.

**Element 4: Exposure to and socialization in the field of study**

The objective of exposure to and socialization in the field of study is to provide students with a range of educational experiences that introduce them to the language and issues of their disciplines. Seminar series, workshops, research exhibitions, discussions with professional peers, informal departmental activities, and other shared experiences serve this purpose for resident students.
Techniques for achieving this socialization include

**Seminars.** Seminars can introduce students to current issues of research and/or practice and provide a forum for interaction with colleagues within the student's field.

*Off-campus example:* Small groups of peers can use a variety of means assisted by technology, computer conferencing or audio conferencing, to discuss a seminar topic introduced by an outside expert or a member of the group. Discussion can be real-time or, in the case of computer conferencing, carried out over a period of days.

**Skill-enhancement workshops.** Workshops on specific aspects of professional practice, such as writing for publication or designing effective conference presentations, offer students opportunities to build skills necessary to actively contribute to their fields.

*Off-campus example:* Faculty or practicing professionals can present skills workshops via a variety of means assisted by technology, including audioconference, videoconference, or the World Wide Web, podcasts, for example. Depending on the requirements of the content, both presentation and interaction can be either real-time or delayed synchronous or asynchronous.

**Research displays.** Exhibitions or displays of in-process or completed research allow students to get an overview of the types and areas of investigation being conducted in their fields. These activities can facilitate networking with those who share students' research interests or suggest possible directions for personal research.

*Off-campus example:* Students can develop multi-media "poster-sessions" of their research for display via the World Wide Web in cyberspace. They can also view the results of others' research and react to/discuss the displays over a period of days or weeks via e-mail.

**Discussions with professional peers.** Discussion with peers at conferences or other meetings of discipline-related professional groups allows students to exchange ideas and network with practicing professionals in their fields.

*Off-campus example:* Off-campus students can be encouraged to participate in regional and/or national conferences and professional society meetings in their geographic areas. Additionally, faculty members can structure and facilitate student participation in the on-line pre- and post-conference discussions that are being incorporated into academic conferences.

**Element 5: Ready access to suitable academic advising and support services**

The objective of ready access to suitable academic advising and support services is to ensure that students are receiving the guidance and personal support required to complete their programs in a
successful and timely manner. Resident students can take advantage of their presence on campus to schedule meetings with program academic advisers or career counselors, if necessary.

Techniques for achieving this support include

**Meetings with an academic adviser or student support staff.** Academic advisers offer guidance in establishing and completing a course of study that reflects a student's academic goals. Faculty members or student support staff can notify students of and explain departmental and institutional policies that govern advanced academic programs.

*Off-campus example:* Faculty or staff advisers can conduct individual academic counseling sessions via telephone or electronic mail, a variety of means assisted by technology (audioconference, videoconference, social media, etc.). General policies and procedures should be posted on program websites electronically for access at the student's convenience, and support related to administrative functions (registration, payments, grades, etc.) should be available online as well as provided by telephone or e-mail. The faculty member with general responsibility for the off-campus program should be available by telephone or e-mail during specified “office hours” to answer questions or direct students to the right source of information about broader issues relating to a student's program.

**Meetings with a career counselor.** Career counselors provide advice relating to entry into or advancement in fields related to the student's course of study.

*Off-campus example:* Students at remote sites can meet with career counselors in a variety of ways assisted by technology, including via telephone, or electronic mail. Small groups of students at remote sites also can be offered audio or videoconferencing sessions with a counselor. General information such as position listings, information for developing resumes, tips for job interviews, etc., should be posted on program websites for and accessed at the students’ convenience electronically.

**Element 6: Contribution of graduate students to the degree program, the college, and the University**

The objective of contributions from graduate students of diverse backgrounds is to share the social and educational experiences students bring into the program, the college, and the University to the benefit of other students, faculty, and the University overall. In a resident program this is made possible through interactions of students, faculty, and other University personnel in classes and other formal and informal events.

Techniques for facilitating student contributions include

**Introduction of new students.** Programs use a variety of methods to introduce new students to returning students and to faculty members. "Veteran" students can interview new students in order to identify perspectives and contributions that these students bring to the program or to the
university as a whole. This personal and professional information can then be disseminated via bulletin boards and newsletters, the program’s informational materials.

Off-campus example: Program or departmental newsletters with new-student information can be disseminated traditionally (i.e., via the postal system) or sent electronically to students and faculty via a variety of technology-assisted means. Programs may also develop Web pages that include information about the professional interests and contributions of both new and continuing students, and students can develop personal Web pages or social media sites on which to share information about themselves.

Informal Seminars. Many graduate students in professional degree programs bring with them considerable knowledge and experience gained through real-world practice. Informal seminars offer opportunities to exchange knowledge and engage in peer networking around topics of mutual professional interest.

Off-campus example: Technology allows audioconferences and videoconferences to conduct real-time presentation and discussion of perspectives gained through previous educational experiences or in professional practice. Computer conferencing services can support an asynchronous seminar format, with new students posting information and then responding to queries or facilitating related discussions.

Element 7: Identification with Penn State

The objective of identification with Penn State is to provide students with a unique educational experience that reflects the history, reputation, personnel, and resources of Penn State. In resident programs, this objective is met by students’ presence on a Penn State campus or campuses and exposure to Penn State traditions.

Techniques for achieving this identification include

Formation of connections through initial and continuing communications. Official correspondence from the program or the University can establish a sense of institutional identification through welcoming messages and communications of interest about Penn State.

Off-campus example: Like their on-campus counterparts, off-campus students receive official communications that establish their relationship with a department and with the University. Prominent display of Penn State logos and other identifying symbols on all communications, including course materials, can help establish a student’s identity as a Penn Stater. Small "gifts" such as Penn State bumper stickers or folders can be useful in establishing a positive feeling toward the institution, as well as giving off-campus students a way to display their institutional affiliation. All Penn State students routinely are assigned off-campus computer accounts, which will ensure that off-campus students are able to interact electronically with the University and its resources.
Formation and maintenance of connections through University publications. General University and department-specific publications can be used to keep students informed about people, activities, policies and procedures, etc.

Off-campus example: Off-campus students can access receive appropriate University publications online via land mail. Some publications, including the student-published newspaper the Daily Collegian, are available online and provide informative and entertaining ways of establishing a sense of identification with the University. Programs comprising primarily or completely entirely of off-campus students can develop print and/or electronic online materials publications specifically designed to foster a sense of inclusion in and connection to the sponsoring department and the University.

Formation and maintenance of relationships with the Penn State chapter of academic or professional societies. Membership in academic and professional groups fosters a sense of identification both with a larger community of scholars and/or practitioners and with those who have shared or are currently sharing a common academic experience.

Off-campus example: Students can be informed of and encouraged to join appropriate academic and professional societies. Off-campus students can receive find information about the availability and location of chapters in their geographic area via land mail or electronically online. Programs can also establish a mentoring system whereby Penn State graduates are matched up with current off-campus students in their geographic region for the purpose of helping them connect to local University and professional activities.

Glossary of Distance Education Terms and Technologies

Asynchronous communication. An interaction between two or more people that is time delayed, that is, separated by minutes, hours, even days. Correspondence and e-mail are asynchronous forms of communication.

Audioconference. Expanding on the idea of the conference call by more formally integrating elements of course design, content, and delivery, instructors can use this telephone technology for the interactive delivery of course content, to provide access to distant experts, and for ongoing collaboration.

Audiographic technology. Combining the telephone and the computer creates a distance learning application called audiographics. In this environment the telephone is used for voice interaction and the computer is used for sharing graphic materials and for collaborative work.

Computer conferencing. Interactive computer-based communication environments can be real-time "chat" modes where participants interact simultaneously by typing their comments on the keyboard or modes where messages are posted to electronic bulletin boards to be retrieved at the reader's convenience.

E-mail. E-mail or electronic mail allows learners and instructors to communicate across time and distance using typed messages sent over both local and global computer networks. Connectivity
to networks is provided by either a modem and telephone line or a direct connection to high speed data networks.

**Internet.** A world-wide network of over four million computers that can communicate with each other at high speed by using the same communication method.

**Multi-media.** A combination of audio, video, and/or computer technologies that provide a fuller range of expression and experience.

**On line.** Being in direct communication to a remote computer or computer system, thus enabling communication and/or transfer or exchange of information.

**Synchronous communication.** An interaction between individuals or groups that occurs in "real-time," that is, with no appreciable delay between the end on one message and the beginning of another. Face-to-face and telephone conversations are synchronous.

**Teleconferencing.** Planned and focused interactive communication (e.g., business meetings, educational coursework, or training seminars) through an electronic medium such as the telephone, fiber-optic cable, or the computer.

**Videoconference.** Videoconference systems provide synchronous video and audio communications between learners and instructors who are not in the same location. All sites in a two-way video system are equipped with cameras, monitors, and microphones, thus enabling instructors and learners to see and hear each other and to exchange a range of information and materials.

**Virtual library resources.** Just as the campus library provides an expansive repository of indexed information for residential students, virtual libraries are beginning to offer seamlessly integrated voice, video, and data resources for the distance learner. Learners and instructors can access such repositories at times and places convenient to themselves, and can easily integrate information from these resources into their own customized information databases and libraries.

**Website.** A location on the World Wide Web that is accessed by instructing the computer to find and connect to the site's specific Internet address, known as its URL (Universal Resource Locator). Websites are repositories of information about a specific topic, institution or organization, person, product, field, etc.

**World Wide Web (also WWW and the Web).** A virtual library of video, audio, and textual data and information stored on the computers of the Internet. This data is accessible to anyone with a reasonably modern personal computer, a way of connecting to the Internet (through a private or institutional service provider), and a computer application program or software designed to allow you to explore this resource.

*Approved by Graduate Council, February 2004*

*Revised by Graduate Council, September 2013*
GUIDELINES FOR SUBMITTING PROPOSALS FOR EXTENDED AND OFF-CAMPUS GRADUATE DEGREE PROGRAMS

INTRODUCTION

The intent of this document is to outline guidelines and procedures by which a department or other academic unit may obtain approval to offer new graduate degree programs that are either extended* or off-campus**, or approval to offer extended or off-campus delivery of existing graduate degree programs to different locations and on different schedules to accommodate local demands. When proposing such extended or off-campus delivery of existing programs***(with no changes to the program otherwise), the following information must be provided to and will be assessed by the Graduate Council Committee on Programs and Courses. For such delivery of new programs, review will be through the full Graduate Council curricular review process (http://www.gradsch.psu.edu/index.cfm/policies/faculty/gccurrrevprocoverviewpdf/).

*Extended graduate degree programs are those that are extended from the University Park campus or other approved graduate center (Behrend College, Great Valley School of Graduate Professional Studies, Capital College, College of Medicine) to another University location.

**Off-campus degree programs are those offered at a non-University location (e.g., World Campus, corporate facility, school district, etc.), which includes both programs delivered in a traditional face-to-face format and those delivered at a distance.

***To determine whether a program change proposal is necessary, consider the following: delivery of any graduate (500- and 800-level) course to students at an off-campus location, either in face-to-face instruction or through distance delivery technologies, requires academic approval as noted below.

Up to three existing graduate courses may be offered to students at an off-campus location with approval from the chair of the Graduate Council Committee on Programs and Courses and the Dean of the Graduate School through an expedited process; see guidelines and request form for the Expedited Review Process of Limited Off-Site Course Offerings.

Approval to offer four existing graduate courses up to half of the course credits required for completion of the degree to students at an off-campus location requires submission of a program change proposal by the graduate program to offer a hybrid program.
Approval to offer more than half of the course credits required for completion of the degree to students at an off-campus location requires submission of a program change proposal by the graduate program to offer the degree program off-site.

**Note** - These guidelines should be used in concert with "Residency and Related Policies for Off-Campus Graduate Programs."

1. Common Requirements for New Extended or New Off-Campus Degree Programs and Extended or Off-Campus Delivery of Existing Degree Programs:
   A. Justification statement including: 1) evidence of demand for the program in the new location, with market survey data if appropriate; 2) the projected size of the program and its anticipated duration; 3) evidence concerning the academic unit's ability to offer a quality program in an off-campus environment; 4) a statement demonstrating the impact of the proposed new program or off-campus delivery of an existing program on other programs (undergraduate and graduate) offered by the academic unit (and in particular, on faculty load), as well as on programs offered by other units; and 5) a statement indicating fiscal responsibility for the program.
   B. A program description in a format for the Graduate Bulletin that includes the following: 1) a statement of admission requirements, e.g., standardized test scores, GPA, recommendations, etc. (Note - Admissions criteria for off-campus degree programs must be the same as those for the same degree program offered to students in residence); 2) complete degree requirements; 3) a list of required courses. In addition, a description of the course sequence and typical scheduling pattern should be provided, but need not be part of the Bulletin description. For proposals involving off-campus delivery of existing degree programs, if any changes to admission or degree requirements are being proposed as a result of off-campus delivery, a side-by-side comparison of the existing program requirements and the revised requirements must be provided, along with a statement justifying all proposed revisions; such proposals will undergo the full Graduate Council curricular review process.
   C. A statement demonstrating how the essential elements of residency (as defined in "Residency and Related Policies for Off-Campus Graduate Programs") will be achieved for off-campus programs. Three years after program inception a report must be made to the Graduate Council Committee on Programs and Courses that provides evidence concerning how the essential elements of residency have actually been incorporated into the program and demonstrates that high-quality graduate education has been delivered in the off-campus program (see Reporting Checklist for Programs Approved to be Offered Off-site/Online). During this three-year period, the Graduate School is charged with monitoring program delivery and quality.
   D. Program operation and maintenance including: 1) identification of a program director who must be a member of the graduate faculty in the academic unit offering the degree; 2) evidence of how academic advising, counseling, and learning support will be provided to students; 3) description of available facilities including research facilities, libraries, technological resources, etc.; and 4) a
statement regarding any technological resources and related specifications that students will be expected to have (e.g., laptop and specifications for operating system, camera, etc.; internet access specifications; etc.).

E. Written responses indicating consultation with other units affected by or that potentially would have interest in the proposed program. In addition, if the program is to be offered online or use technology as the primary delivery method to serve off-campus students, the World Campus must be consulted at the earliest possible stage of program development and a letter of consultation must be provided from the World Campus Director of Academic Affairs for Graduate Programs.

F. Off-campus programs must incorporate a mechanism for assessing program quality through student surveys for feedback at critical milestones in the program as well as a student exit questionnaire at the time of graduation.

2. Additional Requirements for New Extended or New Off-Campus Degree Programs

A. Objectives of the program including: 1) an explanation of how the new program meets the educational objectives and/or strengthens existing programs of the college(s) and the University; 2) an explanation of why this program is appropriate for off-campus delivery; 3) a description of what students may expect to accomplish through the new program; and 4) a statement of how the new offering does not unnecessarily duplicate other degree programs.

B. A list of new courses to be established as a part of the new degree program.

3. Additional Requirements for Online Graduate Courses and Graduate Degree Programs, Blended Graduate Courses, and Hybrid Graduate Degree Programs

Information technology available in the 21st century has presented higher education with a host of new educational opportunities. Accompanying them, however, are a host of potential issues. Key among them is the issue of maintaining a high standard of instructor-student engagement in graduate education. In determining the standards for instructor-student engagement, a number of factors need to be taken into account.

- Technology-enhanced graduate education can come in many forms, such as: resident courses supplemented by information technology applications; blended learning formats that involve some resident and some online students in the same “classroom”; completely online courses.

- Online education does not necessarily mean asynchronous and self-paced learning, or the absence of instructor-student interaction.

- While technology provides myriad opportunities to enhance education, it is up to the instructor and standards groups to choose the best way to deploy the technology.

A. For students enrolled in off-campus degree programs, and eligible for and seeking federal financial aid, the Federal Register requires “significant instructor-

initiated interaction” for courses to qualify as distance education (versus correspondence courses), including online courses. Proposals that involve distance-delivery of courses must describe the kinds of instructor-initiated interaction that will occur in each course, including: mode of communication, frequency of communication, and expectations for student responses. Proposals must describe all student course deliverables and graded artifacts for the course. Proposals also must describe any special considerations needed in order to comply with the Americans with Disabilities Act (for example, audio or video content or interactive web content).

The following sites provide further relevant information:

Graduate Degree Programs Bulletin
Articles of Authority, Bylaws, and Standing Rules of Graduate Council
The Graduate Faculty: Membership Criteria, Responsibilities, and Methods of Appointment
Academic and Administrative Policies and Procedures
Policy AD55 Role of the Department of Distance Education/World Campus
Policy AD20 Computer and Network Security
Policy AD47 General Standards of Professional Ethics
Policy IP02 Co-Authorship of Scholarly Reports, Papers, and Publications
Policy HR36 Educational Privileges for Faculty, Staff and Retirees

FULFILLING THE ESSENTIAL ELEMENTS OF RESIDENCY IN OFF-CAMPUS GRADUATE DEGREE PROGRAMS

The intent of this document is to encourage creative ways of addressing student and community needs in off-campus graduate degree programs, while ensuring that such graduate degree programs maintain academic standards parallel to those of more traditional programs. For the seven essential elements of residency, alternative techniques and technologies are suggested as ways of providing in off-campus graduate degree programs benefits comparable to traditional residency.

A glossary of terms related to e-learning and distance education is available through the World Campus web site.

Element 1: Interaction between faculty members and students above and beyond direct instruction

The objectives of out-of-class interaction include socializing students to their professional fields, providing a broad exposure to developments in the disciplines, supporting the students in their academic programs and career and professional development, and building a community of scholars and professionals. On campus, these objectives are typically met through advising.
sessions with faculty members and through participation in a variety of informal and formal events in which students and faculty can share ideas and experiences.

Techniques for achieving interaction include

**Mentoring, academic counseling, and career counseling.** Faculty members can offer one-to-one advice and counsel on a range of academic and professional issues beyond the scope of a specific course. Advisers can provide academic and career-related counseling.

*Off-campus example:* Mentoring and counseling can be conducted via a variety of means assisted by technology, including email, audioconference, or videoconference. If a course uses interactive video, the faculty member can arrange for the video connection to remain open after class to permit video-based office hours.

**Open discussions.** Faculty members can arrange for open discussion of ideas and issues related to the professional field but not limited to specific course content. Discussions can be moderated or unmoderated.

*Off-campus example:* Open discussions can be conducted in real-time chat areas online or as threaded (topic-specific) discussions using online conferencing applications or social media. They can also be conducted via audioconference or structured as additions to videoconferences, for example.

**Non-class lectures and seminars.** Lectures and departmental or interdepartmental seminars presented by other faculty members or visiting scholars offer students opportunities to interact with faculty representing a range of knowledge and perspectives.

*Off-campus example:* Technology-assisted conferencing via a variety of means (e.g., audiconference, videoconference, podcast) allows faculty members to provide off-campus students opportunities to interact with specialists from either the campus or around the world. The guest speaker can provide an advance set of readings for discussion or make an online presentation, then be available to answer questions or participate in online discussions over a period of several days.

**Element 2: Interaction between peers (i.e., among students in a given program)**

The primary objective of interaction among students in a given program is to permit students to share and benefit from the diverse social and educational experiences other students bring into the program. In a resident program the students are able to benefit socially and educationally from interaction and shared experiences in classes as well as other activities, including student- and campus-sponsored events and organizations. Resident students also have the advantage of exposure to interaction with students in other disciplines on campus through classes and campus events.
Techniques for achieving this type of interaction include

**Collaborative work groups.** Group or team projects allow students to pool their varied knowledge, skills, and experiences in solving a content-based problem or in developing a course-specific project. Collaborative groups can be monitored or facilitated by a faculty member or graduate teaching assistant.

*Off-campus example:* Technology can be used to connect and support synchronous or asynchronous group collaboration on case-study preparation, project development, class presentations, etc. Audioconferencing, for example, can connect students at different sites for real-time development and presentation of a variety of collaborative projects including debates and panel presentations.

**Peer counseling.** Senior graduate students can provide advice on academic issues such as preparation for exams and administrative procedures. They can also provide important support for less-experienced students by offering encouragement and advice relating to the challenges of juggling multiple roles and responsibilities.

*Off-campus example:* A variety of technology-assisted media can provide students in a program with synchronous or asynchronous opportunities to interact with other students who have successfully coped with a variety of graduate student experiences. Interactions can also be scheduled via telephone conversations.

**Discipline-based student clubs and inter-disciplinary social organizations.** Student clubs give graduate students in a particular field of study an opportunity to meet and mix with peers who share similar academic interests and goals. Organizations that include graduate students from a range of disciplines offer a chance to socialize or otherwise interact with peers representing a variety of backgrounds and experiences.

*Off-campus example:* Students can use technology to form discussion groups based on mutual interests, whether academic or social. Social media sites can support the exchange of information among students interested in a particular area of study or in a particular hobby or pastime.

**Element 3: Access to information and instructional resources (such as libraries, laboratories, and research facilities)**

The objective of providing access to information and instructional resources is to expand the educational experiences afforded to the students beyond what can be provided by instructors. For most resident students, this provision can be assumed because graduate programs are generally structured around information resources available on the campus on which the program originates.

**Techniques for achieving this access include**
Providing access to content experts other than the program's instructors. Inviting guest lecturers to a class or outside experts to campus to offer seminars or workshops enriches the learning experience by providing other perspectives on or extended knowledge of topics or subject areas.

Off-campus example: A variety of means assisted by technology, such as videoconferencing, for example, offer ways to connect students directly to extra-institutional content experts. Online seminars and workshops with experts around the world, structured and facilitated by the instructor, greatly expand the geographic range from which these experts can be drawn.

Providing access to a broad range of discipline-specific and interdisciplinary resources. Libraries and other repositories of information complement the information and knowledge provided in the classroom. From these and other sources students gather the raw materials they need to develop a personal knowledge base and a coherent approach to their field of study.

Off-campus example: DVDs, online searches, and electronic connections to library and other data collections offer access to vast collections of data and information. Course Home Pages can offer course-specific resources or direct students to related sources of information. Students can combine these resources with others available onsite and with course content to enhance learning and expand their knowledge base.

Providing access to research facilities. Research projects introduce students to the ways in which knowledge in their fields is constructed and validated. The research process gives students a way to participate in the discovery of new knowledge and opportunities to integrate what is learned in the classroom with what is learned empirically.

Off-campus example: Often students in off-campus programs are pursuing professional master’s degrees in a field in which they are currently employed. In such cases, their work environment offers opportunities both for conducting original research and for putting the results of that research into practice. Such "situated" research and practice provides an excellent way for students to integrate classroom knowledge with new knowledge gained from research and practice.

Element 4: Exposure to and socialization in the field of study

The objective of exposure to and socialization in the field of study is to provide students with a range of educational experiences that introduce them to the language and issues of their disciplines. Seminar series, workshops, research exhibitions, discussions with professional peers, informal departmental activities, and other shared experiences serve this purpose for resident students.

Techniques for achieving this socialization include

Seminars. Seminars can introduce students to current issues of research and/or practice and provide a forum for interaction with colleagues within the student's field.
Off-campus example: Groups of peers can use a variety of means assisted by technology to discuss a seminar topic introduced by an outside expert or a member of the group. Discussion can be synchronous or, carried out over a period of days.

Skill-enhancement workshops. Workshops on specific aspects of professional practice, such as writing for publication or designing effective conference presentations, offer students opportunities to build skills necessary to actively contribute to their fields.

Off-campus example: Faculty or practicing professionals can present skills workshops via a variety of means assisted by technology, including audioconference, videoconference, or podcasts, for example. Depending on the requirements of the content, both presentation and interaction can be either synchronous or asynchronous.

Research displays. Exhibitions or displays of in-process or completed research allow students to get an overview of the types and areas of investigation being conducted in their fields. These activities can facilitate networking with those who share students' research interests or suggest possible directions for personal research.

Off-campus example: Students can develop multi-media "poster-sessions" of their research for display in cyberspace. They can also view the results of others' research and react to/discuss the displays over a period of days or weeks via a variety of means assisted by technology.

Discussions with professional peers. Discussion with peers at conferences or other meetings of discipline-related professional groups allows students to exchange ideas and network with practicing professionals in their fields.

Off-campus example: Off-campus students can be encouraged to participate in regional and/or national conferences and professional society meetings in their geographic areas. Additionally, faculty members can structure and facilitate student participation in the online pre- and post-conference discussions that are associated with many academic conferences.

Element 5: Ready access to suitable academic advising and support services

The objective of ready access to suitable academic advising and support services is to ensure that students are receiving the guidance and personal support required to complete their programs in a successful and timely manner. Resident students can take advantage of their presence on campus to schedule meetings with program advisers or career counselors, if necessary.

Techniques for achieving this support include

Meetings with an academic adviser or student support staff. Academic advisers offer guidance in establishing and completing a course of study that reflects a student's academic goals. Faculty members or student support staff can notify students of and explain departmental and institutional policies that govern advanced academic programs.
**Off-campus example:** Faculty or staff advisers can conduct individual academic counseling sessions via a variety of means assisted by technology (audioconference, videoconference, social media, etc.). General policies and procedures should be posted on program websites for access at the students’ convenience, and support related to administrative functions (registration, payments, grades, etc.) should be available online as well as by telephone or email. The faculty member with general responsibility for the off-campus program should be available by telephone or email during specified “office hours” to answer questions or direct students to the right source of information about broader issues relating to a student’s program.

**Meetings with a career counselor.** Career counselors provide advice relating to entry into or advancement in fields related to the student’s course of study.

**Off-campus example:** Students at remote sites can meet with career counselors in a variety of ways assisted by technology, including telephone, email, or videoconferencing sessions. General information such as position listings, information for developing resumes, tips for job interviews, etc., should be posted on program websites for access at the students’ convenience.

**Element 6: Contribution of graduate students to the degree program, the college, and the University**

The objective of contributions from graduate students of diverse backgrounds is to share the social and educational experiences students bring into the program, the college, and the University to the benefit of other students, faculty, and the University overall. In a resident program this is made possible through interactions of students, faculty, and other University personnel in classes and other formal and informal events.

**Techniques for facilitating student contributions include**

**Introduction of new students.** Programs use a variety of methods to introduce new students to returning students and to faculty members. "Veteran" students can interview new students in order to identify perspectives and contributions that these students bring to the program or to the University as a whole. This personal and professional information can then be disseminated via the program’s informational materials.

**Off-campus example:** Program or departmental newsletters with new-student information can be disseminated to students and faculty via a variety of technology-assisted means. Programs also may develop web pages that include information about the professional interests and contributions of both new and continuing students, and students can develop personal web pages or social media sites through which to share information about themselves.

**Informal Seminars.** Many graduate students in professional degree programs bring with them considerable knowledge and experience gained through real-world practice. Informal seminars offer opportunities to exchange knowledge and engage in peer networking around topics of mutual professional interest.
Off-campus example: Technology allows students to conduct real-time presentation and discussion of perspectives gained through previous educational experiences or in professional practice. Many conferencing services can support an asynchronous seminar format, with new students posting information and then responding to queries or facilitating related discussions.

Element 7: Identification with Penn State

The objective of identification with Penn State is to provide students with a unique educational experience that reflects the history, reputation, personnel, and resources of Penn State. In resident programs, this objective is met by students’ presence on a Penn State campus or campuses and exposure to Penn State traditions.

Techniques for achieving this identification include

Formation of connections through initial and continuing communications. Official correspondence from the program or the University can establish a sense of institutional identification through welcoming messages and communications of interest about Penn State.

Off-campus example: Like their on-campus counterparts, off-campus students receive official communications that establish their relationship with a department and with the University. Prominent display of Penn State logos and other identifying symbols on all communications, including course materials, can help establish a student's identity as a Penn Stater. Small "gifts" such as Penn State bumper stickers or folders can be useful in establishing a positive feeling toward the institution, as well as giving off-campus students a way to display their institutional affiliation. All Penn State students routinely are assigned Access Accounts, which will ensure that off-campus students are able to interact electronically with the University and its resources.

Formation and maintenance of connections through University publications. General University and department-specific publications can be used to keep students informed about people, activities, policies and procedures, etc.

Off-campus example: Off-campus students can access University publications online. Some publications, including the student-published newspaper the Daily Collegian, provide informative and entertaining ways of establishing a sense of identification with the University. Programs comprising primarily or entirely off-campus students can develop online materials specifically designed to foster a sense of inclusion in and connection to the sponsoring department and the University.

Formation and maintenance of relationships with the Penn State chapter of academic or professional societies. Membership in academic and professional groups fosters a sense of identification both with a larger community of scholars and/or practitioners and with those who have shared or are currently sharing a common academic experience.

Off-campus example: Students can be informed of and encouraged to join appropriate academic and professional societies. Off-campus students can find information about the availability and location of chapters in their geographic area online. Programs can also establish a mentoring
system whereby Penn State graduates are matched up with current off-campus students in their geographic region for the purpose of helping them connect to local University and professional activities.

*Approved by Graduate Council, February 2004*

*Revised by Graduate Council, September 2013*
From the Graduate School’s website:

http://www.gradsch.psu.edu/index.cfm/policies/faculty/offcampus/

Proposed revisions are tracked immediately below; a clean version, as the text would appear after approval, appears far below.

Residency and Related Policies for Off-Campus Graduate Degree Programs

Approved by Graduate Council, April 16, 1997

Revised by Graduate Council, [date?]

One of the traditional goals of universities has been to make graduate education accessible to the widest possible range of suitably prepared and motivated students, while maintaining the academic quality that gives advanced degrees their value. With the rapid changes in available instructional technologies, a considerable array of new and innovative approaches to graduate education has become feasible. As a result, it is appropriate to reconsider the meaning of "residency" and its applicability to graduate degree programs. In particular, there are important implications with respect to the offering of graduate degree programs via distance education and other nontraditional means. Our intent is to encourage creative ways of addressing student and community needs while ensuring that such graduate degree programs maintain academic standards parallel to those of more traditional programs. To that end, we recommend adoption of the following definitions, policies and guidelines for all newly proposed off-campus graduate degree programs.

Definitions:

1. "Off-campus courses" will be used in this document to refer to graduate courses which are offered remotely from the site responsible for the class via any suitable technologies and/or without formally scheduled student-instructor interaction (e.g., asynchronous or modular courses).
2. "Off-campus degree programs" will be used in this document to refer to graduate degree programs in which more than half of the course credits required for completion of the degree consists of off-campus courses, as defined above. (Note: such off-campus programs must receive approval from the Graduate Council Committee on Programs and Courses as described in the guidelines for submitting proposals for extended and off-campus graduate degree programs, available on the Graduate School’s web page that documents Graduate Faculty Policies, under the heading “Programs.”)
Residency:

"Residency" requirements have previously been met by a period of enrollment or the completion of a minimum number of credits that are administratively associated with a specific Penn State campus, and that are fulfilled in residence. In some cases this can allow students who never set foot on any Penn State campus to satisfy residency requirements by taking classes offered by distance means. In other cases, it can limit access to graduate education by imposing a burden on students who are location-bound or who can most effectively complete their graduate studies by combining courses offered at different Penn State locations.

Some of the important components and objectives of The essential elements of residency, particularly with respect to research degree programs, include:

- interaction between faculty members and students above and beyond direct instruction (e.g., "journal clubs," "coffee hour" discussion groups, hallway conversations, etc.)
- interaction between peers (i.e., among students in a given program)
- access to information and instructional resources (such as libraries, computer laboratories, and research facilities)
- exposure to and socialization in the field of study, including but not limited to seminar series, workshops, research exhibitions, discussions with professional peers, informal departmental activities, and other shared experiences
- ready access to suitable academic advising and support services
- contribution of graduate students to the degree program, the college, and the University, particularly with respect to the research and scholarship of the institution as a research-intensive university.
- identification with Penn State

To fulfill all of these requirements, it is necessary that students be physically present on campus for at least part of their graduate studies. Therefore, the existing residency requirements for the doctoral and academicresearch Master's degrees offered by the University (Ph.D., D.Ed., D.M.A., M.A., and M.S.), as described in the current Graduate Degree Programs Bulletin, are appropriate and effective in meeting these objectives. No substantive changes are proposed for these degree programs.

However, for professional master's degree programs, it may not always be possible, desirable, or necessary to fulfill residency in the traditional manner. Availability of professional mentors and accessibility to unique facilities at students' work sites or other locales may, in some instances, confer special advantages in well-designed off-campus master's degree programs. Nonetheless, the components of residency described above are important factors in the graduate experience. Consequently:

1. Professional master's degree programs that are not "off-campus degree programs" as defined above (i.e., those in which less than half of the course credits consist of off-campus courses) implicitly have a substantial involvement of the students with the
campus responsible for the program, thus fulfilling the majority of the functions of residency. No further requirements are necessary.

2. Professional master’s degree programs that fall under the definition of "off-campus degree programs" must incorporate as many of the essential elements of residency as possible, including faculty-student and student-student interaction, access to instructional and other resources, exposure to and socialization in the field of study, and suitable academic advising. When the master’s degree program is established, these components must be included. Their successful incorporation into the degree program must be demonstrated and documented to the Graduate Council's Committee on Programs and Courses during the third year after inception of the program, with subsequent reviews at five-year intervals.

3. Postbaccalaureate and graduate credit certificate programs need not require satisfaction of any residency requirements, but incorporation of elements that provide experiences typically normally provided by residency also may also be appropriate for off-campus postbaccalaureate and graduate credit certificate programs.

Related Policies on Off-Campus Courses and Graduate Degree Programs:

1. All 500- and 800-level off-campus courses, whether on- or off-campus and regardless of the delivery mode, must be delivered by approved members of the Graduate Faculty or individuals who have been preapproved to teach specific 800-level courses by the Dean of the Graduate School.

2. New or revised off-campus degree programs delivered at a distance must be offered through existing departments, colleges, and/or intercollege programs at the University, and those units are to retain academic control over program definition and content.

3. Off-campus degree programs ideally should lead to existing degrees offered on-campus by the program or department; however, new degrees may be proposed if sufficiently justified.

4. While all degree programs must be available to and advertised to all applicants, off-campus degree programs or courses delivered at a distance may be offered at specific company or other organizational sites, and instruction (e.g., case studies, problems, or class projects) may be tailored to particular groups of students. Off-campus delivery sites may restrict access at proprietary facilities to their employees or other approved participants. However, off-campus degree programs will not be created to serve a specific organization or client exclusively, and a “public” offering of every degree program must be made available. Off-campus postbaccalaureate or graduate credit certificate programs should also follow these policies where possible.

5. All students enrolled in off-campus degree programs are to be advised throughout their studies, beginning with or prior to initial enrollment, by Graduate Faculty members who serve on the faculty of the relevant degree program in question.

6. Admissions criteria for off-campus degree programs should be the same as those for traditional degree programs, and ideally should be handled by the same individuals or committees making the admissions decisions for the corresponding on-campus degree programs. Admission is not to be offered on a blanket basis (e.g., to all students who have completed a particular training or certificate program, or to all employees identified by a given company).
7.6 Off-campus degree programs must have a specific program **coordinator/faculty director** to act as a focal point for the program and to oversee its development and delivery. This individual must be a member of the Graduate Faculty in the department offering the program, and may be the program chair, department head, graduate program officer or coordinator, or any other suitable faculty member.

8.7 Off-campus degree programs must meet the normal accreditation standards that are applicable to corresponding on-campus degree programs, _where such accreditation related to the field exists_.

9.8 Credits completed in **undergraduate, postbaccalaureate, or graduate credit** certificate programs may not be used to satisfy residency requirements of a subsequent graduate degree, but if eligible by **Graduate Council standards**, may be counted towards degree requirements at the discretion of the **department or graduate** program.

10.9 **Consideration should be given to offering off-campus degree programs on a fixed-cycle basis or cohort model**, _with recognition of the limitations vs. benefits of this model_.

*Approved by Graduate Council, April 1997*

*Revised by Graduate Council, September 2013*
Residency and Related Policies for Off-Campus Graduate Degree Programs

One of the traditional goals of universities has been to make graduate education accessible to the widest possible range of suitably prepared and motivated students, while maintaining the academic quality that gives advanced degrees their value. With the rapid changes in available instructional technologies, a considerable array of new and innovative approaches to graduate education has become feasible. As a result, it is appropriate to reconsider the meaning of "residency" and its applicability to graduate degree programs. In particular, there are important implications with respect to the offering of graduate degree programs via distance education and other nontraditional means. Our intent is to encourage creative ways of addressing student and community needs, while ensuring that such graduate degree programs maintain academic standards parallel to those of more traditional programs.

Definitions:

1. "Off-campus courses" will be used in this document to refer to graduate courses that are offered remotely from the site responsible for the class via any suitable technologies.
2. "Off-campus degree programs" will be used in this document to refer to graduate degree programs in which more than half of the course credits required for completion of the degree consists of off-campus courses, as defined above. (Note: such off-campus programs must receive approval from the Graduate Council Committee on Programs and Courses as described in the guidelines for submitting proposals for extended and off-campus graduate degree programs, available on the Graduate School's web page that documents Graduate Faculty Policies, under the heading “Programs.”)

Residency:

"Residency" requirements previously have been met by a period of enrollment or the completion of a minimum number of credits that are administratively associated with a specific Penn State campus and that are fulfilled in residence. The essential elements of residency, particularly with respect to research degree programs, are:

- interaction between faculty members and students above and beyond direct instruction (e.g., “journal clubs,” “coffee hour” discussion groups, hallway conversations, etc.)
- interaction between peers (i.e., among students in a given program)
- access to information and instructional resources (such as libraries, laboratories, and research facilities)
- exposure to and socialization in the field of study, including but not limited to seminar series, workshops, research exhibitions, discussions with professional peers, informal departmental activities, and other shared experiences
- ready access to suitable academic advising and support services
• contribution of graduate students to the degree program, the college, and the University, particularly with respect to the research and scholarship of the institution as a research-intensive university
• identification with Penn State

To fulfill all of these requirements, it is necessary that students be physically present on campus for at least part of their graduate studies. Therefore, the existing residency requirements for the research degrees offered by the University (Ph.D., M.A., and M.S.), as described in the Graduate Degree Programs Bulletin, are appropriate and effective in meeting these objectives.

However, for professional master’s degree programs, it may not always be possible, desirable, or necessary to fulfill residency in the traditional manner. Availability of professional mentors and accessibility to unique facilities at students' work sites or other locales may, in some instances, confer special advantages in well-designed off-campus master’s degree programs. Nonetheless, the components of residency described above are important factors in the graduate experience. Consequently:

1. Professional master’s degree programs that are not "off-campus degree programs" as defined above (i.e., those in which less than half of the course credits consist of off-campus courses) implicitly have a substantial involvement of the students with the campus responsible for the program, thus fulfilling the majority of the functions of residency. No further requirements are necessary.
2. Professional master’s degree programs that fall under the definition of "off-campus degree programs" must incorporate as many of the essential elements of residency as possible, including faculty-student and student-student interaction, access to instructional and other resources, exposure to and socialization in the field of study, and suitable academic advising. When the master’s degree program is established, these components must be included. Their successful incorporation into the degree program must be demonstrated and documented to the Graduate Council Committee on Programs and Courses during the third year after inception of the program.
3. Postbaccalaureate and graduate credit certificate programs need not require satisfaction of any residency requirements, but incorporation of elements that provide experiences typically provided by residency also may be appropriate for off-campus postbaccalaureate and graduate credit certificate programs.

Related Policies for Off-Campus Courses and Graduate Degree Programs:

1. All 500- and 800-level courses, whether on- or off-campus and regardless of the delivery mode, must be delivered by members of the Graduate Faculty or individuals who have been preapproved to teach specific 800-level courses by the Dean of the Graduate School.
2. New or revised off-campus degree programs delivered at a distance must be offered through existing departments, colleges, and/or intercollege programs at the University, and those units are to retain academic control over program definition and content.
3. While all degree programs must be available to and advertised to all applicants, off-campus degree programs or courses delivered at a distance may be offered at specific company or other organizational sites, and instruction (e.g., case studies, problems, or
class projects) may be tailored to particular groups of students. Off-campus delivery sites may restrict access at proprietary facilities to their employees or other approved participants. However, off-campus degree programs will not be created to serve a specific organization or client exclusively, and a “public” offering of every degree program must be made available. Off-campus postbaccalaureate or graduate credit certificate programs also must follow these policies where possible.

4. All students enrolled in off-campus degree programs are to be advised throughout their studies, beginning with or prior to initial enrollment, by Graduate Faculty members who serve on the faculty of the relevant degree program.

5. Admissions criteria for off-campus degree programs should be the same as those for traditional degree programs, and ideally should be handled by the same individuals or committees making the admissions decisions for the corresponding on-campus degree programs. Admission is not to be offered on a blanket basis (e.g., to all students who have completed a particular training or certificate program, or to all employees identified by a given company).

6. Off-campus degree programs must have a specific program faculty director to act as a focal point for the program and to oversee its development and delivery. This individual must be a member of the Graduate Faculty in the department offering the program, and may be the program chair, department head, graduate program officer or coordinator, or any other suitable faculty member.

7. Off-campus degree programs must meet the normal accreditation standards that are applicable to corresponding on-campus degree programs, where such accreditation related to the field exists.

8. Credits completed in undergraduate, postbaccalaureate, or graduate credit certificate programs may not be used to satisfy residency requirements of a subsequent graduate degree, but if eligible by Graduate Council standards, may be counted towards degree requirements at the discretion of the graduate program.

9. Consideration should be given to offering off-campus degree programs on a fixed-cycle basis or cohort model, with recognition of the limitations vs. benefits of this model.

Approved by Graduate Council, April 1997

Revised by Graduate Council, September 2013
From the Graduate School’s website:

http://www.gradsch.psu.edu/index.cfm/policies/faculty/poer/

**Expedited Review Process of Limited Off-site-Campus Course Offerings**

*February 2000*

There are situations in which Penn State’s graduate degree-granting colleges or campuses (i.e., University Park, Penn State Great Valley, Penn State Harrisburg, Penn State Erie, Penn State College of Medicine) must move quickly to schedule courses off-site (i.e., either a Penn State location that is not a graduate center approved to offer a graduate degree, or a non-Penn State location). These situations may involve an invitation by a corporation to offer courses to employees at corporate headquarters or an unscheduled opportunity to offer courses at an undergraduate campus that does not offer a graduate degree.

The following process is designed to enable graduate degree-granting programs to offer up to three (3) existing graduate courses at a specific off-site location for specific semesters, while bypassing the full procedure of review by the Graduate Council Committee on Programs and Courses. **This process is not a substitute for proposals involving more than three (3) courses, new courses, or degree program delivery.**

**Conditions**

1. No more than a total of three (3) existing courses per graduate degree program may be offered submitted for approval by this expedited process. Requests for more than three existing courses must be submitted to the Graduate Council Committee on Programs and Courses by the graduate degree granting campus at any one off-site location using this procedure.

2. The courses to be delivered off campus must be previously approved, are existing courses from approved graduate degree programs.

3. The faculty members teaching the specified courses are members of the graduate faculty or have been pre-approved to teach these courses by the Dean of the Graduate School.

4. If courses at a specific location are successful and the campus/college decides to seek approval for additional offerings, existing procedures for proposing off-site graduate degree programs must be followed.

5. Whether the courses offered would be accepted as graduate-level courses applicable toward a Penn State graduate degree would depend upon the criteria of the graduate programs as defined by the graduate degree program and approved by the Graduate School Council.

6. Registrants in these courses must have been admitted to the Graduate School as a nondegree graduate students or as a degree-seeking graduate students.
Procedures

1. The graduate degree-granting campus completes the "Expedited Review Process for Limited Form for Off-Campus Offering Graduate Course Offerings Off-Site." form. The following information must be provided on the form includes:
   - delivery location;
   - course(s) to be offered;
   - faculty members scheduled to teach each course;
   - a statement documenting the availability of library, technology, and other required resources;
   - the intended students;
   - a time-line for course offerings (specify the semester[s] to be offered off-campus);
   - in the case of courses offered off-campus as part of a postbaccalaureate/graduate credit certificate program, a statement indicating how current and prospective students will be informed that taking these courses does not constitute acceptance into, or the delivery of, a degree program.

2. The graduate degree-granting campus shares the Expedited Review form is shared with all relevant curricular groups at the campus/college (e.g., college curricular affairs committees, executive councils, etc.), including the Academic Executive Council, Curricular Affairs Committee, and campus faculty senate.

3. Signatures of the department/division head and college/school dean or appropriate administrator are obtained.

4. The document signed form is sent submitted to the Office of the Dean of the Graduate School.

5. The document-signed form is reviewed by the Associate Dean and the chair of the Committee on Programs and Courses and the Dean of the Graduate School/designee. Within ten (10) days of submission, the proposing campus will receive a response.

Form to request Expedited Review Process for Expedited Limited Off-Campus Course OfferingsReview Form

Approved by Graduate Council, February 2000

Revised by Graduate Council, September 2013