Graduate Council Curriculum Report

The Graduate Council Curriculum Report (GCCR), which includes all graduate curricular proposals approved through the Graduate Council curricular review process, is published 12 times each calendar year.

Questions/comments regarding the GCCR or its contents may be directed to the Director of Graduate Education Administration.

April 4, 2018

Graduate Degree Programs

CHANGE

Accounting – change degree requirements for the M.Acc. degree (Smeal College of Business), page 21

Forest Resources – adopt dual-title with International Agriculture and Development (College of Agricultural Sciences), page 43

Higher Education – change degree requirements for the Ph.D., D.Ed., and M.Ed. degrees (College of Education), page 51

Information Sciences – update bulletin listing for the M.P.S. degree (College of Information Sciences and Technology), page 90

Information Sciences and Technology – change name of the program offering the Ph.D. degree to Informatics (College of Information Sciences and Technology), page 96

Information Sciences and Technology – change degree requirements for the M.S. degree (College of Information Sciences and Technology), page 109

Nursing – change degree requirements for the M.S.N. degree (College of Nursing), page 122

Plant Biology – update bulletin listing for the Ph.D. and M.S. degrees (Intercollege Graduate Degree Programs), page 133

Soil Science – change degree requirements for the Ph.D. and M.S. degrees (College of Agricultural Sciences), page 139
Graduate Courses

ADD

CE 556
Environmental Electrochemistry
ENV ELECTROCHEM (3)
This goal of this course is to prepare students to perform and interpret research in the field of environmental electrochemistry. Students will learn the fundamental mechanisms of electrochemistry and will apply this knowledge to (1) design theoretical experiments to address research questions relevant to environmental engineering and science and (2) analyze and re-interpret results from recently published peer-reviewed studies in this field.
Within the field of environmental engineering and science, electrochemical techniques are commonly used to characterize the reactivities and thermodynamic properties of environmental samples, such as soils, minerals, and natural waters. Electrochemical techniques are also frequently used to solve environmental problems, with applications including the treatment and remediation of polluted water and the generation of renewable electricity from waste sources. This course is designed to enable students to critically read environmental electrochemical literature and to design and develop their own electrochemical experimental systems. To achieve this goal, the course consists of five sections that are roughly equal in length. Section 1 covers the underlying chemistry and thermodynamics relevant to electrode potentials and redox chemistry. Section 2 covers galvanic and electrolytic reactions by covering examples of batteries and fuel cells relevant to environmental engineers. Section 3 addresses the role that kinetics and transport play in electrochemical systems and the mathematical expressions used to cover them. Section 4 covers electrochemical techniques used to study environmental systems and solve environmental engineering problems, such as pollution remediation and renewable energy production. Section 5 covers electrochemical impedance spectroscopy, a complex electrochemical technique used to determine how an electrochemical system can be best approximated as a circuit. As a whole, these sections develop students with the educational foundation necessary to further study specific topics relevant to their research or interests.
PROPOSED START: SU2018

CI 896
Individual Studies
INDIVIDUAL STUDIES (1-9/Repeatable Max: 9)
Creative projects with a professional orientation, including nonthesis research, that are supervised on an individual basis and which fall outside the scope of formal courses.
PROPOSED START: SU2018

EEFE 530
Applied Microeconometrics II
MICROECONMETR II (3)
This course is designed to: (1) expose students to the most common econometric and statistical techniques used in applied microeconomic research and (2) give students an overview of the different types of micro data and the most common methods used to manipulate these data to create additional data sets and variables. The course is divided into three broad parts. The first part of the course focuses on computational, data, and methodological issues. The second and third parts of the course are divided equally between reduced-form/treatment effects methods and structural choice models and methods and other nonlinear structural and quasi-structural models. Each of the topics in the second and third part make use of the methods learned in the first part.
PREREQUISITES: EEFE 510, EEFE 512
PROPOSED START: SU2018
EEFE 535  
Empirical Analysis in Food Marketing  
EMP FOOD MKTING (3)  
This is the first course in the Ph.D. field sequence in Industrial Organization, including applications to food marketing. Industrial Organization is the applied study of firms and markets. IO typically focuses on differences across firms and markets, implying the need for a rich set of models. The course presents a series of models of increasing realism and complexity. At each stage, we review the relevant theory as a starting point and then do a detailed study of the empirical application of that theory to real world data with a discussion of the implications for economic policy in areas such as anti-trust, and environmental and food policy analysis.  
PREREQUISITES: EEFE 501, EEFE 512  
PROPOSED START: SP2019

EME 511  
Interfacial Phenomena in Energy and Mineral Systems  
INTERFACIAL PHENOMIN (3)  
The boundary between two phases, the interface between the phases (referred to as the "interface") has very different properties from that of the bulk phase and such interfaces are important in a variety of energy, chemical, and mineral engineering processes. The interface may control transport between the phases, e.g., liquid-liquid extraction, reaction at the interface, e.g., heterogeneous catalysis, or accumulation of a component from one of the bulk phases, e.g., adsorption. All of these are examples of interfacial phenomena relevant to energy conversion, mineral extraction, and oil recovery processes. Course topics are drawn from physical and interfacial chemistry to address engineering and applied science needs in fuel science, fossil fuel recovery, renewable fuel processing, mineral processing, environmental science, and health. Topics include interfacial forces, phase behavior, adsorption/desorption, reaction kinetics, and solution chemistry. The applications of these subjects in various fields such as reservoir engineering, fuel science, mineral separations, reacting flows, and water systems will also be covered.  
PROPOSED START: FA2018

EME 531  
Thermodynamics of Energy and Mineral Systems  
ENERGY THERMODYNAM (3)  
This course presents linear and non-linear irreversible thermodynamics as a means to explore the coupling between physicochemical, kinetic, and transport processes. Linear irreversible thermodynamics will be illustrated by well-known and practical phenomena such as Seebeck effect (thermocouple), Peltier effect (dehumidifier), Soret effect (thermal diffusion), etc. Non-linear irreversible thermodynamics will be used for demonstrating the phenomena of bifurcation, self-organization, and dissipative structures that take place in nature and human society. The self-organizing economy will also be discussed to show how the far-from-equilibrium thermodynamics can be applied to some economic phenomena.  
PROPOSED START: FA2018

EME 551  
Safety, Health and Environmental Risks in Energy and Mineral Production  
SH & E RISKS (3)  
In the energy and minerals sector, safety, health, and environmental concerns have increased in importance to engineering, operations, and applied research. Contemporary experience has demonstrated that the integration of these priorities into the conceptualization, development, and management of energy and mineral technologies is essential. This course will begin with a few case studies of high-profile disasters to foster a broad understanding of the similar managerial,
organizational, behavioral, and technical factors that led to these disasters. The balance of the course will be devoted to study of effective approaches to analyzing, mitigating, and managing risk (qualitative and quantitative), behavioral/psychological dimensions (e.g., cognitive workload and risk biases), and the application and validation of interventions to achieve goals. The intent of this course is to give students an understanding of the challenges and successful approaches that should be part of every project and operation.

PROPOSED START: FA2018

ESC 503
Low Dimensional Nanoelectronics
LOW DIM NANO (3)
This course will cover advanced concepts which are essential to understand modern state-of-the-art electronic devices based on novel nanomaterials. The course is designed for experimentalists, material scientists, and device physicists who are interested to learn how carrier transport takes place in low dimensional semiconductors such as zero dimensional quantum dots, one dimensional nanotubes (CNT), quasi-one dimensional nanowires, and two dimensional nanosheets (graphene, MoS2).

The course will begin with a review of semiconductor physics which includes Fermi-Dirac statistics, dispersion relationship (E-k), density of states, electron density, various definition of carrier velocities, and discussion on traditional drift-diffusion (DD) model for carrier transport. We will then adopt a bottom-up approach to understand current flow through a device with only one energy level, which will eventually lead to the formalism of Landauer-Datta (LD) transport model for ballistic conductors. The concept of quantum conductance and transport modes will be taught. We will also learn how to incorporate different scattering mechanisms into the LD model. The LD model will be used to understand current flow through a carbon nanotube (CNT), graphene, and MoS2. Next, the LD model will be extended to describe heat flow in nanomaterials which forms the basis of various thermoelectric phenomena such as the Seebeck effect, Peltier cooling, etc.

The second part of the course will focus on the electrostatics and transport in ballistic and quasi-ballistic metal-oxide-semiconductor field effect transistors (MOSFETs). We will learn how to solve Poisson’s equation self-consistently with LD model for Si MOSFET and extend it to ultra-thin-body-silicon-on-insulator (UTMSOI) FETs, FinFETs, CNTFETs, graphene and MoS2 FETs. The advantage of ultra-thin body channel material for MOSFET scaling and how nanomaterials help in overcoming short channel effects will also be taught. Concepts such as quantum capacitance limit will be introduced. Contact resistance and related issues will also be extensively taught. Various beyond Boltzmann novel device concepts tunnel FETs, phase change FETs, negative capacitance FETs, excitonic FETs, strain FETs for low power computing will be introduced.

In the third part of the course we will learn multiple quantum mechanical effects related to transport in nanomaterials such as Quantum Hall effect, energy level broadening, and Coulomb Blockade phenomena in quantum dots. We will also learn multi-electron picture through Folk’s Space in order to understand many body interactions. Finally, we will study the matrix version of Schrodinger equation to derive band-structure of different nanomaterials using nearest neighbor semi-empirical approach in orthogonal basis. Generalized transport equations will be obtained using Non Equilibrium Green's Function (NEGF) formalism.

Students will be asked to do literature reviews on multiple topics taught in the course. They will also use their learning and solid foundation developed through out the course to execute group projects that are either exploratory in nature or relevant to the state-of-the-art technological problems of the semiconductor industry. This will prepare them for independent and innovative research.

PROPOSED STARTS: SU2018

MGMT 880
Business Transformation Consulting
BUS TRANS CONSULT (1-3)
This course provides an understanding of key issues, concepts, and methodologies associated with
business transformation and management consulting. It introduces students to the professional services industry, industry best practices, and a variety of client contexts where advisory services are needed. Additionally, students will learn common consulting methods and how to apply them in client organizations. A consulting-oriented solution development lifecycle is used as the organizing framework of the course. The primary phases of this framework include: client qualification/validation, problem identification, data gathering, requirements definition, project planning, solution design, solution development, solution implementation, and client relationship management. Students will learn to how to identify and define organization problems, highlight pain points, map work flows, explore business models, investigate strategic alignment, develop recommendations, present business cases, and prototype solutions. The course will also enable students to learn how to advise clients and present key points and recommendations in a direct, clear, and compelling manner. The course objective is to provide students with consultative methods, skills, and tools essential to facilitating organizational change. It is designed around real-world problems and projects involving organizational assessment, solution development, and implementation planning. Students will be assigned to a consulting team. Each consulting team will be assigned to work with a corporate client to address a real-world business problem. Students will learn how to work proactively with key stakeholders to identify and understand the choices, risks, and benefits of particular solution alternatives, prepare project proposals, develop a plan to support the needed changes, and assess the effectiveness of business transformation efforts. Depending on the project, the recommended solution may be prototyped or fully developed during the course.

PROPOSED START: SU2018

PHS 507
Public Health Surveillance
PH SURVEILLANCE (3)
Public health surveillance, through collecting and monitoring public health related data as they appear in the real world, plays an important role to ensure public health. This course provides an overview of the principles and practice of public health surveillance and will include design, data collection, and data analysis of the public health surveillance system in general. The skills that students learn from this course will help them better understand and analyze public health issues. Using existing public health surveillance data such as NHANES, NHIS, BRFSS, and SEER, this course provides hands-on experience with analyzing public health surveillance data.
PREREQUISITES: PHS 520, PHS 550
PROPOSED START: SU2018

PHS 510
Grant Writing for Clinical Research
GRANT WRITING (3)
To become independent researchers, students will need to write many grants for external funding. The primary purpose of this course will be for students to experience the full range of grant writing, from review of funding opportunities with a focus on patient- or population-based samples, to forming the research question, preparing, and submitting the grant. Most students are expected to write an F31 application to various NIH-institutions, but other training grant opportunities may be chosen according to the topic of interest. In addition, strategies to get involved in high dimensional or big data will be emphasized, such as human genome data, EMR data, and MARKETSCAN data.
PROPOSED START: SU2018

PHS 562
Environmental Epidemiology
ENVIRONMENT EPIDEM (3)
This course provides students with an understanding of the major topics in environmental epidemiology and involves the application of epidemiologic methods to environmental exposures. Environmental
exposures discussed include environmental tobacco smoke, radon, ambient air pollution, and others. The course material covers 1) the statistical methods and software coding needed to analyze these data, as well as the interpretation of the results of these methods; and 2) geographic information system (GIS) software and coding needed to display epidemiologic data. Spatial statistical methods in environmental epidemiology will be discussed, including geostatistical exposure modeling and areal and point-process data analysis. Also, linear mixed effect (LME) models, generalized additive models (GAMs) and generalized additive mixed models (GAMMs) and their use in environmental epidemiology will be discussed.

PROPOSED START: SU2018

**PHS 563**
Infectious Disease Epidemiology II
INF DIS EMPIDEM II (3)
The course is designed to help students gain expertise in modern infectious disease research and apply epidemiological methods to address infectious diseases of national and international importance. Emphasis is given to methods of infectious disease dynamics, designs and evaluation of infectious disease surveillance systems, mathematical models in infectious disease epidemiology, and epidemiological methods for infectious disease research. Specific infectious diseases to be covered include HIV/STD, vaccine-preventable diseases and vaccine safety, healthcare-associated infections, global antimicrobial resistance, infection-associated cancers, and emerging infectious disease.

PREREQUISITES: PHS 550, PHS 553
PROPOSED START: SU2018

**PPOL 801**
The Public Policy Process
POLICY PROCESS (3)
The policy process refers to the development of public policy over time and the actors, events, and contexts surrounding this development. Trying to understand and explain the policy process requires an understanding of the relationships among an uncountable number of factors in a dynamic system with nested levels of interactions and uncertain inputs and outputs. This course decomposes this complexity by first considering the political conceptualization of public policy problems, the tools by which public policies -- laws, regulations, and markets -- are expressed, and the formal and informal actors (voters, legislators, executives, courts, bureaucracies, the media, and interest organizations) engaged in the policy process. The course then examines a number of broad models of the policy process as a whole, including the policy streams, institutional, incremental, advocacy coalition, and punctuated equilibrium models. The course also examines these actors and models at several stages of the policy process running from agenda setting, through policy formulation and adoption, to policy evaluation. The goal of the course is to enable students to identify the wide variety of actors in the policy process, understand the institutional contexts they operate in and the tools of policy influence they seek to employ at several distinct stages of the policy process, and critically assess the implications and empirical veracity of a variety of conceptual models of the policy process.

PROPOSED START: SU2018

**PPOL 802**
Economic Analysis for Public Policy
ECONOMIC ANALYSIS (3)
Should the government directly regulate pollution or allow the market to determine levels of effluents? Should government pay farmers to reduce production of oversupplied crops, or is this an unfair government handout? Economists approach such questions using the basic microeconomic tools of their discipline. Understanding and being able to apply those tools is an essential part of the work of public policy analysts. This course, designed for students with little or no prior training in economics, gives students an overview of the tools and logic economists use in analyzing questions like those above, as
well as many others. The focus will be on gaining a sound understanding and familiarity with the basic concepts and modes of analysis used in microeconomics so they can be applied to public policy questions. This includes first a basic overview of the behavior of consumers, firms, and labor markets, and based on this, the concepts of supply and demand, competition, and consumer and producer surplus. Students will learn how these influence the functioning of markets given that they may be imperfect, including problems of imperfect information, irrational behavior, and market failures associated with externalities and public goods. And third, this course will cover how these problems both play out in the demand for government goods and services and government's production decisions, as well as how these problems might be addressed using the tools of microeconomic analysis. Students will leave this course with a better understanding of how an economist approaches many contemporary policy debates and an ability to use microeconomic analysis to assess policy problems.

PROPOSED START: SU2018

PPOL 804
Public Sector Organization Theory
PUBLIC ORG THEORY
Public policies are more often than not designed by public sector organizations and implemented by them. To understand public policy, then, students must understand public sector organizations. Why are they designed as they are? And why do they behave as they do? Several disciplines offer often competing theories to answer these questions. This course will survey these theories to provide students with a foundation for understanding public sector organizations and how they influence public policy. After first discussing the inherent link between public sector organizations and public policy and discussing how public and private sector organizations differ, this survey will examine several theories that address the internal structure of organizations: bureaucratic, structural, human relations, contingency, and new institutional theories. Behavioral decision theory and incremental theory are then examined as the most prominent views on how organizations make decisions. External influences on organizational structure and behavior are then considered in a review of organization ecology, resource dependency, and organization economics theories. The course will then move beyond isolated organizations by addressing social capital and network theory and social movement theory. In reviewing these several theoretical perspectives, special attention will be placed on public sector organizations and the application of insights from the theories to the design and implementation of public policy. The goals of the course include developing an understanding how the different theories offer critical insights for the design and implementation of public policies.

PROPOSED START: SU2018

PPOL 807
Managing Public Organizations
MGMT PUBLIC ORGS (3)
Public policies are more often than not designed by public sector organizations and implemented by them. To understand public policy, then, students must understand public sector organizations and the people who work in them, interact with them, or are served by them. All of these influence the substantive manner in which public policy is actually implemented and the quality of that implementation. Further, many public policy analysts move into line management positions as their careers develop. How well public sector organizations are managed, then, has a significant impact on public policy outcomes and policy analyst careers. This course considers a range of management issues operative in the daily work of public sector organizations. After first discussing the inherent link between public sector organizations and public policy and discussing how public and private sector organizations differ in regard to management, this discussion considers several broad characteristics that distinguish organizations. This includes organizational structures and cultures. It then addresses the roles of leadership and strategic planning in defining the management function. And last, the course surveys a broad range of persistent management issues with a bearing on public policy: managing the civil service system, motivating employees, organizational performance, contracts and networks, and citizen
involvement. More dynamically, it examines the management of conflict, change and innovation, and the political environment. The goals of the course include developing both an understanding of the internal and external influences on public sector organizations as they implement public policies and an appreciation of the range of distinct management issues that influence policy outcomes.

PREREQUISITES: PPOL 804
PROPOSED START: SU2018

**PPOL 808**
Public Finance and Budgeting
PUBLIC FIN BUDGET (3)
This course provides an overview of taxation and expenditure choices made by government as essential inputs into the policy process. How big should government be? What is a good source of revenue? What is a good expenditure? The course examines and compares how different theoretical and disciplinary approaches to fiscal analysis -- economics, political science, and public administration -- answer these questions. In addition to examining the question of the overall size and growth of the public sector and the governmental institutions responsible for fiscal choices, public expenditures will be evaluated from the perspectives of public goods theory (market failure and non market failure), rational budgeting theory and the development of budget proposals, incremental theory, and democratic theory. Revenue choices will be examined through the lens of both normative tax theory on the criteria of adequacy, stability, efficiency, and equity, and positive theories of taxation that address how taxes are actually adopted and altered by governments. An understanding of tax incidence is central to several of these criteria. The course will also examine the balance of government revenues and expenditures by examining the sources, financing, and consequences of government debt and the use of capital budgets. The course will be especially attentive to how policy professionals apply these varied theoretical approaches to answering these questions. The goal of the course is to enable students to become conversant both with the many conceptual languages in which government taxation and budgeting issues are debated and to prepare them for professional positions in which revenue and expenditures are essential instruments in the formulation and implementation of public policy.

PREREQUISITES: PPOL 801, PPOL 802
PROPOSED START: SU2018

**REST 590**
Colloquium
COLLOQUIUM (1-3/Repeatable Max: 3)
Continuing seminars that consist of a series of individual lectures by faculty, students, or outside speakers.
PROPOSED START: SU2018

**SYSEN 880**
Systems Architecture and Models
SYS ARCHITECTURE (3)
System architecture is an abstract view of a complex system distinct from the details of how such a system is implemented. It plays a significant role in developing complex systems that meet expectations of their stakeholders and achieve the mission and life cycle concepts of the system. This course covers the fundamental concepts, techniques, and methods for creating and analyzing system architecture of complex systems. System engineers, system architects, product design engineers, product managers, and project managers working in system development of commercial or military engineering systems will benefit from this course.

Major topics to be covered include analysis of form and function, the process of mapping form to function, and methods of decomposition and re-integration, application of model based systems engineering for development and analysis of system architecture, and view-based architectural frameworks for documentation of system architecture.
Students will:
- Learn the significance of system architecture,
- Learn fundamental concepts underlying a system architecture,
- Learn models, methods, and tools for architecture development and analysis,
- Demonstrate understanding of influences on system architecture decisions
- Explore architectural frameworks for documentation of system architecture

PROPOSED START: SU2018

OLD
ACCTG 511
Financial and Managerial Accounting
FIN AND MGRL ACCTG (3)
Fundamental financial and managerial accounting concepts and issues from the viewpoint of the report user.
APPROVED START: FA1992

NEW
ACCTG 800
Financial and Managerial Accounting
FIN AND MGRL ACCTG (3)
The purpose of this course is to prepare students to interpret, evaluate, and use both financial and managerial accounting information. Accounting information can be used to evaluate an organization's financial position, to plan future activities (both short-term and long-term), to motivate behavior, and to evaluate performance. The course also focuses on corporate governance and ethical issues.

OLD
ARCH 550
Ethics in Architecture: Green to Post-Green
ETHICS IN ARCH (3)
The intention of this seminar will be to look at the legacy of sustainable design (providing the topical substance for a series of class presentations) and engage students in an interdisciplinary dialogue. The research and work assignment will require each student to write an essay and/or develop a design project, based on the cutting edge of creativity in an important field other than architecture. By pursuing this approach, students in the seminar will be expected to identify a major thinker in the arts, sciences, or humanities, research why this intellectual leader’s theories are significant, and then translate what they have learned into a written paper and/or design project.
The class discussions will relate information delivered by diverse speakers to the subjects of “environmental thinking,” origins of green architecture, examples of good and bad LEED qualified buildings, site-specific art, social and psychological concerns in urban planning, breakthroughs in science that impact on design and, as a fundamental mission of the entire course, the potential value of visionary ideas from other fields in shaping public policy for sustainable buildings and cities.
APPROVED START: FA2014

NEW
ARCH 550
Ethics in the Built Environment
ETHICS BUILT ENVR (3)
Ethics in the Built Environment is an applied theory course that uses negotiation strategies to examine issues broadly relating to the creation and use of the built environment, including research practices and professional ethics. The course examines the role of power imbalances as underlying ethical questions,
and discusses means of mediating the resulting ethical problems in a sustainable manner. Through readings, discussions, short exercises, and a term paper, students will gain a greater awareness of ethical issues raised through the production and use of the built environment, and will develop tools to assess ethical issues and identify appropriate resolutions.

Topics covered in this course include: defining ethical concepts, tools for evaluating ethical issues in the built environment, understanding built power and the role of empowerment, the power of marketing, accuracy in historical research, urban design and planning and the right to the city, gender and the built environment, architectural practices, the ethics of green architecture, the ethics of design computing, as well as research on individual case studies.

OLD

BUSAD 526
Current Issues in Corporate Finance
CUR ISSUE CORP FIN (3)
Finance topics involving strategic financial decisions, including capital structure and cost of capital, financial forecasting, valuation, and corporate control.
PREREQUISITES: BUSAD 525, FIN 531
APPROVED START: SP2011

NEW

BUSAD 826
Current Issues in Corporate Finance
CUR ISSUE CORP FIN (3)
This course covers topics in advanced corporate finance and financial modeling, including capital structure, cost of capital, financial forecasting, and valuation. Estimating the firm’s current market value and projecting its future performance requires one to build accurate and flexible financial models. The ability to understand and build financial models is one of the most essential skills in the finance field, including commercial banking, corporate financial management, investment management, and investment banking. This course bridges the gap between theory and real-world practice through a step by step hands-on approach in financial modeling.
PREREQUISITES: ACCTG 512, BUSAD 525, FIN 531

OLD

AEREC 510
Econometrics I
ECONOMETRICS I (3)
General linear model, multicolinearity, specification error, autocorrelation, heteroskedasticity, restricted least squares, functional form, dummy variables, limited dependent variables.
PREREQUISITES: ECON 490; STAT 462; STAT 501
APPROVED START: SP2011

NEW

EEFE 510
Econometrics I
ECONOMETRICS I (3)
Econometrics is concerned with using aspects of economic theory, mathematics, and statistical inference to analyze economic phenomena and relationships. This course approaches econometrics with three broad considerations: 1. The role of econometrics in theoretical and applied economics; 2. The theoretical basis of econometrics; 3. The applied use of econometrics. Topics include general linear model, multicolinearity, specification error, autocorrelation, heteroskedasticity, restricted least squares, functional form, dummy variables, limited dependent variables.
PREREQUISITES: ECON 490; STAT 462; STAT 501
OLD
AEREC 511
Econometrics II
ECONOMETRICS II (3)
Stochastic regressors, distributed lag models, pooling cross-section and time-series data, simultaneous equation models.
APPROVED START: SU2013

NEW
EEFE 511
Econometrics II
ECONOMETRICS II (3)
Econometrics II builds on the foundations of EEFE 510 to provide students with a good understanding of econometric methods that are frequently used in the empirical literature. Topics include endogeneity and moment-based estimators, linear systems of equations, maximum likelihood estimation, models for qualitative and limited dependent variables, models for time series data, models for panel data and treatment evaluation. This course is geared towards students who are interested in conducting empirical research on topics in applied economics and related fields.
PREREQUISITES: EEFE 510

OLD
AEREC 512
Applied Microeconomic Theory I
MICROECONOMICS I (3)
Principles of microeconomic theory and models that economists use to explain the behavior of consumers, firms, and markets, and how those principles may be applied to real-world problems. Principles and models are developed using calculus. The emphasis is on applied theory and problem solving, rather than formal proofs and derivations.
APPROVED START: FA2017

NEW
EEFE 512
Applied Microeconomic Theory I
MICROECONOMICS I (3)
This course covers basic principles of microeconomic theory with the use of calculus. The emphasis is on applied theory and problem solving, rather than formal proofs and derivations. By developing knowledge of microeconomic theory and economic reasoning skills, the goal of the course is to provide a foundation for more advanced courses and for applied research at the graduate level. Students who successfully complete this course should understand and be able to apply the microeconomic theory needed to solve applied economic problems in the following areas: Consumer choice and demand; Producer choice and supply; Choice under uncertainty; Strategic decision-making (game theory); The functioning of competitive and monopolistic markets; General equilibrium and welfare analysis.

OLD
AEREC 519
Resource and Environmental Economics I
RES AND ENV ECON I (3)
Theories and methods for economic analysis of natural resource and environmental policies with applications to current issues.
PREREQUISITES: ECON 502
APPROVED START: SP2011
NEW

EEFE 519
Resource and Environmental Economics I
RES AND ENV ECON I (3)
This course gives students an overview of essential theories and methods used in the economic analysis of natural resources. Objectives are to provide students with a command of theory and methods needed to teach the field and to conduct contemporary research. Topics include dynamic resource systems; dynamic optimization; dynamic optimization; nonrenewable resource theory; the Hotelling model; stock pollution externalities; common property; option values.
PREREQUISITES: EEFE 512; ECON 502

OLD

AEREC 527
Quantitative Methods I
QUANT METHODS I (3)
Quantitative techniques applied to agricultural economic issues.
PREREQUISITES: ECON 502
APPROVED START: SP2011

NEW

EEFE 527
Quantitative Methods I
QUANT METHODS I (3)
This is a course in quantitative economics and its applications, with heavier emphasis on linear models and how they relate to microeconomic theory in both static and dynamic settings.
The first part of the course reviews the foundations of the mathematical analysis with the goal of modeling feasibility, i.e., the set of possible choices. This prepares us to next move to modeling the optimal choice with an extended presentation on optimization theory and application in the static setting. The final part of the course moves on to the methods for engaging in dynamic optimization.
CONCURRENTS: EEFE 512; ECON 502

OLD

AEREC 531
Applied Microeconometrics I
MICROECONOMETRIC I (3)
In this course, we will study microeconometrics, a subfield that encompasses specification as well as a variety of estimation, computational, and simulation methods that allow us to pursue specification and parameterization of econometric models suitable for analyzing micro-level data. We will see that these methods support an enriched basis for examining the validity of microeconomic theory, and also extend the analytics feasibly tackled by microeconomics. At the micro-level of empirical analysis, we will see our theory predicts high frequencies of corner solutions, abrupt switching, and discontinuities. In each case, these predictions are also apparent in micro data. Together, these conditions call for methods that go beyond simple continuous choice functions and equilibria often found adequate for aggregate static and dynamic modeling. Knowledge of these new methods is essential to empirical learning in most areas of contemporary applied microeconomics. These methods evolved to support the active application of microeconomic theories of micro-level behavior (e.g. discrete choice, corner solutions, cusps in dynamic paths) as well as to address peculiar features of micro-level data such as error-in-measurement, availability of only binary or polychotomous indicators of continuous variables, and substantial heterogeneity. Theory is relied upon to specify models prior to estimation, to specify characteristics of data sets, and to interpret results.
PREREQUISITES: ECON 502, (AEREC 510; ECON 501), (AEREC 511, ECON 510)
APPROVED START: SU2017
EEFE 531
Applied Microeconometrics I
MICROECONOMETRIC I (3)
In this course, we will study microeconometrics, a subfield that encompasses specification as well as a variety of estimation, computational, and simulation methods that allow us to pursue specification and parameterization of econometric models suitable for analyzing micro-level data. We will see that these methods support an enriched basis for examining the validity of microeconomic theory, and also extend the analytics feasibly tackled by microeconomics. At the micro-level of empirical analysis, we will see our theory predicts high frequencies of corner solutions, abrupt switching, and discontinuities. In each case, these predictions are also apparent in micro data. Together, these conditions call for methods that go beyond simple continuous choice functions and equilibria often found adequate for aggregate static and dynamic modeling. Knowledge of these new methods is essential to empirical learning in most areas of contemporary applied microeconomics. These methods evolved to support the active application of microeconomic theories of micro-level behavior (e.g. discrete choice, corner solutions, cusps in dynamic paths) as well as to address peculiar features of micro-level data such as error-in-measurement, availability of only binary or polychotomous indicators of continuous variables, and substantial heterogeneity. Theory is relied upon to specify models prior to estimation, to specify characteristics of data sets, and to interpret results.
PREREQUISITES: (EEFE 512; ECON 502), (EEFE 510; ECON 501), (EEFE 511, ECON 510)

OLD
AEREC 532
Applied Computational Economics
APPLIED COMP ECON (3)
The course explores four topics: computable general equilibrium modeling, growth modeling, uncertainty and formal monte carlo analysis, and agent-based modeling.
PREREQUISITES: AEREC 512
APPROVED START: SU2017

NEW
EEFE 532
Applied Computational Economics
APPLIED COMP ECON (3)
Economists often find themselves in situations where closed-form solutions do not exist or econometric estimation is inappropriate due to data limitations or the nature of the problem. In these cases, numerical approaches, using computer-based methods, may be an economist's best option. In this course, we will explore four topics in the field of computational economics: computable general equilibrium modeling, growth modeling, uncertainty and formal monte carlo analysis, and agent-based modeling. The overall goal of this course is to provide students with an in-depth understanding of computational economics so that they are prepared to build unique mathematical models to address complex situations that have not yet been encountered. Students should have successfully completed a graduate-level course in microeconomic theory prior to enrolling in this course.
PREREQUISITES: EEFE 512

OLD
AEREC 536
Economics of Food Behavior and Health
ECON FOOD BEHAV (3)
Specification, identification, and estimation of models for use in the evaluation and control of agricultural market behavior.
PREREQUISITES: AEREC 510; AEREC 511; ECON 521
APPROVED START: SP2011

NEW
EEFE 536
Economics of Food Behavior and Health
ECON FOOD BEHAV (3)
A course in microeconomic consumer theory and estimation, and other economic approaches to consumer behavior, including applications to food and health. The core of the course will involve the microeconomic theory of the consumer and demand estimation. However, other topics relevant to consumer/household behavior may be discussed, such as Duality Theory, Integrability, Function Forms (Linear Expenditure System, Linear Demand, AIDS model, Translog Model, Rotterdam Model, EASI), Price Indices, Flexibility, Incorporating Demographics and Equivalence Scales, Separability, Intertemporal Choice, Household Production, Intrahousehold Allocations, Zeroses Problem, Aggregation, Savings Decisions, Behavioral/Neuroeconomics, Labor Supply, Hedonic Models, Useful Data Sets.
PREREQUISITES: (EEFE 510; EEFE 511; ECON 521), EEFE 512

OLD
AEREC 541
Resource and Environmental Economics II
RES AND ENV ECON II (3)
Key theories and analytical methods of resource and environmental economics.
PREREQUISITES: AEREC 511; AEREC 519; ECON 521
APPROVED START: SP2011

NEW
EEFE 541
Resource and Environmental Economics II
RES AND ENV ECON II (3)
This course is designed to give students an overview of the field of Environmental Economics. The objectives of this course are to provide students with a basic understanding of the theoretical and methodological foundations used in Environmental Economics, and to explore recent advances in areas of contemporary policy interest.
PREREQUISITES: EEFE 511, EEFE 512

OLD
AEREC 590
Colloquium
COLLOQUIUM (1-3)
Continuing seminars that consist of a series of individual lectures by faculty, students, or outside speakers.
APPROVED START: SP2011

NEW
EEFE 590
Colloquium
COLLOQUIUM (1-3)
Continuing seminars that consist of a series of individual lectures by faculty, students, or outside speakers.
OLD

EME 500
Energy and Mineral Project Investment Evaluation
ENERGY AND MINERAL PROJ INV ED (3)
Emphasizes enterprise level cost review, estimation, and prediction methodology and investment evaluation as a means for project engineering management.
APPROVED START: SP2009

NEW

EME 501
Design Under Uncertainty in Energy and Mineral Systems
SYS DESIGN UNCERT (3)
This class is designed to present a broad range of tools for evaluating energy projects, technologies, and systems. Topics will include project evaluation methods (NPV, discounting), tools for decision/design under uncertainty (Monte Carlo simulation, decision trees, lattices, real options), optimization (linear programming, stochastic programming), and economics/markets/regulation (review of microeconomics, market failures, regulation, and market design). Students will focus both on the intuition and appropriate application of the various methods and theories.

OLD

EGEE 502
Mathematical Modeling of Energy and Geo-Environmental Systems
MATH MODELING (3)
Physical and reactive chemical modeling, model formulation and solution, validation and verification.
PREREQUISITES: EGEE 510
APPROVED START: SP2015

NEW

EME 521
Mathematical Modeling of Energy and Mineral Systems
MATH MODELING (3)
This class develops the understanding of methods of modeling used for important physical and chemical phenomena involved in energy and mineral engineering systems. These include both separate and mixed solid (solid mechanics) and fluid (computational fluid mechanics) systems, including reactive components. The emphasis is on finite element methods but also includes other continuum methods (LBM, SPH), integral methods, and discontinuum methods. Students will develop working programming modules of simple-through-complex models of interactive physical systems and research materials on some form of computational methods.
APPROVED START: SP2015

OLD

FIN 505
Multinational Managerial Finance
MULTI NAT MAN FIN (3)
Analysis of the international aspects of managerial finance. Emphasis on the environmental and institutional factors influencing capital acquisition and allocation.
PREREQUISITES: BA 531
APPROVED START: SP2012

NEW

FIN 805
Multinational Managerial Finance
MULTINAT MANAG FIN (3)
The course integrates macro (global financial markets) and micro (multinational enterprise-centric) dimensions within a practitioner perspective. Students are given an overview of some of the unique global business risks and opportunities facing multinationals and how these two dimensions impact corporate financial strategies. The focus will be on applying fundamental finance concepts and analytical tools for value creation and risk management applicable as they are to multinational financial management.
This course aims to prepare students for a career in multinational corporate financial management in a global setting. It helps students appreciate the strategic motivations, decision processes, and valuation consequences of global financial strategies of multinational corporations. The course facilitates developing the ability among students to plan, implement, and evaluate value adding investing, financing, and risk management strategies in the context of unique opportunities and risks in the global business and financial markets.
PREREQUISITES: FIN 531

OLD
FIN 555
Global Finance
GLOBAL FINANCE (1-3/Repeatable Max: 3)
Analyze international business finance problems, impact of evolving international payment systems on business, financial management in modern multinational enterprise.
PREREQUISITES: FIN 550
APPROVED START: FA2008

NEW
FIN 855
Global Finance
GLOBAL FINANCE (1-3/Repeatable Max: 3)
This course provides a broad exploration of international finance in the context of how a corporate strategic manager analyzes the complexities of international financial markets. In particular, the course develops a tool-kit of techniques to a) understand global market interconnectivity, b) value international financial instruments and c) analyze risk, hedging, and asset pricing strategies to secure strategic competitive advantage.
Building on these insights students will gain a deep understanding of exchange rates, risk management, forecasting, and international capital flows. More specifically students will study foreign exchange markets, hedging strategies using forward and future instruments, purchasing power parity, the eurocurrency market, international portfolio management, and the overall financial management of the international firm.

OLD
FIN 571
Strategic Financial Management
STRAT FIN MGMT (2)
Comprehensive course in corporate finance and the strategic implications of various financial decisions.
PREREQUISITES: BA 531, FIN 550
APPROVED START: SU2002

NEW
FIN 871
Strategic Financial Management
STRAT FIN MGMT (2)
The course provides an integrative study of financial management utilizing applied problems and case studies. It is intended to provide both depth and breadth to students’ knowledge of corporate finance. This course gives an overview of the key concepts, tools, and principles of both strategy formulation and competitive analysis utilized by the successful corporate manager. Students will analyze the dynamic business environment that successful corporate financial managers must navigate to enhance organizational performance.

The skill of decision analysis is presented and then applied by focusing on how managerial decision-making affects the performance of the modern corporate enterprise. Specific topics include capital investment decision making, value creation, strategic cost management, financial performance metrics, strategic financial planning and control, strategic restructuring and growth strategies, corporate governance, and ethics.

OLD
FIN 581
Fundamentals of Financial Markets
FUND FIN MKTS (2)
Operation, structure of money, bond markets and concepts; and techniques used in evaluating and managing fixed income portfolios.
PREREQUISITES: FIN 500
APPROVED START: SU2002

NEW
FIN 881
Fundamentals of Financial Markets
FUND FIN MKTS (2)
This course provides a broad understanding of the pricing mechanism of the bond, equity, and foreign exchange markets. The course also gives students an overview of analytical methodologies that help market participants discern asset price from asset value. How can a market participant understand when they are “buying low and selling high”?

In particular, the course investigates the following questions related to understanding financial markets and why this understanding is important to success as a strategic corporate manager:
• What is the language of financial markets—how do market actors read financial statements with a critical eye to understand assets’ future value?
• What is the difference between price and value?
• What, theoretically, is the “intrinsic value of an asset? What analytical techniques can the financial market participant use to approximate intrinsic value?
• How are decisions made given that market results are uncertain?
• How are decisions made probabilistically using the basic concepts of expected value and standard deviation?
• What is the difference between an “optimal” decision using market data vs. an “accurate” decision?
• How do we understand that the concept of risk is multi-layered and multi-dimensional?
• Which risks are associated with which markets, i.e., bonds vs. equities etc., and how do market participants mitigate risk through hedging?
• Are markets rational or are they subject to “behavioral” characteristics?

At the end of the course students should have a sense that decisions to buy or sell an asset in any financial market are imperfect, and that new information alters the value of assets extremely quickly. As a result, students must develop a keen sense of how markets are moving, and why they are moving in one direction or the other. More importantly, students will realize that decisions must be made, assets must be bought or sold, and hopefully, valuation techniques lead to profitable outcomes.
Modern Portfolio Management: Theory and Practice (2)
Theoretical foundations and tools needed for structuring, managing, and monitoring the performance of an investment portfolio.
PREREQUISITES: FIN 550, FIN 581
APPROVED START: SP2012

Modern Portfolio Management: Theory and Practice (1-3/Repeatable Max: 3)
This course explores tools used by corporate portfolio managers. Topics covered include a review of the structure of the asset markets, basic pricing formulas, fundamental and technical analysis, and the different models relating risk and return, as well as portfolio management and derivative pricing. Statistical concepts such as mean, variance, covariance, and regression analysis will be used extensively throughout the course.
In particular, corporate portfolio management has become part of the DNA of the organization. Tactically, how does strategic management of corporate assets (both short- and long-term) i.e., the corporate portfolio, create shareholder value?
In this course, students will gain an understanding of the theory underlying optimal portfolio construction, the different ways portfolios are actually built in practice, and how to measure and manage the risk of such portfolios.
The course covers investment strategies for bonds, equities, and structured products, including the use of derivatives in managing risk as it relates to overall short- and long-term corporate strategy. Portfolio optimization and asset allocation are covered, as well as how to measure portfolio performance. Ethical investment, the role of taxation, and behavioral investment biases are also explored.
At the end of the course students will be able to choose between different bonds, equities, and structured products, as well as make asset allocation decisions that match overall corporate strategic decision making. Students will also be able to decide on and know how to manage a diversified investment portfolio and its currency risk.

Concepts and institutions affecting the international conduct of business; interface between nations and international firms; alternative policies businesses employ internationally.
APPROVED START: SU2011

This is a foundational course in international business. The basic content of the course includes:
1) an overview of the means of conducting international business, with an emphasis on what makes international different from domestic;
2) the effects of the social systems within countries on the conduct of international business;
3) the major theories explaining international business transactions and the institutions influencing those activities;
4) the financial exchange systems and institutions that measure and facilitate international
transactions;
5) the dynamic interface between countries and companies attempting to conduct foreign business activities;
6) corporate strategy alternatives for global operations;
7) international activities that fall largely within functional disciplines

PREREQUISITES: MGMT 501, (ACCTG 511; ACCTG 512)

OLD

MGMT 521
Complex Negotiations
COMPLEX NEGOT (2)
Develop concepts and strategies for analyzing and conducting multiparty negotiations.
APPROVED START: SP2003

NEW

MGMT 821
Complex Negotiations
COMPLEX NEGOT (1-3/Repeatable Max: 3)
The purpose of this course is to understand the theory and practice of negotiation in a variety of settings, with specific emphasis on multiparty contexts. A basic premise of the course is that while a manager needs analytical skills to discover optimal solutions to problems, a broad array of negotiation skills and an understanding of multiparty dynamics are needed in order for these solutions to be accepted and implemented. The course will allow students to develop these skills experientially and to understand negotiation in useful analytical frameworks.
This course will give students an overview of the unique challenges and intricacies associated with multiparty negotiation, providing an opportunity to understand and develop applied skills regarding (a) the formulation of strategy and tactics before, during, and after a negotiation, and (b) third-party intervention in multiparty negotiation. Students will learn the structural and social characteristics of multiparty negotiation and develop techniques for managing its complexity.

OLD

MGMT 541
Human Resource Management
HUMAN RESouce MGMT (3)
An in-depth examination of the strategic planning and implementation of human resource management, including staffing, development, appraisal, and rewards.
APPROVED START: SU1990

NEW

MGMT 841
Human Resource Management
HUMAN RESorce MGMT (3)
Human Resources Management (HRM) includes evaluating the internal and external environments of an organization, assessing work and work outcomes, and acquiring, training, developing, and compensating employees. In addition, HRM includes labor-management relations, human resource information systems, and international HRM. All managers are responsible for HR practices and managing the employment relationship in organizations, and for the impact of their HRM activities. The primary objective of this course is to investigate how managers might identify, engage in, and evaluate effective Human Resources practices. In addition, the roles and practices of the HR professional are examined.
OLD

**MGMT 571**  
Strategic Management  
STRAT MGMT (3)  
This capstone course provides analysis and application of strategy concepts and techniques in business organizations.  
PREREQUISITES: Only available to students enrolled in the M.B.A. program  
APPROVED START: SP2002

**NEW**

**MGMT 871**  
Strategic Management  
STRAT MGMT (3)  
This capstone course for the M.B.A. is meant to broaden the students' orientation, giving them the perspective of top management. This is accomplished by integrating information from many functional areas such as marketing, accounting, finance, and management, and providing a "big picture" strategic approach to the business environment. The course is meant to be a "value added" experience, and not just a review of what has been learned in the program to date.  
PREREQUISITES: MGMT 501, ACCTG 811, BUSAD523, MBADM 820, BA 800, BA 810  
RECOMMENDED PREPERATION: Student must complete a minimum of 27 credits, including Foundation courses.

OLD

**MGMT 573**  
Corporate Innovation Strategies  
CORP INNOV STRAT (3)  
Survey of managerial issues involved in formulating and implementing a corporate innovation or technology strategy.  
APPROVED START: SU1991

**NEW**

**MGMT 873**  
Corporate Innovation Strategies  
CORP INNOV STRAT (3)  
The goal of this course is to enable students to improve their understanding of managing and leading in changing environments. Students will study approaches to change, including resistance, learning, innovation, resilience, sustainability, and adaptation.  
PREREQUISITES: MGMT 501

**DROP**

**EDLDR 562**  
Methods of Classroom Supervision and Coaching  
MTHD CLRM SUPV COA (3)  
Strategies and techniques for supervision/coaching of instruction intended to enhance teacher reflection, self-direction, and autonomy. C & S (EDLDR) 562 Methods of Classroom Supervision and Coaching (3)  
This course has been designed to equip students with the knowledge, skills, and dispositions necessary to engage in a variety of supervisory processes aimed at teacher growth and renewal as well as enhanced student learning. The outcome of these supervisory activities should be the development of teachers who are more analytical about their practice and its impact on learners, are more adept at solving the complex problems of teaching practice, and are more reflective about their teaching capabilities.
Graduate Council  
Program, Option, or Minor Proposal Form  

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Office of the Dean of the Graduate School, 211 Kern Building, University Park. For more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School:  
Smise College of Business  
Department or Instructional Area:  Accounting  

New Graduate Program, Option, or Minor:  Add  
Designation of new graduate program:  
Classification of Instructional Programs (CIP) Code:  
Designation of new graduate option:  
Designation of new graduate minor:  

Indicate effective semester:  
First semester following approval  
Second semester following approval  

Existing Graduate Program Option, or Minor:  Change  

Current designation of graduate program:  Masters of Accounting  
Current designation of graduate option:  
Current designation of graduate minor:  

New designation of existing graduate program (if changing):  
New designation of existing graduate option (if changing):  
New designation of existing graduate minor (if changing):  

Brief description of the change (if not noted above):  

Indicate effective semester:  
First semester following approval  
Second semester following approval  

Submitted by Graduate Program Head  
Brian Cameron  
Printed name  Signature  Date:  1/25/18  

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:  
Arvind Rangaswamy  
Printed name  Signature  Date:  

Approved by College/School Dean/Chancellor (or Designee):  
Russell Barton  
Printed name  Signature  Date:  1/25/18
<table>
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<tr>
<th>Role</th>
<th>Printed name</th>
<th>Signature</th>
<th>Date</th>
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<tr>
<td>On Behalf of C. Andrew Cole</td>
<td>[Signature]</td>
<td>[Signature]</td>
<td>4/3/2018</td>
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<td>Recommended by Chair, Graduate Council Subcommittee on New and Revised Programs and Courses:</td>
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<td>On Behalf of M. Kathleen Heid</td>
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<td>4/3/2018</td>
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<td>Noted by Dean of the Graduate School:</td>
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<tr>
<td>On Behalf of Regina Vasilatos-Younken</td>
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</table>
The Department of Accounting respectfully submits the following program change proposal to modify its current Masters of Accounting (ACCTG_MACC) Program. The modifications increase all students' exposure to important topics in management information systems and expand the set of advanced accounting electives. These program changes are guided by faculty assessments of students' needs and are responsive to the changing expertise required of accounting professionals generally and Certified Public Accountants (CPAs) in particular.

I. Introduction

A principal mission of the Accounting Department in the Smeal College of Business is to prepare students to become professional accountants. Over time, the body of professional knowledge has expanded and practicing accountants have become more specialized. This is evidenced by the proliferation of post-graduate professional accounting designations: Certified Management Accountant (CMA), Certified Internal Auditor (CIA), Certified Public Accountant (CPA), and Certified Information Systems Auditor (CISA), to name a few.
The curriculum change addresses changes in the educational needs of students planning to become Certified Public Accountants or CPAs.

The CPA designation is among the most prestigious accounting credentials and is the only one that presently imposes the so-called "150 credit-hour requirement," which essentially mandates five years of university-level education to be eligible for professional licensure. When the M.Acc. program was created, a key objective was augmenting the existing undergraduate curriculum to meet the expanded educational requirements for professional licensure as a CPA in Pennsylvania and surrounding states. The proposed curriculum continues to meet this objective while (i) addressing changes in professional skillsets brought about by new technology and (ii) expanding elective choice to permit more specialization.

The Accounting Department offers two paths to earn an ACCTG_MACC degree:

- The One-Year ACCTG_MACC Program primarily admits college graduates with an undergraduate degree in accounting. These students complete fifteen credit hours of coursework in the fall, complete a three-credit internship in spring, and complete the final fifteen credits of coursework in the summer session I and II. This program enrolls about 35 students in each class.
- The Integrated ACCTG_MACC Program is the largest IUG program at Penn State. The program integrates students’ undergraduate degree requirements with the graduate degree requirements of the ACCTG_MACC program. Approximately 125 students are admitted into this program each year in the spring of their second year of study. Coursework for the Integrated ACCTG_MACC Program begins in the fall semester of their third year of study. Students typically complete an internship in the spring or summer of their fourth year of study. The program is a good fit for highly-motivated students who know as of their sophomore year that they want to pursue a career in public accounting and earn a CPA upon graduating. Graduation occurs after the fifth year, at which time students simultaneously earn a bachelor’s and master’s degree in accounting.

These Integrated and One-Year programs have identical degree requirements. This program change proposal does not alter the goals or enrollment base of either program.

II. Rationale/Justification for the Proposed Changes

The accounting profession continues to evolve. The Department’s faculty, its External Advisory Board and senior representatives of the profession seek curricular changes to prepare students for careers in which (i) large amounts of data are assembled and analyzed using advanced technologies and (ii) the base of specialized knowledge in domains such as financial reporting, taxation, auditing, and forensics continues to expand.²

² Academic and professional calls for curricular revision in these two directions are found in Pathways Commission Report "Charting a National Strategy for the Next Generation of Accountants" (July, 2012)
III. Overview of Proposed Changes

Accordingly, the modified proposed curriculum includes the following changes to enhance the preparation of ACCTG_MACC graduates for a career in public accounting:

- creation of four new accounting and tax elective courses (ACCTG 566, ACCTG 821, ACCTG 822, and ACCTG 823),
- removal of ACCTG 440, ACCTG 803, and ACCTG 806 from the list of required courses,
- creation of two new management information systems courses (BA 840 and BA 841), which will be required, and
- requiring and approved and supervised internship experience, ACCTG 495.

ACCTG 873, which is required of all students, will replace ACCTG 803 as the capstone experience. ACCTG 803 is retained as an elective in the revised curriculum. ACCTG 873 culminates instruction in financial accounting. The course addresses the most difficult issues of measurement and disclosure in financial reporting. The topical coverage includes accounting for business combinations and divestitures, multinational enterprises where transactions are recorded in several different currencies, derivative financial instruments, and the valuation of thinly-traded assets, including real estate. Additional topics may be added as new reporting issues arise.

The credits required to earn the ACCTG_MACC degree increase from 30 to 33 credits. An internship experience, ACCTG 495, is a new requirement. This addition reflects the view of faculty that an internship experience is an essential aspect of professional development. Students benefit from professional experience gained under the supervision of licensed CPAs and are able to bring this experience back to the classroom.

There are no substantive changes to admission requirements; however, BA 840 and BA 841 have a prerequisite of 3 credits of business analytics, equivalent in content and rigor to Penn State’s MIS 301. Integrated ACCTG_MACC students should complete MIS 301 in their junior year. One-Year ACCTG_MACC students must enter the program having completed MIS 301 or an equivalent business analytics course.

The existing Integrated M.Acc. admission requirements provide that a student who has not completed ACCTG 211 with superior performance may be provisionally admitted to the program. Provisional admission to the Integrated ACCTG_MACC pending completion ACCTG 211 with superior performance has not occurred. The quality of applicants is so strong that this relaxation of admission standards has been removed.

The enriched set of accounting and tax electives allow students to tailor their education to deepen their knowledge in specific practice areas. A side-by-side view of the proposed

changes and the current requirements is provided along with a listing of the electives students can select from.

<table>
<thead>
<tr>
<th>Proposed ACCTG_MACC Curriculum</th>
<th>Current ACCTG_MACC Curriculum</th>
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<tbody>
<tr>
<td><strong>Fall Term</strong></td>
<td><strong>Fall Term</strong></td>
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<tr>
<td>ACCTG 432 - Accounting</td>
<td>ACCTG 432 - Accounting</td>
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<td>Information Systems</td>
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<tr>
<td>BA 817 – Communication Skills</td>
<td>ACCTG 440 - Advanced</td>
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<td>for Management</td>
<td>Management Accounting</td>
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<td>3</td>
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<tr>
<td>BA 840 - Business Data</td>
<td>ACCTG 803 - Forensic Accounting</td>
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<td>Management</td>
<td>and Litigation Support</td>
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<td>3</td>
<td>3</td>
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<tr>
<td>BA 841 - Business Intelligence</td>
<td>BA 517 - Leadership</td>
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<td>Communications</td>
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<td>BLAW 444 - Advanced UCC and</td>
<td>BLAW 444 - Advanced UCC and</td>
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<td>Commercial Transactions</td>
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<tr>
<td><strong>Spring Term</strong></td>
<td><strong>Spring Term</strong></td>
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<tr>
<td>ACCTG 495 - Internship</td>
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<td><strong>Summer Session One</strong></td>
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<td>FIN 531 - Financial Management</td>
<td>FIN 531 - Financial Management</td>
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<tr>
<td>Accounting/Tax Elective</td>
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<td><strong>Summer Session Two</strong></td>
<td><strong>Summer Session Two</strong></td>
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<tr>
<td>Accounting/Tax Elective</td>
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<tr>
<td>Course</td>
<td>Credits</td>
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<tr>
<td>ACCTG 873 - Advanced Topics in Financial Reporting</td>
<td>3</td>
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<tr>
<td>Accounting/Tax Elective</td>
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<tr>
<td><strong>Total Credits</strong></td>
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<table>
<thead>
<tr>
<th>Accounting/Tax Electives</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACCTG 566 – Corporate Disclosure in the Capital Markets</td>
<td>3</td>
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<tr>
<td>ACCTG 803 - Forensic Accounting and Litigation Support</td>
<td>3</td>
</tr>
<tr>
<td>ACCTG 821 - Analysis and Interpretation of Tax Law</td>
<td>3</td>
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<tr>
<td>ACCTG 822 - Corporate Taxation and Financial Reporting</td>
<td>3</td>
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<tr>
<td>ACCTG 823 - Survey of Tax Topics</td>
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<tr>
<td>ACCTG 881 - Financial Statement Analysis</td>
<td>3</td>
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Provision is made for spring internships because the opportunity for a rich professional internship experience is greatest in the spring. This is due to the nature of public accounting. CPA firms are traditionally busiest in the period after their clients’ fiscal year-ends, which generally fall on December 31.

At least one of the Accounting/Tax electives must be at the 500 level.
Students pursuing the ACCTG_MACC program through the integrated undergraduate/graduate option will follow the same curriculum with some variation in scheduling as shown below:

<table>
<thead>
<tr>
<th>Proposed Integrated ACCTG_MACC Course Schedule</th>
<th>Current Integrated ACCTG_MACC Course Schedule</th>
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<tbody>
<tr>
<td><strong>Year One Bacc - Fall/Spring Terms</strong></td>
<td><strong>Year One Bacc - Fall/Spring Terms</strong></td>
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<td>Crdts</td>
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<td><strong>Year Two Bacc - Fall/Spring Terms</strong></td>
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<td><strong>Year Three Integrated - Fall/Spring Terms</strong></td>
<td><strong>Year Three Integrated - Fall/Spring Terms</strong></td>
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<td>ACCTG 432 - Accounting Information Systems</td>
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<tr>
<td>MIS 301 - Business Analytics (prerequisite)</td>
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<td><strong>Year Four Integrated - Fall Term</strong></td>
<td><strong>Year Four Integrated - Fall Term</strong></td>
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<tr>
<td>BA 817 – Communication Skills for Management</td>
<td>ACCTG 432 - Accounting Information Systems</td>
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<td>BA 840 - Business Data Management</td>
<td>ACCTG 806 – Taxes and Business Planning</td>
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<td>Accounting/Tax Elective</td>
<td>BA 517 - Leadership Communications</td>
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<td>Course</td>
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<td>ACCTG 495 - Internship</td>
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<tr>
<td>ACCTG 873 - Advanced Topics in Financial Reporting</td>
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</tr>
<tr>
<td>BLAW 444 - Advanced UCC and Commercial Transactions</td>
<td>3</td>
</tr>
<tr>
<td>FIN 531 - Financial Management</td>
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</tr>
<tr>
<td>BA 841 - Business Intelligence</td>
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*Up to 12 credits count towards both the B.S. and the ACCTG_MACC degrees*

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tr>
<td>Internship</td>
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<td><strong>Year Five Integrated - Fall Term</strong></td>
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<tr>
<td>ACCTG 440 - Advanced Management Accounting</td>
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<td>ACCTG 873 - Advanced Topics in Financial Reporting</td>
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<td>BLAW 444 - Advanced UCC and Commercial Transactions</td>
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<td>Baccalaureate Requirement</td>
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<td><strong>Year Five Integrated - Spring Term</strong></td>
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<tr>
<td>ACCTG 803 - Forensic Accounting and Litigation Support</td>
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<tr>
<td>ACCTG 881 - Financial Statement Analysis</td>
<td>3</td>
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<td>Accounting/Tax Elective</td>
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<tr>
<td>Baccalaureate Requirements</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>141</td>
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</tbody>
</table>

*9 credits count towards both the B.S. and the ACCTG_MACC degrees*

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<thead>
<tr>
<th>Accounting/Tax Electives</th>
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<tr>
<td>ACCTG 566 -- Corporate Disclosure in the Capital Markets</td>
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<td>Course Code</td>
<td>Course Title</td>
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<tr>
<td>ACCTG 803</td>
<td>Forensic Accounting and Litigation Support</td>
</tr>
<tr>
<td>ACCTG 821</td>
<td>Analysis and Interpretation of Tax Law</td>
</tr>
<tr>
<td>ACCTG 822</td>
<td>Corporate Taxation and Financial Reporting</td>
</tr>
<tr>
<td>ACCTG 823</td>
<td>Survey of Tax Topics</td>
</tr>
<tr>
<td>ACCTG 881</td>
<td>Financial Statement Analysis</td>
</tr>
</tbody>
</table>

Though the IUG program consists of 141 credits, it meets the various states’ “150-credit-hour” requirement because up to 12 credits appearing on the graduate transcript also appear on the undergraduate transcript.

IUG students are counseled on variations of this program of study appropriate to their specific circumstances, which often include large numbers of AP credits and classes taken in summer session. The rare students who are not succeeding in the IUG program are counseled to timely complete the requirements of the B.S. in accounting.

**IV. Program Goals**

The program goals for the proposed Master of Accounting program are consistent with those of the existing program: to prepare students for accounting careers by developing students’ problem-solving and integrative reasoning skills. Students will understand the importance of sound ethical decision-making and the need to articulate their professional judgements to corporate stakeholders and the public in a clear and concise manner. Learning objectives supporting these goals include:

1. **Communication Skills** – Argue one’s point persuasively in written form and oral presentation.
2. **Global Perspective** – Anticipate, understand, and explain the global forces that influence business decisions and accounting practices.
3. **Ethical Decision Making** – Be both a principled leader and a valuable member of a team while adhering to professional accounting standards.
4. **Problem Solving Skills** – Analyze a complicated business problem using the best tools, theories, and evidence, complemented by the ability to recommend solutions and implement plans.
5. **Integrative Understanding** – Consider many perspectives in analyzing and recommending solutions to business problems.
Consistent with present practice, these objectives will be assessed by faculty members in particular courses.

V. New Courses

Seven new accounting, tax, and business analytics courses have been approved. Proposals have been developed in consultation with Smeal faculty and disciplinary faculty at Penn State. These proposals were submitted simultaneously with the proposed ACCTG_MACC changes through the online CRCS system. These courses are:

**ACCTG 566 Corporate Disclosure in the Capital Markets** – ACCTG 566 provides a broad perspective of accounting that spans beyond the Generally Accepted Accounting Principles (GAAP) by exploring the role of financial accounting (and more broadly, corporate disclosure) in the capital markets. This includes discussions about (i) how accounting information flows in the capital markets and why it is so crucial to a well-functioning economy, (ii) key capital market stakeholders, their incentives, and their relation with corporate disclosure, (iii) various disclosure types and venues and their decision usefulness, (iv) the role of corporate governance in ensuring the provision of useful accounting information, (v) earnings management types, incentives, and settings, (vi) the standard setting process, and (vii) the role of emerging technologies in shaping corporate communications with the market. The course will also expose students to the history of accounting to provide insight into how and why accounting has morphed into its current state. Finally, throughout the course, there will be discussion and tie-ins to academic research on capital markets with an emphasis on corporate disclosure research.

**ACCTG 821 Analysis and Interpretation of Tax Law** – ACCTG 821 provides accounting and law students who are interested in the practice of taxation with an overview of U.S. federal income tax system research. The course focuses on resolving tax law questions in support of economic decision making and tax return position defense. Students learn to conduct and document in-depth legal research and analysis within the domain of tax law. This writing intensive course hones students’ writing skills within the domain of tax law and business decision making. Additionally, the course provides an in-depth understanding of the ethical constructs that guide and limit the practice of taxation.

**ACCTG 822 Corporate Taxation and Financial Reporting** – ACCTG 822 provides accounting students with knowledge about the taxation of corporations. The course focuses on the tax law treatment of corporate formations, operations, distributions, mergers, and acquisitions. Additionally, students learn about Accounting StandardsCodification Topic 740--Income Tax, planning for corporate structure classification, and related ethical considerations.

**ACCTG 823 Survey of Tax Topics** – ACCTG 823 provides accounting students who are interested in the practice of taxation a survey of the law defining the taxation of pass-through entities including partnerships, S-corporations, limited liability companies, and trusts. The course focuses on the tax law treatment of formation, operations, distributions, mergers, and acquisitions to the entity and its owners. Planning for structure classification and limitations thereof are embellishments to the basic tax law applicable to pass-through entities. This course also provides an overview of State and Local Taxation (SALT) and taxation of international operations.
BA 840 Business Data Management – Business Data Management will enable students to use various database designs to acquire the information needed to make effective business decisions. Successful students will be able to design, create, and implement a relational database and be able to write SQL statements to obtain information from a database. In addition, students will investigate the next generation approaches for storing, manipulating, and managing web data in unstructured formats. Students will gain an understanding of the advantages and disadvantages among XML, NoSQL, NewSQL, and Relational databases.

BA 841 Business Intelligence – Business intelligence encompasses the IT tools for exploring, analyzing, integrating, and reporting business data for fact-based, intelligent decision making. This course primarily investigates methods and tools for exploring and analyzing large amounts of business data, also called "Big Data". Learning methods emphasize active learning in the application of methods and tools to real data and the presentation of the results. Students will be exposed to a variety of methods for analyzing both structured and unstructured data and they will work with business data sets to understand the value that can be extracted from large data sets. They will also learn how to classify and associate data to discover business rules that can be used to support decision making. The course will also cover methods to analyze social media information and tools that can facilitate such analysis and discovery. Students will work with data from real social networks to gain an appreciation of how value can be obtained from such networks. Finally, they will learn about techniques for visualizing, presenting, and communicating information in a useful way, e.g. through dashboards and with other technologies on various platforms.

VI. Effective Date and Transition Considerations

New courses described in this proposal will be offered in the necessary sequence beginning in fall 2019. This is so that the One-Year ACCTG_MACC program students admitted to the class of 2020 can complete their degrees in summer 2020. To achieve the greatest possible efficiency in delivering the new curriculum to One-Year and IUG students (who will take the new courses in their fourth and fifth years at Penn State), the first offering of the new courses to Integrated ACCTG_MACC students will also occur in fall 2019. This means that this program change is effective for Integrated ACCTG_MACC program students who are admitted to the Integrated ACCTG_MACC program in spring 2018 (i.e., the Integrated ACCTG_MACC class that will graduate in spring 2021). Hence, this program change is effective for One-Year ACCTG_MACC program students who begin their studies in fall 2019 and Integrated ACCTG_MACC program students who begin their studies in fall 2018.
VII. Proposed Graduate Bulletin with Track Changes

Accounting (ACCTG)

Program Home Page

PAUL E. FISCHER, STEVEN HUDDART, Chair
Department of Accounting, Smeal College of Business
354 Business Building
814-865-0041
pef5sjh11@psu.edu

Degrees Conferred:

Master of Accounting (M.Acc.) in Accounting (M.Acc. ACCTG MACC)
Integrated B.S. in Accounting and Master of Accounting (M.Acc.) in Accounting Program

The Graduate Faculty

The Department of Accounting offers a Master of Accounting that is designed to allow students to complete the educational requirements for becoming a certified public accountant in Pennsylvania, as well as most other states. Certified public accountants (CPAs) conduct independent audits and provide accounting, tax, and management advisory services. The program prepares students to enter into careers in public accounting, corporate accounting, management accounting, governmental accounting, financial analysis, and law enforcement.

Admission Requirements

Admission requirements listed here are in addition to requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin. Applicants apply for admission to the program via the Graduate School application for admission.

Entry to the program is competitive and subject to available space. Criteria for evaluating applicants can include: professional and academic accomplishments, GMAT scores, personal data from application forms and, possibly, interviews or examinations. Work on the M.Acc. degree generally begins in the fall semester.

Typically, students who meet the admissions requirements can complete the program in one full year.

Students who apply to the program should have an undergraduate educational background equivalent to a Bachelor of Science degree from the Penn State University Smeal College of Business. Students who apply to the program should have completed the equivalent of the
following Penn State University accounting courses: ACCTG 211, ACCTG 403W, ACCTG 404, ACCTG 405, ACCTG 471, and ACCTG 472, and MIS 301. Applicants to the program from outside Penn State may be required to take an entry exam to demonstrate mastery of the material covered in these courses prior to beginning coursework in the master's program.

Although the program has no fixed minimum grade-point requirement, an applicant is generally expected to have maintained a junior-senior grade-point average of at least 3.00 on Penn State's grading scale of A (4.00) to D (1.00). In addition, an applicant is expected to have maintained a grade-point average of 3.00 for the required accounting courses.

Applicants to the program are generally required to take the Graduate Management Admission Test (GMAT). The GMAT requirement is waived for applicants with an undergraduate GPA of 3.50 or higher, or whose undergraduate degree is awarded by Penn State, with scores reported directly from the testing center to Penn State.

In addition to the Graduate School application for admission, the program requires a completed Smeal College of Business application for graduate study, and official transcripts from all post-secondary institutions attended.

Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

Students must complete a minimum of 30-33 credit-hours of graduate instruction. All of the 30 credits-hours must be earned in 400-level, 500-level, or 800-level courses. At least 18 of the 30 credits-hours must be earned in 500-level and 800-level courses, and at least 6 of the 30 credits-hours must be earned in 500-level courses.

Students must complete the following 24 required credits-courses as part of the 30 credit-hours of graduate instruction:

ACCOUNTING (ACCTG)

- 432. Accounting Information Systems (3)
- 495. Internship (3)
- 440. Advanced Managerial Accounting (3)
- 803. Forensic Accounting (3)
- 806. Advanced Topics in Taxation (3)
- 873. Advanced Topics in Financial Reporting (3)
- 881. Financial Statement Analysis (3)

BUSINESS ADMINISTRATION (B-A)

- 517817. Leadership Communication Skills for Management (3)
ACCTG 803 will be the capstone course for the program, with the final project integrating material learned in the other program courses. Students must also take an additional 3-9 credits of (elective) course selected in consultation with their adviser. A list of approved elective courses is maintained by the graduate program office.

The culminating experience for the degree is the capstone course and internship completed while the student is enrolled in ACCTG 895 ACCTG 873. Elective offerings include:

**ACCOUNTING (ACCTG)**

- **566. Corporate Disclosure in the Capital Markets (3)**
- **803. Forensic Accounting (3)**
- **821. Analysis and Interpretation of Tax Law (3)**
- **822. Corporate Taxation and Financial Reporting (3)**
- **823. Survey of Tax Topics (3)**
- **881. Financial Statement Analysis (3)**

**Integrated B.S. in Accounting and Master of Accounting (M.Acc.) in Accounting Program**

The Department of Accounting offers an integrated program allowing students to receive a B.S. in Accounting and Master of Accounting (M.Acc.) degrees within a five-year period. Students typically are admitted into the integrated program in the spring of the second year of the undergraduate program and the program is completed in the subsequent three years. The program is designed to meet the educational requirements for becoming a certified
public accountant in Pennsylvania as well as most other states. Certified public accountants conduct independent audits and provide accounting, tax, and management advisory services. The program prepares students to enter into careers in public accounting, corporate accounting, management accounting, governmental accounting, financial analysis, and law enforcement. In addition, the program is appropriate for students having an interest in entering law school and graduate programs in business, such as M.B.A. programs or doctoral programs.

Admission Requirements

Students must apply to the program via the Graduate School application for admission, and must meet all the admission requirements of the Graduate School and the Accounting graduate program for the Master of Accounting degree, listed above. Students shall be admitted to an IUG program no earlier than the beginning of the third semester of undergraduate study at Penn State (regardless of transfer or AP credits accumulated prior to enrollment) and no later than the end of the second week of the semester preceding the semester of expected conferral of the undergraduate degree, as specified in the proposed IUG plan of study.

Students will generally apply for the program in the spring of their second year of undergraduate study. To apply for the program, students must:

1. be enrolled in the Smeal College of Business or the Division of Undergraduate Studies, and intend to complete the entrance-to-major requirements by the end of the spring semester in which they apply prior to completing 59 cumulative credits at Penn State.

and

2. complete a Master of Accounting application for graduate study.

Although the program has no fixed minimum grade-point requirement, an applicant is generally expected to have grade-point average of at least 3.20 on Penn State’s grading scale of A (4.00) to D (1.00).

In addition, the Department may request an interview with an applicant or require a GMAT exam or other exam. Admissions decisions will be based upon the student’s application, undergraduate record, SAT scores, and, if applicable, interviews and examination results.

Admitted students must have completed ACCTG 211 with superior performance by the end of the spring semester in which they apply for admission to the program.

In consultation with an adviser, students must prepare a plan of study appropriate to this integrated program, and must present their plan of study in person to the head of the graduate program or the appropriate committee overseeing the integrated program prior to being admitted to the program. The plan should cover the entire time period of the integrated program, and it should be reviewed periodically with an adviser as the student advances through the program.

A student who has not satisfied this requirement by the admissions deadline may be provisionally admitted pending completion of ACCTG 211 with a superior performance.
Degree Requirements

Students must fulfill all degree requirements for each degree in order to be awarded that degree, subject to the alterations and double-counting of credits as outlined below. Degree requirements for the Bachelor of Science in Accounting are listed in the Undergraduate Bulletin. Degree requirements for the Master of Accounting degree are listed above. Students must sequence their courses so all undergraduate degree requirements are fulfilled before taking courses to count towards the graduate degree. If students accepted into the IUG program are unable to complete the M.Acc. degree, they are still eligible to receive their undergraduate degree if all the undergraduate degree requirements have been satisfied.

Students must complete the requirements for a B.S. in Accounting with the following alterations:

- Some of prescribed courses for the B.S. must be taken in sections that are available only to students enrolled in the program. These prescribed courses, which all count toward the undergraduate degree in accounting, are: ACCTG 403W, ACCTG 404, ACCTG 405, ACCTG 471, and ACCTG 472.
- The student need not satisfy the requirement that 6 credit hours be completed from the following list of courses: ACCTG 406, ACCTG 432, ACCTG 473, and ACCTG 481.
- The following courses cannot be used to satisfy the degree requirements of the integrated ACCTG-MACCB.S./M.Acc. program: ACCTG 406, ACCTG 410, ACCTG 411, ACCTG 417, ACCTG 422, ACCTG 450, ACCTG 473, and ACCTG 481.

Up to 12 credits may be double-counted towards the degree requirements for both the graduate and undergraduate degrees; a minimum of 50% of the double-counted courses must be at the 500 or 800 level. Credits associated with the culminating experience for the graduate degree cannot be double-counted.

Students must complete the Master of Accounting Requirements, which total 30-33 credit hours of graduate instruction, in addition to completing 120 credit hours of undergraduate instruction.

The following courses, totaling 9-12 credit hours, will double-count towards both the B.S. and Master of Accounting degrees: BLAW 444(3), FIN 531(3), BA 840(3), and ACCTG 881432 (3), BA 840 (3), BLAW 444 (3), and FIN 531 (3).

Student Aid

Refer to the Student Aid section of the Graduate Bulletin. Students in this program are not eligible for graduate assistantships.

Courses

Graduate courses carry numbers from 500 to 599 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.

VIII. Consultation

The proposed changes to the Master of Accounting program are the culmination of discussions and curricular assessment conducted by the Smeal College Accounting Faculty. Industry trends and accounting standards along with the opportunity to enhance the program were driving forces for change. The infusion of new knowledge was also taken into consideration at the new course development level. Specific stages of consultation include:

- Curricular review at the program faculty level.
- Solicitation of information and feedback from industry professionals who are members of the Smeal College Accounting External Advisory Board.
- Draft proposed changes discussed with faculty in the Accounting Department, the Supply Chain and Information Systems Department, and colleagues in other units with support to move forward.
- Review by the Smeal College Graduate Policy Committee with a vote to move forward.
- Review by the Smeal College Dean’s Advisory Committee with a vote to move forward.
- University consultation with comments below.
- Preliminary review by the Graduate School, specifically, Vicki Hewitt.

University Consultation List

THOMAS AMLIE (tt2) – School of Business, Capital College
HANS BAUMGARTER (jxb14) – Marketing, Smeal College of Business
THOMAS BUTTROSS (TEB11) - School of Business, Capital College
KEITH CROCKER (ist) – Risk Management, Smeal College of Business
ASHUTOSH DESHMUKH (avd1) – Black School of Business, Behrend College
LYDIA N DIDIA (lnd6) – School of Business, Capital College
WILLIAM G ENGELBRET (w7e) – Accounting, Penn State Altoona
GREG FILBACK (mgf11) – Black School of Business, Behrend College
JOHN KETZ (k55) – Accounting, Smeal College of Business
SHAHID ALI KHAN (sak62) – Penn State Berks
BILL KRACAW (wak4) – Finance Chair, Smeal College of Business
VILMOS MISANGYI (vfm10) – Management and Organization, Smeal College of Business
JAMES NEMES (JAN16) - Great Valley School of Professional Studies
University Consultation Responses

Colleagues:

The Smeal College Accounting faculty are proposing changes to their One-Year Master of Accounting (ACCTG_MACC) program.

The modified proposed curriculum includes the following changes to enhance the preparation of ACCTG_MACC graduates for a career in public accounting:

- creation of four new accounting and tax elective courses
  - ACCTG 566 – Corporate Disclosure in the Capital Markets
  - ACCTG 821 – Analysis and Interpretation of Tax Law
  - ACCTG 822 – Corporate Taxation and Financial Reporting
  - ACCTG 823 – Survey of Tax Topics

- removal of ACCTG 440 and ACCTG 806 from the list of required courses,

- creation of two new required management information systems courses
  - MIS BA 831 840 – Business Data Management
  - MIS BA 841 – Business Intelligence

- creation of a new required course, ACCTG 895, which will be an approved and supervised internship experience.

The new courses have gone through University consultation and are pending Graduate School Curricular Council review. The program change proposal is ready at this time for University review and comments.

From: Hans Baumgartner
Sent: Friday, August 4, 2017 10:07 AM
To: Mike Gilpatrick <mjg11@psu.edu>
Subject: RE: Proposed Changes to Smeal's ACCTG_MACC Program

Hi Mike:

Find with me.

Hans

From: Nicholas Petruzzi
Sent: Friday, August 4, 2017 10:09 AM
To: Mike Gilpatrick <mjg11@psu.edu>
Subject: RE: Proposed Changes to Smeal's ACCTG_MACC Program
I am a proponent, Mike.

Thanks, Nick

From: Greg Filbeck [mailto:mgf11@psu.edu]
Sent: Friday, August 4, 2017 12:26 PM
To: Mike Gilpatrick <mig11@psu.edu>
Subject: Re: Proposed Changes to Smeal's ACCTG_MACC Program

Mike

We support your proposal. Thanks for sharing!

Greg

> On Sep 6, 2017, at 8:11 PM, Thomas E. Buttross <teb11@psu.edu> wrote:
> I have no concerns with or objections to the proposed changes.
> Tom B
> Thomas E. Buttross
> Associate Professor of Accounting
> School of Business
> Penn State Harrisburg
> E-mail: TEB11@psu.edu

> On Sep 6, 2017, at 11:05 PM, SHAHID KHAN <sak62@psu.edu> wrote:
> Dear Steve,
> Thank you for the opportunity to be part of this consultation process. I have no concern or objection with the proposed changes.
> Thanks and best regards,
> Shahid Khan
> Assistant Professor of Accounting
> The Pennsylvania State University, Berks Campus

On Sep 7, 2017, at 1:13 AM, WILLIAM G ENGELBRET <w7e@psu.edu> wrote:

Steve,

We at Penn State Altoona support the proposed changes to the MAcc curriculum. While all curriculum changes offer trade offs, we believe that two very positive changes are:
(1) the increased emphasis on data analytics, and
(2) the ability to focus on either tax services or assurance services.

Hope that helps!

--Bill
William G. Engelbret CPA, Ph.D.
Associate Professor of Accounting
Penn State Altoona
3000 Ivyside Park
Altoona, PA 16601-3760
Phone: 814-949-5274

> On Sep 7, 2017, at 7:22 AM, Bill Kracaw <wak4@psu.edu> wrote:
> Steve,
> > No concerns or suggestions.
> > BK
>

From: Ed Ketz
Sent: Thursday, September 7, 2017 10:28 AM
To: Mike Gilpatrick <mjg11@psu.edu>
Cc: Steven Huddart <sjh11@email.psu.edu>
Subject: RE: Proposed Changes to Smeal’s ACCTG_MACC Program

Mike,

I have reviewed the proposed changes to the Accounting MAcc program and believe they are all improvements to the existing program. I have no concerns or objections.

Ed Ketz
J. Edward Ketz
372 Business Building
Smeal College of Business

> On Sep 7, 2017, at 10:04 AM, RMHead <rmhead@smeal.psu.edu> wrote:

> Hi steve. No concerns or objections here. kc
> Keith J. Crocker, Chair
> Department of Risk Management
> Smeal College of Business
> On Sep 8, 2017, at 2:55 PM, ASHUTOSH V DESHMUKH <avd1@psu.edu> wrote:
>
> Steve:
>
> > I support this proposal.
>
> > -Ash
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Office of the Dean of the Graduate School, 211 Kern Building, University Park. For more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: AGRI SCIENCE / ESM
Department or Instructional Area: ESM

New Graduate Program, Option, or Minor: Add
Designation of new graduate program: INTAD
Classification of Instructional Programs (CIP) Code:
Designation of new graduate option: FORESTRY
Designation of new graduate minor:

Indicate effective semester:
- First semester following approval
- Second semester following approval

Existing Graduate Program Option, or Minor: Change Drop
Current designation of graduate program:
Current designation of graduate option:
Current designation of graduate minor:

New designation of existing graduate program (if changing):
New designation of existing graduate option (if changing):
New designation of existing graduate minor (if changing):

Brief description of the change (if not noted above):

Indicate effective semester:
- First semester following approval
- Second semester following approval

Submitted by Graduate Program Head

Printed name: MICHAEL MESSINA
Signature: [signature]
Date: 3/16/17

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:

Printed name: John Ewing
Signature: [signature]
Date: 6/16/17

Approved by College/School Dean/Chancellor (or Designee):

Printed name: RAMA RADHAKRISHNA
Signature: [signature]
Date: 6/16/17
<table>
<thead>
<tr>
<th>Recommended by Chair, Graduate Council Subcommittee on New and Revised Programs and Courses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Behalf of C. Andrew Cole</td>
</tr>
<tr>
<td>Printed name: Valastikũt</td>
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<tr>
<td>Signature:</td>
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<tr>
<td>Date: 4/3/2018</td>
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</tbody>
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<tr>
<th>Recommended by Chair, Graduate Council Committee on Programs and Courses:</th>
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<tr>
<td>On Behalf of M. Kathleen Heid</td>
</tr>
<tr>
<td>Printed name: Valastikũt</td>
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<tr>
<th>Noted by Dean of the Graduate School:</th>
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<tbody>
<tr>
<td>On Behalf of Regina Vasilatos-Younken</td>
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<tr>
<td>Printed name: Valastikũt</td>
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<tr>
<td>Signature:</td>
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<tr>
<td>Date: 4/3/2018</td>
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</tbody>
</table>
PROGRAM CHANGE PROPOSAL TO ADOPT THE DUAL-TITLE DEGREE PROGRAM IN INTERNATIONAL AGRICULTURE AND DEVELOPMENT

Department of Ecosystem Science and Management
College of Agricultural Sciences

CONTENTS

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JUSTIFICATION

What is Forest Resources (FORR)?
Forest Resources (FORR) is the profession devoted to study and management of forest ecosystems. Graduate research projects typically address one or more of the following areas:

- Forest Resources Management: Quantitative forest management systems, economics, biometrics, remote sensing, forest recreation, policy and sociology, watershed management practices, urban forestry
- Forest Biology: Genetics and breeding, ecology, silviculture, revegetation of disturbed lands, reproduction of hardwoods
- Environmental Concerns: Acid precipitation effects, forest microclimatology, municipal wastewater and sludge effects, reclamation of mined lands, urban forestry, water yield and quality
What is the Relevance of INTAD to FORR?
Forests are the single largest land use covering one-third of the world’s land surface. Over one billion people rely on forests for their livelihoods. Forests provide timber, energy, food, recreation and numerous other forest products. As importantly, forests also provide key services such as carbon sequestration, water and soil regulation and biodiversity. Therefore, other sectors such as agriculture, energy, education and health play heavily into forest management decisions. Providing these forests goods and services are critical to ensuring food security and alleviating poverty around the world. This requires knowledge and skills of all land uses including forests. Because of these opportunities and needs, the combination of the FORR and INTAD promises to be a powerful tool for preparing the next generation of land use managers in the international development sector, and catalyzing meaningful and lasting improvements worldwide.

Goal of Dual-Title Program
The goal of the dual-title program in Forest Resources and International Agriculture and Development is to prepare students to effectively apply forest ecosystem solutions that address international development needs in a sustainable, appropriate manner, while creating science-based knowledge that will inform and enable more successful and sustainable land use and economic growth.

Benefits to Students in Dual-Title Program
Students enrolled in the dual-title program in FORR and INTAD will be exposed to a synergistic combination of advanced forest ecosystem science and management, international development practice and principles that will enable them to better understand successful forest management, and the challenges and constraints that face foresters and land-use practitioners and scientists seeking to work in the international development community.

Benefits to Department, College, and University
This program will benefit the department by providing an attractive program combination to students wishing to pursue a career in international development. It will also provide a mechanism for drawing together faculty and students with interests in this area, allowing for more effective mutual support and pursuit of opportunities.

The college and university will benefit through the expanded reach of the INTAD program, additional enrollments in INTAD courses, and graduates with enhanced skills who will not only improve their career prospects and impact, but also enhance the university’s reputation worldwide.
Forest Resources (FORR)

MICHAEL G. MESSINA, Director of the School of Forest Resources and Professor of Forest Resources
121 Forest Resources Building
814-863-7093

Degrees Conferred:

- Ph.D., M.S.
- Dual-title M.S., Ph.D., M.S. (Forest Resources and Human Dimensions of Natural Resources and the Environment)
- Dual-title Ph.D. (Forest Resources and Human Dimensions of Natural Resources and the Environment)

- Dual-title M.S. (Forest Resources and International Agriculture and Development)
- Dual-title Ph.D. (Forest Resources and International Agriculture and Development)
- Dual-title M.S. (Forest Resources and Operations Research)
- Dual-title Ph.D. (Forest Resources and Operations Research)

- The Graduate Faculty

- The Programs

The Doctor of Philosophy and the Master of Science degree programs are oriented toward research, education, and scientific technology in the professions of forest products and forestry. Faculty expertise, laboratories, and outdoor facilities are available to support specialization in a variety of fields. Possibilities for specialization are indicated in part by the courses listed under wood products, forestry, and wildlife and fisheries, and by related courses in agricultural economics, agronomy, animal nutrition, biology, business administration, chemical engineering, computer science, ecology, economics, entomology, environmental pollution control, environmental resource management, genetics, horticulture, industrial engineering, landscape architecture, meteorology, physiology, plant pathology, polymer sciences, recreation and parks, regional planning, or statistics.

Students in this program may elect a dual-degree-title program option in Operations Research, Human Dimensions of Natural Resources and the Environment, or International Agriculture and Development for the Ph.D. and M.S. degrees.

Admission Requirements
Requirements listed here are in addition to requirements stated in the General Information section of the Graduate Bulletin. Applicants apply for admission to the program via the Graduate School application for admission.

Scores from the Graduate Record Examinations (GRE) are required for admission. A student may be admitted at the discretion of the program without GRE scores.

Application materials should be submitted by February by those who want to begin in summer or fall. For admission, an applicant should have at least a 2.75 grade-point average, a 3.00 junior/senior average (on a 4.00 scale), and courses that are basic to the individual's field of specialization. Ordinarily, these include 12 credits in communication; 12 credits in social sciences and humanities; 10 credits in quantification, including calculus and statistics; 8 credits in chemistry and/or physics; 8 credits in biological sciences; and 18 credits in forest products, forestry, fish, wildlife, or related courses. Three reference letters and a brief statement describing the applicant's academic goals, career interests, and special qualifications are required. The best-qualified applicants will be accepted up to the number of spaces available. Exceptions to admission requirements may be made for students with special backgrounds, abilities, and interests, at the discretion of the program.

Admission to the Ph.D. program in Forest Resources requires a master's degree in Forest Resources or a closely related field, or a bachelor's degree with a minimum grade-point average of 3.30 and demonstrated research ability.

Master's Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

A minimum of 30 credits at the 400, 500, 600, or 800 level is required, with at least 18 credits at the 500 and 600 level, combined. The department requires 12 credits of 400- or 500-level formal courses in Forestry (FOR) Soil Science of which 6 must be 500-level. At least 6 credits of 400- or 500-level courses (usually STAT) are required in courses that cover topics such as analysis-of-variance, correlation, regression, and design of experiments; the courses that will satisfy this requirement must be approved by the student's committee. One course, Research Integrity and Communications (1 credit), is required. Participation in at least one colloquium course each semester is expected and students must complete at least 1 credit of colloquium (FOR 590). In addition, Specific specific courses and requirements will be determined by the faculty adviser and advisory committee.

A thesis based on field or laboratory research is required for the M.S. degree and at least 6 credits in thesis research (600 or 610) must be taken in conjunction with completing the thesis. The thesis must be accepted by the advisers and/or committee members, the head of the graduate program, and the Graduate School, and the student must pass a thesis defense.
Doctoral Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

While a minimum number of courses for the degree is not specified, the doctoral committee has the responsibility of specifying courses and credits essential for the education and development of the candidate. Students are expected to be educated in depth in a specific subfield of Forestry (FOR) Soil Science and to have a perspective of the general field. Normally, students will have 50 to 60 credits in formal course work beyond the B.S. degree.

Doctoral candidates are required to participate regularly in a departmental colloquium and to register for at least 1 credit of Colloquium (SOILS FOR 590) during the Ph.D. program. One course, Research Integrity and Communications (1 credit), is required, unless already taken in the M.S. degree program. Ph.D. students are required to complete two separate semesters of Supervised Experience in College Teaching (FOR 602) for 2 credits total; however, these 2 credits cannot be counted towards the degree requirements. Doctoral students must pass a candidacy examination, a comprehensive written and oral examination, and a final oral examination (the dissertation defense). To earn the Ph.D. degree, doctoral students must also write a dissertation that is accepted by the doctoral committee, the head of the graduate program, and the Graduate School.

WATERSHED STEWARDSHIP OPTION

The Graduate Option in Watershed Stewardship is a graduate option intended to provide enhanced educational opportunities for students with an interest in water resources management who are enrolled in a graduate degree program within in Forest Resources. The objective of the Graduate Option in Watershed Stewardship is to educate students to facilitate team-oriented, community-based watershed management planning directed at water resources problems encountered in Pennsylvania communities, especially non-point source water pollution. The Graduate Option in Watershed Stewardship requires 22 credits of graduate course work: 12 credits of breadth courses, 2 credits of Watershed Stewardship Seminar courses (FOR 591A and FOR 591B or LARCH 510.2), and 8 credits of Watershed Stewardship Practicum I and II courses (FOR 570 and FOR 571, or LARCH 540.2 and LARCH 550.2). In the watershed stewardship practicum course students work in teams with community, government, and business leaders to analyze and understand natural resources problems and creatively synthesize appropriate solutions in the form of a written watershed management plan.

Breadth courses will consist of 3 graduate credits of course work from each of four subject matter areas: (1) water resources science, (2) social science, public policy and economics, (3) humanities, and (4) communications and design. A list of acceptable breadth courses from each category is provided in the Graduate Option in Watershed Stewardship Handbook. Students are allowed to petition to the Center for Watershed Stewardship to substitute higher-level or equivalent courses in a major field to suit their specific backgrounds and goals. Courses taken for the Graduate Option in Watershed Stewardship may be used to satisfy other equivalent (400- or 500-level) degree requirements with concurrence of the adviser and advisory/doctoral.
committee. The advisory/doctoral committee for a student enrolled in the Option in Watershed Stewardship must include a faculty representative from the Center for Watershed Stewardship. In the watershed stewardship practicum course students work in teams with community, government, and business leaders to analyze and understand natural resources problems and creatively synthesize appropriate solutions in the form of a written watershed management plan. A representative pattern of scheduling for the Graduate Option in Watershed Stewardship in addition to a student's other degree requirements is:

<table>
<thead>
<tr>
<th>First Year</th>
<th>Second Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall Semester</strong></td>
<td><strong>Fall Semester</strong></td>
</tr>
<tr>
<td>Breadth electives—6 credits</td>
<td>FOR 570 or LARCH 540.2—3 credits</td>
</tr>
<tr>
<td>FOR 591A or LARCH 510.2, Watershed Stewardship Issues Colloquium—1 credit</td>
<td>Keystone Project</td>
</tr>
<tr>
<td><strong>Spring Semester</strong></td>
<td><strong>Spring Semester</strong></td>
</tr>
<tr>
<td>Breadth electives—6 credits</td>
<td>FOR 571 or LARCH 550.2—5 credits</td>
</tr>
<tr>
<td>FOR 591B or LARCH 510.2, Watershed Stewardship Planning Colloquium—1 credit</td>
<td>Keystone Project</td>
</tr>
</tbody>
</table>

A list of acceptable breadth courses from each category is provided in the Graduate Option in Watershed Stewardship Handbook. Students will be allowed to petition to the Center for Watershed Stewardship to substitute higher level or equivalent courses in a major field to suit their specific backgrounds and goals. Courses taken for the Graduate Option in Watershed Stewardship may be used to satisfy other equivalent (400- or 500-level) degree requirements with concurrence of adviser and graduate advisory/doctoral committee. The graduate advisory/doctoral committee for a student enrolled in the Option in Watershed Stewardship must include a faculty representative from the Center for Watershed Stewardship.

Students enrolled in M.S., or Ph.D. degree programs within the School of Forest Resources and other participating programs may apply to participate in the Graduate Option in Watershed Stewardship.
Dual-Title Graduate Degree in Forest Resources (FORR) and Human Dimensions of Natural Resources and the Environment (HDNRE)

"Admissions Requirements"

- Students must apply and be admitted to the graduate program in HDNRE and The Graduate School before they can apply for admission to the dual-title degree program. After admission to their primary program, students must apply for admission to and meet the admissions requirements of the HDNRE dual-title program. Refer to the Admission Requirements section of the _HDNRE Bulletin page_. Doctoral students must be admitted into the dual-title degree program in HDNRE prior to obtaining candidacy in their primary graduate program.

Degree Requirements for FORR/HDNRE Dual-Title M.S.

- To qualify for the dual-title degree, students must satisfy the degree requirements for the M.S. degree in Forest Resources, listed above. In addition, students must complete the degree requirements for the dual-title in HDNRE, listed on the _HDNRE Bulletin page_.

Degree Requirements for FORR/HDNRE Dual-Title Ph.D.

- To qualify for the dual-title degree, students must satisfy the degree requirements for the Ph.D. degree in Forest Resources, listed above. In addition, students must complete the degree requirements for the dual-title in HDNRE, listed on the _HDNRE Bulletin page_.

The candidacy examination committee for the dual-title Ph.D. degree will be composed of Graduate Faculty from Forest Resources and must include at least one Graduate Faculty member from the HDNRE program. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. There will be a single candidacy examination, containing elements of both Forest Resources and HDNRE. Dual-title graduate degree students may require an additional semester to fulfill requirements for both areas of study and, therefore, the candidacy examination may be delayed one semester beyond-the _normal period allowable._

In addition to the _general Graduate Council requirements for doctoral committees_, the doctoral committee of a Forest Resources and HDNRE dual-title Ph.D. student must include at least one member of the HDNRE Graduate Faculty. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. If the chair of the doctoral committee is not also a member of the Graduate Faculty in HDNRE, the member of the committee representing HDNRE must be appointed as co-chair. The HDNRE representative on
Students in the dual-title program are required to write and orally defend a dissertation on a topic that is approved in advance by their doctoral committee and reflects their original research and education in Forest Resources and HDNRE. Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.”

Dual-Title Graduate Degree in Forest Resources (FORR) and International Agriculture and Development (INTAD)

Graduate students with research and educational interests in international education may apply to the dual-title degree program in Forest Resources and International Agriculture and Development. The goal of the dual-title degree FORR and INTAD graduate program is to enable graduate students from FORR to acquire the knowledge and skills of their primary area of specialization in FORR, while at the same time gaining the perspective and methods needed for work in the international agriculture. Graduate study in this program seeks to prepare students to assume leadership roles in science, engineering, outreach, and project management anywhere in the world. Students acquire a broad perspective on how to apply their research findings in the context of the broader international community. Thus, the dual-title will allow students to master their field of specialization from an international perspective so that they can effectively engage in agricultural development activities within various countries and regions.

Admission Requirements

Students must apply and be admitted to the graduate program in FORR and The Graduate School before they can apply for admission to the dual-title degree program. After admission to their primary program, students must apply for admission to and meet the admissions requirements of the INTAD dual-title program. Refer to the Admission Requirements section of the INTAD Bulletin page. Doctoral students must be admitted into the dual-title degree program in INTAD prior to obtaining candidacy in their primary graduate program.

Degree Requirements for FORR/INTAD Dual-Title M.S.

To qualify for the dual-title degree, students must satisfy the degree requirements for the M.S. degree, listed above. In addition, students must complete the degree requirements for the dual-
Degree Requirements for FORR/INTAD Dual-Title Ph.D.

To qualify for the dual-title degree, students must satisfy the degree requirements for the Ph.D. degree, listed above. In addition, students must complete the degree requirements for the dual-title Ph.D. in INTAD, listed on the INTAD Bulletin page. Some courses may satisfy both FORR program requirements and those of the INTAD program. Up to 6 credits of INTAD approved courses can be applied to fulfilling FORR program requirements. Final course selection must be approved by the student’s doctoral committee.

The candidacy examination committee for the dual-title Ph.D. degree will be composed of Graduate Faculty from FORR and must include at least one Graduate Faculty member from the INTAD program. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. There will be a single candidacy examination, containing elements of both FORR and INTAD. Dual-title graduate degree students may require an additional semester to fulfill requirements for both areas of study and, therefore, the candidacy examination may be delayed on semester beyond the normal period allowable.

In addition to the general Graduate Council requirements for doctoral committees, the doctoral committee of an FORR and INTAD dual-title Ph.D. student must include at least one member of the INTAD Graduate Faculty. Faculty members who hold appointments in both programs’ Graduate Faculty may service in a combined role. If the chair of the doctoral committee is not also a member of the Graduate Faculty in INTAD, the member of the committee representing INTAD must be appointed as co-chair. The INTAD representative on the student’s doctoral committee will develop questions for and participate in the evaluation of the comprehensive examination.

Students in the dual-title program are required to write and orally defend a dissertation on a topic that is approved in advance by their doctoral committee and reflects their original research and education in FORR and INTAD. Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.

- On page 4, under Dual-Title Graduate Degree in Forest Resources (FORR) and International Agriculture and Development (INTAD),” first paragraph, first sentence, change “Forestry” to “Forest Resources.”
• On page 5, under Degree Requirements for FORR/INTAD Dual-Title Ph.D., first paragraph, last sentence, change “student’s committee” to “student’s doctoral committee.”

• On page 5, under Degree Requirements for FORR/INTAD Dual-Title Ph.D., third paragraph, first sentence, make “” the link shown here.

• On page 6, first paragraph, after the fourth full sentence (ending in “…comprehensive examination”), insert a paragraph break so the next sentence begins a new paragraph (“Students in the dual-title….”).

• This graduate program has an approved dual title with Operations Research. Add the following section after “Degree Requirements for FORR/INTAD Dual-Title Ph.D.” and before “Student Aid.” The minimum requirements are stated below; please add additional information needed:
Dual-Title Graduate Degree in Forest Resources (FORR) and Operations Research (OR)

Admissions Requirements

Students must apply and be admitted to the graduate program in Operations Research and The Graduate School before they can apply for admission to the dual-title degree program. After admission to their primary program, students must apply for admission to and meet the admissions requirements of the Operations Research dual-title program. Refer to the Admission Requirements section of the Operations Research Bulletin page. Doctoral students must be admitted into the dual-title degree program in Operations Research prior to obtaining candidacy in their primary graduate program.

Degree Requirements for FORR/Operations Research Dual-Title M.S.

To qualify for the dual-title degree, students must satisfy the degree requirements for the M.S. degree in Forest Resources, listed above. In addition, students must complete the degree requirements for the dual-title in Operations Research, listed on the Operations Research Bulletin page.

Degree Requirements for FORR/Operations Research Dual-Title Ph.D.

To qualify for the dual-title degree, students must satisfy the degree requirements for the Ph.D. degree in Forest Resources, listed above. In addition, students must complete the degree requirements for the dual-title in Operations Research, listed on the Operations Research Bulletin page.

The candidacy examination committee for the dual-title Ph.D. degree will be composed of Graduate Faculty from Forest Resources and must include at least one Graduate Faculty member from the Operations Research program. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. There will be a single candidacy examination, containing elements of both Forest Resources and Operations Research. Dual-title graduate degree students may require an additional semester to fulfill requirements for both areas of study and, therefore, the candidacy examination may be delayed one semester beyond the normal period allowable.
In addition to the general Graduate Council requirements for doctoral committees, the doctoral committee of a Forest Resources and Operations Research dual-title Ph.D. student must include at least one member of the Operations Research Graduate Faculty. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. If the chair of the doctoral committee is not also a member of the Graduate Faculty in Operations Research, the member of the committee representing Operations Research must be appointed as co-chair. The Operations Research representative on the student’s doctoral committee will develop questions for and participate in the evaluation of the comprehensive examination.

Students in the dual-title program are required to write and orally defend a dissertation on a topic that is approved in advance by their doctoral committee and reflects their original research and education in Forest Resources and Operations Research. Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.
Dual-Title Graduate Degree in Forest Resources (FORR) and International Agriculture and Development (INTAD)

Graduate students with research and educational interests in international education may apply to the dual-title degree program in Forest Resources and International Agriculture and Development. The goal of the dual-title degree FORR and INTAD graduate program is to enable graduate students from FORR to acquire the knowledge and skills of their primary area of specialization in FORR, while at the same time gaining the perspective and methods needed for work in the international agriculture. Graduate study in this program seeks to prepare students to assume leadership roles in science, engineering, outreach, and project management anywhere in the world. Students acquire a broad perspective on how to apply their research findings in the context of the broader international community. Thus, the dual-title will allow students to master their field of specialization from an international perspective so that they can effectively engage in agricultural development activities within various countries and regions.

Admission Requirements

Students must apply and be admitted to the graduate program in FORR and The Graduate School before they can apply for admission to the dual-title degree program. After admission to their primary program, students must apply for admission to and meet the admissions requirements of the INTAD dual-title program. Refer to the Admission Requirements section of the INTAD Bulletin page. Doctoral students must be admitted into the dual-title degree program in INTAD prior to obtaining candidacy in their primary graduate program.

Degree Requirements for FORR/INTAD Dual-Title M.S.

To qualify for the dual-title degree, students must satisfy the degree requirements for the M.S. degree, listed above. In addition, students must complete the degree requirements for the dual-title M.S. in INTAD, listed on the INTAD Bulletin page. Up to 6 credits of INTAD approved courses can be applied to fulfilling FORR program requirements. Final course selection must be approved by the student’s advisory committee.

Degree Requirements for FORR/INTAD Dual-Title Ph.D.

To qualify for the dual-title degree, students must satisfy the degree requirements for the Ph.D. degree, listed above. In addition, students must complete the degree requirements for the dual-title Ph.D. in INTAD, listed on the INTAD Bulletin page. Some courses may satisfy both FORR program requirements and those of the INTAD program. Up to 6 credits of INTAD approved courses can be applied to fulfilling FORR program requirements. Final course selection must be approved by the student’s doctoral committee.
The candidacy examination committee for the dual-title Ph.D. degree will be composed of Graduate Faculty from FORR and must include at least one Graduate Faculty member from the INTAD program. Faculty members who hold appointments in both programs’ Graduate Faculty may service in a combined role. There will be a single candidacy examination, containing elements of both FORR and INTAD. Dual title graduate degree students may require an additional semester to fulfill requirements for both areas of study and, therefore, the candidacy examination may be delayed on semester beyond the normal period allowable.

In addition to the general Graduate Council requirements for doctoral committees, the doctoral committee of an FORR and INTAD dual title Ph.D. student must include at least one member of the INTAD Graduate Faculty. Faculty members who hold appointments in both programs’ Graduate Faculty may service in a combined role. If the chair of the doctoral committee is not also a member of the Graduate Faculty in INTAD, the member of the committee representing INTAD must be appointed as co-chair. The INTAD representative on the student’s doctoral committee will develop questions for and participate in the evaluation of the comprehensive examination.

Students in the dual-title program are required to write and orally defend a dissertation on a topic that is approved in advance by their doctoral committee and reflects their original research and education in FORR and INTAD. Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.

Student Aid
Graduate assistantships and other forms of student aid are described in the STUDENT AID section of the Graduate Bulletin. Students on graduate assistantships must adhere to the course load limits set forth in 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.
International Agriculture and Development
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106 Agricultural Administration Building
814-867-3831; mjm727@psu.edu

EDWIN RAJOTTE, Co-Program Coordinator, Professor of Entomology
508 Agricultural Sciences and Industries Building
814-863-6461; egrajotte@psu.edu

LELAND GLENNA, Co-Program Coordinator, Associate Professor of Rural Sociology and Science, Technology and Society
114 Armsby Building
814-863-8636; llg13@psu.edu

Degrees Conferred
Students electing this degree program through participating programs will earn a degree with a dual-title at the Master's or Ph.D. level. Students receive a degree that lists their major program and International Agriculture and Development (INTAD).

The International Agriculture and Development (INTAD) program is offered through the Departments of Agricultural and Extension Education (AEE), Agricultural Environmental and Regional Economics (AEREC), Entomology (ENT), Forest Resources (FORR), Food Science (FDSC), Plant Pathology (PPATH), Rural Sociology (R SOC), and Soil Science (SOILS). The dual-title degree enables qualified students from the CAS and other select programs at Penn State to combine their major degree with an internationally focused program of study to gain global competency skills and techniques for application of their discipline in a global environment.

The following graduate programs offer the dual-title in INTAD: M.S. and Ph.D. in Agricultural and Biological Engineering (ABENG), M.S. and Ph.D. in Agricultural and Extension Education (AEE), M.S. and Ph.D. in Agricultural Environmental and Regional Economics (AEREC), M.S. and Ph.D. in Entomology (ENT), M.S. and...
and Ph.D. in Forest Resources (FORR), M.S. and Ph.D. in Food Science (FDSC), M.S. and Ph.D. in Plant Pathology (PPATH), M.S. and Ph.D. in Rural Sociology (RSOC), and M.S. and Ph.D. in Soil Sciences (SOILS).

Degrees Conferred

Students electing this degree program through participating programs will earn a degree with a dual-title at the Master's or Ph.D. level. Students receive a degree that lists their major program and International Agriculture and Development (INTAD).

The International Agriculture and Development (INTAD) program is offered through the Departments of Agricultural Economics, Sociology, and Education, Entomology, Forest Resources, Environmental Systems Management, Plant Pathology and Environmental Microbiology, and Plant Sciences. The dual-title degree enables qualified students from the College of Agricultural Sciences (CAS) and other select programs at Penn State to combine their major degree with an internationally focused program of study to gain global competency skills and techniques for application of their discipline in a global environment.

The following graduate programs offer the dual-title in INTAD: M.S. and Ph.D. in Agricultural and Extension Education (AEE), M.S. and Ph.D. in Agronomy (AGRO), M.S. and Ph.D. in Entomology (ENT), M.S. and Ph.D. in Food Science (FDSC), M.S. and Ph.D. in Forest Resources (FORR), M.S. and Ph.D. in Plant Pathology (PPATH), M.S. and Ph.D. in Rural Sociology (RSOC), and M.S. and Ph.D. in Soil Sciences (SOILS).

The Graduate Faculty

The Program

The INTAD dual-title graduate degree program is administered by the INTAD- Academic Program Management Committee. The committee maintains the curriculum, identifies courses appropriate for the program, and develops and recommends policy and procedures for the program’s operation to the dean of the College of Agricultural Sciences and the dean of the Graduate School. Members of the Graduate Faculty in INTAD also serve on master’s and doctoral committees for students who are accepted into the dual-title program. This dual-title program enables students to learn about international agriculture while maintaining a close association with their primary area of interest in their home department.

Admission Requirements

Students must apply and be admitted to their primary graduate program and The Graduate School before they can apply for admission to the INTAD dual-title degree program. After admission to their primary program, students must apply for admission to and meet the admissions requirements of INTAD dual-title program. The student will submit an application to
the INTAD Academic Program Committee. The application will include a written personal statement indicating the career goals they hope to accomplish by earning a dual-title degree. Doctoral students must be admitted into the dual-title degree program in INTAD prior to obtaining candidacy in their primary graduate program.

**Degree Requirements**

To qualify for the INTAD dual-title degree, students must satisfy the requirements of the primary graduate program in which they are enrolled. In addition, they must satisfy the minimum requirements of the INTAD dual-title degree specified here.

Graduates of the dual-title INTAD master's degree program who wish to pursue an INTAD doctoral degree must re-apply to the INTAD program for admission. INTAD master's degree credits may be carried over to the doctoral program. Six additional INTAD credits will be required. INTAD master's degree graduates who pursue an INTAD Ph.D. are required to take the INTAD 820 International Agricultural Development Seminar a second time.

**Master's Degree**

**Course Requirements**

Students are required to complete a minimum of 12 INTAD course credits (400, 500, or 800) for a dual-title Master's degree. Nine credits will form the core curriculum: INTAD 820 (3 cr.), AEE 450 (3 cr.), and CEDEV 505 (3 cr.). The remaining three credits must be taken as an internship or applied course/independent study with international development content.

Final course selection is determined by the students, their major program advisers and their INTAD advisers. These advisers will discuss with the student a program of study that meets the student's career goals and that is in accord with the policies of the Graduate Council and the INTAD dual-title program. Some courses may satisfy both the major graduate program requirements and those of the INTAD dual-title program.

**Thesis**

Students pursuing a M.S. degree that requires a master's thesis, in addition to the 12 credits specified above, must write the thesis on a topic that reflects both their primary graduate program and the dual-title in INTAD. At least 6 thesis research credits (600 or 610) must be taken in the student's primary graduate program.

All members of the student's committee for the dual-title master's degree will be members of the Graduate Faculty. The committee must include at least one Graduate Faculty member from INTAD.
Ph.D. Degree

Students admitted to the doctoral INTAD dual-title offering must exhibit high research competence, including ability to identify, conceptualize, and execute a significant research project that makes a significant addition to the body of knowledge in the field. Students also must be fluent in reading, writing, and speaking English.

Course Requirements

Students are required to complete a minimum of 18 INTAD credits for a dual-title Ph.D. degree. The 18 required credits must be at the 500 or 800 level. Nine credits will form the core curriculum: INTAD 820 (3 cr.), R SOC 517 (3 cr.), and either R SOC 508 (3 cr.) or R SOC 555 (3 cr.). The remaining 9 credits must be taken from among INTAD electives. In addition, they will be encouraged to pursue proficiency in a language other than English, as appropriate.

Final course selection is determined by the students and their doctoral committees. The doctoral committee will discuss with the student a program of study that meets the student’s career goals and that is in accord with the policies of the Graduate Council and the INTAD dual-title program. Some courses may satisfy both the major graduate program requirements and those of the INTAD dual-title program. Permission from a student's doctoral committee, in consultation with the program chair, is required to substitute a 400-level course for a 500-level course.

Candidacy

The candidacy examination committee for the dual-title Ph.D. degree must include at least one Graduate Faculty member from INTAD program. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. There will be a single candidacy examination, containing elements of both the primary graduate degree program and INTAD. Dual-title graduate degree students may require an additional semester to fulfill requirements for both areas of study and, therefore, the candidacy examination may be delayed one semester beyond the normal period allowable.

Committee Composition

In addition to the general Graduate Council requirements for doctoral committees, the doctoral committee of an INTAD dual-title doctoral degree student must include at least one member of the INTAD Graduate Faculty. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. If the chair of the doctoral committee is not also a member of the Graduate Faculty in INTAD, the member of the committee representing INTAD must be appointed as co-chair.

Comprehensive Exam

At the end of their course work, students must pass a comprehensive examination that follows the guidelines established by the primary program and reflects both their primary program and
the dual-title degree curriculum. International agriculture must be one of the key areas of the exam and the INTAD representative on the student’s doctoral committee must have input into the development of and participate in the evaluation of the comprehensive evaluation.

**Dissertation and Dissertation Defense**

Doctoral students enrolled in the dual-title degree program are required to write and orally defend a dissertation on a topic that reflects their original research and education in both their primary program and the INTAD dual-title program. The dissertation should contribute to the body of knowledge in international agriculture. A public oral presentation of the dissertation is required. The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School and the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree.

**Student Aid**

Graduate Assistantships and other forms of student aid are described in the Student Aid section of the Graduate Bulletin. A limited number of Research Assistantships are also available through the CAS. Students on graduate assistantships must adhere to the course load limits set forth in 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 but courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up for deficiencies or to fill in gaps in previous education but may do not meet requirements for an advanced degree.

**The Graduate Faculty**

**The Program**

The INTAD dual title graduate degree program is administered by the INTAD Academic Program Management Committee. The committee maintains the curriculum, identifies courses appropriate for the program, and develops and recommends policy and procedures for the program’s operation to the dean of the College of Agricultural Sciences and the dean of the Graduate School. Faculty members of the INTAD graduate program also serve on master’s and doctoral committees for students who are accepted into the dual-title program. This dual title program enables students to learn about international agriculture while maintaining a close association with their primary area of interest in their home department.
Admission Requirements
To pursue the INTAD dual-title offering, a student must first apply to and be admitted to one of the participating graduate degree programs and the Graduate School at Penn State. Upon acceptance into the major program, the student can apply to the INTAD dual-title program. The student will submit an application to the INTAD Academic Program Committee. The application will include a written personal statement indicating the career goals they hope to accomplish by earning a dual-title degree. Doctoral students must be admitted into the dual-title degree program in INTAD prior to obtaining candidacy in their primary graduate program.

The language of instruction at Penn State is English. English proficiency test scores (TOEFL/IELTS) may be required for international applicants. Consult the English Proficiency section of the Graduate Bulletin Application and Admission Procedures page for more information.

Degree Requirements
To qualify for the INTAD dual-title degree, students must satisfy the requirements of the primary graduate program in which they are enrolled. In addition, they must satisfy the minimum requirements of the INTAD dual-title degree specified here.

Graduates of the dual-title INTAD master's degree program who wish to pursue an INTAD doctoral degree must re-apply to the INTAD program for admission. INTAD master's degree credits may be carried over to the doctoral program. Six additional INTAD credits will be required. INTAD master's degree graduates who pursue an INTAD Ph.D. are required to take the INTAD 820 International Agricultural Development Seminar a second time.

Master's Degree:
Course Requirements
Students are required to complete a minimum of 12 INTAD course credits (400, 500, or 800) for a dual-title Master's degree. Nine credits will be from the core curriculum, which includes a 3-credit seminar course, the International Agricultural Development Seminar (INTAD 820), and AEE 450 (3 cr.) and CEDEV 505 (3 cr.). The remaining three credits must be taken as internship or applied courses/independent studies with international development content.

Final course selection is determined by the students, their major program advisors and their INTAD advisers. Such advisors will discuss with the student a program of study that meets the student's career goals and that is in accord with the policies of the Graduate Council and the INTAD dual-title program. Some courses may satisfy both the major graduate program requirements and those of the INTAD dual-title program.

Thesis
Students pursuing a M.S. degree that requires a master's thesis, in addition to the 12 credits specified above, must write the thesis on a topic that reflects both the graduate program in their primary degree and
the dual-title offering in INTAD. At least 6 thesis research credits (600 or 610) must be taken in the
student’s primary graduate program.

All members of the student’s committee for the dual-title master’s degree will be members of the Graduate
Faculty. The committee must include at least one Graduate Faculty member from INTAD.

Ph.D. Degree
Students admitted to the doctoral INTAD dual-title offering must exhibit high research competence,
including ability to identify, conceptualize, and execute a significant research project that makes a
significant addition to the body of knowledge in the field. Students also must be fluent in reading, writing,
and speaking English.

Course Requirements
Students are required to complete a minimum of 18 INTAD credits for a dual-title Ph.D. degree. Nine
credits will be from the core curriculum, which includes a 3-credit seminar course, the International
Agricultural Development Seminar (INTAD 820), and RSOC 508 (3 cr.) or RSOC 555 (3 cr.), and R
SOC 517 (3 cr.). The remaining 9 credits must be taken from among INTAD electives. In addition, they
will be encouraged to pursue proficiency in a language other than English, as appropriate.

Final course selection is determined by the students, their major program advisors and their INTAD
advisers. Such advisers will discuss with the student a program of study that meets the student’s career
goals and that is in accord with the policies of the Graduate Council and the INTAD dual-title program.
Some courses may satisfy both the major graduate program requirements and those of the INTAD dual-
title program. The 18 required credits must be at the 500 or 800 level. Permission from a student’s
academic adviser, in consultation with the program chair, is required to substitute a 400-level course for a
500-level course.

Candidacy
Candidacy procedures will be based on the procedures of the major department and will have an
international dimension. Although not encouraged, the dual-title degree student may require an additional
semester or more to fulfill requirements for the dual-title degree program. Therefore, under exceptional
circumstances, the candidacy exam may be delayed at the discretion of the student’s advisor in
consultation with the INTAD program coordinators.

The candidacy examination committee for the dual-title Ph.D. degree must include at least one Graduate
Faculty member from the INTAD program. Faculty members who hold appointments in both programs’
Graduate Faculty may serve in a combined role.

Committee Composition
In addition to the general Graduate Council requirements for doctoral committees, the doctoral committee
of an INTAD dual-title doctoral degree student must include at least one member of the INTAD Graduate
Faculty. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a
combined role. In the chair of the doctoral committee is not also a member of the Graduate Faculty in
INTAD, the member of the committee representing INTAD must be appointed as co-chair.
Comprehensive Exam
At the end of their coursework, students must complete a comprehensive examination that follows the guidelines established by the primary program and reflects both their primary program and the dual-title degree curriculum. A separate comprehensive examination is not required by the INTAD program, but international agriculture must be one of the key areas of the exam and the INTAD representative on the student’s doctoral committee must have input into the development of and participate in the evaluation of the comprehensive evaluation.

Dissertation and Dissertation Defense
Doctoral students enrolled in the dual-title degree program are required to write and orally defend a dissertation on a topic that reflects their original research and education in both their primary program and the INTAD dual-title program. The dissertation should contribute to the body of knowledge in international agriculture. A public oral presentation of the dissertation is required. The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School, and the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree.

Student Aid
Graduate Assistantships and other forms of student aid are described in the Student Aid section of the Graduate Bulletin. A limited number of Research Assistantships are also available through the CAS. Students on graduate assistantships must adhere to the course load limits set forth in the Graduate Bulletin.

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

**Comparison of FORR Master of Science Program to INTAD Master’s Program**

<table>
<thead>
<tr>
<th>Advisory Committee</th>
<th>Master’s Degree in Forest Resources</th>
<th>Master’s Dual-Title Degree in Forest Resources plus International Agriculture and Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least three faculty, all who are members of the Graduate Faculty. If a minor is selected, one member must be from the minor department</td>
<td>Adviser or co-adviser must be on INTAD faculty</td>
<td></td>
</tr>
<tr>
<td>Course Requirements</td>
<td>A minimum of 30 graduate (400-, 500-, 600-level) credits is required, of which at least 20 credits must be earned at an established graduate campus of the University and will include the minimum credits specified in items 3 through 9.</td>
<td>AEE 450 (3 cr)</td>
</tr>
<tr>
<td></td>
<td>At least 12 credits in 400- and 500-level courses that are appropriate to the student’s field of interest, excluding the statistics requirement as shown below.</td>
<td>CEDEV 505 (3cr)</td>
</tr>
<tr>
<td></td>
<td>At least 6 credits of 400- or 500-level courses (usually STAT) are required in courses that cover topics such as analysis-of-variance, correlation, regression, and design of experiments, and are approved by the student’s committee.</td>
<td>INTAD 820 (3 cr)</td>
</tr>
<tr>
<td></td>
<td>Optionally, at least 6 credits of 400- or 500-level courses are taken in the minor or general studies area, according to the minor department. Seminar courses are excluded, except where specifically allowed by the minor department.</td>
<td>Independent study/research/teaching/internship with international development content (3 cr)</td>
</tr>
<tr>
<td></td>
<td>Colloquium - One colloquium course &quot;Research Integrity and Communications.&quot; (1 credit) SARI - Penn State requires training related to research integrity. A portion of this training is incorporated into the course &quot;Research Integrity and Communications.&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seminar - In addition, one seminar presentation is required at the departmental graduate seminar near the end of the student's degree</td>
<td></td>
</tr>
</tbody>
</table>
Final Oral Examination  Each M.S. degree student must complete a final oral examination consisting primarily of defense of the thesis research.  The student’s research topic must reflect both the primary degree (FORR) and the INTAD dual-title program

<table>
<thead>
<tr>
<th>Comparison of FORR Ph.D. Program to INTAD PhD Program</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ph.D. Degree in Forest Resources</strong></td>
</tr>
<tr>
<td><strong>Ph.D. Dual-Title Degree in Forest Resources plus International Agriculture and Development</strong></td>
</tr>
<tr>
<td>Doctoral Committee  At least four faculty, all of whom are members of the Graduate Faculty. The chair and at least one other member must be from FORR. At least one member must be from outside the department. If a minor is selected, one member must be from the minor department. The committee is only appointed after the candidacy examination has been passed.</td>
</tr>
<tr>
<td>Chair or co-chair must be on INTAD faculty</td>
</tr>
<tr>
<td>Course Requirements  Minimum course credits required for the PhD are those defined for the MSc degree. If the minimum course requirements have been fulfilled by the student having obtained his/her MSc or equivalent degree, only additional courses required by the student’s doctoral committee (along with seminar and supervised teaching credits) will need to be taken.  Colloquium - One colloquium course &quot;Research Integrity and Communications.&quot; (1 credit) is required in which presentation techniques are learned by the student. There may also be a student presentation experience as part of this colloquium.  SARI - Penn State requires training related to research integrity. A portion of this training is incorporated into the course &quot;Research Integrity and Communications.&quot;  Seminar - In addition, one seminar presentation is required at the departmental graduate seminar near the end of the student's degree.</td>
</tr>
<tr>
<td>R SOC 517 (3 cr)  R SOC 508 (3) or R SOC 555 (3)  INTAD 820 (3 cr)  Additional courses from the INTAD list (6 cr)  Independent study/research/teaching/internship with international development content (3 cr)</td>
</tr>
<tr>
<td>Teaching Requirement</td>
</tr>
<tr>
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<tr>
<td>Candidacy Examination</td>
</tr>
<tr>
<td>English Competency Assessment</td>
</tr>
<tr>
<td>Residency Requirement</td>
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<tr>
<td>Comprehensive Examination</td>
</tr>
<tr>
<td>Final Oral Examination</td>
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</tbody>
</table>

**CONSULTATION**
Consultation was requested of all the graduate programs participating in the INTAD program. Please see the letter of support from the INTAD co-chairs on the next page.
January 3, 2017

To The Graduate Council Joint Curricular Committee:

This letter is to indicate support for the application from the Forestry program to participate in the International Agriculture and Development (INTAD) dual-title graduate program.

Forestry joins the six graduate programs that have previously adopted the INTAD dual-title: Rural Sociology, Agricultural, Environmental and Regional Economics, Entomology, Agricultural and Extension Education, Soils, and Plant Pathology.

The Forestry program has long been committed to international study and research and INTAD expands on this, particularly as the issue of climate change has emerged as a defining issue in international development. Graduates from Forestry will be better equipped with the contextual knowledge and skill set that will help them translate their skills in a variety of international settings around the world.

Thank you for your consideration of this proposal.

Sincerely,

Leif Jensen

Edwin Rajotte

International Agriculture and Development (INTAD) Co-Chairs
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building, University Park. The proposals will be transmitted to the Office of the Dean of the Graduate School for entry into the Graduate Council curricular review process; for more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: College of Education
Department or Instructional Area: Education Policy Studies

New Graduate Program, Option, or Minor: Add

Designation of new graduate program: ____________________________
Classification of Instructional Programs (CIP) Code: __________
Designation of new graduate option: ____________________________
Designation of new graduate minor: ____________________________

Indicate effective semester:
☑ First semester following approval
☐ Second semester following approval

Existing Graduate Program Option, or Minor: Change

Current designation of graduate program: Higher Education Program
Current designation of graduate option: ____________________________
Current designation of graduate minor: ____________________________

New designation of existing graduate program (if changing):
New designation of existing graduate option (if changing):
New designation of existing graduate minor (if changing):

Brief description of the change (if not noted above): Structural changes in both Master's and doctoral programs

Indicate effective semester:
☑ First semester following approval
☐ Second semester following approval

Submitted by Graduate Program Head

David Gamson
Printed name
Signature
Date: 1/16/18

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:

John Holst
Printed name
Signature
Date: 1/17/18

Approved by College/School Dean/Chancellor (or Designee):

David Monk
Printed name
Signature
Date: 1/18/18
<table>
<thead>
<tr>
<th>Role</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>On Behalf of C. Andrew Cole</td>
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<td>4/3/2018</td>
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<tr>
<td>Recommended by Chair, Graduate Council</td>
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<tr>
<td>Committee on New and Revised Programs</td>
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<tr>
<td>On Behalf of M. Kathleen Heid</td>
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<td></td>
<td>4/3/2018</td>
</tr>
<tr>
<td>Noted by Dean of the Graduate School</td>
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</tr>
<tr>
<td>On Behalf of Regina Vasilatos-Younken</td>
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<td></td>
<td>4/3/2018</td>
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</tbody>
</table>
Program Proposal for a Change to the Higher Education Program (HIED)

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I. Justification for Program Change
II. Overview of Program Changes
III. Proposed Graduate Bulletin w/o Track Changes
IV. Letters of Support
I. Justification for Program Change

The faculty of the higher education program at Penn State University (herein after “PSU”) affirm that periodic revisions are important to the maintenance and furtherance of our vibrant graduate program. In fact, the renewed emphasis for assessment at PSU, among other factors, provided an apropos context from which to take stock of our graduate programs, to revisit hoped-for outcomes, and subsequently to undertake what we believe to be appropriate and useful revisions to master’s and doctoral programs alike. More specifically, the program changes that we envision emerged in response to a number of factors:

1. The renewed assessment effort at PSU offered a natural context to review existing graduate programs;
2. The programs’ curricular structures had largely remained unchanged for decades, despite changes within the field of higher education, programmatic changes that various competitors had undertaken already, and evolving interest areas of contemporary graduate students;
3. A review of the survey results of a graduate student-initiated project that solicited input regarding improvements to the doctoral programs in particular;
4. Considerable turnover among the faculty, including retirements, intentional departures for other opportunities, and new hires (i.e., over the last three years, two faculty have retired, three faculty have taken other positions, four new faculty have been hired [both tenure-track and fixed term], and the PIC has been three different persons. This type of fluctuation alone naturally and necessarily precipitates dialog regarding program purposes and curriculum.);
5. The development and rapid success of a fully-online master’s program;
6. The unexpected discontinuation of the M.S. program due to graduate school changes in graduate faculty membership; and, the subsequent encouragement of our dean to modify the UP M.Ed. program with the M.S. discontinuation in mind, while maintaining affinity with the online M.Ed. program;
7. The time to completion for doctoral students was lengthening, was outpacing available funding, and was resulting in stopped progress with seemingly increased frequency;
8. Concern among faculty that too many doctoral students were too often double-counting courses in an effort to remedy the concerns included in #7 above;
9. A desire to reduce/limit the occasions in which doctoral students and master’s students were in the same course in any given semester;
10. New departmental leadership (i.e., new department chair); and,
11. A very recent department-wide encouragement to improve marketing and recruitment efforts across all graduate programs.

With all of these factors coalescing in a relatively short period of time, the faculty of the higher education program believed that it was a critical moment to modify our graduate programs; in fact, we concluded that we couldn’t not pursue revisions to our programs given the presenting circumstances. We anticipate officially launching all program revisions as soon as possible, pending their timely approval by the relevant committees and bodies of the university.
II. Overview of Program Changes

Expected Enrollments

We anticipate that the modifications that we propose will contribute to making our graduate programs more attractive and competitive to more persons and, in turn, generate both more applicants and more highly qualified applicants. In fact, although our doctoral program is already highly ranked, the proposed revisions in league with our nascent plans to bolster the marketing of and recruitment to our programs strike us as a promising combination. We continue to be thankful for the aid of the college administration in providing financial support in various forms; these investments clearly enhance the viability and excellence of our programs, at both master’s and doctoral levels. We also believe that our programs will continue to attract interest among international audiences, including those who have considerable financial support from their home countries. In terms of more specific estimates, we surmise that we will be able to increase UP master’s and doctoral applications by 50 percent within two years, and increase actual UP graduate enrollments by approximately 5 percent given current human (i.e., faculty advisors) and financial resources. Online master’s enrollments have swelled more rapidly than anticipated; we are currently at capacity, if not beyond. However, we hope that the proposed revisions combined with the current top ranking of this program (i.e., online M.Ed.) nationally will result in positive outcomes with respect to attracting excellent applicants and enrolling stellar students.

Effects on Existing Programs

The proposed revisions will have no negative effects on any other programs in the university. Said another way, the higher education graduate programs are not in competition with any other programs in the university. On the contrary, since higher education is an interdisciplinary field, our graduate programs currently rely on other programs to support our students’ interests and skills-development, and the proposed revisions will continue if not enhance this positive situation. For example, students will continue to look beyond our program for methodological courses (for doctoral students), for complementary courses (e.g., a counseling course for master’s students), and for conceptual/theoretical courses in many other departments/programs. In turn, our graduate courses will continue to attract students from other graduate programs as well. For example, the joint degree options available with Penn State Law provides students with the opportunity to engage in educational research with a legal lens and legal questions with an educational perspective. Thus, students are able to take a truly interdisciplinary approach to significant questions in higher education.

The faculty of the higher education programs propose the following changes in the structure of the program. For clarity, we present changes in the structure of the M.Ed. program, and then changes in the structure of the doctoral programs. We should also note that specific course adds/changes for both master’s and doctoral programs have been completed.
Changes in the structure of the M.Ed. Program

We propose two changes to the structure of the M.Ed. program. The first change involves a change to the core courses required for the M.Ed. degree as follows:

<table>
<thead>
<tr>
<th>Current Core Courses</th>
<th>Proposed Core Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI ED 490 (Professional Seminar Exploration of Careers in Higher Education)</td>
<td>HI ED 808 (Pro-Seminar in US Higher Education and Student Affairs)</td>
</tr>
<tr>
<td>HI ED 545 (Foundations in Higher Ed. and Student Affairs)</td>
<td>HI ED 545 (Foundations in Higher Education and Student Affairs)</td>
</tr>
<tr>
<td>HI ED 595: Internship in Higher Education (for students without substantial experience in HI ED in an administrative capacity – optional)</td>
<td>HI ED 842 (Administrative Leadership in HE)</td>
</tr>
<tr>
<td>HI ED 504 (Research and Assessment in Student Affairs) or HI ED 801 (Foundations of Institutional Research)</td>
<td>HI ED 841 (Research and Assessment in SA) or HI ED 801 (Foundations of IR)</td>
</tr>
<tr>
<td>HI ED 596 Individual Studies</td>
<td>HI ED 596 Individual Studies</td>
</tr>
</tbody>
</table>

The proposed change will identify six required courses for our M.Ed., including four that are currently in place. However, the addition of HI ED 842 and HI ED 846 reflects our belief that all M.Ed. students should be required to take these two courses, as they are central to the hopes of the program; M.Ed. graduates must have facility with college student success and effective administrative leadership. In addition, as the table above highlights, the changes to our core courses reflect a move from 500 level courses to 800 level courses. The rationale for this change is that we would like to clearly distinguish between the courses we offer our doctoral students and the courses we offer our master’s students. It also reflects the reality that our master’s program is fundamentally a professional degree not a research degree.

The second change involves a change to particular areas of emphasis that M.Ed. students may pursue, as follows:

<table>
<thead>
<tr>
<th>Current Suggested Concentrations</th>
<th>Proposed Areas of Emphasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>Advising (HIED 807 and HIED 840)</td>
</tr>
<tr>
<td>Student Affairs</td>
<td>Administration (HIED 810 and HIED 849)</td>
</tr>
<tr>
<td>Institutional Research</td>
<td>Development (LA 402 and LA 802)</td>
</tr>
<tr>
<td>No Area of Emphasis</td>
<td>Enrollment Management (HIED 860 and HIED 807 or HIED 830)</td>
</tr>
<tr>
<td></td>
<td>Institutional Research (HIED 830 and HIED 810 or HIED 840 or HIED 850 or HIED 860)</td>
</tr>
<tr>
<td></td>
<td>Student Affairs (HIED 843 and HIED 844 or HIED 849)</td>
</tr>
<tr>
<td></td>
<td>Teaching &amp; Learning (HIED 806 and HIED 840)</td>
</tr>
<tr>
<td></td>
<td>No Area of Emphasis</td>
</tr>
</tbody>
</table>
We have elected to identify additional areas of emphasis and to highlight relevant coursework that falls under the specialized areas we intend to offer to our master’s students. We seek this change because students in our program continually have requested the ability to pursue other areas outside of the three that we have heretofore recommended. We have expanded our list to include Student Affairs at the suggestion of the college’s dean in response to the dissolution of the M.S. degree. We also have expanded our list to include Enrollment Management, Teaching and Learning, and Development after considering what areas our students were most frequently interested in, and how our current infrastructure and course offerings would support those new specializations. In addition, we have retained “no area of emphasis” as our precedent has been to allow students to opt not to select an area should none of the recommended options fit their interests. Instead, these students may select electives that they believe are most relevant to their interests, needs, and vocational trajectories.

Changes in the Structure of the Doctoral Programs

We propose two changes in the structure of the doctoral programs. The first revision involves a change to the core courses for the doctoral programs as follows:

<table>
<thead>
<tr>
<th>Current Doctoral Core Courses</th>
<th>Proposed Doctoral Core Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIED 548 (Curricula in Higher Education)</td>
<td>HIED 501 (Foundations of Higher Education)</td>
</tr>
<tr>
<td>HIED 552 (Administration in Higher Education)</td>
<td>HIED 502 (Diversity and Equity in Higher Education)</td>
</tr>
<tr>
<td>HIED 554 (History of American Higher Education)</td>
<td>HIED 552 (Administration and Organization in Higher Education)</td>
</tr>
<tr>
<td>HIED 556 (Higher Education Students and Clientele)</td>
<td>HIED 556 (Higher Education Students and Clientele)</td>
</tr>
<tr>
<td>HIED 562 (Organizational Theory in Higher Education)</td>
<td></td>
</tr>
</tbody>
</table>

The proposed change identifies four required courses for our Ph.D. and D.Ed. programs. Upon assessing our current structure, and examining the results of a survey conducted by current doctoral students, we found that the core areas we were offering should better align with the research trends and emphases of the field. As such, we sought to update our courses to address research topics not previously offered, and to re-organize our materials in a manner more digestible by our doctoral students. In regards to courses no longer required in the core, 501 will introduce students to historical and curricular contexts of higher education, and 548 and 554 will remain as recommended choices for the “specialization in higher education” component of the doctoral curriculum. HIED 501 also will introduce students to various perspectives of higher education (e.g. sociocultural, teaching and learning, economics) as indicated by contemporary research. HIED 502 represents our efforts to require students to consider the extant research on issues that are not only ubiquitous in the field, but also central to Penn State’s core values.

The second revision involves a change in the particular categories within which students must demonstrate competency, and the particular courses that are connected to those competencies. The following table represents the current arrangement in this regard:
<table>
<thead>
<tr>
<th></th>
<th>Ph.D.</th>
<th>D.Ed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Area</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Advanced Study (in HIED)</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Research Skills</td>
<td>Minimum of 12 (e.g., statistics, qualitative methods, research design)</td>
<td>Minimum of 12 (e.g., statistics, qualitative methods, research design)</td>
</tr>
<tr>
<td>Advanced Research Skills</td>
<td>Minimum of 9</td>
<td>None required</td>
</tr>
<tr>
<td>Cognate or Minor</td>
<td>Minimum of 15</td>
<td>15</td>
</tr>
<tr>
<td>Proposal Course</td>
<td>3-9</td>
<td>3-9</td>
</tr>
<tr>
<td>Total (pre-dissertation credits)</td>
<td>66-72</td>
<td>57-63</td>
</tr>
<tr>
<td>Dissertation</td>
<td>Not accumulated; Enroll in 601 or 611</td>
<td>15; Enroll in 600 or 610</td>
</tr>
<tr>
<td>Total</td>
<td>66-72</td>
<td>72-78</td>
</tr>
</tbody>
</table>

This table reflects the revisions that we propose:

<table>
<thead>
<tr>
<th></th>
<th>Ph.D.</th>
<th>D.Ed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Specialization (in HI ED)</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Theoretical/Conceptual</td>
<td>Minimum of 9</td>
<td>Minimum of 9</td>
</tr>
<tr>
<td>Methodological#</td>
<td>Minimum of 18</td>
<td>Minimum of 12</td>
</tr>
<tr>
<td>Proposal Course</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total (pre-dissertation credits)</td>
<td>51</td>
<td>45</td>
</tr>
<tr>
<td>Dissertation Credits</td>
<td>Not accumulated</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>60*</td>
</tr>
</tbody>
</table>

*D.Ed. candidates are required by the Graduate School to take 90 credits toward the doctorate. Students possessing a master’s degree are granted advanced standing (normally 30 credits) toward the 90 total credits required. If a student does not have a master’s degree or is not granted advanced standing, he or she must complete additional coursework.

#At least one of these courses will most often be an introductory quantitative course (e.g., EDPSY 406; STAT 500), and at least one of these courses will most often be an introductory qualitative course (e.g., HI ED 586).

The changes above signify an intentional effort to look within our program and identify a course of study that encompasses key areas for the study of higher education, while encouraging our students to supplement their learning in areas that are particularly meaningful to them. A large majority of our requirements have remained the same, although we have re-imagined how and where we count credits, so as to allow for greater flexibility for our students. The tables above demonstrate a change in the number of credits across a number of areas. This change in no way indicates a decrease in rigor. Rather, it is an attempt to eliminate the increasing occurrence of students double-counting courses across several categories (e.g., in the current structure, a doctoral sociology course was counted in the cognate area and in the advanced skills area). In the proposed structure, students will no longer be permitted to double-count any courses. They also will be required to take all of the core courses (cf., currently, students can receive permission to have particular core courses waived).

Two other proposed changes are important to mention regarding the program structure. First, we propose that the Proposal Course be 3 credits, not 3-9 credits. Some students took advantage of the 3-9 credit option, perhaps taking 6 credits of HIED 594 in order to retain full-
time status, though they were not necessarily doing more work on a dissertation proposal compared to a student enrolled in HIED 594 for 3 credits. In the proposed revisions, doctoral students will take a 3-credit course that will assist them in creating a dissertation proposal.

The second proposed structural change is using the language of “theoretical/conceptual” rather than the language of cognate/minor. This proposed change will not prevent a student from pursuing a minor in a discipline/field if desirable. However, we believe that the proposed change of terms in this regard better represents the variety of options that a student may pursue to apply theories and concepts to the study of higher education in ways that may be more disciplinary, more cross-disciplinary, or more interdisciplinary.

Summary

The proposed program modifications included in this document are borne of thoughtful conversations over more than two years among the faculty of the higher education program, and in response to institutional developments, student feedback, and perceived developments within the field. Students and faculty alike are very enthusiastic about the promise that these revisions hold for the continued excellence of our efforts. We eagerly look forward to their full implementation.
Higher Education (HIED)

Program Home Page (Opens New Window)

DAVID GAMSON, Director of Graduate Studies
310D Rackley Building
814-865-2583
dag17@psu.edu

Degrees Conferred:

M.Ed., D.Ed., Ph.D.

The Graduate Faculty

Higher Education

Higher Education (World Campus)

The Program

The graduate program in Higher Education has as its goal the preparation of individuals who will pursue careers and exert leadership in postsecondary education as administrators, faculty, or researchers in the nation's colleges and universities and in a variety of public and private agencies and associations in the United States and other nations. With emphasis on the systematic study of higher education, the program builds on the scholarly and scientific disciplines offered throughout the University and applies these studies to the professional functions and responsibilities that its graduates will assume, and to the knowledge of the field of higher education.

The Higher Education program offers the Ph.D., D.Ed., and M.Ed. in residence at the University Park campus. The Higher Education program also offers the M.Ed. either in part or in full through World Campus.
Admission Requirements

Admission requirements listed here are in addition to requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin. Applicants apply for admission to the program via the Graduate School application for admission.

Doctoral applicants must submit test scores from either the GRE, GMAT, or LSAT, taken no more than 5 years prior to the application date. Master’s applicants must submit test scores from either the GRE, GMAT, MAT, or LSAT, taken no more than 5 years prior to the application date.

The requirement for test scores is waived for World Campus M.Ed. applicants who have either: 1) completed three years of full-time professional experience in higher education; 2) a master’s degree in another field; or 3) completed the Institutional Research Certificate Program at Penn State.

Applicants must also submit a curriculum vitae (CV), a statement of purpose, and three letters of recommendation.

Students in the M.Ed., D.Ed., and Ph.D. programs at University Park normally will begin the program in the fall semester. Students in the M.Ed. program through World Campus may begin the program in the summer, fall, or spring semesters.

M.Ed. Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

A minimum of 30 credits is required, and must include:

- HIED 808 Pro-Seminar in U.S. Higher Education and Student Affairs (3 cr.)
- HIED 545 Foundations of Higher Education and Student Affairs (3 cr.)
- HIED 842 Administrative Leadership in Higher Education (3 cr.)
- HIED 846 College Students and Their Success (3 cr.)
- Either HIED 841 Research and Assessment in Student Affairs or HIED 801 Foundations of Institutional Research (3 cr.)
- HIED 596 Individual Studies (3 cr.)
- Emphasis Area in Higher Education (6 cr.): Students will choose an emphasis area to tailor a program of study to fit an intended career path, in consultation with their adviser. A list of acceptable emphasis areas and their required courses is maintained by the program.
- Elective Courses (6 cr.): Students will choose from a list of approved electives maintained by the program office, in consultation with the student’s adviser.
Culminating Experience in Higher Education (3 cr): HIED 596 Individual Studies (3 cr)
Like other capstone courses, this course provides students the opportunity to demonstrate knowledge and skills that they have developed during the program in a culminating project that, in turn, may showcase their interests and abilities as they seek employment beyond graduation. In addition, students will self-assess their relative progress towards the intended learning outcomes of the program.

D.Ed. Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

The D.Ed. requires a minimum of 90 credits, of which at least 30 credits must be earned in residence at the University Park campus. A maximum of 30 credits from a completed master's degree earned at an institution that does not grant a doctorate in Higher Education may be accepted towards this minimum, subject to limitations listed in the Transfer Credit section of the Doctoral Degrees Bulletin page. A maximum of 60 credits beyond the baccalaureate may be accepted towards this minimum, subject to limitations listed in the Transfer Credit section of the Doctoral Degrees Bulletin page.

Core Courses (12 cr.): HIED 501 Foundations in Higher Education (3 cr.); HIED 552 Administration and Organization in Higher Education (3 cr); HIED 556 Higher Education Students and Clientele (3 cr.); and HIED 502 Equity and Diversity in Higher Education (3 cr.).

Specialization (HIED) (9 cr.): 9 credits in additional HIED course work.

Theoretical/Conceptual (9 cr.): 9 credits

Methodological (12 cr.): At least (a) one quantitative course (e.g., STAT 500 or EDPSY 406) and (b) one qualitative course (e.g., HIED 586).

Proposal (3 cr.): HIED 594 Research Proposal Topics

Dissertation: (15 cr.)

In addition, the program may require a 9-credit internship depending on students’ previous professional experiences in higher education administration. D.Ed. students must pass a candidacy examination, a comprehensive written and oral examination, and a final oral examination (the dissertation defense). Their dissertation must also be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.
Ph.D. Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

Ph.D. students must pass a candidacy examination, a comprehensive written and oral examination, and a final oral examination (the dissertation defense). Their dissertation also must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.

A minimum of 51 credits is required:

- Core Courses (12 cr.): HIED 501 Foundations in Higher Education (3 cr.); HIED 552 Administration and Organization in Higher Education (3 cr.); HIED 556 Higher Education Students and Clientele (3 cr.); and HIED 502 Equity and Diversity in Higher Education (3 cr.).
- Specialization (HIED): (9 cr.) 9 credits in additional HIED course work.
- Theoretical/Conceptual (9 cr.): 9 credits
- Methodological (18 cr.): At least (a) one quantitative course (e.g., STAT 500 or EDPSY 406) and (b) one qualitative course (e.g., HIED 586).
- Proposal (3 cr.): HIED 594 Research Proposal Topics

Dual Title M.Ed., D.Ed., and Ph.D. in Comparative and International Education

Admission Requirements

Students must apply and be admitted to the graduate program in Higher Education and The Graduate School before they can apply for admission to the dual-title degree program. After admission to their primary program, students must apply for admission to and meet the admissions requirements of the Comparative and International Education dual-title program. Refer to the Admission Requirements section of the Comparative and International Education Bulletin page. Doctoral students must be admitted into the dual-title degree program in Comparative and International Education prior to obtaining candidacy in their primary graduate program.

Degree Requirements

To qualify for the dual-title degree, students must satisfy the degree requirements for the degree they are enrolled in Higher Education, listed above. In addition, students must complete the degree requirements for the dual-title in Comparative and International Education, listed on the Comparative and International Education Bulletin.
Some courses may satisfy both Higher Education and Comparative and International Education degree requirements. Final course selection must be approved by the student’s doctoral committee.

The candidacy examination committee for the dual-title Ph.D. degree will be composed of Graduate Faculty from Higher Education and must include at least one Graduate Faculty member from the Comparative and International Education program. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. There will be a single candidacy examination, containing elements of both Higher Education and Comparative and International Education. Dual-title graduate degree students may require an additional semester to fulfill requirements for both areas of study and, therefore, the candidacy examination may be delayed one semester beyond the normal period allowable.

In addition to the general Graduate Council requirements for doctoral committees, the doctoral committee of a Higher Education and Comparative and International Education dual-title Ph.D. student must include at least one member of the Comparative and International Education Graduate Faculty. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. If the chair of the doctoral committee is not also a member of the Graduate Faculty in Comparative and International Education, the member of the committee representing Comparative and International Education must be appointed as co-chair. The Comparative and International Education representative on the student’s doctoral committee will develop questions for and participate in the evaluation of the comprehensive examination.

Students in the dual-title program are required to write and orally defend a dissertation on a topic that is approved in advance by their doctoral committee and reflects their original research and education in Higher Education and Comparative and International Education. Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.

**Joint Degree Program between Penn State Law (J.D.) and the Higher Education Program (M.Ed., D.Ed., Ph.D.)**

Penn State Law (PSL) and the Higher Education (HIED) Program offer a joint degree program leading to a Juris Doctor (J.D.); and either a Master of Education (M.Ed.), a Doctor of Education (D.Ed.), or a Doctor of Philosophy (Ph.D.) in Higher Education.
Admission Requirements

Applicants to the joint degree program must apply and be admitted first to Penn State Law, and subsequently to the Higher Education graduate program. Admissions requirements and applications for admission for Penn State Law are listed in the J.D. Admissions section of the Penn State Law website. The admission requirements for the Higher Education graduate program are listed above. When applying to the Higher Education graduate program, applicants must include two letters of recommendation from Penn State Law faculty members and a career statement. Applicants to the joint degree program may submit LSAT scores instead of GRE scores.

Residency

Students will normally spend four semesters in residence at PSL and as many additional semesters in residence as needed to complete the additional requirements for the pertinent HIED degree. Ph.D. candidates must arrange the sequence of semesters to ensure that they are in residence as full-time students in the HIED program for at least two consecutive semesters (Fall-Spring or Spring-Fall) excluding summer in a single twelve-month period.

Degree Requirements

Students must fulfill all requirements for each degree in order to be awarded that degree, subject to the double-counting of credits as outlined below. Degree requirements for the J.D. program are listed on the Penn State Law website. Degree requirements for the Ph.D., D.Ed., and M.Ed. degrees are listed above.

**PSL:** A maximum of twelve credits for HIED coursework may be double-counted for credit toward the J.D. degree at PSL. Students must obtain a grade satisfactory to PSL for the course work to be credited towards the J.D. degree. The following HIED program may qualify for credit in PSL: (1) HIED 545 (Higher Education in the United States); (2) HIED 552 (Administration in Higher Education); (3) HIED 560 (Legal Issues in Higher Education); (4) HIED 546 (College Teaching) and (5) HIED 587 (Education Policy and Politics).

**HIED:** The courses that may be double-counted will be determined by the student's degree program. Normally a maximum of twelve credits of PSL course work will be counted for credit for the minimum requirements for a master's degree, subject to approval by the student's advisory committee.

**Sequence:** The sequence of courses will be determined by the students and their advisors.
**Recommended Program of Study and Advising:** All students in the program will have two advisers, one from PSL and one from HIED. Periodic interaction between the two advisers is encouraged.

**Tuition:** Students will be charged the applicable PSL tuition to cover the J.D. program and the applicable graduate tuition to cover the HIED degree program. PSL tuition will be paid for the semesters in which the student is registered for PSL courses, and graduate tuition will be paid for the semesters in which the student is registered for graduate courses. A student may take up to one course (3 credit hours) per semester in the program where the student is not primarily registered without any change in tuition, but must pay additional tuition to the program that the student is not primarily registered if he or she wishes to take additional course work pursuant to that program during the semester.

**Financial Aid and Assistantships:** Decisions on financial aid and assistantships will be made by each school according to that school's procedures. Generally, assistantships and financial aid granted by HIED will not apply to time spent at PSL.

**Fulfillment of Degree Requirements and Graduation:** All courses in one program that will count toward meeting the requirements of the other program must be completed before the awarding of either degree. If students accepted into the joint degree program are unable to complete the J.D. degree, they are still eligible to receive the Higher Education degree if all Higher Education degree requirements have been satisfied.

**Student Aid**

Graduate assistantships available to doctoral students in this program and other forms of student aid are described in the STUDENT AID section of the *Graduate Bulletin*. Students on graduate assistantships must adhere to the course load limits set forth in 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.
IV. Letters of Support
Hi Sally and Dave,
I support the changes in the HIED program. This is a very thoughtful and well crafted proposal.

Best of luck!
Katerina

Katerina Bodovski, PhD
Associate Professor
Professor-in-Charge, Educational Theory & Policy
Department of Education Policy Studies
The Pennsylvania State University
310 F Rackley
University Park 16802 PA

Across Three Continents: Reflections on Immigration, Education and Personal Survival
https://www.amazon.com/Across-Three-Continents-Reflections-Immigration/dp/1433130653

Google Scholar Citations link:
http://scholar.google.com/citations?user=EcKdFdwAAAAJ&hl=en

From: Sally Kelley
Sent: Wednesday, November 01, 2017 2:17 PM
To: Katerina Bodovski; vcr1@psu.edu
Cc: Guthrie, Dave
Subject: HIED Program Changes Proposal

Drs. Bodovski and Romero:
Attached please find the HIED Program Change proposal that Dr. David Guthrie asked you to consult on and write a letter of support. If it’s more convenient, you can respond to this e-mail and I will attach it to the proposal.

Thank you so much for doing this. If you have questions or need anything clarified, you can contact Dr. Guthrie via e-mail. I look forward to hearing from you soon.

Sally J. Kelley
Education Policy Studies
The Pennsylvania State University
300 Rackley Building
University Park, PA 16802
(814) 863-3760; FAX: (814) 865-1480
From: "Romero, Victor" <vcr1@psu.edu>
To: "sjk4" <sjk4@psu.edu>, "Katerina Bodovski" <KaterinaB@psu.edu>,
"Romero,
Victor" <vcr1@psu.edu>
Cc: "DAVID STEWART GUTHRIE" <dsg18@psu.edu>
Sent: Thursday, November 2, 2017 9:34:45 AM
Subject: RE: HIED Program Changes Proposal

Dear Ms. Kelley,

Thank you for the opportunity to review this proposal. Based on our
review, I fully support the HIED program changes Dr. Guthrie has proposed.

Best,

Victor C. Romero
Associate Dean for Academic Affairs, Maureen B. Cavanaugh Distinguished
Faculty Scholar
& Professor of Law | Penn State Law
The Pennsylvania State University | University Park
814-865-8989 | vcr1@psu.edu
252D Lewis Katz Building | University Park, PA 16802
Webpage: http://pennstatelaw.psu.edu/faculty/romero
You may access my work at http://works.bepress.com/victor_romero/ and
http://ssrn.com/author=223943

From: Sally Kelley [mailto:sjk4@psu.edu]
Sent: Wednesday, November 1, 2017 2:17 PM
To: Katerina Bodovski <KaterinaB@psu.edu>; Romero, Victor <vcr1@psu.edu>
Cc: Guthrie, Dave <dsg18@psu.edu>
Subject: HIED Program Changes Proposal
Importance: High

Drs. Bodovski and Romero:
Attached please find the HIED Program Change proposal that Dr. David
Guthrie asked you to consult on and write a letter of support. If it’s
more convenient, you can respond to this e-mail and I will attach it to
the proposal.

Thank you so much for doing this. If you have questions or need anything
clarified, you can contact Dr. Guthrie via e-mail. I look forward to
hearing from you soon.

Sally J. Kelley
Education Policy Studies
The Pennsylvania State University
300 Rackley Building
University Park, PA 16802
(814) 863-3760; FAX: (814) 865-1480
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Office of the Dean of the Graduate School, 211 Kern Building, University Park. For more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

---

**College/School:** College of Information Sciences and Technology
**Department or Instructional Area:**

---

**New Graduate Program, Option, or Minor:** Add

**Designation of new graduate program:**

**Classification of Instructional Programs (CIP) Code:**

**Designation of new graduate option:**

**Designation of new graduate minor:**

**Indicate effective semester:**
- First semester following approval
- Second semester following approval

---

**Existing Graduate Program Option, or Minor:** Change Drop

**Current designation of graduate program:** M.P.S in Information Sciences

**Current designation of graduate option:**

**Current designation of graduate minor:**

**New designation of existing graduate program (if changing):**

**New designation of existing graduate option (if changing):**

**New designation of existing graduate minor (if changing):**

**Brief description of the change (if not noted above):** No programmatic changes; just bulletin listing

**Indicate effective semester:**
- First semester following approval X
- Second semester following approval

---

**Submitted by Graduate Program Head**
Mary Beth Rosson, Associate Dean, UG and Grad Education

[Signature]

**Date:** 2/20/18

**Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:**
Mary Beth Rosson, Associate Dean, UG and Grad Education

[Signature]

**Date:** 2/20/18

**Approved by College/School Dean/Chancellor (or Designee):**
Andrew Sears, Dean

[Signature]

**Date:** 2/20/18
<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Andrew Cole</td>
<td>[Signature]</td>
<td>4/3/2018</td>
</tr>
<tr>
<td>M. Kathleen Heid</td>
<td>[Signature]</td>
<td>4/3/2018</td>
</tr>
<tr>
<td>Regina Vasilatos-Younken</td>
<td>[Signature]</td>
<td>4/3/2018</td>
</tr>
</tbody>
</table>

Recommended by Chair, Graduate Council Subcommittee on New and Revised Programs and Courses:

Recommended by Chair, Graduate Council Committee on Programs and Courses:

Noted by Dean of the Graduate School:
Information Sciences (INSCI)

Program Home Page

ANDREW SEARS, Dean, College of Information Sciences and Technology
MARY BETH ROSSON, Associate Dean for Graduate and Undergraduate Studies

Office of the Dean
College of Information Sciences and Technology
The Pennsylvania State University
E397F Westgate Building, University Park, PA 16802-6823
Dean's office: 814-865-3528

Degree Conferred

M.P.S. in Information Sciences

The Graduate Faculty

Program Description

The Master of Professional Studies in Information Sciences (MPS-INSCI) is an innovative program that targets professionals and organizational leaders who seek a professional education and training program. The purpose of the professional master's 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 the resulting 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-INSCI equips students to:

1. Understand and analyze the profound information and technological changes sweeping the world;
2. Meet challenges by developing innovative solutions using the foundations of information sciences and technology; and
3. 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 apply for admission to the program via the Graduate School application for admission.

Applicants to the program 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 goals. The GRE or GMAT requirement may be waived for applicants to the Master of Professional Studies Program at the discretion of the 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 accepted 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 will have an overall grade point average of 3.00 (on a 4.00 scale) or higher for his or her undergraduate study and/or graduate-level study. 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.

DEGREE REQUIREMENTS

Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

The MPS-INSCI program requires a minimum of 33 credits, 24 of which must be earned at Penn State. A maximum of 9 transfer credits of high-quality graduate work may be applied toward the requirements for the degree, subject to restrictions outlined in the Transfer Courses section of the
At least 18 credits must be courses at the 500 or 800 level, with at least 6 credits at the 500 level. A student can choose to be in the Base Program or in the Cybersecurity and Information Assurance (CIA) Option. The 33 credits are distributed among the following requirements. A student first takes 9-credits of core courses. The student then takes 12 credits of prescribed courses for either the base program or the Cybersecurity and Information Assurance Option. An additional 9 credits are elective courses. Lastly, the student must complete a master’s project guided by the student’s adviser and completed while enrolled in IST 594.

Core Courses (9 credits). The core of the MPS-IS consists of three courses -- IST 852, IST 554, and IST 816. 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 required courses - IST 815, IST 521, IST 532, and IST 564 - and 9 credits of elective courses, in addition to the 9-credit core and 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 adviser. 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 to fulfill the prescribed courses (by substitution) and 9 credits of electives.

Cybersecurity and Information Assurance (CIA) Option (12 credits of prescribed courses and 9 credits of electives). The CIA option consists of four prescribed courses, IST 815, IST 555, IST 456, and IST 885, and 9 credits of elective courses selected from a list of approved electives available from the program office, in addition to the 9-credit core and 3-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 Project (3 credits). The project requires all students in the 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 adviser 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.

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. Students on graduate assistantships must adhere to the course load limits set forth in 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.

**INFORMATION SCIENCES AND TECHNOLOGY (IST) course list**

Last Revised by the Department: Fall Semester 2016

Review Date: 8/23/2016

Faculty linked: 6/20/14; Deans updated: 7/1/15; Program home page link: 7/16/15
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Office of the Dean of the Graduate School, 211 Kern Building, University Park. For more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: College of Information Sciences and Technology
Department or Instructional Area:

Penn State Graduate School

New Graduate Program, Option, or Minor: Add

Designation of new graduate program:
Classification of Instructional Programs (CIP) Code: FEB 21 2018
Designation of new graduate option:
Designation of new graduate minor:

Indicate effective semester:
First semester following approval
Second semester following approval

Office of the Vice Provost and
Dean of the Graduate School

Existing Graduate Program Option, or Minor: Change Drop

Current designation of graduate program: M.S. in Information Sciences and Technology
Current designation of graduate option:
Current designation of graduate minor:

New designation of existing graduate program (if changing):
New designation of existing graduate option (if changing):
New designation of existing graduate minor (if changing):

Brief description of the change (if not noted above): Expanding curriculum options by reducing core and increasing specialization courses.

Indicate effective semester:
First semester following approval X
Second semester following approval

Submitted by Graduate Program Head
Mary Beth Rosson, Associate Dean, UG and Grad Education
Printed name
Signature
Date: 2/20/18

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:
Mary Beth Rosson, Associate Dean, UG and Grad Education
Printed name
Signature
Date: 2/20/18

Approved by College/School Dean/Chancellor (or Designee):
Andrew Sears, Dean
Printed name
Signature
Date: 2/20/18
<table>
<thead>
<tr>
<th>Recommended by Chair, Graduate Council Subcommittee on New and Revised Programs and Courses:</th>
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<tr>
<td>On Behalf of C. Andrew Cole</td>
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<td>Date: 4/3/2018</td>
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<tr>
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<th>Noted by Dean of the Graduate School:</th>
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<td>On Behalf of Regina Vasilatos-Younken</td>
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<tr>
<td>Printed name</td>
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<td>Date: 4/3/2018</td>
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</table>
Program Name Change Proposal

Doctor of Philosophy, Information Sciences and Technology

Contact:
Dr. Mary Beth Rosson, Associate Dean for Graduate and Undergraduate Education
College of Information Sciences and Technology
Mur13@psu.edu  (814) 863-3450

Dr. Andrea Tapia, Graduate Programs Director
College of Information Sciences and Technology
AXH50@psu.edu  (814) 865-1524

February 21, 2018
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Supporting Documentation

A. Comparison of current vs. proposed changes

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<th>Current</th>
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<tr>
<td>Doctor of Philosophy in Information Sciences and Technology (IST)</td>
<td>Doctor of Philosophy in Informatics (INMAC)</td>
<td>Change name of the graduate program from Information Sciences and Technology to Informatics, for the Ph.D. degree only</td>
</tr>
</tbody>
</table>

B. Justification

Regarding Title Change

When the College of Information Sciences and Technology was formed and the Ph.D. in Information Sciences and Technology (IST) was established, the title “Information Sciences and Technology” was a generic term typically associated with library sciences and generically applied to describe activities in the market place that included functions in IT, business processes, and information management.

The field has rapidly moved out of the generic IT and library science “space” and into an interdisciplinary field that integrates a variety of perspectives including, but certainly not limited to, computer and information sciences, psychology, social science, economics, and public policy.

Moreover, the application of those perspectives to the design of innovative technologies and the social impact on our communities quickly became integral to the maturation process of the field. Today, nearly 20 years later, the field has evolved and matured into a more universally-recognized discipline, better known as Informatics.

Therefore, the current title of the Ph.D. degree, “Doctor of Philosophy in Information Sciences and Technology”, is outdated and does not adequately reflect the curriculum. It is confusing to our prospective students, faculty, and employers. We propose to change the name of the graduate program for the Ph.D. degree to Informatics (INMAC), which better represents what the degree encompasses. Informatics offers clarity and is recognized today as a defined academic discipline. The proposed title was approved by the College of IST Graduate Advisory Committee (GAC) in 2017, and subsequently approved by the College of IST faculty.
C. Evidence of Consultation (PSU Great Valley, Harrisburg, and Liberal Arts)

From: Mary Beth Rosson
Sent: Monday, February 5, 2018 10:57 AM
To: sxs28@psu.edu
Cc: Priscilla Cetnar <pcetnar@ist.psu.edu>; Andrea H. Tapia <atapia@ist.psu.edu>
Subject: Proposed PhD name change for IST

Steve,

IST is proposing to change the name of its PhD program from “Information Sciences and Technology” to “Informatics” (see attached proposal document). We are doing this in recognition of how the iSchool concept and research activities have evolved since our doctorate degree was originally created, making the shorter name a better match.

As part of the process, we are consulting with other members of Penn State graduate education community who have overlapping interests; hence this email to you as the representative of Harrisburg’s MS in Information Systems.

Please let me know if you have any questions or concerns. If I do not hear from you by Monday February 19th, I will assume you have no concerns to share.

Regards,

Mary Beth

__________________
Mary Beth Rosson
Professor and Associate Dean
College of Information Sciences & Technology
The Pennsylvania State University
http://mrosson.ist.psu.edu

From: Steve Schappe <sxs28@psu.edu>
Date: Tuesday, February 6, 2018 at 5:31 PM
To: Mary Beth Rosson <mrosson@ist.psu.edu>
Cc: Priscilla Cetnar <pcetnar@ist.psu.edu>, Andrea Tapia <atapia@ist.psu.edu>, Girish Subramanian <ghs2@psu.edu>
Subject: Re: Proposed PhD name change for IST

Hi Mary Beth,
Thanks for letting me know of your intention to change the name of your PhD program from "IST" to "Informatics." The reasoning behind the proposed change makes sense, and we're pleased to support your efforts.

Regards,

Steve

Stephen P. Schappe, Ph.D.
Director, School of Business Administration
777 W. Harrisburg Pike
Middletown, PA 17057
717-948-6141
http://hbg.psu.edu/sba

---

From: Mary Beth Rosson <mrosson@ist.psu.edu>
Date: Monday, February 5, 2018 at 10:56 AM
To: Burt Monroe <burtmonroe@psu.edu>
Cc: Priscilla Cetnar <pcetnar@ist.psu.edu>, Andrea Tapia <atapia@ist.psu.edu>
Subject: Proposed PhD name change for IST

Burt,

IST is proposing to change the name of its PhD program from “Information Sciences and Technology” to “Informatics” (see attached proposal document). We are doing this in recognition of how the iSchool concept and research activities have evolved since our doctorate degree was originally created, making the shorter name a better match.

As part of the process, we are consulting with other members of Penn State graduate education community who have overlapping interests; hence this email to you as the representative of Liberal Art’s PhD in Social Data Analytics.

Please let me know if you have any questions or concerns. If I do not hear from you by Monday February 19th, I will assume you have no concerns to share.

Regards,

Mary Beth

Mary Beth Rosson
Professor and Associate Dean
College of Information Sciences & Technology
February 16, 2018

Mary Beth Rosson
Associate Dean, Graduate and
Undergraduate Studies College of
Information Sciences and Techno

Prof. Rosson:

I enthusiastically endorse the proposed name change of the PhD program to “Informatics.”

I agree that the term better captures the content of the degree. From the viewpoint of the Program in Social Data Analytics (SoDA), this strikes me as an unambiguous improvement, drawing the connections between the programs a bit more clearly.

I should note that this proposal will ultimately interact with the parallel proposal for the dual title with SoDA, in that an additional minor bulletin change will be required in both of our programs. If both proposals are successful, the IST – SoDA dual-title should ultimately be listed under “Degrees Conferred” as “Ph.D. in Informatics and Social Data Analytics” in both the Informatics bulletin listing and the SoDA bulletin listing.

Sincerely,

Burt L. Monroe
Liberal Arts Professor of Political Science and Social Data Analytics Head, Program in Social Data Analytics
burtmonroe@psu.edu
From: Mary Beth Rosson
Sent: Monday, February 5, 2018 10:57 AM
To: jan16@psu.edu
Cc: Priscilla Cetnar <pcetnar@ist.psu.edu>; Andrea H. Tapia <atapia@ist.psu.edu>
Subject: Proposed PhD name change for IST

James,

IST is proposing to change the name of its PhD program from “Information Sciences and Technology” to “Informatics” (see attached proposal document). We are doing this in recognition of how the iSchool concept and research activities have evolved since our doctorate degree was originally created, making the shorter name a better match.

As part of the process, we are consulting with other members of Penn State graduate education community who have overlapping interests; hence this email to you as the representative of Great Valley’s MS in Data Analytics.

Please let me know if you have any questions or concerns. If I do not hear from you by Monday February 19th, I will assume you have no concerns to share.

Regards,

Mary Beth

__________________
Mary Beth Rosson
Professor and Associate Dean
College of Information Sciences & Technology
The Pennsylvania State University
http://mrosson.ist.psu.edu

From Great Valley

__________________
Mary Beth Rosson
Professor and Associate Dean
College of Information Sciences & Technology
The Pennsylvania State University
http://mrosson.ist.psu.edu

From: JAMES A NEMES <jan16@psu.edu>
Date: Friday, February 16, 2018 at 12:01 PM
To: Mary Beth Rosson <mrosson@ist.psu.edu>
Subject: RE: Proposed PhD name change for IST
Hi Mary Beth,

I support the name for this program. No other comments.

Best of luck!

jim

James A. Nemes, D.Sc.
Chancellor and Chief Academic Officer
Professor of Mechanical Engineering
School of Graduate Professional Studies
Penn State Great Valley
30 East Swedesford Road
Malvern, PA 19355-1443
Phone: 610-648-3206
jan16@psu.edu

From: Mary Beth Rosson [mailto:mrosson@ist.psu.edu]
Sent: Friday, February 16, 2018 9:41 AM
To: JAMES A NEMES <jan16@psu.edu>
Subject: Re: Proposed PhD name change for IST

Hi James – did you have further comments? (Beyond changing the “!” to a “?” in your initial email? :)

__________________
Mary Beth Rosson
Professor and Associate Dean
College of Information Sciences & Technology
The Pennsylvania State University
http://mrosson.ist.psu.edu

From: JAMES A NEMES <jan16@psu.edu>
Date: Monday, February 5, 2018 at 11:48 AM
To: Mary Beth Rosson <mrosson@ist.psu.edu>
Subject: Re: Proposed PhD name change for IST

Hi Mary Beth. Name change only!

Sent from my iPhone
Informatics (INMAC)

Program Home Page

ANDREW SEARS, Dean, College of Information Sciences and Technology
MARY BETH ROSSON, Associate Dean for Graduate and Undergraduate Studies

Office of the Dean
College of Information Sciences and Technology
The Pennsylvania State University
E397 Westgate Building, University Park, PA 16802-6823
Dean's office: 814-865-3528

Degree Conferred

Ph.D.

The Graduate Faculty

Program Description

The graduate program in Informatics 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 informatics, and an understanding of the integration of the critical constructs that drive the field: people, information, and technology.

Admission Requirements

Requirements listed here are in addition to general Graduate Council requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin. Applicants apply for admission to the program via the Graduate School application for admission.

Applicants to the program are required to submit scores from the general portions of the Graduate Record Examinations (GRE), three letters of reference, a current resume (including present position and any publications), a 1 to 3 page statement of research background and goals related to pursuing an advanced degree and career in informatics, which also briefly discusses personal motivation for obtaining a Ph.D., and a sample of the applicant’s writing (e.g., technical paper, etc.).

Because the program is multidisciplinary in nature, students from many different disciplines may be accepted 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 provision status for no more than one year while work is completed to meet these expectations.

It is expected that the successful applicant will have an overall grade point average of 3.00 (on a 4.00 scale) or higher for his or her undergraduate study and/or graduate-level study. 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. English proficiency test scores (TOEFL/IELTS) may be required for international applicants. Consult the English Proficiency section of the Graduate Bulletin Application and Admission Procedures page for more information.

**Degree Requirements**

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

The doctoral degree in Informatics requires a minimum of 32 credits, including 8 required core credits in IST 501 (3); either IST 510, IST 520, or IST 530 (3); and IST 590 (2). In addition, doctoral students must take 12 credits of research methodology courses and 12 credits of specialization courses.

To complete a Ph.D. degree, students must in their first semester take the 3-credit introduction to interdisciplinary research methods (IST 501) and one credit of graduate colloquium (IST 590). In their second semester, students must take a second credit of graduate colloquium. During their first two semesters, students must take at least one of the three foundations courses (IST 510, IST 520, or IST 530).

In addition to these first-year requirements, doctoral students must complete 12 credits of research methodology courses selected to introduce or increase proficiency in 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. Students must have completed 18 graduate credits before taking the candidacy exam and must pass 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 doctoral committee, with the student submitting a dissertation proposal and defending that proposal in the defense examination. To earn the Ph.D. degree, doctoral students must
write a dissertation that is accepted by the doctoral committee, the head of the graduate program, and the Graduate School, and the student must pass a final oral examination (the dissertation defense).

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. Students on graduate assistantships must adhere to the course load limits set forth in 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.

INFORMATICS Course List

Last Revised by the Department: Fall Semester 2018

Review Date:

Faculty linked: 6/20/14; Deans updated: 7/1/15; Program home page link: 7/16/15
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Office of the Dean of the Graduate School, 211 Kern Building, University Park. For more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: College of Information Sciences and Technology
Department or Instructional Area: 

New Graduate Program, Option, or Minor: Add

Designation of new graduate program:
Classification of Instructional Programs (CIP) Code: 

Designation of new graduate option:

Designation of new graduate minor:

Indicate effective semester:
- First semester following approval
- Second semester following approval

Existing Graduate Program Option, or Minor: Change

Current designation of graduate program: Ph.D in Information Sciences and Technology
Current designation of graduate option:
Current designation of graduate minor:

New designation of existing graduate program (if changing): Ph.D. in Informatics
New designation of existing graduate option (if changing):
New designation of existing graduate minor (if changing):

Brief description of the change (if not noted above): Change name of the program from Information Sciences and Technology (IST) to Informatics (INMAC).

Indicate effective semester:
- First semester following approval X
- Second semester following approval

Submitted by Graduate Program Head
Andrea Tapia, Associate Professor
Printed name Andrea Tapia
Signature [Signature]
Date: 2/21/2018

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:
Mary Beth Rosson, Associate Dean, UG and Grad Education
Printed name [Signature]
Date: 2/20/18

Approved by College/School Dean/Chancellor (or Designee):
Andrew Sears, Dean
Printed name [Signature]
Date: 2/20/18
<table>
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<tr>
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<td>4/3/2018</td>
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</tr>
<tr>
<td>On Behalf of Regina Vasilatos-Younken</td>
<td>signature</td>
<td>4/3/2018</td>
</tr>
</tbody>
</table>
Program Change Proposal

Master of Science in Information Sciences and Technology

Contact:
Dr. Mary Beth Rosson, Associate Dean for Graduate and Undergraduate Studies, College of IST
mrosson@psu.edu (814) 863-3450

Dr. David Fusco, Assistant Teaching Professor, College of IST

February 21, 2018
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Updated Graduate Bulletin Listing    pg 7
## Supporting Documentation

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<th>Current</th>
<th>Proposed</th>
<th>Change</th>
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<tbody>
<tr>
<td><strong>Bulletin Listing</strong> Includes Ph.D., M.S. and M.P.S.</td>
<td><strong>Bulletin Listing M.S.</strong></td>
<td>All references to Ph.D. and M.P.S. have been removed from the bulletin. We are also submitting a program change for the Ph.D. with a new bulletin listing and a new bulletin listing for the M.P.S. degree</td>
</tr>
<tr>
<td><strong>Core Courses (6 credits).</strong> 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 taking IST 504 and IST 505.</td>
<td><strong>Core Courses (3-6 credits).</strong> 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 taking IST 504. Candidates may also take IST 505 to gain a deeper understanding of research design.</td>
<td>Changed the required credits from 6 to 3-6 for the core courses; also suggested IST 505 for candidates who wish to gain a deeper understanding of research design</td>
</tr>
<tr>
<td><strong>Specialization Courses (12 credits).</strong> In consultation with his/her advisor, a candidate is expected to choose courses in one or more areas customized to support the thesis or scholarly paper. 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.</td>
<td><strong>Specialization Courses (12-18 credits).</strong> In consultation with his/her advisor, a candidate is expected to choose courses in one or more areas customized to support the thesis or scholarly paper. In addition to advanced courses in IST, a support area could be in cybersecurity, data sciences, law, business, education, engineering, the liberal arts, science, or any area that is linked to the information sciences.</td>
<td>Changed the required credits from 12-15 to 12-18 for the specialization courses. Added cybersecurity and data sciences to the list of support areas.</td>
</tr>
</tbody>
</table>
**Thesis or Scholarly paper (6 credits).** Students may choose a thesis or scholarly paper option. Students who choose the thesis option must register for 6 credits of IST 600 or 610, write a satisfactory thesis accepted by the master's committee, the head of the graduate program, and the Graduate School, and pass a thesis defense. The thesis should focus on a well-defined problem relevant to the information sciences. Students who choose the scholarly paper option must register for 3 credits of IST 594 and complete a scholarly paper. The scholarly paper 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 scholarly paper report. Students who choose the scholarly paper option must write a scholarly paper that is accepted by their M.S. committee. An oral presentation is at the discretion of the student's adviser.

---

**Thesis or Scholarly paper (3-6 credits).** Students may choose a thesis or scholarly paper option. Students who choose the thesis option must register for 6 credits of IST 600 or 610, write a satisfactory thesis accepted by the master's committee, the head of the graduate program, and the Graduate School, and pass a thesis defense. The thesis should focus on a well-defined problem relevant to the information sciences. In addition, students choosing the thesis option must also complete IST 505. Students who choose the scholarly paper option must register for 3 credits of IST 594 and complete a scholarly paper. The scholarly paper 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 scholarly paper report. Students who choose the scholarly paper option must write a scholarly paper that is accepted by their M.S. committee. An oral presentation is at the discretion of the student's adviser.

---

**If admitted to the IUG, the final years of study include graduate courses IST 504 (fall) and IST 505 (spring), plus two semesters of graduate research, six credits of research methods courses, and twelve credits of specialty courses.**

---

**If admitted to the IUG, the final years of study could include graduate courses IST 504 (fall) and IST 505 (spring), plus two semesters of graduate research, six credits of research methods courses, and twelve credits of specialty courses.**

---

**Added the word “could” to provide flexible options for IUG students.**
B. Justification

Given that the field of IST continues to grow at a rapid pace, it is incumbent on the College of IST to keep pace with the evolving discipline. Therefore, the purpose of these changes is to give students who wish to pursue an M.S. in IST the ability to expand their options of academic focus.

As an example, the focus on Data Sciences in its application in IST to support other disciplines is sorely lacking at the university. This change will allow students who wish to pursue a concentrated focus in a supporting IST area the ability to add one additional course to their elective portfolio.

Additionally, for students who wish to continue the existing course pathway, they may choose to complete both IST 504 and IST 505 and increase their knowledge of research design. This will provide them with a deeper research background, allow them to explore the design of research methodologies, and perhaps continue their academic career by pursing a Ph.D. program.

Further, in order to provide flexibility within the curriculum, the credit requirement for the scholarly paper option has been changed from six (6) credits to three (3). This will provide students with the ability to increase their specialization courses by three credits, thus expanding their exposure to topics supporting their scholarly interest.

In summary, these changes will not impact current students, but will give future M.S. in IST students the ability to focus on a supportive IST concentration area by allowing them to take one additional course in this area.
C. Evidence of Consultation

These proposed changes expand curriculum options for students that will enhance their academic pathway. Because of the positive impact and given the changes will not impact other departments or colleges, we are not seeking external consultation for this proposal.
Information Sciences and Technology (IST)

Program Home Page

ANDREW SEARS, Dean, College of Information Sciences and Technology
MARY BETH ROSSON, Associate Dean for Graduate and Undergraduate Studies

Office of the Dean
College of Information Sciences and Technology
The Pennsylvania State University
E 397F Westgate Building University Park, PA 16802-6823
Dean's office: 814-865-3528

Degree Conferred

M.S.
Integrated B.S. in Information Sciences and Technology and M.S. in Information Sciences and Technology
Integrated B.S. in Security and Risk Analysis and M.S. in Information Sciences and Technology

The Graduate Faculty

Program Description

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.
1. Admission Requirements

Requirements listed here are in addition to general Graduate Council requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin. Applicants apply for admission to the program via the Graduate School application for admission.

Applicants to M.S. program are required to submit scores from the general portions of the Graduate Record Examinations (GRE), three letters of reference, a current resume (including present position and any publications), 1 to 3 page statement of goals related to pursuing an advanced degree and career in IST and provide a sample of the applicant’s writing (e.g., technical paper, etc.).

Because the program is multidisciplinary in nature, students from many different disciplines may be accepted 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 will have an overall grade point average of 3.00 (on a 4.00 scale) or higher for his or her undergraduate study and/or graduate-level study. However, accomplishments demonstrated through work experience and recommendation letters from the applicant’s academic adviser or employer will also play an important role in the admission decision. The most qualified applicants will be accepted into the program until all spaces for new students are filled.

DEGREE REQUIREMENTS

M.S. Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

The M.S. in Information Sciences and Technology requires a minimum of 30 credits at the 400, 500, 600, or 800 level, with at least 18 credits at the 500 or 600 series combined; 27 of the 30 credits must be earned at Penn State. These 30 credits are distributed among the following requirements:

Core Courses (3-6 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 taking IST 504. Candidates may also take IST 505 to gain a deeper understanding of research design.
**Specialization Courses (12-18 credits).** In consultation with his/her adviser, a candidate is expected to choose courses in one or more areas customized to support the thesis or scholarly paper. In addition to advanced courses in IST, a support area could be in cybersecurity, data science, law, business, education, engineering, the liberal arts, science, or any area that is linked to the information sciences. A list of suggested specialization courses is maintained by the graduate program office.

**Research Methods (6 credits).** All candidates must develop a basic understanding of the research methods utilized in the information sciences, by taking at least two research methods courses 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. A list of courses that will satisfy this requirement is maintained by the graduate program office.

**Thesis or Scholarly paper (3-6 credits).** Students may choose a thesis or scholarly paper option. Students who choose the thesis option must register for 6 credits of IST 600 or 610, write a satisfactory thesis accepted by the master's committee, the head of the graduate program, and the Graduate School, and pass a thesis defense. The thesis should focus on a well-defined problem relevant to the information sciences. Students who choose the thesis option must also complete IST 505. Students who choose the scholarly paper option must register for 3 credits of IST 594 and complete the scholarly paper. The scholarly paper will be a focused piece of technical work that applies the student's expertise and knowledge base, and that is documented and presented as a scholarly paper report. Students who choose the scholarly paper option must write a scholarly paper that is accepted by their M.S. committee. An oral presentation may be required at the discretion of the student's adviser.

**IUG Degree Requirements**

The Integrated Undergraduate Graduate (IUG) program is available for strong undergraduate students who wish to pursue a bachelor’s and master’s degree in a shorter period of time than would be necessary if the degrees were pursued separately. There are two approved IUG programs: an Integrated B.S. in Information Sciences and Technology and M.S. in Information Sciences and Technology, and an Integrated B.S. in Security and Risk Analysis and M.S. in Information Sciences and Technology.

The first two to three years of undergraduate coursework follow the same undergraduate curriculum that other students follow in the Information Sciences and Technology major. Information Sciences and Technology undergraduates may apply for admission to the IUG program no earlier than February 15th of their sophomore year and no later than February 15 of their junior year after completing a minimum of 60 credits, if they meet the following admission requirements:

1. Must be enrolled in a College of IST undergraduate degree program.
2. Must have completed 60 credits of an IST undergraduate degree program.
3. Must apply to the IUG program by February 15 of their junior year.
4. Must apply to and be accepted without reservation into the Graduate School and M.S. program in IST. Students must complete the [Graduate School application](#). Admission requirements for the M.S. in IST are listed in the Admission Requirements section above.
5. Must have an overall GPA of 3.5 (on a 4.0 scale) in undergraduate coursework and a minimum GPA of 3.5 in all coursework completed for the major.
6. Must present an approved plan of study. The plan should cover the entire time period of the integrated program, and it should be reviewed periodically with an adviser.

7. Must present two letters of recommendation from faculty members.

8. Must meet with both the Director of Undergraduate Academic Affairs and the Graduate Program Coordinator to declare interest and receive information about the IUG program.

Students must fulfill all degree requirements for each degree in order to be awarded that degree, subject to the double-counting of credits as outlined below. Degree requirements for the Bachelor of Science in Information Sciences and Technology and the Bachelor of Science in Security and Risk Analysis are listed in the Undergraduate Bulletin. Degree requirements for the Master of Science in Information Sciences and Technology degree are listed above. Students must sequence their courses so all undergraduate degree requirements are fulfilled before taking courses to count solely towards the graduate degree. If students accepted into the IUG program are unable to complete the M.S. degree, they are still eligible to receive their undergraduate degree if all the undergraduate degree requirements have been satisfied.

Up to 12 credits may be double-counted towards the degree requirements for both the graduate and undergraduate degrees; a minimum of 50% of the double-counted courses must be at the 500 or 800 level. Credits associated with the culminating experience for the graduate degree cannot be double-counted. The required 3 credits of IST 504 will apply to both the graduate program and the undergraduate program. Students may choose an additional 9 credits to double-count for both the undergraduate and graduate degrees from the following: IST 411, IST 412, IST 413, IST 420, IST 421, IST 431, IST 432, IST 505.

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. Students on graduate assistantships must adhere to the course load limits set forth in 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.

INFORMATION SCIENCES AND TECHNOLOGY (IST) course list
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Office of the Dean of the Graduate School, 211 Kern Building, University Park. For more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: Nursing
Department or Instructional Area: Nursing

New Graduate Program, Option, or Minor: Add

Designation of new graduate program:
Classification of Instructional Programs (CIP) Code: _______________________
Designation of new graduate option: _______________________
Designation of new graduate minor: _______________________

Indicate effective semester:
First semester following approval
Second semester following approval

Existing Graduate Program Option, or Minor: Change Drop

Current designation of graduate program: M.S.N.
Current designation of graduate option:
Current designation of graduate minor:

New designation of existing graduate program (if changing):
New designation of existing graduate option (if changing):
New designation of existing graduate minor (if changing):

Brief description of the change (if not noted above): change in one of the M.S.N. core courses

Indicate effective semester:
First semester following approval
Second semester following approval

Submitted by Graduate Program Head
Judith Hupcey
Printed name
Signature
Date: 1/24/18

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:
Kelly Wolgast
Printed name
Signature
Date: 5/26/18

Approved by College/School Dean/Chancellor (or Designee):
Judith Hupcey
Printed name
Signature
Date: 1/24/18
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Introduction

This proposal addresses a change in an M.S.N. core course for all M.S.N. options.

M.S.N.

a. Justification for proposed change

Overview of Change
NURS 512 Nursing Research (3 credits) has been the required research course for the professional masters’ programs. This course will be replaced with NURS 830 Evidence-Based Practice I: Theory and Research Methods (3 Credits). This change will not change the total number of credits for the degree.

Rationale
The M.S.N. Council in the College of Nursing has been working on updating the M.S.N. core curriculum. When the Council reviewed the American Association of Colleges of Nursing’s Master’s Essentials, which are the criteria by which we are evaluated for our national accreditation, it was found that the present research course (NURS 512) does not align with the Essentials. The Essentials focus on students being taught about evidence-based practice and not specific basic research content. We reviewed the syllabi for both courses and there was overlap between NURS 512 and NURS 830, but NURS 830 more strongly met the Master’s Essential objectives.

b. Revised version of the affected areas showing the old program requirements and new program requirements

Present Curriculum with Additions Underlined, Strikethrough of Changes/Deletions

M.S.N. Core (12 credits)
- NURS 501: Issues in Nursing and Health Care (3 credits)
- NURS 510: Theoretical and Scientific Foundations of Advanced Nursing Practice (3 credits)
- NURS 512: Nursing Research (3 credits)
- NURS 513: Evidence-Based Practice in Professional Nursing (3 credits)
- NURS 830: Evidence-Based Practice I: Theory and Research Methods (3 Credits)

There are no other changes to the option-specific course requirements.

c. Departments affected
No departments will be affected by these program revisions.

d. Consultation with ORP
Not needed; no changes to SARI requirements in any of the options.

e. Graduate Bulletin
A copy of the existing Graduate Bulletin description, with all changes highlighted.
Nursing (NURS)

Degrees Conferred:

Ph.D., D.N.P., M.S., M.S.N.
Dual-Title Ph.D. in Nursing and Bioethics (BIOET)
Dual-Title Ph.D. in Nursing and Clinical and Translational Sciences

The Graduate Faculty

The Programs

The graduate programs emphasize productive scholarship and research in the development of nursing knowledge and the translation of knowledge into practice. Advanced study is in human health and development throughout the life span, and in nursing’s role in providing health services to individuals, families, and communities.

The Ph.D. program, the dual-title Ph.D. program in nursing and bioethics, and the dual-title Ph.D. program in nursing and clinical and translational sciences prepare nurse scientists to provide leadership in nursing education, practice and research. Individualized curricula prepare nursing graduates to assume positions as faculty, researchers and leaders in educational, community, governmental, or institutional settings.

The D.N.P. degree program prepares nurse administrators and advanced practice nurses to assume leadership roles in practice settings in the community, governmental agencies, or healthcare institutions.

The M.S. degree program with a major in nursing prepares nurse scientists and clinical scholars who plan to complete a Ph.D. in nursing or dual-title Ph.D. in nursing and bioethics or a dual-title Ph.D. in nursing and clinical and translational sciences.

The M.S.N. degree in Nursing consists of a base program and five options. The options include: Family Nurse Practitioner, Adult Gerontology Primary Care Nurse Practitioner, Adult Gerontology Acute Care Nurse Practitioner, Nurse Administrator, and Nurse Educator.

The M.S., M.S.N., and D.N.P. degree programs in Nursing are accredited by the Commission on Collegiate Nursing Education.

The Nurse Practitioner options are designed to help prepare the professional nurse to function in an expanded nursing role providing direct care to specific groups of clients in a variety of health care settings. Since that practice is inherently interdisciplinary in nature, advanced knowledge and research from nursing is combined with knowledge from science, medicine, and related disciplines. The Nurse Practitioner may also function in supervisory, consultative, education, and research roles.

The Nurse Administrator option enables the student to acquire advanced knowledge of organizational leadership, health policy, and evidence-based health care delivery. The program is designed to prepare students for leadership and administrative roles in a variety of health care settings.
The Nurse Educator option enables the student to acquire advanced knowledge of evidence-based teaching and learning principles, curriculum development, and evaluative techniques. The program is designed to prepare students for educator roles in a variety of academic and health care settings.

Admission Requirements for M.S., M.S.N., D.N.P., and Ph.D. Programs

Requirements listed here are in addition to requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin. Applicants must apply for admission to the program via the Graduate School application for admission.

1. For admission to the Nursing program, an applicant must hold either (1) a bachelor's degree in Nursing from a U.S. regionally accredited institution or (2) a postsecondary degree in Nursing that is equivalent to a U.S. baccalaureate degree earned from an officially recognized degree-granting international institution. Students entering the doctoral program via the traditional post-master's route must have earned a master's degree with a major in nursing from a program accredited by a national accrediting agency for nursing. Well-qualified Ph.D. applicants with a baccalaureate degree in nursing and master's degree in a related discipline (e.g., public health) will be evaluated individually to assess the need for prerequisite master's-level course work in nursing for doctoral program admission.

2. Applicants must submit official transcripts from all post-secondary institutions attended. For M.S.N. applicants, a cumulative grade-point average of 3.3 (on a 4.0 scale) for the baccalaureate degree is expected with a B or better in all science and nursing courses. For M.S. applicants, a cumulative grade-point average of 3.5 (on a 4.0 scale) for the baccalaureate degree is expected with a B or better in all science and nursing courses. College chemistry and statistics are also required (chemistry is not required for the nurse administrator option). B.S.N. to D.N.P. applicants are expected to have a cumulative undergraduate grade-point average of 3.5 (on a 4.0 scale). For master's to Ph.D. or D.N.P. applicants, a cumulative grade-point average 3.5 (on a 4.0 scale) for master's and subsequent course work is expected.

3. Two letters of reference are required for the M.S.N. degree program and three letters of reference are required for the M.S., D.N.P., and Ph.D. degree programs. The letters should be solicited from professional supervisors and faculty who can attest to the applicant's ability.

4. All applicants must submit a statement of purpose. In addition, M.S., D.N.P., and Ph.D. degree applicants must also submit a published or unpublished scientific paper, thesis, or other scholarly writing sample and a complete curriculum vitae.

5. GRE scores are required for admission to the M.S. and Ph.D. programs. GRE scores are not required for the M.S.N. or D.N.P. applicants, but if the scores are submitted to Penn State they will be reviewed as part of the application.

6. The language of instruction at Penn State is English. English proficiency test scores (TOEFL/IELTS) may be required for international applicants. Consult the English Proficiency section of the Graduate Bulletin Application and Admission Procedures page for more information. Applicants to the Nursing program must have a minimum TOEFL total score of 80 with a 25 on the speaking section for the internet-based test (iBT). For the paper-based test, taken prior to July 2017, a minimum of 580 is required. The minimum composite score for the IELTS for applicants to the Nursing program is 7.

7. Applicants to the M.S.N. options and D.N.P. degree offered online via the World Campus must hold a current license to practice professional nursing in at least one U.S. state or in a foreign country. All other applicants to the M.S. and M.S.N. degree programs must hold a current Pennsylvania license to practice professional nursing. Applicants to the Ph.D. degree program must be licensed to practice professional nursing in at least one state or in a foreign country.

8. Applicants to the Adult Gerontology Acute Care Nurse Practitioner Option are required to have two years of acute care hospital experience.

9. Applicants to the M.S.N. degree program are encouraged to discuss program options with the faculty; however, an interview is not required. Doctoral (B.S.N. - Ph.D., B.S.N.- D.N.P., D.N.P., and Ph.D.) applicants will be contacted by the College of Nursing to schedule a required interview (either in person or via internet-based video conferencing).

M.S. and M.S.N. Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

Candidates in the Master of Science (M.S.) degree program in nursing (B.S.N.- Ph.D.) are required to complete a minimum of 30 credits, with at least 18 credits in the 500 and 600 series combined, to be awarded an M.S. degree. A minimum of 12
credits in course work (400, 500, and 800 series), as contrasted with research, must be completed in the major program. There are 9 credits required in M.S. core coursework, including NURS 510 Theoretical and Scientific Foundations of Advanced Nursing Practice (3 credits); NURS 808: Population Health Perspectives (3 credits); and NURS 836: Healthcare Informatics (3 credits). In addition, 9-12 credits are required in research and statistics courses approved in advance by the student’s adviser. Additional courses that will count as electives towards this degree can be chosen from a list of approved elective courses maintained by the graduate program office.

If the M.S. student chooses to complete a thesis, at least 6 credits in thesis research (600 or 610) must be taken in conjunction with the thesis. The thesis must be accepted by the advisers and/or committee members, the head of the graduate program, and the Graduate School, and the student must pass a thesis defense. If the student chooses the non-thesis track, the students must submit a satisfactory scholarly paper while enrolled in NURS 596 (3 credits). If no thesis is required, at least 18 credits of course work must be in 500-level courses.

The Master of Science in Nursing (M.S.N.) requires a minimum of 30 credits, with at least 6 credits at the 500 level, including 12 credits of M.S.N. Program Core courses, 15 credits of electives, and at least 3 credits in a capstone course. The M.S.N. Program Core Courses are: NURS 501: Issues in Nursing and Health Care (3 credits), NURS 510 Theoretical and Scientific Foundations of Advanced Nursing Practice (3 Credits), NURS 830 Evidence-Based Practice I: Theory and Research Methods (3 Credits), and NURS 513 Evidence-Based Practice in Professional Nursing (3 credits). Additional courses that will count as electives towards this degree can be chosen from a list of approved elective courses maintained by the graduate program office. Students in the M.S.N. degree program are required to complete a capstone project, which demonstrates the application of theory and research to a clinical problem based on review of the literature and research utilization for that problem. For M.S.N. students who do not choose to complete an option, the capstone project is completed while enrolled in NURS 596 (3 credits).

The five advanced role options offered in the M.S.N. degree program include nurse educator, nurse administrator, family nurse practitioner, adult gerontology primary care nurse practitioner, and adult gerontology acute care nurse practitioner. Students in these options complete the 12 credits of M.S.N. Program Courses as described above. The option-specific course requirements described below replace the requirement for 15 credits of electives.

Students must earn a minimum of 45 credits for the M.S.N. with the Family Nurse Practitioner option. The option-specific course requirements total 27 credits, including: NURS 802 (3), NURS 802A (1), NURS 803 (3), NURS 804 (3), NURS 870 (3), NURS 871 (3), NURS 872 (3), NURS 873 (4), NURS 875 (2), and NURS 876 (2). The capstone course for students completing this option is NURS 874 (6).

Students must earn a minimum of 41 credits for the M.S.N. with the Adult Gerontology Primary Care Nurse Practitioner option. The option-specific course requirements total 23 credits, including: NURS 802 (3), NURS 803 (3), NURS 804 (3), NURS 870 (3), NURS 871 (3), NURS 872A (4) and NURS 873A (4). The capstone course for students completing this option is NURS 874A (6).

Students must earn a minimum of 43 credits for the M.S.N. with the Adult Gerontology Acute Care Nurse Practitioner option. The option-specific course requirements total 25 credits, including: NURS 802 (3), NURS 803 (3), NURS 804 (3), NURS 860 (3), NURS 861 (3), NURS 862 (4), NURS 863 (4), NURS 865 (1), and NURS 866 (1). The capstone course for students completing this option is NURS 864 (6).

Students must earn a minimum of 37 credits for the M.S.N. with the Nurse Administrator option. The option-specific course requirements total 12 credits, including: NURS 836 (3), NURS 845 (3), NURS 846 (3), and NURS 847 (3). The capstone course for students completing this option is NURS 843 (4). Students in this option are required to take 9 additional elective credits chosen from a list of approved elective courses maintained by the graduate program office.

Students must earn a minimum of 37 credits for the M.S.N. with the Nurse Educator option. The option-specific course requirements total 18 credits, including: NURS 802B (3), NURS 803 (3), NURS 804 (3), NURS 840 (3), NURS 841 (3), and NURS 842 (3). The capstone course for students completing this option is NURS 843 (4). Students in this option are required to take 3 additional elective credits chosen from a list of approved elective courses maintained by the graduate program office.

D.N.P. Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.
Students may enter the program directly with a B.S.N. degree or following completion of a Master's degree in nursing.

For the B.S.N. to the D.N.P., a core of master's courses is required. A minimum of 61 credits, 1000 hours of practicum time, and a DNP project is required. The 61 credits include:

- 9 credits of Master's Core Courses: NURS 501(3), NURS 510(3), and NURS 512(3)
- 13 credits of Nurse Administrator Option Courses: NURS 845(3), NURS 846(3), NURS 847(3), and NURS 848A(4).
- 12 credits of D.N.P. Core Courses: NURS 830(3), NURS 831(3), NURS 832(3), and NURS 833(3).
- 8 credits of Other Required Courses: NURS 590(1), NURS 587(1), NURS 808(3), and NURS 836(3).
- 5 credits of Advanced Practice Clinical (needed to meet the 1000 hour practicum requirement): NURS 834(5)
- 6 credits of DNP Project: NURS 835(6)
- 8 credits of electives chosen from a list of approved elective courses maintained by the graduate program office

The Master of Science in Nursing (M.S.N.) to D.N.P. program requires a minimum of 30 post-master's degree credits completed at Penn State. The curriculum is individualized based on previous coursework and number of practicum hours completed during the master's program. A maximum of 550 practicum hours from the previous master's program will be accepted to fulfill to 1000 hours of required practicum hours. The curriculum is composed of 5 components, for a minimum of 38 credits:

- 12 credits of D.N.P. Core Courses: NURS 830 (3), NURS 831 (3), NURS 832 (3), and NURS 833 (3).
- 14 credits of Other Required Courses: NURS 510 (3), NURS 590 (1), NURS 587 (1), NURS 808 (3), NURS 836 (3) and NURS 845 (3).
- 6 credits of DNP Project: NURS 835 (6)
- 6 credits of electives chosen from a list of approved elective courses maintained by the graduate program office

In addition to the minimum 38 credits, up to 8 credits of NURS 834 may be required for M.S.N. to D.N.P. students, depending on the number of practicum hours completed in the student's M.S.N. program

For both entry options, students are required to participate in 3 intensives offered at the University Park or Hershey Medical Center campus. For full-time students, the first intensive is August of semester I for M.S.N. to D.N.P. and Semester III for B.S.N. to D.N.P. students. Intensive 2 is the beginning of the subsequent semester, Intensive 3 is at the end of semester II for M.S.N. to D.N.P. and semester IV for B.S.N. to D.N.P. students.

In addition to coursework, all students are required to complete a series of three benchmarks, Candidacy Examination, Comprehensive Examination, and a Final Oral Presentation.

D.N.P. Doctoral Committee Composition: The doctoral committee will consist of the student's academic adviser, the DNP project course (NURS 835) instructor, and a third member of the graduate faculty, all from the graduate program in Nursing. The academic adviser will be the chair of the committee.

Candidacy Examination: All students must satisfactorily complete the candidacy examination, which is designed to evaluate the student's past performance and potential for successfully completing the program. Candidacy typically occurs prior to the 2nd intensive, which follows completion of one semester of full-time study for the M.S.N. to D.N.P. student and after three semesters of full-time study for the B.S.N. to D.N.P. student. Students who fail the examination on the first attempt may repeat it once. Students who fail the examination the second time are terminated from the program.

Comprehensive Examination: The comprehensive examination marks the student's progression into their D.N.P. project. This occurs during the 3rd intensive, when students present their D.N.P. project proposal. The comprehensive examination needs to be successfully completed prior to the submission of the proposal for human subjects' review or carrying out the project (if it does not require a review). Students who fail the examination on the first attempt may repeat it once. Students who fail the examination the second time are terminated from the program.

Final Oral Presentation: Upon completion of the project, the Final Oral Presentation is scheduled. Students are required to present the project for approval by their doctoral committee. The Associate Dean for Graduate Education & Research will sign off on the final paper, following completion of the paper during NURS 835 and the student's passing of the oral presentation. Students who fail the presentation on the first attempt may repeat it once. The student's final paper will be made publicly available through ScholarSphere.
Ph.D. Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

Students may enter the program directly with a B.S.N. degree (and may receive an M.S. degree en route to the Ph.D.) or a concurrent M.S.N. (nurse practitioner option) or following completion of a B.S.N. and a Master's degree (either in Nursing or non-Nursing). A dual-title Ph.D. degree in Nursing and Bioethics, and a dual-title Ph.D. degree in Nursing and Clinical and Translational Sciences are also available.

Students entering with an M.S.N. will complete a minimum of 43 credits. The curriculum is composed of 3 components:

1. Nursing Science Core: minimum of 16 credits, consisting of NURS 580 (3), NURS 582 (4), NURS 583 (3), NURS 587 (1), NURS 588 (3), and NURS 590 (2). NURS 596 (3) will also be required of students who are not research assistants on an active faculty research study.
2. Research Methodology and Statistics: minimum of 15 credits approved by the student's adviser and/or doctoral committee.
3. Courses for Individual Specialty: minimum of 12 credits; minimum of 15 credits for a minor.

In addition to course work, all students are required to complete a series of examinations: the Candidacy Examination, the Comprehensive Examination (written and oral components), the Dissertation Proposal Defense, and Final Oral Examination. Students are required to pass the Final Oral Examination, have the dissertation approved and submitted, and graduate within five years of passing the candidacy examination.

Candidacy Examination: All students must satisfactorily complete the candidacy examination, which is designed to confirm the student's mastery of basic nursing theory and research methods. For students entering the doctoral program with a master's degree, the candidacy examination must be taken at the end of the first year of full-time study or the equivalent. Students who fail the examination on the first attempt may repeat it once. Students who fail the examination the second time are terminated from the program.

Comprehensive Examination: The comprehensive examination is designed to test the student's mastery of and ability to synthesize and integrate the theoretical basis for nursing science, advanced research methods, and the chosen specialty area. This examination is taken when a candidate has substantially completed all course work. Students who fail the examination on the first attempt may repeat it once. Students who fail the examination the second time are terminated from the program.

Dissertation and Final Oral Examination (the Dissertation Defense): Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. Each student is required to conduct an original and independent research project which adds to nursing's body of knowledge, and to communicate the research report in a written dissertation. A written dissertation proposal is required and must be approved at a proposal hearing by a majority vote of the student's doctoral committee. A majority vote is also required for approval of the completed written dissertation at the Final Oral Examination (the dissertation defense). The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.

Dual-Title Ph.D. in Bioethics

Nursing Ph.D. students may pursue additional training in bioethics through the dual-title Ph.D. program in Bioethics. Students must apply and be admitted to the graduate program in Nursing and the Graduate School before they can apply for admission to the dual-title degree program. Admission to the dual-title is determined upon review of all application materials (forwarded from the College of Nursing) by the admissions committee in Bioethics. Students must apply and be admitted to the dual-title degree program in Bioethics prior to taking the candidacy exam.

To qualify for the dual-title degree, students must satisfy the requirements of the Nursing Ph.D. program. In addition, they must satisfy the requirements described below, as established by the Bioethics program committee. Within this framework, final course selection is determined by the student, their Nursing adviser, and their Bioethics program adviser.

The dual-title Ph.D. in Nursing and Bioethics requires a minimum of 1 credit of course work beyond the requirements for the Ph.D. in Nursing (17 credits of the 18 Bioethics credits are part of the current degree requirements in Nursing), as follows:
- 10 credits: 7 required credits (BIOET 501 (3), BIOET 502 (3), and BIOET 590 (1)), plus at least 3 additional BIOET credits at the 500 level. These credits can be applied to the Courses for Individual Specialty requirement for the Nursing Ph.D.
- 8 additional credits from a list of approved electives at the 400 or 500 level, at least two of these courses must be at the 500 level. Many of the available electives that students may wish to take are 3-credit courses, so 9 additional credits may be a more typical number for most students. The list of elective courses will be maintained by the Director of the Bioethics Graduate Program in consultation with the Bioethics Program Committee. The Nursing Science core constitutes 7 of these elective credits.

**Candidacy Examination:** In order to be admitted to Ph.D. candidacy in the dual-title degree program, students must meet the Ph.D. candidacy requirements specified by Nursing; a single candidacy examination will be administered that includes assessment of both Nursing and Bioethics. At least one member of the candidacy committee must have a Graduate Faculty appointment in Bioethics. Because students must first be admitted to a graduate major program of study before they may apply to and be considered for admission into a dual-title graduate degree program, dual-title graduate degree students may require an additional semester to fulfill requirements for both areas of study and, therefore, the candidacy examination may be delayed one semester beyond the normal period allowable.

**Comprehensive Examination:** In addition to the general Graduate Council requirements for doctoral committees, the doctoral committee of a Nursing and Bioethics dual-title Ph.D. student must include at least one member of the Bioethics Graduate Faculty. Graduate faculty members who hold appointments in both programs may serve in a combined role. If the chair of the committee representing Nursing is not also a member of the Graduate Faculty in Bioethics, the member of the committee representing Bioethics must be appointed as co-chair. The faculty member (or members) affiliated with the Bioethics Program will be responsible for administering a portion of the comprehensive exam that will require the student to demonstrate an understanding of various theoretical and methodological approaches to bioethics, and an ability to apply them to issues and problems (including, where appropriate, practical problems) in their nursing.

**Dissertation and Final Oral Examination (the Dissertation Defense):** Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. Students enrolled in the dual-title program are required to write and orally defend a dissertation on a topic that is approved in advance by their doctoral committee and reflects their original research and expertise in Nursing and Bioethics. The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.

**Dual-Title Ph.D. in Clinical and Translational Sciences**

Nursing Ph.D. students may pursue additional training in CTS through the dual-title Ph.D. program in CTS. Students must apply and be admitted to the graduate program in Nursing and the Graduate School before they can apply for admission to the dual-title degree program. Admission to the dual-title is determined upon review of all application materials (forwarded from the College of Nursing) by the admissions committee in CTS. Students must apply and be admitted to the dual-title degree program in CTS prior to taking the candidacy exam.

To qualify for the dual-title degree, students must satisfy the requirements of the Nursing Ph.D. program. In addition, they must satisfy the requirements described below, as established by the CTS program committee. Within this framework, final course selection is determined by the student, their Nursing adviser, and their CTS program adviser.

The CTS dual-title requires 26 credits: 18 credits from a list of approved electives in each of the following areas (at least half of which must be at the 500 or 800 level): Statistics (3 cr.), Epidemiology (3 cr.), Bioinformatics (3 cr.), Experimental Design and Interpretation (3 cr.), The Regulatory Environment (3 cr.), and Scientific Communication (3 cr.); 2 credits of CTS 590; and 6 credits of CTS 595 or BMS 571. Of the 18 elective credits required, 12 credits can be double-counted from the required courses for the Ph.D. in Nursing: STAT 500/PHS 520 meets the 3-credit requirement for Statistics, and an additional 9 credits of Individual Specialization Coursework required for Nursing can be selected from the list of CTS approved electives to meet the 3-credit requirements in Epidemiology, Bioinformatics, and The Regulatory Environment. Therefore, dual-title Ph.D. students in Nursing and CTS may require a minimum of 14 credits of additional coursework, consisting of approved electives in Experimental Design and Interpretation (3 cr.) and Scientific Communication (3 cr.), 2 credits of CTS 590; and 6 credits of CTS 595 or BMS 571.

**Candidacy Examination:** In order to be admitted to Ph.D. candidacy in the dual-title degree program, students must meet the Ph.D. candidacy requirements specified by Nursing; a single candidacy examination will be administered that includes assessment of both Nursing and CTS. At least one member of the candidacy committee must have a graduate faculty appointment in CTS. Because students must first be admitted to a graduate major program of study before they may apply to and be considered for admission into a dual-title graduate degree program, dual-title graduate degree students may require an additional semester to fulfill requirements for both areas of study and, therefore, the candidacy examination may be delayed one semester beyond the normal period allowable.
**Comprehensive Examination:** In addition to the general Graduate Council requirements for doctoral committees, the doctoral committee of a Nursing and CTS dual-title Ph.D. student must include at least one member of the CTS Graduate Faculty. Graduate faculty members who hold appointments in both programs may serve in a combined role. If the chair of the committee representing Nursing is not also a member of the Graduate Faculty in CTS, the member of the committee representing CTS must be appointed as co-chair. The faculty member (or members) affiliated with the CTS Program will be responsible for administering a portion of the comprehensive exam that will require the student to demonstrate an understanding of various theoretical and methodological approaches to CTS, and an ability to apply them to issues and problems (including, where appropriate, practical problems) in their nursing.

**Dissertation and Final Oral Examination (the Dissertation Defense):** Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. Students enrolled in the dual-title program are required to write and orally defend a dissertation on a topic that is approved in advance by their doctoral committee and reflects their dissertation research and expertise in Nursing and CTS. The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.

**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. Students on graduate assistantships must adhere to the course load limits set forth in the Graduate Bulletin.

In addition to the STUDENT AID section of the Graduate Bulletin, the following awards typically have been available to graduate students in this program:

**U.S. PUBLIC HEALTH SERVICE TRAINEESHIPS IN NURSING**
Open to selected registered nurse, full-time students in nursing; stipend may be available plus tuition. Apply to Associate Dean for Graduate Education & Research, College of Nursing.

**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 but 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.

**NURSING (NURS) course list**

Last Revised by the Department: Fall Semester 2017

Blue Sheet Item #: 46-04

Review Date: 1/9/2018

Faculty linked: 6/27/14
**Graduate Council**

**Program, Option, or Minor Proposal Form**

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Office of the Dean of the Graduate School, 211 Kern Building, University Park. For more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

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**College/School:**  **Graduate School**

**Department or Instructional Area:**  Intercollege Graduate Degree Program in Plant Biology

---

**New Graduate Program, Option, or Minor:**  **Add**

**Designation of new graduate program:**

Classification of Instructional Programs (CIP) Code:  

**Designation of new graduate option:**

**Designation of new graduate minor:**

**Indicate effective semester:**  
First semester following approval  
Second semester following approval

---

**Existing Graduate Program Option, or Minor:**  **Change**  **Drop**

**Current designation of graduate program:**

**Current designation of graduate option:**

**Current designation of graduate minor:**

**New designation of existing graduate program (if changing):**

**New designation of existing graduate option (if changing):**

**New designation of existing graduate minor (if changing):**

**Brief description of the change (if not noted above):**

**Indicate effective semester:**  
First semester following approval  
Second semester following approval

---

**Submitted by Graduate Program Head**

Teh-hui Kao  
Signed  
Date: 1/21/18

---

**Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:**

Mu Verdovane  
Signed  
Date: 2/22/18

---

**Approved by College/School Dean/Chancellor (or Designee):**

Mu Verdovane  
Signed  
Date: 2/22/18
Recommended by Chair, Graduate Council Subcommittee on New and Revised Programs and Courses:

On Behalf of C. Andrew Cole
Printed name
Signature
Date: 4/31/2018

Recommended by Chair, Graduate Council Committee on Programs and Courses:

On Behalf of M. Kathleen Heid
Printed name
Signature
Date: 4/3/2018

Noted by Dean of the Graduate School:

On Behalf of Regina Vasilatos-Younken
Printed name
Signature
Date: 4/3/2018
PROGRAM CHANGE PROPOSAL FOR
Intercollege Graduate Degree Program in Plant Biology

SUBMITTED BY
Teh-hui Kao, 333 S. Frear, 814-863-1042, txk3@psu.edu
Plant Biology (PLBIO)

Program Home Page (Opens New Window)

TEH-HUI KAO, Head of the Graduate Program in Plant Biology
Plant Biology Program Office
101 Huck Life Sciences Building
814-865-8165
huck-plantbio@psu.edu

Degrees Conferred:

Ph.D., M.S.

The Graduate Faculty

The Program

The Intercollege Graduate Degree Program in Plant Biology includes faculty from nine departments in the College of Agricultural Sciences, College of Engineering, and Eberly College of Science. Each student becomes associated with the adviser's department, which may provide financial support, research facilities, and office space. Applicants are encouraged to explore opportunities by contacting faculty who may be prospective advisers.

The objective of this program is to educate and train plant biologists using the most modern techniques available today. Graduates from this program have gone on to a diverse range of careers, including positions in colleges and universities, research institutes, industry, and government. Research interests of the program faculty span the breadth of scientific areas ranging from molecular, cell, and evolutionary biology, biochemistry, biophysics, genetics, and functional genomics to whole-plant physiology and ecology. Student training includes a comprehensive set of team-taught courses that reflects this breadth of scientific approaches.

Admission Requirements

Requirements listed here are in addition to requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin. Applicants apply for admission to the program via the Graduate School application for admission.

Scores from the Graduate Record Examinations (GRE) Aptitude Test (verbal, quantitative, analytical) are required for admission.
Students with a 3.00 junior/senior grade-point average (on a 4.00 scale) and with appropriate course background will be considered for admission. The best-qualified applicants will be accepted up to the number of spaces available for new students. Students entering this program should have a strong foundation in the biological sciences, including biochemistry, general physics, and college mathematics through calculus. Students with limited deficiencies may be admitted but must make up their deficiencies concurrently with their graduate studies. B.S.-level applicants with good academic records who have had strong training in plant biology and related courses, including research experience, are generally admitted directly into the Ph.D. program.

Master's Degree Requirements

Requirements listed here are in addition to requirements stated in the Degree Requirements section of the Graduate Bulletin.

All M.S. degree candidates will be required to complete 30 credits of course work at the 400, 500, 600, or 800 level, with at least 18 credits at the 500 and 600 level, combined. All students must complete the following core courses: PLBIO 512 (4 cr.); PLBIO 513 (4 cr.); MCIBS 591 (1 cr.); and PLBIO 590 (1 cr.). The remaining elective credits may be chosen from a list of approved electives maintained by the program office.

Students are required to write a thesis, and at least 6 credits in thesis research (600 or 610) must be taken in conjunction with completing the thesis. The thesis must be accepted by the advisers and/or committee members, the head of the graduate program, and the Graduate School, and the student must pass a thesis defense.

Doctoral Degree Requirements

Requirements listed here are in addition to requirements stated in the Degree Requirements section of the Graduate Bulletin.

Students in the Ph.D. program must successfully pass the candidacy, comprehensive, and final oral examinations required by Graduate Council. To earn the Ph.D. degree, doctoral students must also write a dissertation that is accepted by the doctoral committee, the head of the graduate program, and the Graduate School.

Ph.D. candidates must complete a minimum of 17 credits, including the following courses: PLBIO 512 (4 cr.); PLBIO 513 (4 cr.); PLBIO 514 (2 cr.); PLBIO 515 (2 cr.); PLBIO 516 (2 cr.); MCIBS 591 (1 cr.); PLBIO 590 (2 cr.); and two biochemistry courses. A list of courses approved to count towards the biochemistry course requirement is maintained by the graduate program office. Upon consultation with the head of the graduate program, equivalent courses taken at another university may be substituted for some of the above requirements. Based on the results of the candidacy examinations, the student's adviser and doctoral committee will determine other course requirements.

One of the main goals of the candidacy examination is to determine the potential of a student to successfully obtain a Ph.D. degree and is intended to be a rigorous test of a student's abilities, prior to the major investment in time and effort necessary to pass the comprehensive examination. Students enrolled in the Ph.D. program must pass a written English competency evaluation based on the dossier of papers written for PLBIO 512 and PLBIO 513. This evaluation is done at the end of the student's first year. The oral candidacy examination is based on two of the papers, jointly chosen by the student and the Candidacy Examination Committee, and must be passed by the end of the student's third semester.
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. Students on graduate assistantships must adhere to the course load limits set forth in the Graduate Bulletin.

In most participating departments, Plant Biology applicants are eligible for departmental teaching or research assistantships, and other assistantships supported by grant funds of individual faculty who make the award decisions. More detailed and up-to-date information about student aid may be found in the Plant Biology Student and Faculty Handbook, which is updated annually during the summer.

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.

PLANT BIOLOGY (PLBIO) course list
Graduate Council
Program, Option, or Minor Proposal Form

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The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: College of Agricultural Sciences
Department or Instructional Area: Ecosystem Science and Management - Soils Program

New Graduate Program, Option, or Minor: Add
Designation of new graduate program: 
Classification of Instructional Programs (CIP) Code: 
Designation of new graduate option: 
Designation of new graduate minor: 

Indicate effective semester:
  First semester following approval
  Second semester following approval

Existing Graduate Program Option, or Minor: Change Drop
Current designation of graduate program: 
Current designation of graduate option: 
Current designation of graduate minor: 

New designation of existing graduate program (if changing): 
New designation of existing graduate option (if changing): 
New designation of existing graduate minor (if changing): 

Brief description of the change (if not noted above): _Update degree requirements_

Indicate effective semester:
  First semester following approval
  Second semester following approval

Submitted by Graduate Program Head
_Dr. Michael Messina_ 
Printed name
Signature
Date: 10/3/17

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:
_John Ewing_ 
Printed name
Signature
Date: 10/4/17

Approved by College/School Dean/Chancellor (or Designee):
_Rama Radhakrishna_ 
Printed name
Signature
Date: 10/4/17
<table>
<thead>
<tr>
<th>Role</th>
<th>Printed name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended by Chair, Graduate Council Subcommittee on New and Revised Programs and Courses:</td>
<td>C. Andrew Cole</td>
<td>4/3/2018</td>
<td></td>
</tr>
<tr>
<td>Recommended by Chair, Graduate Council Committee on Programs and Courses:</td>
<td>M. Kathleen Heid</td>
<td>4/3/2018</td>
<td></td>
</tr>
<tr>
<td>Noted by Dean of the Graduate School:</td>
<td>Regina Vasilatos-Younken</td>
<td>4/3/2018</td>
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### Table of Proposed Changes For Soils MS and PhD Program Requirements

<table>
<thead>
<tr>
<th>Previous Requirements – MS</th>
<th>Proposed Requirements - MS</th>
<th>Justification</th>
<th>Expected Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>No statement about SARI Requirements and no required course in Research Communications and Integrity</td>
<td>Research Communications and Integrity (1 credit) is required</td>
<td>Course has been approved for the purpose of meeting SARI Requirements* and providing a clear documentation that students have met SARI requirements</td>
<td>Better tracking of SARI requirements being met plus improved skills in science communication</td>
</tr>
<tr>
<td>Attendance at one colloquium course each semester is required</td>
<td>Attendance at one colloquium course each semester is expected</td>
<td>Many divergent colloquia across campus provide reasonable exposures to new ideas but tracking compliance is not feasible.</td>
<td>Faculty will be the compliance monitor rather than a formal tracking mechanism.</td>
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<table>
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<tr>
<th>Previous Requirements – PhD</th>
<th>Proposed Requirements - PhD</th>
<th>Justification</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Colloquium credits required were 2</td>
<td>We have changed the Colloquium credits required of PhD students from 2 credits to 1 credit, and require Research Communications and Integrity course</td>
<td>The Research Communications and Integrity course provides students an opportunity to receive training and practice regarding communication skills, which seems more important than simply giving two presentations</td>
<td>Students better prepared to communicate scientific results to both peers and non-scientific community members</td>
</tr>
<tr>
<td>No statement about SARI Requirements and no required course in Research Communications and Integrity</td>
<td>Research Communications and Integrity is required</td>
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<td>monitor rather than a formal tracking mechanism.</td>
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<tr>
<td>Foreign Language Requirement</td>
<td>Dropped</td>
<td>No longer seen as important since major research journals are available primarily in English</td>
<td>Frees time for greater focus on research skills</td>
</tr>
</tbody>
</table>

From: Shriver, Sharon [mailto:sps10@psu.edu]
Sent: Tuesday, September 29, 2015 11:07 AM
To: Diane Monteith
Cc: Jack Watson; 'ANGELA CLARK (adg3@psu.edu)'; Dries, Sara
Subject: RE: ESM SARI Plan

Thanks, Diane! You’re good to go; Sara will take it from here.

Let me know if you need anything else!

Sharon

From: Diane Monteith [mailto:dxm66@psu.edu]
Sent: Tuesday, September 29, 2015 10:59 AM
To: Shriver, Sharon
Cc: Jack Watson; ANGELA CLARK (adg3@psu.edu)
Subject: RE: ESM SARI Plan

Sharon:

Thanks for your help on this. I made the recommended changes and have attached the revised version.

Diane Monteith
Graduate Staff Assistant
Department of Ecosystem Science and Management
College of Agricultural Sciences
The Pennsylvania State University
319 Forest Resources Bldg.
University Park, PA 16802
Phone: 814-863-7221; Fax: 814-865-3725
Email: dxm66@psu.edu
http://ecosystems.psu.edu/

From: Shriver, Sharon [mailto:sps10@psu.edu]
Sent: Tuesday, September 29, 2015 10:39 AM
To: Diane Monteith
Subject: RE: ESM SARI Plan
Hi Diane-

Thanks for sending the updated plan. The CITI program has changed; there is a new login system, and only one RCR course which covers all disciplines. I made a suggested change to your plan to reflect this. If it’s ok, please send back the revised version and Sara will upload it. Or feel free (of course!) to revise it as you like and I’ll be happy to take another look.

Thanks!

Sharon

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Sharon Shriver, Ph.D.
Assistant Director, Educational Programs
Director, Scholarship and Research Integrity (SARI@PSU) Program
Office for Research Protections
Penn State University
The 330 Building, Suite 205
University Park, PA 16802
http://www.research.psu.edu/orp
814-867-2130; sps10@psu.edu

From: Diane Monteith [mailto:dxm66@psu.edu]
Sent: Monday, September 28, 2015 4:48 PM
To: Dries, Sara <sad33@psu.edu>
Cc: Jack Watson <jew21@psu.edu>; Michael Messina <mgm20@psu.edu>; ANGELA CLARK (adg3@psu.edu)
<adg3@psu.edu>
Subject: ESM SARI Plan

Hi Sara:

Attached is our updated ESM Department SARI Plan. Please let me know if you need anything else.

Thanks.

Diane Monteith
Graduate Staff Assistant
Department of Ecosystem Science and Management
College of Agricultural Sciences
The Pennsylvania State University
319 Forest Resources Bldg.
University Park, PA 16802
Phone: 814-863-7221; Fax: 814-865-3725
Email: dxm66@psu.edu
http://ecosystems.psu.edu/
Soil Science (SOILS)

Program Home Page

MICHAEL G. MESSINA, Head of the Department of Ecosystem Science and Management
121 Forest Resources Building
814-863-7093

JOHN E. (JACK) WATSON, Director of Graduate Studies in Ecosystem Science and Management
409 ASI Building
814-863-6714

Degrees Conferred:

Ph.D., M.S. Soil Science
Dual-Title Ph.D. (Soil Science and Biogeochemistry)
Dual-Title Ph.D. (Soil Science and International Agriculture and Development)
Dual-Title M.S. (Soil Science and International Agriculture and Development)

The Graduate Faculty

The Soil Science program is administered in the Department of Ecosystem Science and Management, College of Agricultural Sciences. Each student will be associated with an adviser who may provide financial support, research facilities, and/or office space. Applicants are encouraged to explore, study, and research opportunities in the Department by contacting faculty who may be prospective advisers.

This program provides opportunities for candidates interested in soil and related water resources to become a professional leader and an independent scholar. Faculty in this program are competent to prepare candidates in the subfields of Soil Science including: soil genesis, soil classification, soil morphology, soil mapping, soil physics, soil biogeochemistry, soil mineralogy, soil microbiology, soil fertility, soil conservation, geographic information systems, computer mapping, watershed analysis, soil hydrology, soil and water management, resource inventory and assessment, remote sensing, land evaluation, land waste disposal, and land management.

Admission Requirements

Requirements listed here are in addition to requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin. Applicants apply for admission to the program via the Graduate School application for admission.

Scores from the Graduate Record Examinations (GRE), or from a comparable substitute examination, are required for admission. At the discretion of the Graduate Programs Committee, a student may be admitted for graduate study in the program without these scores.

Prerequisites for major work in Soil Science vary with the area of specialization and the degree sought, but courses in chemistry, mathematics, physics, geology, and basic and applied biological sciences are required.

Applicants for the M.S. degree must have a baccalaureate degree including 76 credits of basic and applied natural sciences. Admission to the Ph.D. program usually requires an M.S. or equivalent degree with a minimum cumulative grade-point average of 3.25 (on a 4.00 scale). Applicants for the Ph.D. program will be evaluated on the quality of work completed in all previous degree programs. Students who lack some of the prerequisite courses may be admitted at the discretion of the faculty member who will serve as the student’s adviser. The best-qualified applicants will be accepted up to the number of spaces available for new
students. Generally students are not admitted into the program without a faculty member agreeing to serve as the adviser. Credits for prerequisite courses cannot be applied towards requirements for the degree.

Master's Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

A minimum of 30 credits at the 400, 500, 600, or 800 level is required, with at least 18 credits at the 500 and 600 level, combined. The department requires 12 credits of 400- or 500-level formal courses in Soil Science of which 6 must be 500-level, and 6 credits of 400- or 500-level courses in a minor or general studies area. A total of 6 credits, with at least 3 credits at the 500 level, must be taken in statistics. Participation in at least one colloquium course each semester is expected and students must complete at least 1 credit of colloquium (SOILS 590). In addition, M.S. students are required to complete 1 credit of Supervised Experience in College Teaching (SOILS 602); however, this 1 credit cannot be counted towards the degree requirements. Specific courses and requirements will be determined by the faculty adviser and advisory committee.

A thesis based on field or laboratory research is required for the M.S. degree and at least 6 credits in thesis research (600 or 610) must be taken in conjunction with completing the thesis. The thesis must be accepted by the advisers and/or committee members, the head of the graduate program, and the Graduate School, and the student must pass a thesis defense.

Doctoral Degree Requirements

Requirements listed here are in addition to requirements stated in the DEGREE REQUIREMENTS section of the Graduate Bulletin.

While a minimum number of courses for the degree is not specified, the doctoral committee has the responsibility of specifying courses and credits essential for the education and development of the candidate. Students are expected to be educated in depth in a specific subfield of Soil Science and to have a perspective of the general field. Normally, students will have 50 to 60 credits in formal course work beyond the B.S. degree. A minimum of 12 credits of 500-level courses beyond the baccalaureate degree are required. Additional requirements include a minimum of 15 credits of 400- or 500-level courses in a minor or general studies area, 6 credits of statistical methods beyond the baccalaureate degree, of which a minimum of 3 will be at the 500 level, and 12 credits of 600 or 610 (thesis research).

Doctoral candidates are required to participate regularly in a departmental colloquium and to register for at least 1 credit of Colloquium (SOILS 590) during the Ph.D. program. Ph.D. students are required to complete two separate semesters of Supervised Experience in College Teaching (SOILS 602) for 2 credits total; however, these 2 credits cannot be counted towards the degree requirements. Doctoral students must pass a candidacy examination, a comprehensive written and oral examination, and a final oral examination (the dissertation defense). To earn the Ph.D. degree, doctoral students must also write a dissertation that is accepted by the doctoral committee, the head of the graduate program, and the Graduate School.

Dual-Title Ph.D. Degree in Soil Science (SOILS) and Biogeochemistry (BGC)

Doctoral students with research and educational experiences in soil science may apply to the Soil Science/Biogeochemistry Dual-Title Doctoral Degree Program. The goal of the dual-title Ph.D. degree in Soil Science and Biogeochemistry is to enable SOILS graduate students to acquire the knowledge and skills of their major area of specialization in SOILS, while at the same time gaining expertise and skills in biogeochemistry. Graduate study in this program seeks to provide students with the intellectual foundation for integrated and mechanistic understanding of interactions between microbes, soils, and plants in diverse
environmental systems. Interdisciplinary training that includes biogeochemistry will prepare students for positions in academia, government, non-profit organizations, and the private sector. It will also prepare students for a wide array of research careers in the private sector, including agricultural and environmental sciences, energy industries, and the integrated study of the sustainability of biological systems.

Admission Requirements

For admission to the dual-title doctoral degree in Biogeochemistry, a student must first apply and be admitted to the Soil Science graduate program and The Graduate School. It is preferable but not necessary to discuss the dual-title interest beforehand with a major adviser who has been appointed to the Biogeochemistry program. Refer to the Admission Requirements section of the Biogeochemistry Bulletin page. After admission to the Soil Science program, students must apply for admission to the Biogeochemistry dual-title program by submitting an application to the Biogeochemistry Graduate Program Coordinator. The application consists of a written personal statement describing the student’s biogeochemistry research interests and career goals that can be met by earning a dual-title SOILS/BGC degree. The statement should be signed by the student’s major advisor in support of the student’s taking on the academic responsibilities of the dual title degree. The application will be reviewed by the BGC Program Coordinator, in consultation with the BGC Executive Committee, who will make the admission decision and notify the Graduate School. Students must be admitted into the BGC program prior to the candidacy exam.

Degree Requirements

To qualify for the dual-title degree, students must satisfy the Soil Science Ph.D. degree requirements, listed above. In addition, students pursuing the dual-title Ph.D. in Soil Science and Biogeochemistry must complete the degree requirements for the dual-title Biogeochemistry Ph.D., listed on the Biogeochemistry Bulletin page. Students are required to have two advisers from separate disciplines: one individual serving as a primary adviser in their major degree program and a secondary adviser in an area within a field covered by the dual-title program who is a member of the Biogeochemistry graduate faculty. The major program adviser normally will also be a member of the Biogeochemistry graduate faculty. The two faculty advisers can represent different academic programs, but this is not required, as faculty from a scientifically diverse department could represent very different areas of expertise.

The candidacy examination committee for the dual-title Ph.D. degree will be composed of Graduate Faculty from Soil Science and must include at least one Graduate Faculty member from the Biogeochemistry program. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. There will be a single candidacy examination, containing elements of both Soil Science and Biogeochemistry. Dual-title graduate degree students may require an additional semester to fulfill requirements for both areas of study and, therefore, the candidacy examination may be delayed one semester beyond the normal period allowable.

In addition to the general Graduate Council requirements for doctoral committees, the doctoral committee of a Soil Science and Biogeochemistry dual-title doctoral degree student must include at least one member of the Biogeochemistry Graduate Faculty. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. If the chair of the doctoral committee is not also a member of the Graduate Faculty in Biogeochemistry, the member of the committee representing Biogeochemistry must be appointed as co-chair. The Biogeochemistry representative on the student’s doctoral committee will develop questions for and participate in the evaluation of the comprehensive examination.

Students enrolled in the dual-title program are required to write and orally defend a dissertation on a topic that reflects their original research and education in Soil Science and Biogeochemistry. Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.
Dual-Title Graduate Degree in Soil Science (SOILS) and International Agriculture and Development (INTAD)

Graduate students with research and educational interests in international education may apply to the Soil Science/INTAD Dual-Title Degree Program. The goal of the dual-title degree Soil Science and INTAD graduate program is to enable graduate students from Soil Science to acquire the knowledge and skills of their primary area of specialization in Soil Science, while at the same time gaining the perspective and methods needed for work in the international agriculture. Graduate study in this program seeks to prepare students to assume leadership roles in science, science education, outreach, and project management anywhere in the world. Students are required to write research proposals and expected to write grants to support their research activities, reflecting the dual-title degree. As part of their professional development presentations, publication of research articles and active participation in professional societies is expected. Emphasis is placed upon the professional development of the student. Students are able to specialize in the research program areas of soil genesis, classification, morphology, mapping, microbiology, chemistry, physics, mineralogy, fertility, geographic information systems, remote sensing, watershed analysis, hydrology, and land management. At the same time they will acquire a broad perspective about how to apply their research findings in the context of the broader international community. Thus, the dual-title will allow students to master their field of specialization from an international perspective so that they can compare practices and outcomes between countries and regions.

Admission Requirements

For admission to the dual-title graduate degree under this program, a student must first apply and be admitted to the Soil Science graduate program. Once accepted into the Soil Science program, the student can then submit an application to the INTAD Academic Program Committee for the dual-title degree program. Refer to the Admission Requirements section of the INTAD Bulletin page. The application consists of an application form, a written personal statement indicating the career goals that a student hopes to accomplish by earning a dual-title SOILS/INTAD degree, and a letter from the Soil Science academic adviser supporting the student's taking on additional academic responsibilities. The letter also must confirm that the student is in good standing and is capable of taking on the dual-title degree. The application will be reviewed by the INTAD Academic Program Committee, which will make all final admission decisions. Doctoral students must be admitted into the INTAD program prior to the candidacy exam.

Degree Requirements

To qualify for the dual-title degree, students must satisfy the degree requirements for the degree they are enrolled in Soil Science, listed above. In addition, students must complete the degree requirements for the dual-title in INTAD, listed on the INTAD Bulletin page. Some courses may satisfy both the graduate primary program requirements and those of the INTAD program. The double counting of credits must be approved by the student’s adviser(s), the head of the SOILS graduate program, and the INTAD Co-Chairs.

Degree Requirements for SOILS/INTAD Dual-Title M.S.

To qualify for this dual-title degree, students must satisfy the requirements of the Soil Science Master of Science degree program, listed above under "Master’s Degree Requirements." In addition, they must satisfy the INTAD program requirements for the dual-title master’s degree. Refer to the Master’s Degree Requirements section of the INTAD Bulletin page. Some courses may satisfy both the graduate primary program requirements and those of the INTAD program. The double counting of credits must be approved by the student’s adviser(s), the head of the SOILS graduate program, and the INTAD Co-Chairs.

For the dual-title M.S. degree in Soil Science and INTAD, the thesis must reflect the student’s education and interest in both Soil Science and INTAD. All members of the student's committee must be members of the Graduate Faculty. The master’s committee must include at least one Graduate Faculty member from INTAD. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role.
Degree Requirements for SOILS/INTAD Dual-Title Ph.D.

To qualify for the dual-title degree, students must satisfy the degree requirements for the Ph.D. in Soil Science, listed above under "Doctoral Degree Requirements." In addition, students must complete the degree requirements for the dual-title in INTAD, listed on the INTAD Bulletin page. Some courses may satisfy both Soil Science and INTAD degree requirements. The double counting of credits must be approved by the student's adviser(s), the head of the SOILS graduate program, and the INTAD Co-Chairs.

Graduates of the dual-title INTAD master's degree program who wish to pursue an INTAD doctoral degree must re-apply to the INTAD program for admission. INTAD master's degree credits may be carried over to the doctoral program. Six additional INTAD credits will be required. INTAD master's degree graduates who pursue an INTAD Ph.D. are required to take the INTAD 820 International Agricultural Development Seminar a second time.

Candidacy

Candidacy procedures will be based on the procedures of the Soil Science graduate degree program, but will integrate the fields of Soil Science and International Agriculture and Development. Although not encouraged, the dual-title degree student may require an additional semester or more to fulfill requirements for the dual-title degree program. Therefore, under exceptional circumstances, the candidacy exam may be delayed at the discretion of the student's Soil Science adviser in consultation with the INTAD program coordinators. The candidacy examination committee for the dual-title Ph.D. degree will be composed of Graduate Faculty from Soil Science and must include at least one Graduate Faculty member from INTAD.

Doctoral Committee Composition

In addition to the general Graduate Council requirements for doctoral committees, the doctoral committee of a Soil Science and INTAD dual-title Ph.D. student must include at least one member of the INTAD Graduate Faculty. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. If the chair of the doctoral committee is not also a member of the Graduate Faculty in INTAD, the member of the committee representing INTAD must be appointed as co-chair.

Comprehensive Exam

At the end of the coursework, candidates for the dual-title doctoral degree in Soil Science and INTAD will be required to pass an oral and written comprehensive examination based on their dissertation proposal and area of specialization in Soil Science, while reflecting their dual-title curriculum. A separate comprehensive examination is not required by the INTAD program, but international agriculture must be one of the key areas of the comprehensive exam and the INTAD representative on the student's doctoral committee must have input into the development of and participate in the evaluation of the comprehensive examination.

Dissertation and Dissertation Defense

Ph.D. students enrolled in the dual-title degree program are required to write and orally defend a dissertation on a topic that reflects the integration of their original research and education in Soil Science and International Agriculture and Development. In order to satisfy the INTAD dissertation requirement, students may: 1) conduct all or part of their research in an international location, 2) conduct an analysis of a subject in an international context, 3) conduct an analysis of secondary data of international origin, or 4) incorporate another international dimension by approval of the INTAD committee member. Additionally, the dissertation should reflect the student's technical knowledge, knowledge of and sensitivity to a wide diversity of cultures and backgrounds, and the perspective needed to transfer their knowledge in other cultures, particularly in the developing world. The dissertation should contribute to the body of knowledge in
soil science and global agricultural development and have potential application in both U.S. and international contexts. A public oral presentation of the dissertation is required. Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. The dissertation must be accepted by the doctoral committee, the head of the graduate program, and the Graduate School.

**Student Aid**

Graduate assistantships and other forms of student aid are described in the [STUDENT AID](#) section of the *Graduate Bulletin*. Students on graduate assistantships must adhere to the [course load limits set forth in 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.

[SOIL SCIENCE (SOILS) course list](#)
[INTERNATIONAL AGRICULTURE AND DEVELOPMENT (INTAD) course list](#)

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