PURDUE UNIVERSITY
GRADUATE SCHOOL

Minutes of the Graduate Council Meeting
April 20, 2023
2:30 p.m.

Seventh Meeting
PGSC 105

PRESENT: Council Members, Linda J. Mason, chair, Raida Abuizam, Nurgul Aitalieva, Yong Bao, Shawn G. Bauldry, Vetria Byrd, William B. Collins, Joy Colwell, G. Jonathan Day, Duane D. Dunlap, Emad Elwakil, Keith B. Gehres, Kevin D. Gibson, Catherine A. Golden (Provost's Representative), Jeffrey P. Greeley, Chong Gu, Nilupa Gunaratna, Nancy A. Jackson, Troy D. Janes, Qing Jiang, Ann L. Kirchmaier, Yanjun Li, Qiang Liu, Patti Ludwig-Beymer, Clarence D. Maybee, James L. Mohler, Deputy Chair, Melanie Morgan, Brad E. Oliver, Tina L. Payne, Julia M. Rayz, David Rollock, Abraham Schwab, Alex Seto, Michael G. Smith, James E. Tisdale, Amanda D. Zelechoski

APOLOGIES FOR ABSENCE RECEIVED FROM: Thomas W. Atkinson, Carrie Berger, Stacy K. Betz, Arun Bhunia, Steven J. Burdick, Eric D. Deemer, Kimberly P. Kinzig, Douglas J. LaCount, Judith Lewandowski, Michael G. Smith, Nicole Widmar

ABSENCES: Kola Ajuwon, Bradley J. Alge, Suzanne C. Bart, Janice S. Blum, Levon Esters, Richard H. Grant, Erla Heyns, Mary E. Johnson, Tong, Jin Kim, Jiliang Li, Rodolfo Pinal, Joseph P. Robinson, Paul Salama, Abraham Schwab, Ann Shanahan, Kristin K. White, Joshua R. Widhalm, Christine Wuenschel

GUESTS: Macy Angrick, Tatiana Elistratova, Debbie Fellure, Korena Vawter

I. MINUTES

The March 2023 Graduate Council meeting minutes were approved via the Qualtrics Survey.

II. DEANS REMARKS AND REPORTS

Linda Mason

- Thanked the members for their service, and hard work serving on the Graduate Council throughout the year.

III. AREA COMMITTEE REPORTS (Area Committee Chairs)

Graduate Council Document 23D Graduate Council Documents Recommended for Approval. See Appendix B. Voted via Qualtrics survey.

IV. PRESENTATION

Melanie Morgan, Associate Dean of the Graduate School and Professor of Communication presented information of Mentoring. See Appendix C.

V. TASK FORCE

James Mohler, Research Integrity Officer, Associate Dean & Professor presented the Online Ph.D. Offerings at Purdue University. Discussion/Endorsement to move forward with guidelines and policy creation. See Appendix D.

VI. PURDUE GRADUATE STUDENT GOVERNMENT -- PRESIDENT'S REPORT

Alex Seto, President of the Purdue Graduate Student Government (PGSG)

- A number of legislation items have been approved by the Graduate Student Senate.
- The bus contract for students on the weekend is in process.
- The PGSG picnic will be held in a few weeks.

VII. NEW BUSINESS

James Mohler, Research Integrity Officer, Associate Dean & Professor presented Graduate Council Report 23-E, Proposed Modification to the Policy and Academic Process for Requests for Graduate Program Majors by Academic Units. See Appendix E.

The council meeting was adjourned by Dean Mason at 3:41 p.m.

Linda J. Mason, Chair
Tina L. Payne, Secretary

APPENDIX A

PENDING DOCUMENTS
(April 2023)

BOLDED ITEMS ARE IN REVIEW WITH AN AREA COMMITTEE

Area Committee A, Behavioral Sciences (G. Jonathan Day, chair; gjday@purdue.edu):

Graduate Council Document 23-18a, **SLHS 52501, Language And Communication In Autism Spectrum Disorders (PWL)**
Graduate Council Document 23-18b, **SLHS 54100, Cognitive Communication Disorders (PWL)**
Graduate Council Document 23-18c, **SLHS 58800, Evaluating Research In Evidence-Based Practice (PWL)**

Area Committee B, Engineering, Sciences, and Technology (Duane Dunlap, chair; ddunlap@purdue.edu):

Graduate Council Document 23-13b, **CE 55010, Unit Operations And Processes In Environmental Engineering I – Physical And Chemical Treatment (PNW)**
Graduate Council Document 23-13a, **CE 57910, Foundations Analysis And Design (PNW)**
Graduate Council Document 23-17a, **CIT 56800, Distributed Systems And Cloud Computing (IUPUI)**
Graduate Council Document 23-17b, **CIT 59800, Directed MS Project (IUPUI)**
Graduate Council Document 23-20a, **CM 55800, Advanced Construction Management For Disaster Recovery (PWL)**
Graduate Council Document 23-8a, **CS 52200, High-Performance Computing (PFW)**
Graduate Council Document 23-8b, **CS 56100, Software Testing (PFW)**

Graduate Council Document 22-23d **ECE 60432, Nanophotonic Modeling (PWL)**
Graduate Council Document 23-9a, **ECE 61220, Advanced VLSI Design (PWL)**
Graduate Council Document 23-10c, **MSE 51700, Materials For Hypersonics (PWL)**
Graduate Council Document 23-10f, **MSE 52000, Steel And Aluminum Alloys: Processing, Structure And Properties (PWL)**
Graduate Council Document 23-10a, **MSE 53500, Lean Manufacturing Of Materials (PWL)**
Graduate Council Document 23-10g, **MSE 56800, Additive Manufacturing Of Materials (PWL)**
Graduate Council Document 23-10d, **MSE 57000, Introduction To Materials Modeling And Informatics (PWL)**
Graduate Council Document 23-10b, **MSE 57400, Sports Engineering And Entrepreneurship (PWL)**
Graduate Council Document 23-10e, **MSE 57700, Materials Science Of Rechargeable Batteries (PWL)**
Graduate Council Document 23-10h, **MSE 58500 Magnetic Materials: Physical Properties And Applications (PWL)**

Area Committee C: Chemistry, Engineering, and Physical Sciences, (Suzanne Bart; chair, sbart@purdue.edu):

Graduate Council Document 23-15b, **BME 54600, Engineering Analysis Of Tissues (IUPUI)**
Graduate Council Document 23-19a, **CHE 50200, Analytical Approach To Healthcare Delivery (PWL)**
Graduate Council Document 23-16a, **MA 57300, Numerical Solution Of Ordinary Differential Equations (PWL)**

Area Committee D, Humanities and Social Sciences (William (Bart) Collins, chair; bcollins@purdue.edu):

Graduate Council Document 23-15a, **HIST 68000, Entering The History Profession (PWL)**
Graduate Council Document 23-2b, **ILS 55200, Research Data Management For Quantitative Data (PWL)**

Area Committee E: Life Sciences, (Richard Grant, chair; rgrant@purdue.edu):

Graduate Council Document 23-5b, **BIOL 51610, Molecular Biology Of Cancer (PNW)**
Graduate Council Document 23-5a, **BIOL 52601, Eukaryotic Microbiology (PFW)**

APPENDIX B

GC Document 23-D

DOCUMENTS RECOMMENDED FOR APPROVAL
BY THE GRADUATE COUNCIL
APRIL 2023

GRADUATE COURSE PROPOSALS:

Area Committee A, Behavioral Sciences (G. Jonathan Day, chair; gjday@purdue.edu):

Graduate Council Document 23-18a, **SLHS 52501, Language And Communication In Autism Spectrum Disorders** (PWL) Lecture 2 times per week for 110 minutes for 8 weeks. Credit 2.

This course explores the characteristics, courses, and potential causes of autism spectrum disorder (ASD) with a particular emphasis on language and social communication. And, how our understanding of these issues informs the assessment, diagnosis, and treatment of ASD. Students discuss and evaluate issues associated with ASD, including early diagnosis, behavioral challenges, evidence-based treatment techniques, and current issues in the field.
https://purdue.curriculog.com/proposal:24086/form

Graduate Council Document 23-18b, **SLHS 54100, Cognitive Communication Disorders** (PWL) Lecture 2 times per week for 110 minutes for 8 weeks. Credit 2.

This course examines the theoretical aspects and clinical management of cognitive communication disorders with an emphasis on right hemisphere brain damage, traumatic brain injury, dementia, and other degenerative neurological conditions.
https://purdue.curriculog.com/proposal:23843/form

Graduate Council Document 23-18c, **SLHS 58800, Evaluating Research In Evidence-Based Practice** (PWL) Lecture 1 time per week for 100 minutes for 8 weeks. Credit 2.

The focus of this course is on developing the skills necessary to critically consume literature and apply it to clinical practice as speech-language pathologists and audiologists. Students complete a comprehensive evidence-based practice project, which includes developing a clinical question, conducting a literature review, and critiquing acquired research articles. They gain guidance from a skilled mentor in their research area and receive course instruction on best practices in appraising research necessary for evidence-based practice.
https://purdue.curriculog.com/proposal:23393/form

Area Committee B, Engineering, Sciences, and Technology (Duane Dunlap, chair; ddunlap@purdue.edu):

Graduate Council Document 23-13b, **CE 55010, Unit Operations And Processes In Environmental Engineering I – Physical And Chemical Treatment** (PNW) Lecture 2 times per week for 75 minutes. Credit 3. Prerequisite(s): C or better in CE 35400.

To develop knowledge and skills necessary for the design and analysis of physical and chemical operations and processes utilized in water and wastewater treatment. Instructor permission required.
https://purdue.curriculog.com/proposal:23902/form

Graduate Council Document 23-13a, **CE 57910, Foundations Analysis And Design** (PNW) Lecture 2 times per week for 75 minutes. Credit 3. Prerequisite(s). CE 32300.

Exploration and engineering evaluation of subsoil and groundwater conditions for selection and design of foundations for structures and earth masses.
https://purdue.curriculog.com/proposal:21956/form

Graduate Council Document 23-17a, **CIT 56800, Distributed Systems And Cloud Computing** (IUPUI) Lecture 2 times per week for 75 minutes. Credit 3.

The objective of this course is to give students a basic grounding in designing and implementing distributed and cloud systems. This course will combine hands-on experience in developing cloud services with a firm grounding in the tools and principles of building both client-side and server-side cloud applications.
https://purdue.curriculog.com/proposal:22886/form

Graduate Council Document 23-17b, **CIT 59800, Directed MS Project** (IUPUI) Lecture 3 times per week for 50 minutes. Credit 1 to 3.

A formal investigation of a particular problem under the guidance of the Advisory Committee. Not applicable to a thesis option plan of study. Enrollment during at least two consecutive terms for a total of three credits is required. Permission of instructor is required.
https://purdue.curriculog.com/proposal:21260/form

Graduate Council Document 23-20a, **CM 55800, Advanced Construction Management For Disaster Recovery** (PWL) Distance. Credit 3.

Prepares construction project professionals to better plan and deliver post-disaster built environment and infrastructure restoration and reconstruction services. Emphasizes differences between conventional construction and disaster recovery work, considering projects of larger scope and including international concerns. Technical facets of restoration processes introduced to advise comprehensive management. Includes executive-level management case study with team solution. Permission from department required.
https://purdue.curriculog.com/proposal:21266/form

Graduate Council Document 23-8a, **CS 52200, High-Performance Computing** (PFW) Lecture 1 time per week for 165 minutes. Credit 3.

This course is an introductory course on high performance computing. High-performance computing refers to the use of everything from software to hardware to speed up computations. As the CPU clock speed of desktop and commodity processors has decayed due to physical limitations, more creative use of software and parallel hardware is required to further speed up data processing. To program and accelerate applications on the new high performance computing devices, we must understand both the computational architecture and the principles of program optimization. The driving outcome for this course is for students to understand and utilize high performance computing concepts, architectures, and tools to develop and run optimized code for shared- and distributed-memory parallel programming models. Topics usually include parallel programming models, performance analysis, shared memory programming, parallel algorithm design, programming with message-passing, and advanced topics such as CUDA and hybrid programming.

https://purdue.curriculog.com/proposal:22675/form

Graduate Council Document 23-10c, **MSE 51700, Materials For Hypersonics** (PWL) Lecture 2 times per week for 75 minutes. Credit 3. Prerequisite(s): Graduate standing or concurrent prerequisite with MSE 33000.

This course will include a brief history of hypersonic flight and design, along with a description of the aerothermal environment, to provide motivation for the use of ceramic materials as thermal protection systems and window materials. The classroom approach is to develop a fundamental understanding of materials structure, forming and sintering, and properties (mechanical and thermal) of ceramics, and then apply that knowledge for hypersonic applications such as ultra-high temperature ceramics (UHTCs including ZrB_2), ceramic matrix composites (including C_f/SiC, SiC_f/SiC, and Carbon/Carbon), and materials requirements for RF and IR radomes and windows.

https://purdue.curriculog.com/proposal:20982/form

Graduate Council Document 23-10f, **MSE 52000, Steel And Aluminum Alloys: Processing, Structure And Properties** (PWL) Lecture 2 times per week for 75 minutes or 3 times per week for 50 minutes. Credit 3. Prerequisite(s): MSE 33000 or MSE 36700, or graduate standing.

Steel and aluminum alloy processing will be studied to provide fundamental understanding of how the final properties are influenced by processing from the extraction of metal from ore, through shaping by casting, hot-working and cold-working, and heat treatment for control of microstructure. This understanding will enable the student to go beyond comparisons of standard handbook values and recognize the fundamental metallurgical phenomena leading to differences in performance among the main alloy classifications. By examining the relationships among processing, microstructure, and properties, the course will provide the "know-how" for specifying, designing, and manufacturing with steels and aluminum alloys.

https://purdue.curriculog.com/proposal:23969/form

Graduate Council Document 23-10a, **MSE 53500, Lean Manufacturing Of Materials** (PWL) Lecture 3 times per week for 50 minutes. Credit 3.

This course provides perspectives on materials processing and product innovation with an economic lens on efficiency and elimination of waste. It includes an historical perspective of manufacturing via the transition from mass to lean production in the automotive industry; and extends manufacturing and product development in context of emerging trends in automation (e.g., control and PAT, I4.0), modular design, supply chain, and sustainability. The class covers lean tools, focusing on value stream analyses and optimization using simulations. As an elective, the course accommodates a range of student interest profiles. It includes both individual and interest-based group assignments. The mix of students adds to the effectiveness of group exercises. A term paper enables individuals to do a deeper dive into specific interests. Overall, the course has shown to be adaptable over a broad range of students representing a variety of departments and professional backgrounds.
https://purdue.curriculog.com/proposal:22609/form

Graduate Council Document 23-10g, **MSE 56800, Additive Manufacturing Of Materials (**PWL) Lecture 2 times per week for 75 minutes or 3 times per week for 50 minutes. Credit 3. Prerequisites: MSE 33000 or MSE 36700, or graduate standing.

The course takes an MSE approach to additive manufacturing, integrating deposition processing, powder processing, and solidification processing principles in the full range of AM process configurations and kinematics. The overarching goal is to learn how microstructure development, and thus the resulting material properties, are controlled by the interaction of physical, chemical, thermal and mechanical phenomena in the shaping of materials by additive processing. All the main classes of materials and AM processes are covered. Additional objectives are to quantitatively analyze the capabilities and limitations of AM relative to established commercial shaping processes; and to critically analyze the AM research literature.
https://purdue.curriculog.com/proposal:23972/form

Graduate Council Document 23-10d, **MSE 57000, Introduction To Materials Modeling And Informatics** (PWL) Lecture 2 times per week for 75 minutes. Credit 3. Prerequisites: Graduate Standing OR MSE 27000 and MSE 37000.

This course provides an introduction at the graduate level to theory and methods for simulating the structure and properties of materials. The course will provide a broad initial overview of many atomistic modeling techniques, followed by a detailed study of density functional theory (DFT) over several weeks, then a few lectures on classical molecular dynamics (MD) and Monte Carlo (MC) simulations, and finishing with an introduction to materials informatics techniques which rely on learning from materials data. Students will obtain an essential understanding of quantum and classical theory and become acquainted with practical methods for running DFT, MD and MC simulations, as well as combining such simulations with simple machine learning and data science methods for materials design. Existing and new tools on nanoHUB, access to open-source simulation software, and writing simple Python code will be utilized for all necessary coursework and exercises. Permission of department required.
https://purdue.curriculog.com/proposal:20777/form

Graduate Council Document 23-10e, **MSE 57700, Materials Science Of Rechargeable Batteries** (PWL) Lecture 2 times per week for 75 minutes. Credit 3.

This course is aimed at junior/senior undergraduate and graduate students interested on developing an understanding on the Materials Science of Rechargeable Batteries. The focus is on electrochemical materials, its non-idealities (e.g., transport limitations, failure mechanisms), and its application to energy storage devices, such as batteries and fuel cells, particularly for portable electronics and hybrid/electric vehicles. This course will deliver an introduction to basic electrochemistry, principles of electrochemical devices, and electroactive materials as used in such systems. Current trends and directions in the field of battery technology will be outlined. Permission from department required.
https://purdue.curriculog.com/proposal:21812/form

Graduate Council Document 23-10h, **MSE 58500 Magnetic Materials: Physical Properties And Applications (**PWL) Lecture 2 times per week for 75 minutes. Credit 3.
Prerequisite(s): Graduate standing or MSE 33000 and MSE 37000.

This course provides an introduction of the basic physical and structural properties that determine the functionality of magnetic materials and devices. Starting from basic concepts on the physics of magnetism, materials synthesis and device fabrication, the functional requirements of magnetic materials for diverse applications will be discussed. Magnetic material properties depend on the electronic structure of the constituent elements and their electronic interactions. These interactions are controlled by their atomic arrangement, microstructure, defects, and strain fields that distort the local atomic order. Furthermore, the role of reduced dimensionality on the physical and functional properties of nanoscale materials will be discussed.
https://purdue.curriculog.com/proposal:23839/form

Area Committee D, Humanities and Social Sciences (William (Bart) Collins, chair; bcollins@purdue.edu):

*Graduate Council Document 23-15a***, HIST 68000, Entering The History Profession** (PWL) Lecture 1 time per week for 150 minutes. Credit 3. Prerequisite(s): HIST 61000 and HIST 61100.

This seminar is for advanced graduate students who are in the final two years of the program. In your earlier courses, you have become proficient in various methodological approaches and have gotten well acquainted with the historiography in various fields of study. You also have pursued original research and have navigated the classroom challenges. Now is the time to prepare for the job market, thinking critically about the skills you have acquired during graduate school and discerning strategies to communicate your credentials to a hiring committee. During this seminar, we will focus on how to structure a curriculum vitae, write a cover letter, create a teaching portfolio, craft a diversity statement, and select writing samples. We will also hold mock interviews to prepare you to orally communicate your skills, experiences, and expertise. Graduate students will also meet with professionals outside academia to learn about navigating the world of business, journalism, politics, non-profits, and public history. Permission of department required.
https://purdue.curriculog.com/proposal:22963/form

Graduate Council Document 23-2b, **ILS 55200, Research Data Management For Quantitative Data** (PWL) Lecture 1 time per week for 50 minutes. Laboratory 1 time per week for 100 minutes. Distance. Credit 3.

This course will provide students working with quantitative data an overview of major issues in quantitative data management such as data set organization; data versioning, backup, and archiving; computer file and directory organization; data quality control, exploration, visualization and analysis; and data sharing, publication, copyright and ownership. Students will be introduced to a wide range of public databases to serve as examples of data organization, sources of reusable research data, and possible platforms for data publication. Recent trends and emerging issues in data and information science will be discussed, but the primary focus will be on encouraging students to apply critical thinking so they can develop practical strategies to their own research data issues. Accordingly, the course places a strong emphasis on active learning with theoretical lectures and discussions reinforced by applied lab sessions using tools such as Excel, R, Unix, Git, and parallel computing.
https://purdue.curriculog.com/proposal:23798/form

Area Committee E: Life Sciences, (Richard Grant, chair; rgrant@purdue.edu):

Graduate Council Document 23-5b, **BIOL 51610, Molecular Biology Of Cancer (PNW)** Lecture 2 times per week for 75 minutes. Credit 3. Prerequisite(s): BIOL 24300 and BIOL 24400.

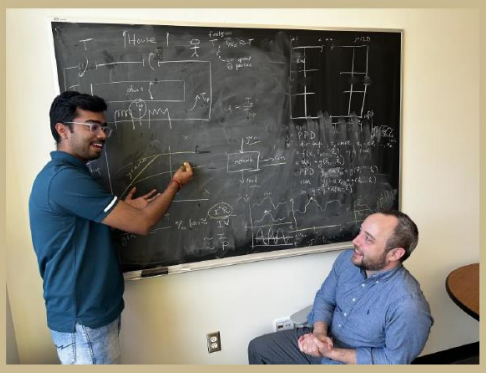
A detailed course examining the molecular mechanisms controlling the growth of animal cells. Emphasis will be placed on current experimental approaches to defining the molecular basis of growth regulation in developing systems and the uncontrolled proliferation of cells in metabolic disorders, such as cancer.
https://purdue.curriculog.com/proposal:23838/form

Graduate Council Document 23-5a, **BIOL 52601, Eukaryotic Microbiology (PFW)** Lecture 2 times per week for 75 minutes. Credit 3. Prerequisite(s): BIOL 43700 C- equals the lowest passing grade.

This upper-level course examines the origin, evolution, and diversity of major eukaryotic microbial groups including algae, fungi, and parasites (protozoans and helminths). Lecture topics include recent classification and taxonomic schemes, ecology of important lineages, and relevance to wildlife, animals and humans. Eukaryotic microbes are considered as the primary cause of human diseases throughout the world. We will analyze the complex life cycle of pathogenic fungi and parasites. We will also examine some of the Neglected Tropical Diseases (NTDs) that are a group of diseases causing significant problems often resulting in death in more than 1 billion people worldwide. We will discuss the origin and transmission patterns of fungal and parasitic diseases as well as evolutionary and ecological approaches that are now crucial to much research in the area of infectious diseases. Permission of department required.
https://purdue.curriculog.com/proposal:22336/form

APPENDIX C

GRADUATE SCHOOL MENTORING INITIATIVE



PURDUE UNIVERSITY | The Graduate School

Mentoring is key to our research success

- Effective mentoring is one of the most important variables in predicting graduate student success
- Ethical mentoring will be tied more and more to large funding agency criteria

5 Year Mentoring Initiative on Campus

Mentoring Faculty Fellow Program

Spring of 2021 and Fall of 2022

- 11 Faculty
- 14 Graduate Students

Example Projects Across Colleges

Liberal Arts

Dr. Nush Powel, Dr. David Atkins, Jianfen Chen, Alejandra Duran Trinidad

- Surveys and Focus Groups
- Mentoring is perceived as good across the college, but more training, structure and rewards are needed
- Recommend a Center for Mentoring Excellence be established in the college

Example Projects Across Colleges

Engineering

Dr. Joseph Ripoli, Dr. Chris Brinton Emily Garcia, Rachel Gehr, Suzanne Swaine

1. IDPs were not utilized in 8 of the 11 departments
   - Document was designed implemented and has received a high amount of traffic
2. Survey – faculty could use more support when it comes to mentoring and guidance on best practices
3. Workshop series:
   - Individual Development Plan
   - Navigating Toxic Work Environments
   - Building Healthy Mentoring Relationships
   - Mentoring, Managing and Diversifying Grad Student Research Groups

Example Projects Across Colleges

College of Education

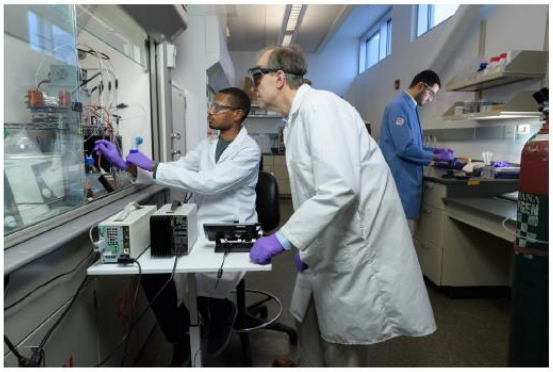
Dr. Maris Exter, Zeynep Gonca Akdemir, Krista Robbins

- Focus Groups & Surveys
  - Policy changes to allow more time for mentoring
  - Clear expectations for the relationship
  - Ongoing series of interactive training for faculty
  - Quick Access online resources
  - Robust mechanism for students to provide mentoring feedback

Big Take Aways

Faculty and Graduate Students Want:

- More structure for effective mentoring
  - Training
  - Resources
  - Feedback
- More rewards for excellence in mentoring



Spring 2023: Peer Mentoring Project *Dr. Melissa Franks and Alex Seto*

- Benefits of these programs
- Success of these programs

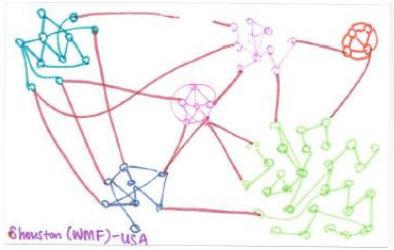
A Call for Peer Mentoring Programs

Summer 2023 Peer Mentoring Programs Grants Available

- Apply to Start a Peer Mentoring Program
  - Ten programs will be selected
  - Will receive $1200 for programing
  - Will provide structure and training for programs
  - Will conduct an assessment of program effectiveness

Series of Research Projects

- Dr. Jeremy Foote – A Social Network Analysis of Mentoring and its impact on student productivity and well-being
- Alejandra Duran Trinidad – Mentoring and International Student Success



QUESTIONS??

PURDUE UNIVERSITY | The Graduate School

APPENDIX D

PURDUE UNIVERSITY | The Graduate School

Graduate Council Report 23-F

Online PhD TF v6 - 1

To: **Purdue University Graduate Council**

From: **James Mohler, Associate Dean, the Graduate School**

Date: **April 20, 2023**

Subject: **The Potential for Online PhD Offerings at Purdue University**

The Potential for Online PhD Offerings at Purdue University

Online PhD Task Force

Carrie Berger, Purdue Online; Bart Collins, Liberal Arts; Jonathan Day, Health and Human Sciences; Duane Dunlap, Purdue Polytechnic; Audeen Fentiman, Engineering; Jim Greenan, Education; Patty Hart, Liberal Arts; Athena Kennedy, Purdue Online; Yanjun Li, Management; Jamie Mohler, Graduate School

Background

Currently no PhD program is approved by Purdue University or the Indiana Commission for Higher Education to be offered from a distance (i.e., over 80% online). Additionally, no PhD research course (XXX 69900) is approved for distance delivery either. Students may take graded coursework online as part of their PhD pursuit so long as it comprises less than 80% of their degree. They may also request research in absentia or a research leave that allows them to do a limited amount of research at another location but for the most part, Purdue University PhD degrees require a significant (if not, entirely) on-campus component.

Some faculty have questioned whether Purdue could or should offer PhDs completely online. It is also evident that some faculty erroneously believe that they can already offer a PhD completely at a distance *at their discretion*. Thus, the Online PhD Task Force was assembled to address the question of whether Purdue University at West Lafayette could or should offer PhDs at a distance should a unit desire it. The PhD task force began in 2019 prior to the onset of the pandemic. And, while the groups' work was paused during the pandemic, it has continued in 2022-2023 with the insights that were learned during non-normative operations during COVID-19.

Purdue University does have a limited number of doctoral degrees (non-PhD) that are offered 100% online. The Doctor of Technology from the Purdue Polytechnic Institute is one such

example. It seems that there is no dispute with programs wanting to offer non-PhD doctorates online (given certain controls and approval by the Graduate Council). The mode of delivery for these degrees aligns with the professional nature of such degrees and their focus on meeting the needs of the working professional. As such, the question considered by the Online PhD Task Force was therefore limited to consideration of the PhD being offered 100% online.

The Task Force also looked to see if other examples might already exist within the State of Indiana. There are a limited number of programs:

- Ball State - PhD in Special Education (85-90% online)
- IU - PhD in Music Therapy (100% online); PhD in Nursing Science (80-99% online)
- Indiana State University: PhD in Educational Administration - Higher Education Leadership or PhD in Technology Management (both online with modest residency)

Appendix A provided a national market scan of higher education institutions and their offerings.

What Defines the PhD Experience?

One of the first things discussed by the Task Force was, what defines the PhD experience at Purdue University? The committee defined four critical components of the PhD experience:

- Attainment of deep knowledge and expert skills in a discipline
- Expertise in written and oral communication and the creation of related scholarship
- Ability to conduct guided and independent research in the discipline
- Mentorship and apprenticeship in the discipline

The Task Force recognizes that the PhD prepares students for positions as researchers both in and outside academia. These components may have some variability across positions, but in sum total the PhD is marked by the presence of all four.

The Task Force generally believes that distance delivery works quite well for the first component (knowledge/skills) but can be challenging for the two (research and mentorship). There is mixed opinion of the ability to do good communication and scholarship remotely.

In sum, if a unit were to propose a distance PhD, it would have to wrestle with how it ensures an *equivalent experience* for the distance student, *not just a high-quality experience* in comparison to other distance offerings. **A student getting a PhD in a distance mode should have equivalent quality and experience as a student on campus.** Any program proposing a distance PhD would have to clearly articulate and provide measures to ensure that mode of delivery would result in **no decrease of quality or experience**.

Another significant discussion point was the diversity of programs (and associated research types) at Purdue University West Lafayette. For some, thinking that research could be done online or at a distance is unthinkable (due to either logistics, requirements or both), while for others it seems quite natural and doable with today's technology. **The consensus of the Task Force was that any unit desiring to propose an online PhD should be allowed to do so.** It would be up to the Graduate Council to determine whether the proposal had merit and should be moved forward. Such proposals would also need to satisfy the Provost's Office, Board of Trustees, and the Higher Learning Commission.

A third discussion was focused around whether the university should allow distance PhDs. It seems that **there may be an openness to this idea by the faculty at WL as a whole**, but there are many questions surrounding the logistics and tactics of doing so. Likely this discussion of whether Purdue University should offer distance PhDs should be a larger discussion within the Graduate Council with input from more of the graduate faculty from across the West Lafayette campus.

A fourth area of discussion is the **balance between capability of doing programs online** and **the need for some amount of in-person interaction**. PhD students are more mature, tech savvy and diligent, making online delivery of the PhD a possibility. Fundamental for any program is making sure that the student understands what the expectations are for the online and face to face components of the degree as well as the myriad technologies that might be used in both. The committee believes that even in an online degree, **there needs to be some exposure to the research and larger Purdue community to fully capture not only the quality but experience that is the Purdue University PhD**. The committee recognizes that these things can be balanced in many different ways and thus does not wish to prescribe a single approach. Any program proposing an "online" PhD needs to fully describe which aspects, if any, may be face to face and which aspects may be online.

A final area of discussion by the committee is a recognition that **online PhD programs, if they exist, should be small**, with faculty to student ratios that are manageable. An online PhD should be seen as a vehicle to serve students in niche areas or for enabling unique research opportunities; **it should not be seen as a mechanism for large enrollments or admissions**. It should not be assumed that PhD students in an online program would need less attention or engagement. The opposite is true: i**t takes more effort, attention and engagement to do any kind of effort online due to the requirements of intentionality in relationship and communication.** An online PhD, if it exists, should provide a custom and unique experience to the student, as do the on-campus programs.

Considerations

Given these points of discussion, the Online PhD task force addressed several things that a program/proposer would need to outline and define in a proposal to the Graduate Council should a unit wish to propose a PhD for which more than 80% is offered online. Such a proposal would need approval by the Provost's Office, Board of Trustees and the Indiana Commission for Higher Education.

Presently, the committee assumes that any PhD may be offered as a hybrid degree (up to 80% of the degree being online) if approved to do so and in conjunction with Purdue Online. In most cases, a "hybrid" PhD likely has the candidate doing most, if not all, coursework online, and conducting the research credits while registered as on campus, although a student may be gathering data at another location.

Any unit desiring a PhD with more than 80% of it offered online would need to address each of the following elements.

- How will program equivalence and quality be evaluated and how frequently?
- How will the mentor/mentee relationship be managed in the online environment? How will the mentee experience of a traditional PhD program be replicated online?
- How will scholarship – the publishing of journals, conferences, manuscripts, reports, grants – be managed in the online environment? What agreements will be in place ahead of time to ensure originality, authorship credit, and intellectual ownership and the like?
- How will intellectual property be handled? On-campus, Purdue University typically has a majority stake due to the use of university resources. The online environment shifts this. Who will own the intellectual property and what agreements will be in place to define that for each online student?
- How will research data issues be handled? What Material Transfer Agreements, Data Transfer Agreements or other agreements will be needed?
- How will students garner the experiences available to students on campus – teaching experience, professional development and other?
- How will qualifying examinations (if applicable), preliminary examinations, and final examinations be handled?
- How will committees meet and provide feedback to the student?
- Will the student be expected to spend any time on campus?
- What are the financial considerations for units considering online PhDs?
- What are the challenges and risks for international students?

Given this set of questions, the Task Force set out to provide some initial guidance and thoughts surrounding these questions.

Program and Experiential Equivalence

The expectation is that any unit desiring a fully online PhD would need to address the questions outlined by the task force and approvals would be required by the Graduate Council, Provost's Office, Board of Trustees, and the Indiana Commission for Higher Education. The onus is on the proposing unit; however, the Task Force offers some ideas for how students might garner the experiences available to students on campus, including teaching experience, professional development, mentoring of students, and community.

Course Availability

Purdue has rapidly increased the availability of higher-level courses (500/600 level) available online. This provides a solid foundation for the implementation of online Ph.D. programs.

While requirements are determined by discipline, Ph.D. coursework can be considered in three general categories: Discipline related coursework, foundations of research, and outside specialties. Each of these types of courses will have specific challenges to be worked through by the program. Some sample issues are raised below.

Discipline-related: Departments considering offering online Ph.D. programs will need to ensure they have sufficient courses available online. Many Ph.D. programs are relatively small and programs will need to consider the issues of modality when offering these classes to pool of online and residential students.

Foundational Courses: There are a number of types of courses that are foundational to a range of research disciples. For example, many disciplines require statistics and methodology classes as required components of Ph.D. plans of study. Ensuring these classes are available will be critical to transitioning to online PhDs. Collaborating with the departments that provide these courses may be necessary.

Outside Specialties: Many PhD programs require students to take courses from fields outside the immediate discipline. Departments considering adopting online PhDs would need to be confident that there were sufficient offerings in outside fields relevant to the discipline to satisfy student needs and achieve the goals of this approach.

It will be necessary for each discipline to assess the viability of current and anticipated online courses to satisfy the requirements of PhD programs.

The discussion of availability has several dimensions. Assessing availability requires addressing the following questions:

- Is the course offered online?

- Is it scheduled at times that align with student needs? For example, a course offered once every 2 years may create problems for students. Another example – synchronous classes may create scheduling problems for some students)
- Is there space in the class for students, including students from other disciplines, where appropriate?

Teaching experience

PhD students pursuing their degree online could serve at teaching assistants and/or instructors of record for undergraduate courses after receiving proper training. There is training available to faculty to help them learn best practices for teaching online; this support could be extended to PhD students. Georgia Tech uses online MS students as paid teaching assistants for their very popular online Master of Science in Computer Science (OMSCS). Currently graduate students at Purdue cannot teach 50000 or 60000 level courses; they could however teach in lower division courses.

Hiring and paying domestic students living in another state is not a major barrier as Purdue is committed to registering in any state domestically required to do our work. Purdue is currently registered in thirty states. There are different payroll laws and tax laws that would apply but the differences are not significant enough to cause major issues to this approach.

Paying students to teach when they are living in another country adds compliance challenges related to tax and employment laws. A possible solution is to work with a service provider such as Velocity Global (VG) to comply with local laws. VG would serve as the employer of record for the PhD student. The fees associated with this option may be prohibitive. Another option could be to leverage international relationship to partner with a local institution of higher education. The partner institution would hire the student and we would reimburse the associated expenses. In both these scenarios, we could provide unpaid employee status to the student so they would have access to the Purdue systems needed to do their work.

Progress and Progression assistance

Online PhD students should have a clear understanding of milestones within their academic plan of study for the management of their progression while balancing professional and personal commitments. It may benefit the faculty advisor and student to have a more formalized schedule of meetings and progress, such as the Individual Development Plan as outlined in Appendix B. The Online Student Success Coach would be able to support this effort as part of their persistence and retention strategies. Purdue Online could work collaboratively with the academic unit to incorporate online doctoral students into its tracking systems for retention, persistence, and academic performance.

Professional development

The Graduate School at Purdue offers 102 professional development classes/opportunities for graduate students and 76 of these are already fully online or hybrid. It does not seem like a heavy lift to provide these opportunities for remote students. The Graduate School will be the primary source of information and resources relevant to students seeking or utilizing fellowships and/or assistantships. Purdue Online will build professional development programming and resources for students on a variety of topics focused on adult and online learners. Purdue Online will provide consistent onboarding and orientation to the online learning environment and will guide online doctoral students as they connect with the offices, services, and resources available through Purdue West Lafayette.

Mentoring of students

Online PhD students could be partnered with undergraduate experiential and capstone courses to provide mentoring to teams of undergraduate students. Many of these types of teams are already engaged with company sponsors and/or community stakeholders by meeting remotely. Meeting virtually with a PhD student mentor could provide additional, specialized support for teams. Online PhD students can also be paired with undergraduate students or online graduate students working with their advisor to gain valuable mentoring experience.

Community

Arguably, one of the most important aspects of a PhD program is networking and being part of a robust intellectual community, which allows for the exchange of ideas, support of peers, and having a sense of belonging. With attention and intentionality, this too can be accomplished in a virtual format. Faculty can establish online scholarly communities such as journal clubs, writing groups, and peer mentoring groups. Online PhD students can be supported to travel and attend in-person conferences. Special events that foster a community of connectedness can be planned to make the most of the time people are together in-person. Purdue Online has established a community for online students at the graduate level and has a dedicated student success coach team focusing on engagement to the campus community and to their peers. Partnering with faculty to assist in additional activities and resources as well as providing location bound opportunities with the remote staff in Purdue Online unit.
Faculty can make a greater effort to know who their students are. There are existing online resources such as the Global PhD Server and @PhDForum that expand students' networking and community building opportunities.
Just with on-campus programs, there will not, nor should there be a "one size fits" all approach to remote PhD programs. For example, it is possible that teaching experience is not important

for an individual's career path. Faculty and students should work together to develop an individualized development plan (IDP) that extends beyond coursework and research to ensure that there is alignment of needs and expectations and to help ensure needs and expectations are being met. While IDPs are important (and in some cases required) for graduate students, the Task Force believes they would be imperative and likely should be required for online PhD students.

Examination and Other Processes

Post-Covid, each department has undoubtedly developed a process for handling these exams remotely. The question in the case of online Ph.D. students becomes "Do we require them to be on campus for the exams or not?" A follow-up question is "Does the Graduate School establish rules about whether or not preliminary and final examinations for online graduate students are held on campus?" Qualifying examinations are optional for departments, and there are no current Graduate School standards for them.

Preliminary and final examinations have a written component and an oral component. The written portion is almost always a document prepared by the student and submitted to the committee for review at least two weeks before the oral portion of the exam. There is no reason for the student to be on campus to write the document, and it can be submitted to the committee electronically, which is common even for students who are on campus. Originality of the document can be established by faculty expertise and the use of tools such as iThenticate.

The oral component of the exam can easily be held remotely. In most cases, the student and committee members all attend a Zoom (or Teams or WebEx or …) meeting. The student makes a presentation and committee members ask questions as usual. The student goes to a breakout room while the committee deliberates and comes back to the meeting room to hear the results of the exam and receive feedback. Faculty members complete the assessment rubric for the exam and submit it electronically. Likewise, they can sign the required forms electronically.

During the pandemic, the Graduate School implemented guidelines for remote exams. Post-pandemic, those guidelines have been permanently adopted:

https://catalog.purdue.edu/mime/media/15/9730/Remote+Graduate+Examinations+and+Defenses.docx.pdf

Should virtual oral exams be allowed? If a student is international, and we must assume that some will be, it could be quite a financial burden to come to campus to take the oral portion of an exam in person. Many, if not most, of our domestic online Ph.D. students are also likely to be place bound by job, family, disability, or other circumstances.

When a degree program is marketed as being fully online, students have the expectation that all requirements can be fulfilled remotely. If students will be required to be on campus for the preliminary exam, the final exam, or both, that needs to be clear (and emphasized) before the student enrolls in the program. For some students, it could make the degree program impossible.

Requiring On-Campus Presence

Why is it important for a student to spend time on campus? Being on campus provides a student with an opportunity to interact frequently with their advisor and with other students, especially those in their advisor's research group. Students on campus can attend seminars and participate in professional development workshops. While on campus, they have an opportunity to absorb the culture of their discipline.

Can the student realize those benefits remotely? If the advisor is accustomed to virtual interactions, holding regular meetings with the student virtually will not be a problem. Technology is available to have research group meetings that include remote members. Virtual meetings are not unusual in research groups where the advisor or some of the students are away from campus for an extended period (e.g., gathering data, on sabbatical). Many departments now provide the option for remote participation in seminars. They may even advertise their seminars to other institutions. Professional development workshops are more and more frequently available virtually – either synchronously or asynchronously.

Absorbing the culture of the discipline is more difficult to do virtually. Many, if not most, of the online Ph.D. students are likely to be working. They already understand the culture of their workplace but may not have an appreciation of academic research. If we have a fully online research degree program, there will need to be some thought given to how a person develops research skills without being immersed in research with people who have a passion for it. Or else we must find a way for the student to be immersed in the research group remotely. It seems apparent, post pandemic, that the biggest challenges to long term, remote work are relationship, connectedness and informal exchange. Aside from immersion, programs need to consider how these challenges will be overcome.

Intellectual Property

One of the biggest challenges for programs wanting to deliver online PhD programs is the issue of intellectual property. As it pertains to on campus students, all intellectual property is owned by the University (see Policy 1.A.1) by virtue of student or employee status and the use of University resources.

However, when a student conducts their research off campus, having no physical footprint on campus and potentially only having student status, issues if intellectual property rights emerge.

> ***Of importance, any program wanting to enable students to conduct research off campus will require intellectual property agreements to be developed by the Office of Legal Counsel in conjunction with the Chief Intellectual Property Officer of the University.***

Because each PhD student would be working on unique research problems in an environment other than Purdue, an IP agreement would be needed for each student. Additionally, programs wanting to have large numbers of students in an online PhD program would be expected to provide appropriate resources to negotiate the required IP agreements.

Authorship and Scholarship

Scholarly activities on the Purdue campus are a common practice between faculty and graduate students. However, students working outside the University while in student status may pose some distinctive challenges. As such faculty working with remote PhD students would need to consider issues unique to such students.

Recommended practice in the development of research and publication development includes:

- Establishing clear roles and responsibilities in collaborative works via authorship agreements or contracts
- Discussing contributions and expectations and determining author order throughout the lifecycle of a project and subsequent publications
- Ensuring that all authorship arrangements abide by relevant University Standards (see Standard S-24)

Financial Considerations

Most online graduate programs currently supported at PWL provide graduate education to industry professionals seeking professional degrees to advance their careers while working full-time. These programs are expected to be self-sustaining through tuition dollars paid by students, and, over time, most programs hope to realize a return on investment to support a range of initiatives within their academic units.

However, launching and sustaining online programs can be expensive, therefore, online Ph.D. programs that seek to be self-sustaining through tuition and/or other revenue sources need to have accurate estimates of program startup and support expenses associated with their program relative to anticipated Ph.D. student enrollment at anticipated tuition rates.

Programs proposing an Online Ph.D. should consider the full range of possible startup and support costs typically associated with online graduate programs as a part of their proposal. Depending on the degree program and existing department, school, or college resources, these potential expenses may vary considerably.

Potential Initial Start-Up Costs

- Online Ph.D. Proposal Development
- Course Design (e.g., instructional designers, subject matter experts, multimedia development, etc.)
- Marking/Recruitment Planning and Design (e.g., marketing staff)
- Initial Marketing Direct Costs (e.g., digital advertising campaigns, academic conference recruitment, industry association engagement, etc.)

Potential Ongoing Support Costs

Departmental Expenses

- Graduate Application Management
- Instructional Personnel Costs (e.g., full-time faculty, full-time lecturers, limited term lecturers, teaching assistants)
- Instructional Materials Costs (e.g., software, textbooks, course materials)
- Research Experience Coordinator (Assist in coordinating/managing research experiences for Ph.D. students with employers, faculty advisor, etc. Advise and assist with non-disclosure agreements, publication restrictions, etc.)
- Dissertation Advising

Online Program Support Costs

- Purdue Online Staff
    - Program Administration
    - Marketing Professionals
    - Recruitment/Admission Counseling Staff
    - Academic Advisors
    - Student Support and Success
    - Instructional Design
- Non-Personnel Expenses
    - Direct Marketing Direct Costs
- Purdue F&A (currently 10%)
- Purdue Online Digital Education Fee ($50 per credit hour)

- Department/School/College revenue sharing expectations

Potential Revenue Sources

- Market Based Tuition
- Differential Fees
- Internal and External Grants
- Corporate/Industry Partnerships
- Program Fees

Key questions to help determine financial feasibility of an online Ph.D. program:

1. What are the program's financial goals?
2. Is there a market of qualified students for the program?
3. What competition for this program exists at other institutions?
4. How many online courses would need to be developed to serve students in the program? Are there existing online MS courses that can be leveraged for the Ph.D. program?
5. How difficult is it to develop online curriculum and resources for the program (e.g., virtual labs, virtual lectures, etc.)
6. Does the department have adequate faculty and instructional resources to deliver and develop coursework for the program, mentor, and chair committees for the students?
7. Would additional faculty or lecturers need to be identified to support an additional online version of you Ph.D. program?
8. What tuition rates are competitive for the program?
9. How many students at a given tuition rate would be needed to cover administrative and instructional costs?
10. Does the program anticipate providing scholarships, fellowships, or assistantships to students in the program? Grad and staff fee remissions are not currently applicable for online programs.
11. How long will it take to realize an ROI for the program given the number of anticipated students and expenses?
12. What plans are in place to "sunset" and teach out the program if it fails to meet enrollment or revenue needs/expectations?

Resources for Building a Financial Model

For each college, Purdue Online has Senior Managing Directors that serve as liaisons with Purdue Online for discussing potential online programs. They can work with departments,

schools, and colleges to discuss potential program and initiate initial market research to help facilitate information collection to help inform decision making.

International Students

The two largest challenges with international students participating in a proposed online PhD degree program are not unlike challenges of them participating in other degrees. The challenges hinge upon degree recognition by their home country and risks associated with visa/international status.

Degree recognition

On January 28, 2023, China's Ministry of Education (CMoE) published a statement that, effective immediately, they will no longer recognize degrees that are earned via online education or recognize courses that are delivered online from any foreign institution. The CMoE allowed online learning during COVID, but not before COVID. As such this action is deemed a return to "normal" by the CMoE.

The Saudi Arabia Cultural Mission, and other similar government and military funding programs, do not allow any students they sponsor to engage in online courses. If the student mistakenly engages in online learning, they will be required to retake the course delivered in the traditional format at their own expense. Violating the policy can result in the loss of their sponsorship. Overall, countries in the middle east are less likely to recognize online degrees.

India and many other industrialized nations do recognize foreign degrees earned online if they are earned from an accredited institution.

Visa/International Status

It is a violation of visa status for any foreign national inside the United States under the F or J visa types to enroll in a fully online program. Any program offering online PhDs would need to ensure foreign nationals inside the US did not mistakenly enroll in an online program.

Students in F or J status who are engaged in employment based on the post-completion benefits of their visa program would lose any remaining employment eligibility and violate their lawful status if enrolled in an online PhD program. Students with F or J visa will have earned their previous degree from any of the SEVIS approved institution in the United States, including Purdue. Thus, the online PhD would likely be uninteresting for international students who have completed a BS or MS inside the U.S.

Foreign nationals in the U.S. under other visa types are allowed to pursue educational opportunities either online or via residential learning. Distinguishing between those who may, and those who may not pursue the online/hybrid programs can be particularly challenging.

Conclusions

If amenable, the Graduate Council should have a larger discussion of the could/should question. If the council agrees that units should be able to propose distance PhDs, then Council should decide if the questions above request sufficient detail to approve or deny such a proposal. If the above questions are sufficient, the Graduate Programs Office will create a form in Curriculog (and the necessary information in the online Policies and Procedures for Administering Graduate Student Programs) such that programs may propose such a degree (or addition of online delivery to an existing degree) should a unit elect to do so. **It is recommended that any PhD program that is online through this described process be subject to a program review cycle of not more than 3 years to ensure that the quality and experience are representative of Purdue University. The Graduate School would conduct the review at the direction of the Dean of the Graduate School and the Provost.**

Appendix A – National Market Scan of Online PhD Programs

Institution	Offering Online or Hybrid Ph.D.?
Arizona State University	None
Auburn University	None
Baylor University	Online Ph.D. in Social Work
Binghampton University	None
Boston College	None
Boston University	None
Brandeis University	None
Brown University	None
California Insitute of Technology	None
Carnegie Mellon University	None
Case Western Reserve University	None
Clemson University	Blended Ph.D. in Rhetoric, Communication, and Information Design
	Blended Ph.D. in Parks, Recreation and Tourism Management
Colorado School of Mines	Online Ph.D. in Space Resources
Colorado State University	Online Ph.D. in Systems Engineering
	Hybrid Ph.D. in Higher Education Leadership
	Hybrid Ph.D. in Organizational Learning, Performance, and Change
Columbia University	Partially Online Doctorate in Engineering Science (has identical academic requirements to a Ph.D.)
	Partially Online Doctorate in Electrical Engineering (has identical academic requirements to a Ph.D)
	Partially Online Doctorate in Mechanical Engineering (has identical academic requirements to a Ph.D.)
Cornell University	None
Dartmouth College	None
Drexel University	None
Duke University	None
Emory University	None
Florida International University	None
Florida State University	Blended Ph.D. in Nursing
George Mason University	None
George Washington University	Online Ph.D. in Systems Engineering
Georgetown University	None
Georgia Institute of Technology	None
Georgia State University	Online Ph.D. in Nursing
Graduate Center, CUNY	None
Harvard University	None
Indiana University Bloomington	Online Ph.D. in Music Therapy
	Online Ph.D. in Nursing Science

Iowa State University	Hybrid Ph.D. in Apparel, Merchandising, and Design
	Hybrid Ph.D. in Hospitality Management
Johns Hopkins University	None
Kansas State University	Hybrid Ph.D. in Adult Learning & Leadership
	Online Ph.D. in Curriculum & Instruction
Kent State University	None
Louisiana State University	None
Massachusetts Institute of Technology	None
Michigan State University	None
Mississippi State University	Various
Montana State University	None
New Jersey Institute of Technology	None
New York University	None
North Carolina State University	None
North Dakota State University	None
Northeastern University	None
Northwestern University	None
Ohio State University	None
Ohio University	None
Oklahoma State University- Stillwater	Online Ph.D. in Fire and Emergency Management Administration
	Online Ph.D. in Health, Leisure and Human Performance
Old Dominion University	Online Ph.D. in Community College Leadership
	Online Ph.D. Educational Leadership
	Online Ph.D. in English
	Online Ph.D. in Public Administration and Policy
Oregon State University	Hybrid Ph.D. in Counseling
Pennsylvania State University	None
Princeton University	None
Rensselaer Polytechnic Institute	None
Rice University	None
Rutgers University- New Brunswick	None
Stanford University	None
Stony Brook University	None
Syracuse University	None
Temple University	None
Texas A&M University	Online Ph.D. in Plant Breeding
	Online Ph.D. in Interdisciplinary Engineering
Texas Tech University	Online Ph.D. in Curriculum and Instruction
	Online Ph.D. in Educational Leadership Policy
	Online Ph.D. in Family and Consumer Science Education
	Online Ph.D. in Higher Education Administration
	Online Ph.D. in Special Education

Tufts University	Online and Hybrid Ph.D. in Data, Biotech, and Engineering
Tulane University	None
University at Albany, SUNY	Online Ph.D. in Curriculum and Instruction
	Online Ph.D. in Literacy
University at Buffalo	Online Ph.D. in Information Science
	Online Ph.D. in Nursing
University of Alabama	Online Ph.D. in Communication & Information Sciences
	Online Ph.D. in Mechanical Engineering
University of Alabama at Birmingham	None
University of Alabama at Huntsville	Hybrid Ph.D. in Engineering Management
	Hybrid Ph.D. in Industrial and Systems Engineering
	Hybrid Ph.D. in Civil Engineering
	Hybrid Ph.D. in Join Nursing Science
University of Arizona	None
University of Arkansas	None
University of California, Berkeley	None
University of California, Davis	None
University of California, Irvine	None
University of California, Los Angeles	None
University of California, Riverside	None
University of California, San Diego	None
University of California, Santa Barbara	None
University of California, Santa Cruz	None
University of Central Florida	Online Ph.D. in Nursing
University of Chicago	None
University of Cincinnati	None
University of Colorado Boulder	None
University of Colorado Denver	None
University of Connecticut	None
University of Delaware	None
University of Denver	None
University of Florida	Online Ph.D. in Classical Civilization
	Online Ph.D. in Latin and Roman Studies

University of Georgia	None
University of Hawaii at Manoa	None
University of Houston	None
University of Illinois at Chicago	None
University of Illinois Urbana-Champaign	None
University of Iowa	None
University of Kansas	Online Ph.D. in Nursing
University of Kentucky	Online Ph.D. in Arts Administration
University of Louisiana at Lafayette	None
University of Louisville	None
University of Maine	None
University of Maryland, Baltimore County	None
University of Maryland, College Park	None
University of Massachusetts Amherst	None
University of Memphis	Online Ph.D. in Nursing
University of Miami	None
University of Michigan	None
University of Minnesota	None
University of Mississippi	None
University of Missouri	Online Ph.D. in Architectural Studies Online Ph.D. in Information Science and Learning Technologies
University of Montana	Online in Ph.D. International Educational Leadership
University of Nebraska-Lincoln	Online Ph.D. in Educational Leadership and Higher Education with a concentration in Educational Studies
University of Nevada- Las Vegas	Online Ph.D. in Nursing
University of Nevada- Reno	None
University of New Hampshire	None
University of New Mexico	None
University of North Carolina Chapel Hill	None
University of North Texas	Online Ph.D. in Learning Technologies
University of Notre Dame	None
University of Oklahoma	None
University of Oregon	None
University of Pennsylvania	None
University of Pittsburgh	None
University of Rochester	Hybrid EMBA

University of South Carolina	Online Ph.D. in Civil Engineering Online Ph.D. in Computer Engineering Online Ph.D. in Computer Science Online Ph.D. in Mechanical Engineering Online Ph.D. in Nuclear Engineering
University of South Florida	Online Ph.D. in Career & Workforce Education
University of Southern California	None
University of Southern Mississippi	None
University of Tennessee	Online Ph.D. in Educational Psychology & Research Online Ph.D. in Industrial Engineering Online Ph.D. in Nursing
University of Texas at Arlington	None
University of Texas at Austin	None
University of Texas at Dallas	None
University of Texas at El Paso	None
University of Texas at San Antonio	None
University of Utah	None
University of Virginia	None
University of Washington	None
University of Wisconsin- Madison	Online Ph.D. in Nursing
University of Wisconsin- Milwaukee	Online Ph.D. in Nursing
Utah State University	Online Ph.D. in Career & Technical Education
Vanderbilt University	None
Virginia Commonwealth University	Online Ph.D. in Nursing
Virginia Tech	None
Washington State University	None
Washington University in St. Louis	None
Wayne State University	None
West Virginia University	Online Ph.D. in Nursing
Yale University	None

Appendix B – Example Graduate student Individual Mentoring Plan

The goal of the mentoring program will be to provide the skills, knowledge and experience to prepare the PhD student for a successful career. To accomplish this goal, the mentoring plan will enhance the PhD student experience by providing career planning assistance and opportunities to learn a number of career skills such as preparing grant proposals, writing journal papers and presenting their work.

The PhD student, [insert name], will be mentored academically by [insert name], on the project, "[insert title]" (please refer to the attached project plan for details regarding specific tasks and responsibilities). [insert student name] will be mentored in performing research in an interdisciplinary environment. [insert student name], as an expert in [list expertise], will join a team of collaborators with additional expertise in [list expertise]. By the end of the project, the team will have significant understanding and experience in all these areas and expertise in how to bridge across these disciplines. [insert student name] will be mentored administratively by Dr. [insert name], Executive Associate Dean for Research and Strategic Initiatives.

Orientation, Personalized Professional Development, Communication & Timeline

[insert student name] will begin with in-depth conversations with [insert faculty mentor names] to align expectations for the nature and scope of work as well as a basic skills assessment. These initial conversations will form the beginning of the PhD student's personalized professional development plan with an associated timeline. [insert student name] will be provided orientation to each investigator's lab as well as to other key collaborators (if any). A communications plan will also be developed including weekly team meetings and frequent communication to discuss progress, issues, and satisfaction. Specific items to be addressed include:

1. The amount of independence the PhD student requires;
2. Interaction with coworkers (frequency and in what form);
3. Productivity including the importance of scientific publications;
4. Work ethics and laboratory safety;
5. Documentation of research methodologies and experimental details so that the work can be continued by other researchers in the future.

Training in the Responsible Conduct of Research

[insert student name] will assist in the design of experiments and the collection and interpretation of data to understand the social and behavioral aspects of this project. They will participate in Purdue Institutional Review Board (IRB) training (if required), including the online training and certification in the responsible conduct of research through the online CITI responsible conduct of research training modules. [insert student name] will also gain experience in developing and submitting protocols for IRB approval (if required by the project).

Project Manager Responsibilities
[insert student name] will take on all responsibilities of project manager for the project including writing and editing publications (in collaboration with mentors), giving presentations as appropriate, writing progress reports, submitting research proposals on his/her ideas, and mentoring undergraduate and graduate students who are involved in the execution of the project. The performance of [insert student name] on this measure will be closely monitored by the faculty mentors, watching for his/her leadership and offer guidance if needed.

Experience with Preparation of Grant Proposals
[insert student name] will be directly involved in the development and writing of proposals prepared in collaboration with [insert faculty name]. As is appropriate, [insert student name] will be a named Co-PI on proposals. If effort for [insert student name] is included in grant applications, salary and other expenses required to perform assigned tasks will be included in the budget of the proposed grant, cost sharing is not allowed. To help build [insert student name] academic reputation, the PIs will recommend they serve on NSF or other panels or replace them as appropriate.

Publications and Presentations
Publications and presentations are expected to result from the work performed by [insert student name]. These will be prepared under the direction of and in collaboration with the mentors. [insert student name] will receive guidance and training in the preparation of manuscripts and professional presentations. [insert student name] will work with the mentors to identify appropriate venues for publishing and presenting. Conference travel support may be requested from the Polytechnic Research Office to present the work in the form of a talk at venues supported by the faculty mentors and should be included in the budget request.

Career Counseling
[insert student name] will be exposed to a variety of campus resources such as Purdue's Center for Career Opportunities and the Writing Lab. [insert student name] is encouraged to get involved with graduate student groups at Purdue. Additionally, they are expected to attend relevant Research Impact Area meetings, and Polytechnic Research Mentoring lunches.

Mentors, [insert faculty mentor name]. will provide [insert student name] with the skills, knowledge, and experience needed for to launch a successful career. Topics mentors will consider range from setting and achieving career goals, resume preparation, applying for a faculty position, career paths outside of academia, to tips for negotiating salary and start-up funds.

Timeline and Progress
The mentor will work with the graduate student to establish an Individual Development Plan (IDP). Thereafter, the mentors and the graduate student will review and assess progress each

month to assess progress. Reporting of mentoring will be included in annual and final project reports to the Polytechnic Executive Associate Dean of Research and Strategic Initiatives.

Success of this mentoring plan will be assessed by tracking the progress of the graduate student through their Individual Development Plan, interviews with the student to assess satisfaction with the mentoring program and tracking of the student's progress toward his career goals after finishing the appointment. The Online Student Success Coach will be able to follow the student's milestone and add appropriate guidance and support into the IDP to support the academic plan. The evaluation will be every six months with [insert name]. In case of termination due to unsatisfactory performance; the graduate student will be notified of concerns in writing, where the researcher will be put on probation for 30 calendar days. During this period, the researcher has to opportunity to demonstrate the ability to perform at expected levels. At the end of this period, the academic and administrative mentors will discuss any change in the student's performance and decide on an action.

Individual Development Plan

Mentoring Activities and Milestones		2021				2022					
		SEP-DEC				JAN-APR			MAY-AUG		
Task 4	**Professional Development**										
4.1	Training courses										
4.1.1	CITI-RCR and IRB training								x	x	
4.1.2	Preparing for funding opportunities								x	x	x
4.1.3	Research Seminar or Job Talk for the Academic Interview										x
4.1.4	The Teaching Demonstration for the Academic Interview										x
4.1.5	Postdoc Grant Writing Lecture	x	x	x	x						
4.1.6	NSF Personal Statement Writing Workshop (Grantsmanship)						x				
4.1.7	NSF Research Statement Writing Workshop (Grantsmanship)						x				
4.1.8	Battery Management Systems	x	x	x	x	x	x	x	x	x	x
4.2	Post-doc Specific Events										
4.2.1	Relevant lab meetings	x	x	x	x	x	x	x	x	x	x
4.2.2	Weekly online group check-in	x	x	x	x	x	x	x	x	x	x
4.2.3	Weekly meeting with mentors	x	x	x	x	x	x	x	x	x	x
4.2.4	Guest lectures, guest talks and research presentations			x	x		x	x			

4.2.5	Prepare application packages and apply for faculty/research scientist positions	x	x	x							
4.2.6	Give practice job talks to the mentors and the research group						x	x			
4.3	Polytechnic Research Events										
4.3.1	Polytechnic Research Mentoring Lunch	x	x	x	x	x	x	x	x	x	x
4.3.2	Monthly RIA meetings	x	x	x	x	x	x	x	x	x	x
4.4	Deliverables										
4.4.1	Submit abstract and paper to one of the following: Power Sources, IMECE, or ECS Conference										x
4.4.2	Submit journal manuscript to ECS or JPS and other relevant Journals						x			x	
4.4.3	Submit Grant Proposal to UL and one of: NRL/ONR/NSWC								x	x	x
4.5	Services										
4.5.1	Review papers and proposals			x			x			x	
4.5.2	Help organize RDE research symposiums	x	x	x	x	x	x	x	x	x	x
4.6	Others										

_____ _____

Faculty Mentor

_____ _____

Postdoctoral Research Assistant

APPENDIX E

PURDUE UNIVERSITY

Graduate Council Doc 23-E

To: **Purdue University Graduate Council**

From: **James Mohler, Graduate School Associate Dean**

Date: **April 20, 2023**

Subject: **Proposed modifications to the Policy and Academic Process for Requests for Graduate Program Majors by Academic Units**

Rationale

In Spring of 2016, the Graduate Council voted to allow academic departments to have more than one major under each degree. At the time, the minimum credits required to define a major were established, but maximums were not. It is necessary to define the upper bound so that departments know when it is appropriate to create a new degree, rather than a new major.

Existing	Proposed
Definition of a Graduate Major A major is an academic field of study within an approved graduate degree (requiring 60% of the graded credit hours for a master's degree or 18 graded credit hours for a PhD), approved by the Purdue University Graduate Council and the Provost's Office.	**Definition of a Graduate Major** A degree hosts a minimum of one major and may propose additional major(s). A major is an academic field of study within an approved graduate degree requiring a defined and unique set of courses that differentiates the major from other majors that might exist within the same degree.
Graduate majors will have the following features: **1.** Specialization in an academic field of study within a graduate degree. **2.** For MS degree programs, a major is defined by a minimum of 60% of the credit hours required for the degree (see Table 1 for examples). **3.** For PhD programs a major is defined by a minimum of 18 credit hours of graded course credits required for the degree.	**Graduate majors will have the following features:** **1.** Specialization in an academic field of study within a graduate degree. **2.** For master's degrees seeking more than one major, each additional major must be a minimum of 60% distinct in the credit hours required for the degree and no more than 80% distinct from the existing major(s) in the degree (see table 1).

	3. For doctoral degrees seeking more than one major, each additional major must have a minimum of 18 credits required for the degree. **4.** A proposal below the threshold should consider a concentration proposal, and above the threshold should consider a new degree proposal.

Existing Table 1

Minimum Credit Hours for the Master's Degree Program	**Required Minimum Number of Graded Credit Hours Required for a Major**
30-39	18
40-49	24
50+	30

Proposed Table 1

Total Credits Hours for the Master's Degree Program	**Minimum Number of Graded Credit Hours Required for a Major**	**Maximum Number of Graded Credit Hours Allowed for a Major**
30-39	18	24
40-49	24	32
50+	30	40