

**PURDUE UNIVERSITY  
GRADUATE SCHOOL**

Minutes of the Graduate Council Meeting  
April 20, 2017  
1:30 p.m.

Eighth Meeting  
Room 310  
STEW

PRESENT: Mark J. T. Smith, chair; Council Members, Thomas W. Atkinson, Bedrich Benes, Richard E. Blanton, Natalie J. Carroll, David S. Cochran, Joy L. Colwell, Carlos M. Corvalan, Marius D. Dadarlat, (Vincent) Jo Davisson, Lucy M. Flesch, Melissa M. Franks, Takashi Hibiki Michael A. Jenkins, David B. Klenosky, Linda J. Mason, James L. Mohler, Jerry P. Ross, Paul Salama, David G. Skalnik, Carol S. Sternberger, Candiss B. Vibbert (Provost's Representative), Jun Xie, Yan Ping Xin, Mohammad Zahraee, Howard N. Zelaznik

APOLOGIES FOR ABSENCE RECEIVED FROM:

Michael J. Connolly, Jonathan M. Harbor, Mary E. Johnson, Melanie Morgan, James L. Mullins, Kathryn M. Obenchain, Vikas Tomar, Andrew K. Zeller

ABSENCES:

Susan M. Mendrysa, Steven Son, Jen Tang, Henry E. Williams, Chong Xiang

GUESTS: Jim Burg, Rita Burrell, Kevin Dittman, Shawn Donkin, Debbie Fellure, April Ginther, Lee Gordon, Marcela Martinez, Mark Schuver, Brittany Wright

I. MINUTES

The minutes of the March 23, 2017, Graduate Council meeting were approved as presented.

II. DEANS REMARKS AND REPORTS

- a) Dr. Mark Smith noted that Council of Graduate Schools (CGS) will meet with congress and senators in Washington, D.C. on Thursday, April 27, 2017 to discuss the importance of graduate education. It is an opportunity for Graduate Deans to let congress and the senators know why it is important for them to continue funding research and why it is important for them to make the investment in graduate students particularly more so now than in recent history.
- b) Dr. Mark Smith noted the various topics that have been discussed at recent Graduate Council meetings on the holistic admissions review and how the GRE may be used.

Dr. Smith noted that representatives from the Education Testing Services met with Purdue. Best practices were collected from the West Lafayette campus as well as recommendations from the GRE Board on how they envision the GRE should be used.

Dr. Smith noted that this information has been assembled in a document that has been distributed to the Council members. We are in the process of creating a one page summary of this document which may be distributed to faculty member who serve on admissions committees in particular departments. It is important to look at these practices and consider updating current practices that are going on in a particular department as appropriate.

Dr. Smith also noted there have been discussions on the English Proficiency which will be noted later in the meeting.

- c) Dr. James Mohler noted that there will be a May Graduate Council meeting which will be held on Monday, May 8<sup>th</sup>. Dr. Mohler noted that there are several course proposals in process.
- d) Dr. James Mohler gave a report on pending degree program proposals in various stages of review and approval.
- e) Dr. James Mohler gave a report on pending course proposals in review with the Graduate Council area committees, proposals awaiting additional information from proposers, course proposals requested by departments for removal, and new course proposals received since the previous Graduate Council meeting.

### III. PANEL DISCUSSION

A panel discussion was held with the topic being *Rankings*. Dean Mark Smith noted that the Graduate School does a survey of all admitted students. One question that we pay attention to is, “What source do you look at for your information in making the selection about graduate school?” The number one answer is *US News and World Report*. Dean Smith noted that we do not want to be driven by rankings in changing processes; however, this is something that we need to pay attention to.

Dean Smith introduced the panelists, Harm Hogenesch from the College of Veterinary Medicine, Associate Dean for Research, Professor of Immunopathology, Department of Comparative Pathobiology; Audeen W. Fentiman from the College of Engineering, Associate Dean of Graduate Education and Interdisciplinary Programs, Interim Head of Engineering Education, Crowley Family Professor in Engineering Education and Professor with Courtesy Appointment in Nuclear Engineering; and Brent Drake from the Office of Institutional Research, Assessment and Effectiveness (OIRAE), Chief Data Officer.

**Dr. Harm Hogenesch** noted that he was in the role as the chair of the committee on *Reputational Stewardship* which is an advisory committee to the Provost that began in January 2016. This committee consisted of faculty across campus and Diane Beaudoin, from the Office of Institutional Research, Assessment, and Effectiveness (OIRAE). The committee began as a result of another task force with the advisory group called *Academic Program Excellence in Rankings* which was lead by Dr. Jeffrey Roberts, the former Dean of the College of Science. One of the recommendations of this Task Force was to institute a committee on Reputational

Stewardship. He noted the role of this committee was to look at what we can do to enhance the reputation in excellence at Purdue University. As Dean Smith mentioned it does come down to rankings and Dr. Hogenesch agreed that rankings should not drive what we do; however, at the same time there are things that we can do better in terms of increasing our rankings. Which rankings do we follow with all of the new rankings coming out on a monthly basis? The committee decided to focus on *US News and World Report* as one of the rankings, especially here in the United States, which is quite influential. In addition, *Times of Education* is an international ranking and U.S. World University ranking and it is also an International Ranking. International students who may be invested in joining Purdue look at those rankings in addition to *US News and World Report*. The committee will meet next week with Provost Dutta to discuss their recommendations: 1) Increase awareness to have discussions with faculty about citation. This is something that could be met by library faculty to look at how to best position papers to increase citations to maximum publications. 2) To enhance the reputation of Purdue by organizing conferences and workshops at the University and by inviting high profile speakers. 3) There would be a competition to receive proposals every year for workshops that would be supported by the Provost Office.

**Dr. Audeen Fentiman** presented the topic of rankings (being Engineering specific) by outlining the process they use. They ask their graduate students how they decide where to come. They indicate that rankings in *US News and World Report* are very high on their list, especially for international students, with over half of Engineering students being international, so she focused on *US News Rankings*. On their website they provide you with exactly how they determine these rankings and how they are weighted. Engineering decided to go further by noting Quality Assessment is 40% of the ranking for the College as a whole. For the individual departments it is a peer review contest. They just ask everyone what they think and that is how they determine what the rankings are. For the College, you are able to get some numbers that you can actually work with.

- 40% of Quality Assessment for the College is peer assessment and recruiter assessment. What do your peers think and what do your recruiters think?
- 10% Student Selectivity – the mean GRE score, quantitative score, and the acceptance rate. What percentage of people who applied get accepted?
- 25% Faculty Resources - the student to faculty ratio for your Master students and student to faculty ratio for your Ph.D. students. The percentage of faculty who are members of the National Academy of Engineering and some other disciplines have similar top national recognitions and the number of doctoral degrees awarded.
- 25% Research Activity – this would include your total research expenditures and your average research expenditure per faculty.

As we look through the Quality Assessment, Student Selectivity, Faculty Resources, and Research Activity the graduate committees can directly affect one of these.

Indirectly, for example:

- Peer Assessment from other universities is 25% of the entire ranking. So what do you do? You try to get more of your graduates in faculty positions so that they can vote as part of the game. You also try to invite people to your campus who are in position to vote to make sure they know who you are and how well you do things.
- Recruiter Assessment is the same thing- you try to get your people positioned well in companies so that the ones voting can help. You want to make sure that people know that you turn out quality students.
- Faculty Resources – how many faculty we have and how many are in the National Academy, e.g. Doctoral degrees awarded if we can improve the retention that helps

to increase the number of doctoral degrees awarded. That is something that you can work on.

- Research Activity – the research faculty has to work on expenditures. The average research for a faculty person if you can hire strong faculty then you can win more proposals.

Dr. Fentiman stated that this is the breakdown in what are the factors in determining the ranking and how you can perfect it.

**Dr. Brent Drake** noted the Office of Institutional Research, Assessment and Effectiveness (OIRAE) has historically been tasked with keeping a continuous count of some of the more established and most commonly used rankings. You may find those rankings on the OIRAE website. Dr. Drake noted that rankings are something of inevitability in higher education because our student population (at the undergraduate level) have their parents footing the bill, so they want any easy way to see what the best institution is. That leads to some perverse practices in the ranking organization in generating more rankings and trying to create press for themselves. *US News and World Report* was once a magazine and it is now a ranking service. Being aware of the rankings and the methodology that goes into them is a necessity of how we operate as an institution. The fact is that particularly for *US News and World Report* and some of the others, that the reputational part often factors highly into what comes across as your rankings.

Dr. Drake noted the way he tends to review rankings in making them better rather than thinking what is the definite determining factor and push on one specific thing at the institution which some institutions have done. They looked at ways that they could either legitimately or in a game like fashion impact their student to faculty ratios. There have been others who have done reputational rankings by putting themselves high and put everyone else as low as possible that are in their peer group. Instead of focusing on those things that can lead to some perverse behavior like that, Dr. Drake noted that we should be focusing on things that are missions and impact our excellence overall that lined up in these rankings in some form outside the reputational resources.

Dr. Drake noted that our research activity in the quality of the students coming in, how well we do graduating them, how many degrees we complete, where we place the student, citations comes into that, but along with the citations all the research activity occurs around it. He is encouraged that Purdue has been investing resources over the past several years into trying to increase our faculty base at the institution which means that our faculty produce high quality research and are guiding our students through the institution. Obviously, we all want to bring in the best students possible as it is relative to the pool we receive and we will continue to do that as an institution. We want to continue to press on and make sure that those students we bring in are successful here and ultimately graduate and in a timely fashion. If we do those things, those parts that are the quantitative metrics that occur in the rankings will continue to move in the direction we want and will impact us.

Dr. Drake also noted the reputational part in that the more things we can do the better that drive eyes towards the campus by having various conferences and summits on the campus, getting more of that out there in the ethos as published. Some of it also in terms of our national organizations and conference circles, we need to get it out there that Purdue is doing more of those things. He noted that there is nothing that you can completely do to chase that reputation. Dr. Drake noted that there are things as an institution that we want to do in terms of pushing our excellence. As long as we are continuing to do those things and making efforts in those areas we will continue to push on the metrics with rankings.

#### IV. AREA COMMITTEE REPORTS (Area Committee Chairs)

*Graduate Council Document 17-D*, Graduate Council Documents Recommended for Approval:

Area Committee A, Behavioral Sciences (Yan Ping Xin, yxin@purdue.edu):

*Graduate Council Document 16-14h*, PSY 62901, fMRI Design and Analysis (PWL)

*Graduate Council Document 17-10a*, TCM 52000, Teaching Technical & Professional Communication (IUPUI)

*Graduate Council Document 17-10b*, TCM 53000, Advanced Visual Technical Communication (IUPUI)

*Graduate Council Document 17-10c*, TCM 55500, Advanced Research Approaches for Technical and Professional Communication (IUPUI)

Dr. Yan Ping Xin presented four courses for consideration. The courses were approved by the council, upon a motion by Dr. Xin.

Area Committee C, Engineering, Chemistry, and Physical Sciences (Lucy Flesch, lmflesch@purdue.edu):

*Graduate Council Document 17-6c*, CE 53210, Fundamentals of Design of Steel Girder Bridges (PNW-Calumet)

*Graduate Council Document 17-6d*, CE 53410, GIS and Remote Sensing Applications in Civil Engineering (PNW-Calumet)

*Graduate Council Document 17-6e*, CE 53710, Optimization and Simulation Models (PNW-Calumet)

*Graduate Council Document 17-6f*, CE 53910, Advanced Hydraulics (PNW-Calumet)

*Graduate Council Document 17-9a*, SYS 50000, Perspective on Systems Engineering (PWL)

*Graduate Council Document 17-9b*, SYS 51000, Tools and Methodologies for Designing Systems (PWL)

*Graduate Council Document 17-9c*, SYS 53000, Practical Systems Thinking (PWL)

Dr. Lucy Flesch presented seven courses for consideration. The course were approved by the council, upon a motion by Dr. Flesch.

#### **GRADUATE CERTIFICATE:**

Area Committee A, Behavioral Sciences (Yan Ping Xin, yxin@purdue.edu):

*Graduate Council Document, 17-12a*, Graduate Certificate in Information Technology Business Analysis, Department of Computer and Information Technology, PWL

#### V. PURDUE GRADUATE STUDENT GOVERNMENT -- PRESIDENT'S REPORT

Dr. Tom Atkinson introduced Ms. Marcela Martinez the new Purdue Graduate Student Government (PGSG) President. Ms. Martinez reported the 2017-2018 Goals of the PGSG:

- Graduate student success
- Professional development programs
- Increase retention

## VI. OLD BUSINESS

- a) Dr. Jun Xie, Chair of the English Proficiency Task Force presented GCdoc 17-14a, Graduate Council Task Force on English Proficiency for consideration. The Task Force recommendations were approved by the Council, upon a motion by Dr. Xie.
- b) Dr. Shawn Donkin presented GCdoc 17-17b, Final Report for 60000 Level Courses on Undergraduate Plans of Study to the Graduate Council for consideration. The policy change was approved by the Council, upon a motion by Dean Mark Smith.
- c) Dr. Mark Smith provided GCdoc 17-18a, Guidelines for Graduate Student Mentoring and Advising for the Councils review of the expectations for mentoring which will be voted on at the May 8<sup>th</sup> Graduate Council meeting.

## VII. NEW BUSINESS

- a) Natalie Carroll noted that Youth Development Agricultural Education (YDAE) does a lot of communication. Several of the graduate students would like to take one of the online classes that the Brian Lamb School of Communication offers for their online program for Professional Masters. While YDAE does not offer these type of classes, there is a large fee for the YDAE students to take this class. Would it be possible for the Council to look at this in order for on-campus students to take this class without this large fee? Dean Mark Smith agreed that this would be worth researching.

## VIII. CLOSING REMARKS AND ADJOURNMENT

The council meeting was adjourned by Dr. Smith at 2:53 p.m.

Mark J. T. Smith, Chair  
Tina L. Payne, Secretary

## **APPENDIX A**

### **PENDING DOCUMENTS**

(April 20, 2017)

### **BOLDED ITEMS ARE IN REVIEW WITH AN AREA COMMITTEE**

Area Committee A, Behavioral Sciences (Yan Ping Xin, chair; [yxin@purdue.edu](mailto:yxin@purdue.edu)):  
***Graduate Council Document 16-14h, PSY 62901, fMRI Design and Analysis (PWL)***  
***Graduate Council Document 17-10a, TCM 52000, Teaching Technical & Professional Communication (IUPUI)***

**Graduate Council Document 17-10b, TCM 53000, Advanced Visual Technical Communication (IUPUI)**

**Graduate Council Document 17-10c, TCM 55500, Advanced Research Approaches for Technical and Professional Communication (IUPUI)**

Area Committee C, Engineering, Chemistry, and Physical Sciences (Lucy Flesch, chair: [lmflesch@purdue.edu](mailto:lmflesch@purdue.edu))

**Graduate Council Document 17-6b, CE 52910, Matrix Analysis of Structures (PNW-Calumet)**

**Graduate Council Document 17-6c, CE 53210, Bridge Engineering (PNW-Calumet)**

**Graduate Council Document 17-6d, CE 53410, GIS and Remote Sensing Applications in Civil Engineering (PNW-Calumet)**

**Graduate Council Document 17-6e, CE 53710, Optimization and Simulation Models (PNW-Calumet)**

**Graduate Council Document 17-6f, CE 53910, Advanced Hydraulics (PNW-Calumet)**

**Graduate Council Document 17-9a, SYS 50000, Perspective on Systems Engineering (PWL)**

**Graduate Council Document 17-9b, SYS 51000, Tools and Methodologies for Designing Systems (PWL)**

**Graduate Council Document 17-9c, SYS 53000, Practical Systems Thinking (PWL)**

Area Committee F, Management Sciences (Jun Xie, chair; [junxie@purdue.edu](mailto:junxie@purdue.edu)):

**Graduate Council Document 17-11a, ECON 63300, Macroeconomics with Heterogeneous Agents (PWL)**

**Graduate Council Document 17-11b, ECON 64100, Computational Economics/Numerical Methods (PWL)**

**Graduate Council Document 17-11c, ECON 65300, Economics of Early Childhood and Skill Formation (PWL)**

**Graduate Council Document 17-11d, ECON 68100, Bayesian Econometrics I (PWL)**

**Graduate Council Document 17-11e, ECON 68200, Bayesian Econometrics II (PWL)**

**Graduate Council Document 16-16a, HTM 50300, Business Statistics and Quantitative Analysis in Hospitality (PWL)**

**Graduate Council Document 16-16b, HTM 51100, Hospitality Business Law and Risk Management (PWL)**

**Graduate Council Document 16-16d, HTM 53600, Advanced Service Management for Hospitality and Tourism (PWL)**

**Graduate Council Document 16-16e, HTM 54200, Strategic Revenue Management in the Hospitality Industry (PWL)**

**Graduate Council Document 16-16f, HTM 59500, Applied Management Project (PWL)**

### **NEW DOCUMENTS RECEIVED**

(After the April 20, 2017 Graduate Council Meeting)

Area Committee C, Engineering, Chemistry, and Physical Sciences (Lucy Flesch, chair: [lmflesch@purdue.edu](mailto:lmflesch@purdue.edu)):

**Graduate Council Document 17-5c, ME 50601, Design Optimization Methods (IUPUI)**

Sem. 1 and 2. SS. Lecture 2 times per week for 75 minutes. Credit 3. Prerequisites: MATH 26600 and MATH 26100. Graduate standing; or approval of instructor. This course is intended for engineering graduate students and engineering undergraduate senior students; however, any student

with knowledge of linear algebra, multivariable calculus, and numerical methods should be able to successfully follow the content of this course.

In this course, the general theory of optimization, concepts and problem statement are presented. Methods for minimization of a function of one or n variables with and without constraints are discussed. Response surface methods and design of experiments are shown to significantly reduce analysis time. Applications using a commercial software package to solve typical engineering design optimization problems are demonstrated. Uncertainty in the design process is introduced. In addition to engineering, the methods studied can be applied to a variety of diverse disciplines such as finance, investment portfolio management, and life sciences. Professor Tovar.

*Graduate Council Document 17-5d, ME 51200, Energy Storage Devices and Systems (IUPUI)*  
Sem. 1 and 2. Lecture 2 times per week for 75 minutes. Credit 3. Prerequisites: ME 29500/  
EEN 22000 and/or permission of instructor.

The basic concepts and components of primary and rechargeable batteries; Faraday's Law: electrode process and kinetics; electric double layer; electroanalytical techniques; battery standard, operation, and other considerations; materials for Li-ion batteries; next generation high energy rechargeable lithium batteries; batteries for electric vehicles and hybrid electric vehicles; and battery for the electrodes, electrolytes, temperature range and operation of different types of batteries. Graduate standing. Professor Fu.

*Graduate Council Document 17-5e, ME 53501, Introduction to Systems Engineering (IUPUI)*  
Sem. 1. Lecture 2 times per week for 75 minutes. Credit 3. Prerequisites: Senior or Graduate standing, or consent of instructor.

This course offers an examination of the principles of systems engineering and their application across the system life cycle. Special emphasis is given to concept exploration, requirements analysis and development, analysis of alternatives, preliminary design, integration, verification, and system validation. The students will use the international space station (on-orbit modules) for practical application of the principles introduced in this course. This is the first of two courses in systems engineering and is a prerequisite to the Systems & Specialty Engineering course. Both courses use the same text book and have a 15% overlap of the text material. Professor El-Mounayri.

*Graduate Council Document 17-5f, ME 53502, Systems and Specialty Engineering (IUPUI)*  
Sem. 1 and 2. Lecture 2 times per week for 75 minutes. Credit 3. Prerequisites: ME 53501 or consent of instructor.

This course offers an examination of the interaction between the principles of systems engineering and the "design for" specialty engineering areas. The focus of their interactions is viewed across the system life cycle. Special emphasis is given to contributions of the specialties to the essential knowledge development needed for concept exploration, requirements analysis and development, trade-offs and decisions with uncertainty, preliminary design, system integration, verification, and system validation. Students will use the international space station and its support systems for practical application of the principles introduced in this course. Professor El-Mounayri.

*Graduate Council Document 17-5g, ME 54800, Fuel Cell Science and Engineering (IUPUI)*  
Sem. 1 and 2. Lecture 2 times per week for 75 minutes. Credit 3. Prerequisites: ME 31400 (or equivalent), or instructor's permission.

Fundamental principles of fuel cell science and engineering (fuel cell reactions, charge and mass transport in fuel cells, water transport management, and materials development in the fuel cells, fuel cell system designs and integrations), current state-of-the-art fuel cell technology and the current technical challenges on the development of fuel cells, codes and standards for safe handling of fuel cells. Graduate standing.



*Graduate Council Document 17-5h, ME 57201, Analysis and Design of Robotic Manipulators* (IUPUI) Sem. 1 and 2. SS. Lecture 2 times per week for 75 minutes. Credit 3.

Prerequisites: ECE 38200 or ME 48200 or equivalent (Automatic Control), or permission from instructor, and any high-level programming languages.

The basic components of robotic systems; selection of coordinate frames; homogeneous transformations; solutions to kinematics of manipulator arms; velocity and force-torque relations; dynamic equations using Euler-Lagrange formulation; motion planning; obstacle avoidance; controller design using torque method; and classical controllers for manipulators. Graduate standing. Professor Razban.

*Graduate Council Document 17-5i, ME 60601, Optimal Design of Complex Mechanical Systems* (IUPUI) Sem. 1 and 2. Lecture 2 times per week for 45 minutes. Laboratory 1 time per week for 90 minutes. Credit 3. Pre-requisite or co-requisite: ME 50601.

The objective of this research course is to prepare students to address mechanical systems design and innovation challenges through appropriate advanced optimal design methodologies. This course will focus on current design approaches, which are rapidly expanding in research and industrial applications, but are not commonly included in engineering curricula. The course also focuses on the theoretical aspects of multi-objective optimization, global approximation methods (metamodel-based optimization), and applications in mechanical engineering systems. Students of this research course will acquire an understanding of state-of-the-art analysis and optimization tools through hands-on experience and the involvement in research projects. The research experiential learning will prepare students to design innovative mechanical systems and to increase their problem solving capabilities through the use of effective design methodologies. Graduate standing or consent of instructor. Professor Tovar.

Area Committee E, Life Sciences (Natalie J. Carroll, chair; [ncarroll@purdue.edu](mailto:ncarroll@purdue.edu)):

*Graduate Council Document 17-20a, BIOL 53600, Biological & Structural Aspects of Drug Design & Action* (PWL) Sem. 2. Lecture 3 times per week for 50 minutes. Credit 3. Prerequisites: BIOL 23100 or 23000 and CHM 25600 or CHM 26605 or MCMP 20500.

(Cross-listed BCHM 53600) This course is aimed at expanding students' fundamental interests in biology, chemistry and biochemistry to how drugs work. The course will provide an overview of the modern day drug discovery pipeline and an in-depth look at the basic biology, structure, and mechanisms-of-action behind marketed therapeutics. The course will start with a historical account of the discovery of natural product drugs such as aspirin and penicillin and will then venture into the modern day era of drug discovery including structure-based drug design. We will explore different classes of antibiotics, antiviral, and anti-cancer drugs and their targets including small molecule drugs and modern biologics-based drugs. Professor Bartlett.

*Graduate Council Document 17-21a, BCHM 53600, Biological & Structural Aspects of Drug Design & Action* (PWL) Sem. 2. Lecture 3 times per week for 50 minutes. Credit 3. Prerequisites: BIOL 23100 or 23000 and CHM 25600 or CHM 26605 or MCMP 20500.

(Cross-listed BIOL 53600) This course is aimed at expanding students' fundamental interests in biology, chemistry and biochemistry to how drugs work. The course will provide an overview of the modern day drug discovery pipeline and an in-depth look at the basic biology, structure, and mechanisms-of-action behind marketed therapeutics. The course will start with a historical account of the discovery of natural product drugs such as aspirin and penicillin and will then venture into the modern day era of drug discovery including structure-based drug design. We will explore different classes of antibiotics, antiviral, and anti-cancer drugs and their targets including small molecule drugs and modern biologics-based drugs. Professor Bartlett.