TO: The Faculty of the College of Engineering

FROM: School of Engineering Education

RE: New Graduate Course, ENE 50101

The faculty of the School of Engineering Education has approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ENE 50101: Foundations of Engineering Education

- Terms offered: Fall
- Credit type: Fixed credit, 3 credit hours
- Schedule type: 50 minutes per meeting, 3 meetings per week, 16 weeks
- Pre-requisites: None
- Restrictions: None
- Attributes: None

Description: Credit Hours: 3.00. In this course, new doctoral students in engineering education explore their roles within the field of engineering education, create a learning plan that maps to program requirements, and develop habits of mind to support their ongoing professional development. Students learn to write clearly and coherently in an academic context. Students examine research trends and faculty interests so they can make informed choices about advising and program opportunities. Permission of instructor required. Typically offered Fall.

Reason: The course seeks to support a "community of practice" culture in which Purdue graduate students and faculty in the School of Engineering Education (ENE) participate in learning partnerships of mutual support, critical reflection, and discourse that will enhance students' graduate experiences. Major course activities include visits by ENE faculty members, practice in academic writing, and discussion of ENE community practices, milestones, and competencies. The course is currently being taught as ENE 595, and we would like to have a permanent number for it.

Enrollment in the ENE 59500 course for the past three years has been: Fall 2016 – 14, Fall 2017 – 18, Fall 2018 – 15.

The syllabus for ENE 59500 is attached. The syllabus for ENE 50101 will be the same. The Curriculog request for a new graduate course has been submitted.

Donna Riley, Kamyar Haghighi Head
School of Engineering Education

ENE 59500: Engineering Education Foundations
Fall 2017

Instructor

Michael C. Loui, Dale and Suzi Gallagher Professor of Engineering Education
E-mail: mloui@purdue.edu
Office: ARMS 1331. Office hours: to be determined; and by appointment.

Classes

Section 030: Tuesdays and Thursdays, 9:30 to 10:20 a.m., ARMS 1028
Section 031: Thursdays, 2:30 to 3:20 p.m., ARMS 1028
Students must register for **both** sections

Course Web Site

Blackboard (https://mycourses.purdue.edu/) Fall-2017-ENE-59500-030

Credit

Three credits

Prerequisite

None

Course Overview and Purpose

This course gives students entering the graduate program in engineering education (ENE) opportunities to explore their roles within the field of engineering education, to create a learning plan that maps to program requirements, and to develop habits of mind to support their ongoing professional development. In particular, students will refine their ability to write clearly and coherently in an academic context. The course also provides new graduate students with dedicated time to explore research trends and faculty interests so they can make informed choices about advising and program opportunities.

The course seeks to support a "community of practice" culture in which Purdue graduate students and faculty participate in learning partnerships of mutual support, critical reflection, and discourse that will enhance students' graduate experiences. Major course activities include visits by ENE faculty members, practice in academic writing, and discussion of ENE community practices, milestones, and competencies.

This course replaces the courses ENE 50100-001 (Professional Development in Engineering Education) and ENE 69500-015 (Research in Engineering Education).

Course Objectives

In this course, you will have opportunities to learn to

1. Identify members of the ENE faculty and describe their research interests and mentoring philosophies
2. Compare faculty interests and mentoring approaches with your own interests and mentoring needs

3. Connect research questions and motivations with research methodologies
4. Contrast your ideas with others' ideas in academic writing
5. Craft coherent, cohesive paragraphs
6. Critically reflect upon personal learning goals and articulate a learning plan
7. Identify and use resources that will help you complete the doctoral program and transition into the professional engineering education community.
8. Prepare a biosketch and a curriculum vitae

Required Texts

- [GB] Graff, G., & Birkenstein, C. (2014). *They say / I say: The moves that matter in academic writing* (3rd ed.). New York, NY: W. W. Norton.
- [WB] Williams, J. M., & Bizup, J. (2017). *Style: Lessons in clarity and grace* (12th ed.). Boston, MA: Pearson.
- Additional readings as assigned, available via Blackboard

Community Expectations

Students are expected to

- Attend all scheduled class sessions. If you must miss a class, please let us know and make arrangements with other class members for a summary and review.
- Fully engage in all class sessions. Full engagement requires reading and reflecting on all assigned materials by the assigned dates, participating actively in class discussions and activities, and completing quality work. Full engagement also means being attentive in class and limiting use of electronic devices to course-related activities such as taking notes, viewing slides, finding information, and posting answers to writing exercises.
- Act with civility and professionalism.
- Complete and submit a thoughtful online course evaluation.

Students can expect that the instructors will

- Provide a supportive learning environment that fosters your success.
- Create assignments and exercises that are meaningful to you.
- Honor and respect your interests.

Class Sessions: Academic Writing

Designated class sessions (usually Thursday mornings) will include collaborative writing exercises. Most exercises will come from the GB and WB textbooks. To these class sessions, you should bring the GB and WB textbooks and either a laptop computer or tablet with keyboard for writing exercises and for Internet access.

Class Sessions: Graduate Program

In some class sessions, usually Thursday mornings, Professor Brent Jesiek will discuss the requirements and expectations of the doctoral program in engineering education. Professor Jesiek chairs the Graduate Committee in ENE.

Class Sessions: Faculty Visitors

In most weeks, on Tuesday mornings and Thursday afternoons, an ENE faculty member will visit. Each visitor will select one of their research articles, which will be posted in Blackboard at least one week before the visit. You should read this article and prepare written questions for the visitor before the visit. During the class session, the visitor will recount his or her career, particularly the critical events that led to an interest in engineering education research. Then the visitor will describe the "backstory" of the article, the events that could not be inferred by reading the published article alone.

What are faculty visitors asked to think about as they prepare to visit the class?

- How did your career develop? What were the pivot points (forks in the road)? How did you decide which path to follow? What do your decisions reveal about your core values and about how you help advisees navigate their own career paths?
- What is the backstory of the article you selected for students to read? From your experience with this article, what can you share with students about the "lived" experience of being an engineering education researcher? How might your experience vary from the linear depiction of research often presented in textbooks?
- What research questions intrigue you? What method(s) do you use to answer those questions?

What might you think about as you prepare for and listen to the visitors?

- How do the faculty career stories illuminate your own career stories? What do their stories tell you about their mentoring styles? What aspects of their mentoring practices connect with your needs?
- What surprises you about the backstory of the article? How does the "lived" experience of the research process differ from what you had expected?
- How do the faculty visitors' interests fit with your research interests?
- Are there approaches to answering research questions that are particularly appealing to you? Surprising to you? Totally new to you?

Course Assignments

Course assignments will help you achieve the objectives of the course. Brief descriptions of the assignments follow; detailed instructions for the Website Scavenger Hunt, Application of Writing Skills, and Portfolio Learning Plan will be provided in separate documents. Unless otherwise specified, all written assignments must be submitted in Blackboard. Due dates are specified in the Course Schedule below.

Questions for Visitors

You will read one research article written by each faculty visitor. You will prepare at least one question about the article and at least one question about the visitor's professional career or research interests. The career question should be unique to that visitor, based on specific information that you find online. Post these questions in the folder for that visitor in the Discussions area of Blackboard at least 24 hours before that visitor's class session, to enable the visitor to review your questions before the session.

The questions will be graded based on completion. Since there will be 24 visitors, you will be expected to contribute 48 questions for visitors during the semester. At most 40 questions will count toward the course grade.

Weekly Writing Exercises

In Week 2, you will submit a 150-word biographical sketch, written in the third person, a 100-word statement of current research interests, and 100-word statement of current career goals; the word counts are estimates. These three items should fit on one page, single spaced. You can give this page to potential doctoral advisors when you meet them individually.

In each subsequent week, you will complete a set of writing exercises in the GB and WB textbooks. Many exercises ask you to analyze your own writing. Most exercises are specifically assigned; you may choose additional exercises from GB or WB or both. Spend a minimum of two hours on exercises each week.

The exercises are due at 5 p.m. Eastern Time on Wednesdays each week. We will discuss your answers to the exercises on Thursday morning.

The exercises will be graded from zero to three points based on completion: one point for each completed exercise submitted on time. There will be eleven weeks with assigned exercises. At most 27 of 33 possible points will count toward the course grade.

Website Scavenger Hunt

You will be asked to find answers to questions about the ENE doctoral program on the ENE website.

Application of Writing Skills

As a graduate student, you have many opportunities to apply writing skills in courses and in research. You will demonstrate your proficiency in writing skills at the end of this course by presenting a long scholarly paper that you have written for a **different** academic course. Your paper will receive a writing grade in this course. The grade will be based on a rubric with components drawn from the GB and WB textbooks. Students who are concurrently enrolled in ENE 502, History and Philosophy of Engineering Education, will present their final essay in ENE 502 for the writing grade in this course.

Portfolio Learning Plan

To promote your development as an engineering education professional, you will be asked to identify your personal learning objectives within the overall context of the ENE doctoral program. Then you will draft a portfolio that can guide your learning decisions. There will be a set of activities to help you develop these critical reflection skills, create learning goals and plans, map goals to ENE graduate deliverables (e.g., competencies and plan of study), and self-assess progress towards these goals. You will also discuss your portfolio learning plan with your doctoral advisor.

Course Synthesis

At the end of the semester, you will analyze and evaluate the ideas that you have heard and read, and you will integrate them into a personally relevant summary. Expected length: 1,000 to 1,500 words.

Readings

When you read a scholarly work, read *intentionally*, with a goal in mind. As you read a chapter in GB or WB, read carefully and thoroughly, because you will want to master each skill. In contrast, as you read a

professor's article, read selectively to gain familiarity, so that you can engage in a conversation about the article. You might seek answers to the following questions. What are the research questions? How do the authors argue for the importance of their study and their results? What methods did the authors use to collect data? How did they connect their analyses of the data to their claims and conclusions?

Grading

Assignment	*Percentage*
Questions for Visitors	20
Writing Exercises	20
Website Scavenger Hunt	10
Application of Writing Skills	20
Portfolio Learning Plan	20
Course Synthesis	10

Course grades will be assigned on a criterion-reference scale as follows; minimum totals for grades may be lowered, but they will not be raised:

A 93%	**A– 90%**	**B+ 87%**	**B 83%**	**B– 80%**	**C+ 77%**	**C 73%**	**C– 70%**	**D 60%**

Tentative Course Schedule

Week/ Dates	Topic (Some topics may be reordered)	Readings	Writing exercises	Other assignments
Week 1 Aug 22, 24	Overview, introductions; Writing principles; Finding an advisor	Gopen & Swan		
Week 2 Aug 28, 30	Faculty visitors; Writing: academic conversations; ENE Milestones	Articles by visitors this week; GB Preface, Introduction; WB Lessons 1 and 2	Biosketch/ Research interests/ Career goals	Questions for visitors
Week 4 Sep 12, 14	Faculty visitors; Writing: characters, summarizing; Navigating ENE web resources; Early feedback	Articles by visitors this week; GB Ch. 2, Summarizing; WB Lesson 4, Characters	GB Ch. 2, #1; WB #4.3, #4.5	Questions for visitors
Week 5 Sep 19, 21	Faculty visitors; Writing: cohesion, coherence, quoting; Choosing spring courses	Articles by visitors this week; GB Ch. 3, Quoting; WB Lesson 5, Cohesion and coherence	GB Ch. 3 #2; WB #5.1, #5.2	Questions for visitors; Scavenger hunt answers
Week 6 Sep 26, 28	Faculty visitors; Writing: emphasis, responding; Advising scenario	Articles by visitors this week; GB Ch. 4, Responding; WB Lesson 6, Emphasis	GB Ch. 4, #1; WB #6.1, #6.2	Questions for visitors
Week 7 Oct 3, 5	Faculty visitors; Writing: motivation, contrasting; AAMC Compact	Articles by visitors this week; GB Ch. 5, Distinguishing your	GB Ch. 5, #1; WB #7.1; one	Questions for visitors

Week/ Dates	Topic (Some topics may be reordered)	Readings	Writing exercises	Other assignments
		ideas; WB Lesson 7, Motivation	more of your choice	
Week 8 Oct 10, 12	Oct 10: No class (Fall Break); Oct 12 (a.m. and p.m.): Faculty visitors	Articles by visitors this week		Questions for visitors; Progress report on finding an advisor
Week 9 Oct 17, 19	Faculty visitors; Writing: global coherence, objections; Advising scenario	Articles by visitors this week; GB Ch. 6, Planting a naysayer; WB Lesson 8, Global coherence	GB Ch. 6, #1; WB #8.1 (two paragraphs)	Questions for visitors
Week 10 Oct 24, 26	Faculty visitors; Writing: concision, conclusions; Panel of advanced students on advisor matching	Articles by visitors this week; GB Ch. 7, So what; WB Lesson 9, Concision	GB Ch. 7, #2; WB #9.1, #9.3	Questions for visitors
Week 11 Oct 31, Nov 2	Faculty visitors; Writing: shape, connections; Reviews of ENE graduate student progress	Articles by visitors this week; GB Ch. 8, Connecting the parts; WB Lesson 10, Shape;	GB Ch. 8, #1; WB #10.1, #10.2	Questions for visitors; Advisor request form
Week 12 Nov 7, 9	Faculty visitors; Writing: elegance, personal style; Campus resources	Articles by visitors this week; GB Ch. 9, Providing your voice; WB Lesson 11, Elegance	GB Ch. 9, #1; WB #11.1, #11.2	Questions for visitors
Week 13 Nov 14, 16	Faculty visitors; Writing: ethics, metacommentary; Writing exercise	GB Ch. 10, Metacommentary; WB Lesson 12, Ethics	GB Ch. 10, #1; WB #12.2; one more of your choice	Questions for visitors
Week 14 Nov 21, 23	Nov 21: Optional individual consultations Nov 23: No class (Thanksgiving)			
Week 15 Nov 28, 30	Peer review of portfolio learning plan; peer review of curriculum vitae	Readings on writing the curriculum vitae (to be determined)		Bring drafts of portfolio learning plan and curriculum vitae
Week 16 Dec 5, 7	Planning for next semester and beyond			Portfolio learning plan; Course synthesis
Week 17 Dec 11				Application of writing skills

Course Policies

We will follow all standard campus policies on accommodations for disabilities and religious practices, academic integrity, student conduct, and nondiscrimination:
http://www.purdue.edu/drc/
http://www.purdue.edu/studentregulations/regulations_procedures/classes.html
https://www.purdue.edu/odos/academic-integrity/
http://www.purdue.edu/studentregulations/student_conduct/index.html
http://www.purdue.edu/purdue/ea_eou_statement.html

Attendance

Although attendance will not be recorded, you are expected to participate actively in class sessions and online. When students share ideas and experiences, all students benefit.

Late Submission Policy

During the first week of the semester, we will discuss and negotiate our course policy for late submissions.

Electronic Devices

During class sessions, you may use laptop and tablet computers for work related to ENE 595. Please silence cell phones. If your cell phone rings during a class session, you will be asked to bring snacks to the following class session.

Reasonable Accommodation Policy

If you require special accommodations, notify an instructor as soon as possible. Contact an instructor if a disability might interfere with full participation in the course or the successful completion of a course requirement.

Nondiscrimination Policy

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University prohibits discrimination against any member of the University community on the basis of race, religion, color, sex, age, national origin or ancestry, marital status, parental status, sexual orientation, disability, or status as a veteran. The University will conduct its programs, services and activities consistent with applicable federal, state and local laws, regulations and orders and in conformance with the procedures and limitations as set forth in Executive Memorandum No. D-1, that provides specific contractual rights and remedies.

Emergencies

For any emergency, call 911. If we hear an indoor fire alarm, we will evacuate to the Stadium Mall, east of the Student Health Center. If we hear an outdoor emergency siren, or if we receive an emergency notification

to shelter in place, we will proceed as follows. For a tornado, we will move to the basement of Armstrong Hall. For a civil disturbance, we will remain in the classroom or in an interior hallway.

A major campus emergency may require us to change course requirements, deadlines, and grading percentages. Should a major emergency occur, please consult the course website in Blackboard for further information.

Resources

Supplemental Readings

- Gopen, G. D., & Swan, J. A. (1990). The science of scientific writing. *American Scientist*, *78*(6), 550–558. http://engineering.missouri.edu/civil/files/science-of-writing.pdf
- AAMC Compact Between Biomedical Graduate Students and Their Research Advisors https://www.aamc.org/initiatives/research/gradcompact/

Recommended Books

- Alley, M. (1996). *The craft of scientific writing* (3rd ed.). New York, NY: Springer.
- Pinker, S. (2014). *The sense of style: The thinking person's guide to writing in the 21st century*. New York, NY: Viking.

Online Resources

- ENE graduate student competencies
  https://engineering.purdue.edu/ENE/Academics/Graduate/Competencies
- ENE doctoral program
  https://engineering.purdue.edu/ENE/Academics/Graduate/PhD
- ENE Research Report
  https://engineering.purdue.edu/ENE/Research/ResearchReport
- Purdue Online Writing Lab (OWL)
  https://owl.english.purdue.edu/