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**ENGR 49400 Women in Engineering Senior Seminar: Gender in the Workplace**

**Description:** This course provides junior and senior engineering students an opportunity to maximize their earning potential, promotion opportunities, and retention within engineering or related fields. Enrolled students will 1) become aware of and discuss solutions for internal and external barriers which can prevent women from reaching their greatest potential in the workforce; 2) enhance professional development and transition skills required to move successfully from an academic to professional environment; and 3) acquire skills and knowledge to serve as engineering role models/ambassadors for diverse populations.

**Reason:** Research has shown that women earn less than men for the same job in which both candidates are equally qualified. Salary rate increase and possible promotions may also be hindered from a lack of understanding or adjustment to the workforce climate. This course engages students in the practice of professional development skills to maximize the earning potential and promotion opportunities of female engineers while studying the transition in climate and culture from academia to the workforce. Understanding and adapting to this new environment early will improve our engineering graduates’ workforce experience, promotion and professional growth opportunities, and overall retention of women in engineering and related fields. This course may not be repeated.

In addition, individual required readings will be provided.

**Course Goals:**

*Upon completion of this course each student will be able to:*

- Identify and develop solutions to internal and external barriers which prevent attainment of career trajectory
- Define and apply professional and transition skills to move from an academic to professional environment in order to improve the workforce experience and promotion opportunities
- Recognize and engage in engineering stewardship opportunities to build general public knowledge about the field of engineering
- Utilize coaching skills developed in class to assist themselves and others in making decisions/taking action

**Assessment:** Assignments (and % of final grade)

- Class participation (20%)
- Journal entries (20%)
Class Overview
Part 1 - Identifying barriers: Internal/external barriers to success and retention for female engineers
Part 2 – Addressing barriers: putting knowledge and skills/techniques to work – what works best for you?
Part 3 – Supporting peers/colleagues and the next generation of female engineers: engineering stewardship opportunities

Assignments
Class Participation
Each week will include reading assignments. All assigned readings are due the following week unless indicated otherwise by syllabus or instructor. Come prepared to participate in class discussion on the readings/topic based on 1) what you have read; 2) personal experiences related to the topics and/or 3) from other sources you have encountered on the topic (e.g., peers, the media, etc.).

Journal Entries
Journals are an expression of your thoughts and reactions to academic and social experiences that shape you and will help or hinder your progress toward your degree and a fulfilling career. You will be required to submit journal entries (9, including the final reflection) by 4 pm on specified dates electronically on Blackboard. Specific topics will be posted on Blackboard. Length: at least one page double-spaced. See below for special instructions for the final journal reflection. Journal entries will also include completion of and reflection on the implicit bias test (http://implicit.harvard.edu/), listening skills assessment, and two “self-discovery” surveys (e.g., Myers-Briggs, StrengthsQuest, Gregoric Learning Styles).

Coaching sessions
You and a coaching partner will be required to meet together at least 5 times during the semester. One of these 5 sessions will be with the course instructor and should take place within the first 11 weeks of the semester. You may elect to meet more often as a pair. Specific topics for each coaching session will be posted on Blackboard the week a coaching session is assigned. Plan to meet for at least one hour for each session. You are required to complete this session and submit on Blackboard a Coaching Reflection Form (done as a pair – one submission for both of you) by 4 pm the day before the next coaching session is assigned. The coaching session you do together with the course instructor can be scheduled any time during the semester but must be done before Dead Week begins. Contact Cathy Deno (denoc@purdue.edu) to schedule one hour with Dr. Groh. This meeting will take place in ARMS 1245.
Course Project
Over the course of the semester, you will select a project of interest to you AND which relates to at least one topic presented in this course. You will also prepare a rubric by which a classmate (randomly assigned by the instructor and will NOT be your coaching pair) will assess your project for 40% of the project grade. The course instructor will assign 60% of the project grade. Project and rubric need approval from the course instructor according to the schedule on the course syllabus. Examples are listed below with suggestions for minimum criteria to be met. We will share what we learned from our projects during our class Final Exam time.

Possible project ideas

Research paper/presentation: Pose a topic of interest to you in the form of a question. The topic should relate to any current research on topics in this class, including gender issues, professional development, corporate/academic culture, gender and/or multiculturalism issues in STEM, etc. You should include sources from peer-reviewed journals (ideal search terms: STEM, engineering, etc.), reputable websites (e.g., not Wikipedia), or other scholarly articles and writings.

Engineering Professionals Interviews: Do informational interviewing of at least three engineering professionals (e.g., engineers in academia, industry, government, non-profits, etc.). You may choose who you interview or you may ask the course instructor or others within your network for suggestions (I only ask that you go outside your comfort zone and NOT interview a family member!). Interview projects should include a list of questions you generate in preparation for your interview and some way of relaying responses and what you learned (e.g., develop a general theory based on what you have learned – similar to a qualitative research study).

WIE course: You are an instructor in a College of Engineering and have the opportunity to create a class for women in engineering students. What would your course look like? How would you either redesign this course or what would a different offering look like? Course development includes putting together (typically in the form of a syllabus): goals, class expectations, grading, class schedule, assignments, and assessment (look at class syllabi you have received for examples). You might also consider who is the target audience and how will you know if students will want to take your class? How will you market the class to students? What literature/supporting material would you choose for the class participants to read/use and why?

What other creative project ideas do you have? Must 1) relate to at least one topic presented in this course and 2) incorporate the impact of the topic on gender in the workforce. See Class Topics/Discussion list on course schedule for topics. For example, feel free to incorporate your passions/interests in art, dance, theater, etc.
## Draft schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Class topics/discussion</th>
<th>Homework/project/readings</th>
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| 1    | Networking & course introduction  
*Coaching introduction*                                                                 | Assigned reading  
Journal reflection #1                                               |
| 2    | Changing the Culture vs. Changing the woman: Part I  
*Coaching pair assignments*                                                 | Assigned reading  
*Coaching Commitment Form*                                             |
| 3    | Changing the Culture vs. Changing the woman: Part II  
*Coaching and the Engineering Design Process - Sample role play and debrief* | Assigned reading  
*Coaching Session #1*                                                  |
| 4    | Imposter Syndrome                                                                        | Assigned reading  
Implicit Bias test  
Journal reflection #2                                                   |
| 5    | Implicit Bias & Stereotype Threat                                                        | Project proposal due  
Listening skills assessment  
Journal reflection #3                                                  |
| 6    | Gendered Communication  
*Coaching: powerful questions and acknowledging*                             | Assigned reading  
*Coaching Session #2*                                                  |
| 7    | Playing Devil’s Advocate                                                                  | Assigned reading  
Self-Discovery task  
Journal reflection #4                                                   |
| 8    | Professional development/advancement: Managing your career                               | Project rubric due  
Assigned reading  
Journal reflection #5                                                  |
| 9    | Academic/Corporate culture: Part I  
*Coaching pairs*                                                            | Coaching Session #3                                                |
| 10   | Spring Break                                                                            | N/A                                                              |
| 11   | Academic/Corporate culture: Part II                                                      | Assigned reading  
Journal reflection #6                                                |
| 12   | Confidence/self-promotion/sponsorship                                                    | Assigned reading  
*Coaching Session #4*                                                  |
| 13   | Leadership                                                                              | Project due for Peer Assessment  
Journal reflection #7                                                   |
| 14   | Presenting your best self in the workplace                                               | Assigned reading  
Journal reflection #8                                                |
Possible assigned readings include excerpts from:

- Fouad, N., R. Singh (2011). *Stemming the Tide: Why Women Leave Engineering*. Supported by the National Science Foundation, award Number 0827553.

**Quotes**

**Quotes from recent graduates:**

“At only 3 years out of college I see the gender divide in my male dominated workforce first-hand: men around me are tenaciously working to find opportunities and get more money as I struggle to "have it all" (the clean house, a happy fiancé, dinner on the table every night all while have to work 9-5). Although I've already beat statistics by making it through the College of Engineering at Purdue, I have found myself at a point where my brain is getting stuck at how to balance expectations of success in work and the home. The proposed course would help build confidence and make attempting to move up in the workforce seem like more of the norm than something that is taking me away from everything else that is going on. Learning skills while still in college helped me build..."
confidence as I transitioned to the workforce and adding to that skillset would only add more value to Purdue's female engineers.”

“The struggles that a freshman and a senior face are extremely different, so a Women in Engineering Seminar tailored to professional development would be very helpful to upperclassmen. I know that I, along with many others, struggled when deciding which job offer to take and how to transition in the best way to professional life. The underclassmen seminar was a huge factor in making my transition from high school to Purdue engineering student easy and in encouraging me to stay in engineering, so I know the upperclassmen seminar would provide the same kind of support when making the transition to professional life.”

"The professional world can be tough to navigate as a recent graduate, and even tougher with spoken and unspoken gender barriers - such as ones encountered while being the project engineer (and only female) on a construction site of over 30 workers for six months. A class like ENGR 49400 would have been a great opportunity to develop the skills needed for the transition to a full-time engineering position, especially as a female engineer who suddenly finds herself even more a minority in the engineering world than she did in university! What a great opportunity this would be for future engineers to hit the ground running after graduation!”

“To have been able to experience this seminar during my undergraduate career would have allowed women to have their questions answered. After graduation there are a lot of transitions occurring and to have been prepared for some of them would have been great. Also, being able to learn about barriers in the workforce would have allowed women to power through them in a professional manner.”

"I had the privilege of taking ENGR 194 which is a Women in Engineering seminar for freshmen to gain an insight into what it is like to be a woman in the engineering field. That class solidified my decision to remain in engineering, but I didn't have any classes after that to receive further support and encouragement. ENGR 494 would be perfect for helping women engineers in affirming their decision as engineers, providing support and encouragement during their time in difficult classes, and transitioning from college life to the engineering field.”

“This course will be beneficial for upperclass students because it will give them a chance to gain a better understanding of what life after college will be. I particularly like the aspect where discussions will center around barriers women will face in the workforce being a minority STEM careers and how women can face and overcome them.”

“During my first engineering internship (after sophomore year), I was the only intern placed at a manufacturing facility in the middle of Delaware. I was the only female and the only individual under 40. I contribute my understanding of what to expect and how to excel in that environment to WIEP. Learning what to expect from professionals in the industry is so important.”
Quotes from current students:

“As I am currently working through my first internship experience I am confident a course to help me understand the mental barriers women place on themselves to prevent them from ascending to leadership in engineering fields would be invaluable. I personally have started to realize that while I have genuine ideas and input, I struggle with the confidence to speak up and bring my thoughts to the table. As a young female engineer with an interest in people leadership, I would be first in line to sign up for a class that helps me in the transition from student to professional woman.”

“For me personally I know how greatly I benefited from taking a Women in Engineering Seminar my first semester at Purdue. I felt that I not only gained networking experience but also a support group of fellow women in engineering. Which is why creating a new seminar with a focus on professional development will be invaluable to any woman in engineering, including myself, getting ready for the transition from academic to professional life.”

“I think there are a lot of resources that help college students with transitioning between school and work, but what I really think would be useful about this course is the discussion for solutions to tackle the internal barriers that women face in the workforce. I feel like many times we are our own toughest critic, and learning how to be confident and assertive in the workplace would be a very beneficial topic.”

“ENGR 49400 really offers a holistic approach to preparing us for the transition from classes and campus life to the workforce. Not only are we able to learn and grow, but we are able to pass on this learning and growth to others outside of the class, via the outreach segment of the class. What a wonderful opportunity that I may very well take advantage of junior or senior year!”

“As far as the Women in Engineering seminar, it helped me immensely. When I went into my first year I thought I knew what type of engineer I wanted to be, and that course is what really solidified it. Seeing what you can do with all of the different types of engineering was so inspiring, and hearing it from a woman made it that much better. That once a week pep-talk was one of the only things keeping me in the first year engineering program; it was like a little motivational seminar more than anything! Those women came in and said, “Look what you can accomplish if you just keep trying!” It was an inspiring, informational, and overall very helpful course that taught me a lot about professions, types of engineers, and everything you can do once you become an engineer. Women can do anything, especially women in engineering!”