iEFX: Illinois Engineering Freshmen Experience

ENG 198: Syllabus

Introduction to the Missing Basics of Engineering: Preparing for a World of Work & Service in a Creative Era.

Day	Time	Section	Location	TA
Monday	12:00 – 12:50	AL 1	206 Transportation	Alysia Watkins
Monday	12:00 – 12:50	AL 2	106B3 Engineering Hall	Suhail Barot
Monday	3:00 – 3:50	CL 1	1214 Siebel	Alysia Watkins
Monday	3:00 – 3:50	CL 2	1105 Siebel	Suhail Barot
Monday	4:00 – 4:50	EL 1	1131 Siebel	Judy Sunderman
Monday	4:00 – 4:50	EL 2	1111 Siebel	Suhail Barot
Tuesday	12:00 – 12:50	HL 1	106B1 Engineering Hall	Alysia Watkins
Tuesday	3:00 – 3:50	GL1	MEB 335	Alysia Watkins
Wednesday	12:00 – 12:50	BL 1	1103 Siebel	Judy Sunderman
Wednesday	12:00 – 12:50	BL 2	106B3 Engineering Hall	Suhail Barot
Wednesday	3:00 – 3:50	DL 1	4101 MSEB	Judy Sunderman
Wednesday	3:00 – 3:50	DL 2	101 Transportation	Alysia Watkins
Wednesday	4:00 – 4:50	FL 1	1109 Siebel	Alysia Watkins
Wednesday	4:00 – 4:50	FL 2	163 Everitt	Judy Sunderman

Instructor Contact Information

Dr. Pete Dragic (Projects), p-dragic@illinois.edu

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Course Website: www.compass.illinois.edu

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Course Description

Introduction to the Missing Basics of Engineering (ENG 198) provides iFoundry students with a broad interdisciplinary view of the field of engineering. The "basics" in engineering are usually assumed to be math, science, and engineering science, but young engineers on their first assignments sometimes struggle with the combination of critical and creative thinking, communications, and people skills that are essential to being an engineer in a century characterized by rapid technological innovation and global connectedness. This course investigates the missing basics through classroom study, reading, hands-on exercises, and design projects to prepare students for an exciting environment in which engineers make important contributions to the world.

Course Materials

1. Goldberg, D. E. (2006). *The Entrepreneurial Engineer.* Hoboken, NJ: Wiley-Interscience.
2. Roam, D. (2008). *The Back of the Napkin.* New York: Penguin Books.
3. The Miniature Guide to Critical Thinking (The Foundation for Critical Thinking)
4. The Miniature Guide to Taking Charge of The Human Mind (The Foundation for Critical Thinking)
5. Online accounts with blogger.com and YouTube.com.
6. Additional readings and handouts as assigned.

Recommended: Laptop and YouTube-ready digital camera.

Objectives

After taking this course, you should:

- Be able to describe what it means to be an engineer in the 21st century.
- Understand the basic critical thinking skills necessary to engineering thinking and work in organizations and society.
- Appreciate the complex social and technical interactions in engineering.
- Develop skills for lifelong learning and engagement in professional and social communities.

Course Assignments

Lab Projects: 50% of final grade

The laboratory projects component of this course is an important and sizeable one. Your grade will depend on various performance criteria, including team participation, documentation of your work, plans and proposals, status and final reports, and project demonstrations. For a detailed description please refer to the projects grading policy posted on the course website.

Assignments: 40% of final grade

Blog postings

You are asked to post your assignments on your blog. Each student will open a blog on blogger.com. We expect students to post at least seven entries (text or text and photos) plus one video in their blogs over the course of the semester. Blog posts should be thoughtful and analytical related to the topic of the assignment.

Participation & Engagement: 10% of final grade.

The classroom component of this course emphasizes qualitative thinking skills essential to becoming a great engineer. Students will learn to identify these skills and practice them through the ongoing exchange of ideas anytime-anywhere. This requires attending class and participating actively.

Evaluation of Assignments

Your assignments will be evaluated based upon the following criteria. Simply ***knowing*** something is the lowest level of learning, ***understanding*** is the next highest level, and ***applying*** your learning is the highest level.

1. **Knowing**: You can simply recognize information and ideas you have learned. (*Examples: You can write, list, label, name, state, and define information and ideas*.)
2. **Understanding**: You can translate and interpret information and ideas into new situations. (*Examples: You can explain, summarize, paraphrase, describe and illustrate information*.)
3. **Application**: You can use data and ideas to solve problems or complete tasks with minimal direction. (*Examples: You can use, compute, solve, demonstrate, apply, and construct solutions to problems and tasks.*)

Grading

Grading of your performance and work is based on the percentage of total points you earned:

A	90-100%
B	80-90%
C	70-80%
D	60-70%
F	< 60%

NOTE: If you would be so unfortunate as to receive a Failing grade (F), you will not receive credit for this course toward your degree.

Disability Accommodations

Students with disabilities are encouraged to contact UIUC Disability Services [(217)-333-4603] and to discuss any accommodations and other special needs with course facilitator.

Academic Integrity

All students in attendance at the University of Illinois at Urbana-Champaign have the obligation to maintain high personal standards of academic integrity. Students unfamiliar with the University of Illinois policy regarding academic dishonesty please refer to the Student Code (online)—especially Article 1 or seek advice from the course instructors. The instructors will not tolerate any violations of academic integrity.

Tentative Course Schedule and Assignments

Expect to make changes to the syllabus, course schedule, and assignments as necessary.

Week	Class	Assignments due
Week 1 8/23, 24, 25	Introduction to the Missing Basics	None
Week 2 8/30, 31, 9/1	Joy of Engineering	*The Entrepreneurial Engineer* Ch. 1, 2 Cards: What are you passionate about? Blog post #1: Reflections and mini-action plans
Week 3 9/7, 8	Take Initiative & Network	*How to Be a Star at Work.* Ch. 5, 6

Week 4 9/13, 14, 15	Communicating: Write and Present	*The Entrepreneurial Engineer* Ch 5, 6 Feynman *"Cargo Cult Science"* Blog post #2: Taking initiative in your first semester
Week 5 9/20, 21, 22	Inquiry: Asking Questions	*The Entrepreneurial Engineer Ch. 7* *Critical Thinking Handbook (read entire book)* *Back of the Napkin, Ch 2, 3* *Blog post #3: The importance of communication.*
Week 6 9/27, 28, 29	Learn to label & Categorize	*Back of the Napkin Ch. 4, 5, 6, 7* *Responses to others' blogs* Video lecture 1: #6--*2 Techniques from Athens*
Week 7 10/4, 5, 6	Modeling	*Back of the Napkin Ch. 8, 9, 10, 11* *Blog post #4: Labeling and categorizing a system.* Video lecture 2: #4--*What is a model? Modeling for TVs*
Week 8 10/11, 12, 13	Decomposing Problems	*TBD*
Week 9 10/18, 1, 20	Visualization	*Back of the Napkin Ch. 12, 13, 14* *iFoundry videos on visualizing*
Week 10 10/25, 26, 27	Systems Thinking	*Living with the Dragon, Ch. 1, 2*
Week 11 11/1, 2, 3	Emotional Intelligence	*Goleman article: Social intelligence* *TED video –Emotional intelligence*
Week 12 11/8, 9, 10	Creativity	*iFoundry videos on creativity*
Week 13 11/15, 16, 17	Ethics	*TBD*
Week 14 11/29, 30, 12/1	Joy of Engineering, Personal Aspirations	*TBD* Video lecture 3: #2--*The joy of engineering*
Week 15 12/6, 7, 8	Planning for the Future	*TBD* Guide to Taking Charge of The Human Mind Video lecture 4: #4--*Signature Strengths*