



Syllabus
The Culture of Engineering Profession
Summer 2017
EN.660.354.11
(3 credits, S, W)

Course Overview

The Culture of the Engineering Profession is designed to engage you in thinking critically, theoretically, empirically and historically about critical issues encountered by professional engineers of all disciplines. Course goals and objectives incorporate the following key ABET (formally the Accreditation Board for Engineering and Technology) standards for professional engineers:

- an understanding of professional and ethical responsibility;
- an ability to communicate effectively;
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- a recognition of the need for, and an ability to engage in, life-long learning;
- and a knowledge of contemporary issues.

The course is taught through online lectures, readings, online discussions and written/video assignments. You are responsible for managing your time to meet all of the deadlines for assignments, discussions, reports and other components. Course assignments will require you to explore issues like professional ethics and social impacts of engineering interventions by examining cases, readings and inventions that express the decisions engineers make on a daily basis.

Course content is focused around three specific course goals: teaching you to consider the culture and consequences of engineering decisions and interventions; equipping you with the framework to investigate issues of unintended consequences and professional ethics in the context of organizational cultures; and providing you the communication skills to convey your ideas and findings to various professional audiences.

In addition, course activities revolve around several specific objectives that apply to all assignments.

Description

This course focuses on building understanding of the culture of engineering while preparing students to communicate effectively with the various audiences with whom engineers interact. Working from a base of contemporary science writing (monographs, non-fiction, popular literature and fiction), students will engage in discussion, argument, case study and project work to investigate: the engineering culture and challenges to that culture, the impacts of engineering solutions on society, the ethical guidelines for the profession, and the ways engineering information is conveyed to the range of audiences for whom the information is critical. Additionally, students

will master many of the techniques critical to successful communication within the engineering culture through a series of short papers and presentations associated with analysis of the writings and cases. For Engineering sophomores, juniors and seniors or by permission of instructor. No audits.)

Instructor

Professor Bob Graham, bgraham@jhu.edu
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Office hours: Online, Mondays, Wednesdays, 9 AM - Noon, or by appointment, by phone or on Skype at bgwriter@gmail.com.

Meetings

Online, asynchronous.

Textbook

Required: *Applied Minds: How Engineers Think*, Guru Madhavan (ISBN 978-0-393-23987-4); *Salt, Sugar, Fat*, Michael Moss (ISBN 978-0-8129-8219-0); *The Sixth Extinction: An Unnatural History*, Elizabeth Kolbert (ISBN 978-1-250-06218-5).

In addition, a series of readings will be placed on Blackboard. Reading assignments will be assigned, in advance, for discussion online and for use in written assignments.

Online Resources

Please log in to Blackboard for all materials related to this course.

Course Objectives

Students will learn to:

- Recognize and understand indicators of organizational culture and how they affect the decision-making;
- Apply the standards for engineering ethics to situations and decisions that practicing engineers make every day;
- Research, analyze and consider the social, community and global impacts that engineering interventions create (and have generated) in society;
- Consider the concept of half-life of knowledge, especially as applied to your discipline;
- Select and use evidence compellingly in making the case for an argument or idea;
- Identify the characteristics of different audiences and use appropriate strategies to meet the needs and desires of each target audience;
- Work with others as colleagues to complete, improve and present findings and products; and
- Use best practices for a variety of writing and oral communication issues, including visuals, internal reports, writing for more than one audience and oral presentations.

Course Topics

- The culture of engineering organizations
- Engineering ethics

- The role of engineering within a wider context of business and organizational structure
- Decision-making practices of engineers
- The concept of half-life of knowledge
- Development of an effective argument and presentation to meet a specific audience's needs
- Collaboration in creating a presentation
- Best practices for oral and written communication
- Creating effective reports and visuals

Course Expectations & Grading

You will complete three (3) written; at least two (2) recorded oral graded assignments; and participate in weekly online discussion boards during this course. Expect to produce at least 20 - 25 pages of final copy as well as several presentations (all assignments included) for class. Written directions for each assignment will be distributed and discussed in online lectures and notes. Each assignment sheet includes information about due dates, product specifications, grade value of products, and grading criteria. You will complete at least one assignment as a collaborative project as explained on the assignment sheet for that work.

While your instructor reserves the right to adjust assignments and their values, you may expect our assignments and their value to be as follows:

Reflection #1 – Communication memo	10%
Reflection #2 – Smartphone reflectiony	10%
Individual poster project	10%
Poster evaluation assignment	10%
Engineering intervention/proposal memo/bibliography	30%
Class participation/online discussions	30%

Final Grade Scale

A	94%-100%
A-	90%-93%
B+	87%-89%
B	83%-86%
B-	80%-82%
C+	77%-79%
C	73%-76%
C-	70%-72%
D+	67%-69%
D	63%-66%
D-	60%-62%
F	59% and below

Grades are assigned for class participation (exercises, assignment activities, workshops, and discussion), presentations, draft copy, editorial comments, revision, and final copy. Further, the final semester grade is influenced by evidence of growth, based on written work.

Each assignment is graded, based on criteria for that assignment. Assignments carry individual weights toward your final grade with individual weights indicated on each Assignment Sheet. Typically, your papers are returned for consideration within a few days and/or before the next product is due.

You may re-write **one** assignment in an effort to improve the grade you earned; your final grade for that assignment becomes the higher of the two marks. Re-write means major revision and involves rethinking and reworking papers rather than just correcting grammar mistakes. Re-writing activities include an online meeting with your instructor, preparing a written plan for the revision and producing final copy. Note that your instructor reserves the right to substitute an alternative assignment as your rewrite opportunity. Rewrites are due not later than July 22.

Normally a grade of "Incomplete" is not available; if a problem arises, please see me and we will work on the issues.

The penalty for plagiarism is an automatic "F" and possible dismissal from the University. We will discuss the meaning of this term in class.

You will complete some assignments with one or more colleagues. Other assignments you must complete independently. Most "final copy" of papers must be completed independently. However, on several assignments, part of your grade is determined by the quality of feedback you provide to another classmate. You need not accept the feedback another classmate gives you on the draft, but you must consider it as well as provide written feedback on another student's paper. The expectations for different assignments are explained on the Assignment Sheets.

You must reference all sources of information in your papers. We will discuss guidelines for references in class.

Conferences

Informal or scheduled visits are welcome anytime during office hours or when an appointment is made in advance. Schedule appointments by email, offering several convenient times, to which I can respond once I check my schedule.

Papers: All papers must be printed by laser or inkjet and submitted on appropriate paper for the kind of product you are writing. Most copy will be submitted on 8 1/2" x 11" paper with 1" margins on all sides. Place your name and appropriate identification on each page. Staple pages together rather than using a binder. Back up your work and keep a copy of each paper for your records. Your graded papers will be returned for your examination and as part of a general class discussion. Note on the Assignment Sheets how many copies of any given assignment you must submit; expect to submit more than one copy of some draft materials.

Due Dates

Writing products and presentation materials are due as class begins on the date indicated on Blackboard and on the assignment sheet. Late papers will be marked down one letter grade for each missed class. Draft materials also are required for several assignments; appropriate information is noted on individual Assignment Sheets and discussed in class. Papers will not be due on religious holidays you observe.

Writing Assistance

You will find a tutor to help you with a specific skill, a grammatical problem, or provide a general reaction to your draft at the JHU Writing Center. The phone number is (410) 516-4258 or via email at writingcenter@jhu.edu. If you request or your instructor determines that you need ESL assistance, you will be referred to an ESL tutor provided by the CLE.

Attendance and Participation

Class participation are required each week. This participation involves your dedicated involvement in discussion boards and staying on top of reading assignments.

Key Dates

Key dates will appear on Blackboard, where any updates can be found.

Assignments & Readings

Assignments and readings are listed at the end of this syllabus and will be updated in Blackboard, if necessary to meet pacing, scheduling and unexpected issues.

Ethics

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition.

Report any violations you witness to the instructor.

You can find more information about university misconduct policies on the web at these sites:

- For undergraduates: <http://e-catalog.jhu.edu/undergrad-students/student-life-policies/>
- For graduate students: <http://e-catalog.jhu.edu/grad-students/graduate-specific-policies/>

Students with Disabilities

Any student with a disability who may need accommodations in this class must obtain an accommodation letter from Student Disability Services, 385 Garland, (410) 516-4720, studentdisabilityservices@jhu.edu.

ABET Outcomes

- Ability to apply mathematics, science and engineering principles (a).
- Ability to design and conduct experiments, analyze and interpret data (b).
- Ability to design a system, component, or process to meet desired needs (c).
- Ability to function on multidisciplinary teams (d).
- Ability to identify, formulate and solve engineering problems (e).
- Understanding of professional and ethical responsibility (f).
- Ability to communicate effectively (g).
- The broad education necessary to understand the impact of engineering solutions in a global and societal context (h).
- Recognition of the need for and an ability to engage in life-long learning (i).
- Knowledge of contemporary issues (j).
- Ability to use the techniques, skills and modern engineering tools necessary for engineering practice (k).

Course Schedule (Subject to Changes, to be noted on Blackboard)

- Week 1 Introduction. What is Organizational Culture? What is Engineering Culture?
Readings: What is Organizational Culture (C.M. Christensen, Harvard Business School)
 Read and discuss online: The Science of Scientific Writing (G.O. Gopen and J.A. Swan, American Scientist)
Read Book: *Applied Minds: How Engineers Think*
Assignment: Memo 1
- Week 2 **Read and discuss online:** The Science of Scientific Writing (G.O. Gopen and J.A. Swan, American Scientist)
 The Future of Cars Look Very Different (Joseph White, Wall Street Journal, December 22, 2014)
Assign: Cars Essay
DUE June 16, 11:59 PM EDT: Memo on engineers and communication
Read: *Sugar, Salt, Fat*
- Week 3 **Discuss:** *Applied Minds: How Engineers Think*
Assign: Individual Poster Project
Read: *Salt, Sugar, Fat*
Due June 23, 11:59 PM EDT: Smartphone Essay
- Week 4 **Discuss:** Engineering Code of Ethics (on Blackboard)
Discuss: *Salt, Sugar, Fat*
Assign: Proposal
Due July 5, 11:59 PM EDT: 1-minute video pitch of proposal
Due July 5, 11:59 PM EDT: Individual Poster Project (PDF version only)
- Week 5 **Blackboard Discussion on Current Engineering Event** (to be provided on Blackboard)
Due July 12, 11:59 PM EDT: Critiques of two other students' posters and 1 paragraph evaluation of every other student's proposal
- Week 6 **Read:** *The Sixth Extinction: An Unnatural History*
Discuss: Engineering Culture News
Due July 19, 11:59 PM EDT: First Version of Proposal

Week 7

Discuss: *The Sixth Extinction: An Unnatural History*
Hold Phone or Skype Conference with Professor on Your Proposal
DEADLINE FOR REWRITE: July 21, 11:59 PM EDT

Week 8

Final Discussion
FINAL PROPOSAL DUE, July 27, 11:59 PM EDT