

# ENC 3246: PROFESSIONAL COMMUNICATION FOR ENGINEERS

## FALL 2023

**Modality: face-to-face**

**Class number:** 12692

**Instructor:** Josh Mckinley

**Email:** joshmckinley@ufl.edu

**Office:** Turlington 2215

**Office hours:** TBA

### COURSE DESCRIPTION

- 3 credits
- Prerequisite: ENC 1101 or ENC 1102
- General education: Composition, satisfies 6,000 words of the Writing Requirement (WR)

Engineers write at all stages in their careers, and writing can account for well more than 50% of engineer's workday by mid-career (Leydens J., *IEEE Transactions on Professional Communication*, vol. 51, no. 3, pp. 242-263, 2008). This course teaches professional communication for engineers. Professional communication is the practice of conveying technical information to clients and stakeholders who vary in levels of engineering knowledge. In this class students learn how to research, organize, and present technical information in professionally written documents, work in collaboration with other professionals, and use various technologies to support their communication efforts.

This course is designed to help students master a variety of communication strategies and genres of writing relevant to engineering, including everyday acts of communication, such as emails and memos, to documents common in the fields of engineering, including failure analyses, research reports, and proposals, and progress reports.

Students analyze writing situations in the professional engineering workplace and develop strategies for addressing audiences, organizing information, using appropriate style, and presenting the work. The objective of this class is to learn to respond in writing to complex rhetorical situations, preparing students for the professional communities they will join.

### COURSE FORMAT DESCRIPTION

This is an in-person course with flexibility for some online synchronous instruction pending circumstances dictated by the University. What this means is that the course will meet in person on the days and periods designated by the Registrar for this section. All sessions will be conducted in person, as long as health safety allows. If a COVID-related illness compromises in person sessions, this course will continue to meet via Zoom for synchronous sessions. Students are required to attend and participate fully in all online sessions.

As an in-person course with *possible* online components, this course adheres to the UF Student Computing Requirements: <https://it.ufl.edu/policies/student-computing-requirements/>. During synchronous sessions, headphones with a microphone are strongly recommended. Synchronous

sessions will require that you access Zoom or Microsoft Teams using your UF Gatorlink account, since only authenticated users may join to ensure privacy.

#### **For synchronous courses using a communication platform (EX: Zoom, Teams)**

- Per CLAS policy, using Canvas is required in this class.
- The UWP adheres to the [UF Student Computing Requirements](#).
  - If you're in a noisy or distracting environment, we strongly recommend headphones with a microphone for synchronous classes.
  - All students should have access to a web cam of some kind.
- Synchronous classes will require that you access Zoom using your UF Gatorlink account.

**Some portions of this course may be recorded.** The instructor will announce when a recording is taking place. Students who keep a camera on and display a profile image are consenting to have these recorded as part of the session. Likewise, students who participate orally are consenting to have their voices recorded. If a student does not consent to being recorded, then the student should turn off the camera and microphone. The chat feature may be used for class activities. Chat content may be recorded but will only be shared with consent. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited. Students should inform instructors of accessibility or technology assistance before the course begins.

### **OUTCOMES**

In ENC 3246, students will learn to

- plan, draft, revise, and edit documents for use in professional settings
- adapt writing to different audiences, purposes, and contexts
- synthesize and report on the professional and technical literature in the field
- write in a clear, coherent, and direct style appropriate for engineering communication
- understand and employ common documents in engineering writing, including proposals, failure analyses technical descriptions, research reports, and professional correspondence
- avoid plagiarism
- search, evaluate, and cite primary and secondary sources
- format documents in IEEE, the formatting style used in engineering communication

### **REQUIRED TEXTS**

- M. Alley, *The Craft of Scientific Writing*, 4<sup>th</sup> ed. University Park, PA, Penn State University: 2018.

You may use an ebook or hard copy. The textbook can be purchased or rented from the UF Bookstore: <http://www.ufl.bkstr.com>. The textbook can also be purchased anywhere online. Students must have the textbook on or before the first day whereon a reading is due.

### **REQUIRED TECHNOLOGY**

In addition to the UF Online student computer requirements, this course requires you to have access to a webcam and microphone, or a smart device which can record video with audio. You will use your webcam and microphone to record your Elevator Speech.

## MAJOR ASSIGNMENTS AND GROUP PROJECTS

The assignments below include two group projects. For the group projects, planning and research will be collaborative, while the written work must be completed independently by each student.

### **Job Application Packet** (100 points, 400 words)

In this multi-part assignment, students will first identify an internship or job they hope to secure. Next, students will research the field, construct a profile for the ideal candidate for this position, followed by an analysis of their own qualifications. Then, students will write a letter of application and a résumé for this particular position. The elevator pitch teaches students to market themselves at conferences and career showcases.

### **Failure Analysis Project** (100 points, 1400 words)

In this two-part paper, students will write about cases and modes of failures, analysis methods, and industry standards in their field of engineering. Students will also write a detailed description of an engineering failure (similar to a case study) in their field which will include the context of the failure, an analysis of the failure, and recommendations for practice based on the failure. Preparation for this work includes learning about academic and trade publication in their field of engineering and document design conventions.

### **Group Project 1: Research Report Project** (145 points, 1200 words)

Derived from the scientific method, the research report is the most common type of report written in the field and in academia. It is the form taken by lab reports and other documents that are based on original data collected by the researcher or research team. Working in a small group, students will establish a research question, devise a method of gathering original data, and collect the data. Individually, students will write a research report that presents and analyzes the data collected as a group.

### **Group Project 2: Proposal** (215 points, 3000 words)

The capstone project will be a proposal for an actual engineering grant (like an undergraduate NSF grant) to fund an engineering solution. The proposal will seek to persuade a target audience that a significant problem exists and offer a feasible solution. Drawing on all of the skills developed over the semester, students will analyze the rhetorical situation and employ communication strategies designed to persuade the audience to act on the plan. This project will also include a prospectus and a progress report.

#### **Prospectus** (40 points, words count toward Proposal total)

This is a brief report to the project supervisor emphasizing the problem statement driving the proposal, a possible feasible solution, and a tentative schedule for completion.

#### **Progress Report** (40 points, words count toward Proposal total)

*Students will write a progress report on proposal work. This will track activities, problems, and progress for both the individual's tasks, and the group's overall task. The focus will be on schedules, setbacks, problems solved, and the dates and stages of the progress.*

**Technical Plan** (40 points, words count toward Proposal total)

The Technical Plan is the core of the Proposal. It is the section wherein your team presents your solution in a series of steps. The Technical Plan describes each stage or aspect of implementation with proper context. Considerations for the Technical Plan may include - but are not limited to - categories such as: materials, design, location, conditions (environmental, social, physical), anticipated impediments or challenges, and maintenance.

## Scaffolding assignments and in-class activities

### **Memos, Discussion board posts, digital content** (320 points total, words count toward Major Writing Assignments)

These lower-stakes assignments enable students to practice drafting and build writing and collaborative skills. Students receive feedback on their drafting in order to improve their writing and produce content for the Major Writing Assignments.

## General Education and Learning Outcomes

Composition Credit: Students must pass this course with a “C” or better to satisfy the CLAS requirement for Composition (C). To earn general education Composition credit, students will

- Demonstrate forms of effective writing (focusing on analyses, arguments, and proposals);
- Learn different writing styles, approaches, and formats and successfully adapt writing to different audiences, purposes, and contexts; effectively revise and edit their own writing and the writing of others;
- Organize complex arguments in writing, using thesis statements, claims, and evidence;
- Employ logic in arguments and analyze their own writing and the writing of others for errors in logic;
- Write clearly and concisely consistent with the conventions of standard written English;
- Use thesis sentences, claims, evidence, and logic in arguments.

University Writing Requirement: The University Writing Requirement (WR) ensures students both maintain their fluency in writing and use writing as a tool to facilitate learning. Course grades now have two components. To receive University Writing Requirement (WR) credit (E6), a student must earn a course grade of C or higher **and** assignments must meet minimum word requirements totaling at least 6000 words. Thus, to earn WR-E6 credit, **students must complete all the major writing assignments.**

## Grading

Grading for this course will be rigorous. Do not rely on the instructor for copy-editing, even on drafts. To receive a passing grade, each paper must reach the minimum assigned word count.

Assignments descriptions, point values, and word counts will be provided in Canvas.

**NOTE: An instructor may modify the point value of an assignment, or modify minor assignments or required elements.**

## SUBMITTING ASSIGNMENTS

**All major writing assignments are due on the date and time indicated on Canvas.** It is your responsibility to make sure you submit your work by this deadline. You may find it helpful to use a [Time Zone Converter](#) to Eastern Standard Time when coordinating times to meet deadlines.

### REVISION OF ASSIGNMENTS OR EXTRA CREDIT ASSIGNMENTS

During the course of the semester, the instructor **MAY** open up the option to rewrite **one** individual Major Writing Assignment (pending total class performance); your new grade will replace the previous one. Revisions must be exhaustive; that is, ALL changes recommended by the writing coach/instructor must be made or no new score will be given. Revisions are due by the last day of class, and are submitted to the “Revisions” assignment tab in Canvas.

The instructor **MAY** open up one or more optional, small extra credit assignments. Students will be notified if extra credit will be made available.

### SCHEDULE OF ASSIGNMENTS

**All of the information about when assignments, activities, discussion, quizzes, and peer reviews are due is available through Canvas. See the “Syllabus” and “Calendar” links for due dates.**

#### Grading Scale

|    |      |        |          |    |      |       |         |
|----|------|--------|----------|----|------|-------|---------|
| A  | 4.0  | 94-100 | 940-1000 | C  | 2.0  | 73-76 | 730-769 |
| A- | 3.67 | 90-93  | 900-939  | C- | 1.67 | 70-72 | 700-729 |
| B+ | 3.33 | 87-89  | 870-899  | D+ | 1.33 | 67-69 | 670-699 |
| B  | 3.0  | 83-86  | 830-869  | D  | 1.0  | 63-66 | 630-669 |
| B- | 2.67 | 80-82  | 800-829  | D- | 0.67 | 60-62 | 600-629 |
| C+ | 2.33 | 77-79  | 770-799  | E  | 0.00 | 0-59  | 0-599   |

NOTE: It is UWP policy NOT to round grades in any direction. 89.9 is a B+. 92.8 is an A-, etc.

At the discretion of the instructor, minor assignments (homework and class activities) may be dropped from or added to the schedule. If assignments are dropped, the final grade will be calculated as a percentage of the remaining points.

**NOTE: Extra credit opportunities may be opened only at the discretion of the instructor. A published extra credit assignment is only open for submission if an instructor declares that it is open for submission.**

#### **Assignment Submissions:**

Most assignments will be submitted via Canvas. **Submitting assignment requires that students upload their correct document by the deadline, ensure that the assignment uploads properly, and that the file opens and is viewable for the instructor.** Doing so is required for each assignment, and **an assignment is not complete if the student does not follow these uploading requirements.**

### Course Policies and Procedures

Attendance is required. The policy of the University Writing Program is that if students miss more than six periods during the term, they will fail the entire course. Double periods count as two absences. The UWP exempts from this policy only those absences due to university-sponsored events, such as athletics and band, religious holidays, quarantine, illness, or serious family emergencies. For absences due to quarantine or illness, your instructor may require a signed doctor's note or confirmation from UF Screen, Test, & Protect. Students are responsible for updating their UF-required Screen, Test, & Protect status.

Absences due to university-sponsored events must be discussed with the instructor prior to the date that will be missed. Requirements for class attendance and make-up exams, assignments, and other work in this class are consistent with university policies that can be found at <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Please note: If students are absent, it is their responsibility to make themselves aware of all due dates. If absent due to a scheduled event, students are still responsible for turning assignments in on time.

Since this class is based on active learning, any fewer number of absences, excused or unexcused, will affect your grade because of missed workshops or activities that are graded. Repeated tardiness will also hurt your grade. Entering into a class after the instructors has begun teaching, or more than 15 minutes after class starts, will count as an absence.

Since so much of professional writing is collaborative, participation is a crucial part of the class. Students are expected to work with their peers in a professional manner designed to support the success of the groups.

### ***Attendance and Participation in the Online Context***

Attendance and participation will be recorded and evaluated in any online sessions for this course. During online sessions, attendance and active engagement are required. Students should use the video, audio, and chat functions as required or requested by the instructor. If a student does not have audio, video, or chat capabilities in any session, the student should contact the instructor to discuss methods of documenting attendance and participation. During asynchronous sessions, students are required to fulfill all activities according to the instructor's guidelines and stated timeframe. Students can be marked absent or docked for participation points if the analytics provided by the communication platform confirms absence or inactivity during synchronous sessions.

If a student is absent during a synchronous session, it is their responsibility to contact the instructor to provide documentation and to obtain missed course materials.

### ***Illness Policy***

Students who feel ill should remain at home, notify the instructor as soon as possible, and follow instructions from [Screen Test Protect](#). Submitting medical documentation of illness is strongly encouraged but not mandatory. Students can return to in-person classes after being cleared.

Students must comply with any CDC guidelines for mask wearing and social distancing which are issued by the University, in order to ensure classroom safety.

### ***Academic Honesty***

As a University of Florida student, your performance is governed by the UF Student Honor Code, <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>. The Honor Code requires Florida students to neither give nor receive unauthorized aid in completing all assignments. Violations include cheating, plagiarism, bribery, and misrepresentation, all defined in detail at the above site.

### ***Plagiarism***

Plagiarism is a serious violation of the Student Honor Code. UF's full Honor Code (with additional codes than the ones listed here, are here: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>). The Honor Code prohibits and defines plagiarism as follows:

A Student must not represent as the Student's own work all or any portion of the work of another. Plagiarism includes but is not limited to:

1. Stealing, misquoting, insufficiently paraphrasing, or patch-writing.
2. Self-plagiarism, which is the reuse of the Student's own submitted work, or the simultaneous
3. Submission of the Student's own work, without the full and clear acknowledgment and permission of the Faculty to whom it is submitted.
4. Submitting materials from any source without proper attribution
5. Submitting a document, assignment, or material that, in whole or in part, is identical or substantially identical to a document or assignment the Student did not author.

**Part of the submission requirements for each assignment is to upload the proper version of the assignment, ensure that it opens properly and is completely viewable, and to check the Turn It In score. This score should be as low as possible.**

### ***Submission of Academic Work Purchased or Obtained from an Outside Source***

A Student must not submit as their own work any academic work in any form that the Student purchased or otherwise obtained from an outside source, including but not limited to: academic materials in any form prepared by a commercial or individual vendor of academic materials; a collection of research papers, tests, or academic materials maintained by a Student Organization or other entity or person, or any other sources of academic work.

University of Florida students are responsible for reading, understanding, and abiding by the entire [Student Honor Code](#). The University Writing Program takes plagiarism very seriously, and treats instances of plagiarism as dishonesty and as a failure to comply with the scholarly requirements of this course. Students commit plagiarism when they present the ideas or words of someone else as their own.

Using an assignment or part of an assignment from any other class or another student is considered plagiarism (your assignments will be run through anti-plagiarism sites).

***Important tip:*** Never copy and paste something from the Internet without providing the exact location and citation information for the source.

If a student plagiarizes all or any part of any assignment, he or she may receive a failing grade on the assignment. Additionally, instructors may impose a course grade penalty and report any incident of academic dishonesty to the Office of the Dean of Students. Each student's work may be tested for its originality against a wide variety of databases by anti-plagiarism sites to which the University subscribes, and negative reports from such sites may constitute proof of plagiarism. Other forms of academic dishonesty will also result in a failing grade on the assignment as a minimum penalty. Examples include cheating on a quiz or citing phony sources or quotations.

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**Important tip:** There should never be a time when you copy and paste something from the Internet and don't provide the exact location and citation information for the source.

If a student plagiarizes all or any part of any assignment, he or she will be awarded a failing grade on the assignment. Additionally, instructors may impose a course grade penalty and report any incident of academic dishonesty to the Office of the Dean of Students. Each student's work may be tested for its originality against a wide variety of databases by anti-plagiarism sites to which the University subscribes, and negative reports from such sites may constitute proof of plagiarism. Other forms of academic dishonesty will also result in a failing grade on the assignment as a minimum penalty. Examples include cheating on a quiz or citing phony sources or quotations.

## General Education and Learning Outcomes

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- Demonstrate forms of effective writing (focusing on analyses, arguments, and proposals);
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The instructor will evaluate and provide feedback on the student's written assignments with respect to



content, organization and coherence, argument and support, style, clarity, grammar, punctuation, and mechanics. Conferring credit for the University Writing Requirement, this course requires that papers conform to the following assessment rubric. More specific rubrics and guidelines applicable to individual assignments may be delivered during the course of the semester.

### ***Classroom Conduct***

Much of this class is discussion-based, so it is vital that we show respect for each other's views. During synchronous sessions, students are required to be attentive and be mindful of mitigating background noise and unnecessary interferences during synchronous sessions. Students should refrain from using their computers for anything other than the course's work during sessions; failure to do so can result in deducted participation or attendance points. During asynchronous sessions and when communicating with the instructor and classmates, students should be clear, courteous, and timely.

### **Assessment Rubric**

|                            | SATISFACTORY (Y)   | UNSATISFACTORY (N)  |
|----------------------------|--|---|
| CONTENT                    | Papers exhibit evidence of ideas that respond to the topic with complexity, critically evaluating and synthesizing sources, and provide an adequate discussion with basic understanding of sources.  | Papers either include a central idea(s) that is unclear or off-topic or provide only minimal or inadequate discussion of ideas. Papers may also lack sufficient or appropriate sources.                     |
| ORGANIZATION AND COHERENCE | Documents and paragraphs exhibit identifiable structure for topics, including a clear thesis statement and topic sentences.  | Documents and paragraphs lack clearly identifiable organization, may lack any coherent sense of logic in associating and organizing ideas, and may also lack transitions and coherence to guide the reader. |
| ARGUMENT AND SUPPORT       | Documents use persuasive and confident presentation of ideas, strongly supported with evidence. At the weak end of the satisfactory range, documents may provide only generalized discussion of ideas or may provide adequate discussion but rely on weak support for arguments. | Documents make only weak generalizations, providing little or no support, as in summaries or narratives that fail to provide critical analysis.   |

|           |  |  |
|-----------|--|--|
| STYLE     | Documents use a writing style with word choice appropriate to the context, genre, and discipline. Sentences should display complexity and logical structure.   | Documents rely on word usage that is inappropriate for the context, genre, or discipline. Sentences may be overly long or short with awkward construction. Documents may also use words incorrectly. |
| MECHANICS | Papers will feature correct or error-free presentation of ideas. At the weak end of the satisfactory range, papers may contain a few spelling, punctuation, or grammatical errors that remain unobtrusive and do not obscure the paper's argument or points. | Papers contain so many mechanical or grammatical errors that they impede the reader's understanding or severely undermine the writer's credibility.  |

### ***Due Dates, Make-up Policy, and In-Class Work***

Papers and drafts are due at the beginning of class or online at the assigned deadline. Late papers may not be accepted or receive a zero score. Failure of technology is not an excuse. If illness or injury prevents a student from turning in a paper on time, the student should consult with the instructor to turn in the work as soon as is feasible given the situation, and provide documentation when possible. Extensions, make-up work, and rewriting options are only given at the instructor's discretion.

### ***Readings***

Reading assignments typically appear in the syllabus on the day they are due. Students should have completed these readings **before** coming to class that day.

### ***Lecture and Reading Quizzes***

This course has assigned quizzes, and additional quizzes on the readings may be given randomly during the semester. Quizzes cannot be made up, and students are only excused from a quiz with a doctor's note on letterhead or written verification of participation in a university-sponsored event for the day missed.

### ***Conferences and Writing Studio***

Students are encouraged to use the instructor's office hours if there are questions about progress in the course, work underway, or any other course-related concerns. If there is a conflict with the posted office hours, please contact the instructor to schedule a better time. Having conferences on assignments is often the best way to improve the quality of final drafts. The [Writing Studio](#) also offers one-on-one assistance on writing projects and is available to students of all levels.

### ***Evaluations***

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be

notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

### ***Students with Disabilities***

The University of Florida complies with the Americans with Disabilities Act. Students requesting classroom accommodation must first register with the Dean of Students Office. Students must ensure that their Disabilities Resource Center (DRC) Accommodations Letter is submitted to their instructor ON or BEFORE the semester begins. The DRC website is here: <https://disability.ufl.edu>. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.

Readings are due by the session whereon they appear on the syllabus. This schedule and course content are subject to change.

### ***Week 1 – Professional Profile and Engineering Audiences***

#### ***Session 1-2***

- Learning objective: Course orientation; Professional profile
- Course Introduction -- Syllabus: Goals, policies, assignments, textbooks and readings, and course organization
- Introduce: Professional Bio
- Read:
  - CSW: Sec. 9, An effective email is a balance between *I* and *you*
  - How Engineers can Improve Technical Writing
  - Netiquette: Key factors in writing emails

### ***Week 2 – Career Advancement***

#### ***Session 1***

- Learning objective:
  - Professional profile and audiences for engineering/documents
  - Features of professional correspondence
- Introduce:
  - Major Assignment: Job Application Materials
- Lecture: "Looking for an Internship"
- Activity
  - Reading and Writing for the Job Ad
  - Avoiding plagiarism / plagiarism quiz
- Read - CSW: Sec. 1, Analyzing the Audience, Purpose, and Occasion (covers knowing whom you're writing for, to tailor your document)

Additional Readings:

- Listed in module

### **Session 2**

- Activity:
  - Reader-Centered Communication in Job Applications
  - Student Samples - Resumes and Cover Letters

### ***Week 3 – Career Advancement***

#### **Session 1**

- Learning objective:
  - Professional profile and audiences for engineering/documents
  - Features of professional correspondence
- Introduce: The Elevator Pitch
- Lectures:
  - Elevator Pitch
  - Cover Letter
  - Resumes
  - Writing the Application

#### **Session 2**

- Activity: Peer Review - Job App Portfolio

**Important due dates: Job App Portfolio should be complete by end of Week 3**

### ***Week 4-5 – Analyzing document design; Scholarly and Trade literature***

#### **Session 1**

- Learning objective: Analyzing document design
- Assignment: Analyzing Publications in Your Field – Document Design
- Activity:
  - Document Design: Academic Journal
  - Document Design: Trade Journal
  - Graphics Analysis: Academic vs Trade
- Read: *CSW*: Sec. 7, Organizing the Content for the Audience (covers organization for technical documents)

#### **Session 2**

- Learning objective: Identifying credible sources in your field of engineering
- Assignment: Scholarly Versus Trade Sources – Comparing Two Types of Sources
- Activity:
  - Evaluating scholarly journals and trade publications in your field

- Evaluating how sources discuss an engineering solution in your field – a prelude to citing sources in your own documents
- IEEE Citation style: Document formatting style, in-text citations and wording, composing a References page
- Read: Appendix D, "Format: Dressing Documents for Success" (covers general formatting - not IEEE style)

**Important due dates: Document Design Analysis due at end of Week 4 or beginning of Week 5**

### ***Week 5 – Citing and synthesizing credible sources in engineering***

#### ***Session 1***

- Learning objective: Citing and synthesizing credible sources in engineering
- Quiz:
  - Scholarly Documents Quiz
- Activity:
  - Synthesizing Sources in Your Field
- Read: CSW: Sec. 2, Balancing Precision with Clarity (covers wording and clarity in technical writing)

#### ***Session 2***

- Activity: Summarizing the latest research on an engineering solution in your field – citing and synthesizing scholarly and trade publications

### ***Week 6 – Failure Analysis***

#### ***Session 1***

- Learning objective – Understanding failure analysis: cases, modes/types of failure, methods of testing, industry standards
- Assignment: The Failure Analysis Paper
- Lectures:
  - Writing Part 1 of the Failure Analysis
- Read: CSW:
  - Sec. 6, Beginning with the Familiar (covers structuring a document and defining technical terms)
  - Failure Analysis Subject Guide

#### ***Session 2***

- FA Paper Part 1 walkthrough
- Assignment: Analyzing an everyday failure
- Activity: Analyzing an everyday failure
- Read: Failure Analysis and Materials Testing – A Subject Guide

**Week 7 -Failure Analysis****Session 1**

- Lecture:
  - Writing Part 2 of the Failure Analysis Paper
  - How to locate, cite, and word standards
- Assignment:
  - Methods and Types of Testing
  - Making Recommendations in the FA Paper
- Activity:
  - Sample FA Papers

**Session 2**

- Introduce: Planning Email 4: FA Case Study and Analysis (for Part 2)
- Assignment: Planning the FA paper
- Activity:
  - Locating sources for the FA Paper: using journals that publish Failure Analyses / Case Reports of Failure
  - In-class drafting and peer review of FA Paper

**Important due dates: Failure Analysis Paper due at end of Week 7 or beginning Week 8**

**Week 8 – The Research Report****Session 1**

- Learning objective: Learn the IMRD format for engineering research
- Introduce: The Research Report (gathering data for a solution to an engineering problem)
- Lecture: Preparing to write the Research Report
- Activity:
  - Parts of a Research Report / Sample Research Report in Engineering
  - Form teams and choose topic
  - Brainstorm with Group on Research Project
- Read:
  - CSW: Sec. 7, Organizing the Content for the Audience (covers organization for technical documents)
  - Sec. 5, Connecting Your Ideas (covers sentence coherency, graphs, illustrating)
  - Driscoll: Introduction to Primary Research: Observations, Surveys, and Interviews

**Session 2**

- Assignment: Pitching the Proposal Topic and Research Report
- Activity:
  - Research questions, hypotheses, and problem statements – when and how to write each
  - Establishing Problem Statements

**Week 9 – Intro and Methods for the Research Report****Session 1**

- Learning objective: writing parts of the Introduction; Methods of data collection – surveys, direct observation, datasets
- Assignment: Investigation Type and Methods Statement
- Lecture: Methods and Results Sections
- Activity:
  - Writing and distributing surveys / Using Qualtrics
  - Research Report - Intro parts:
    - Topic
    - Problem / Gap statement
    - Literature review
    - RQ / hypothesis

**Session 2**

- Assignment: Gathering Sources
- Activity:
  - Writing Introductions and Methods sections
  - Sample student papers
- Read:
  - How to write a research journal article
  - Writing research reports in engineering

**Week 10 – Results and Discussion for the Research Report****Session 1**

- Learning objective: writing the Results and Discussion sections
- Lecture: Introductions and Conclusions
- Activity:
  - Results – creating and including visuals
  - Discussions – the return of secondary sources
  - Sample student papers

**Session 2**

- Activity: Peer Review – Research Report drafts

**Week 11 – Team conferences on Research Report OR More prep work****Session 1**

- Activity: Conferences / Outcomes and Analysis
- Peer review

**Session 2**

- Activity: Conferences / Outcomes and Analysis
- Peer review

**Important due dates: Research Report due at end of Week 11 or beginning of Week 12**

### ***Week 12 – The Proposal Project***

#### **Session 1**

- Learning objective: Understanding the Proposal / RFPs; Prospectus
- Assignment: The Proposal Project
- Lecture:
  - Understanding Proposals and RFPs
- Activity:
  - Topics that meet CFPs – feasibility of locality, scope, budget
  - Sample student Proposals – the sections of this document
  - Getting to know your team / pitching Proposal ideas
- Read: CSW: Sec. 9.3, A proposal is an argument for how to solve a problem (covers Proposal writing)

#### **Session 2**

- Assignment: The Proposal Prospectus
- Activity:
  - Sample Proposal Prospectuses
  - Team Work on Prospectuses
  - Audience analysis exercises for Proposals

### ***Week 13 – The Proposal Project***

#### **Session 1**

- Assignment: The Progress Report
- Lecture: Writing Progress Reports
- Activity:
  - Sample Progress Reports
- Read: I wrote the book on user-friendly design – what I see today horrifies me

#### **Session 2**

- Peer review: Prospectuses

### ***Week 14 – The Proposal Project***

#### **Session 1**

- Assignment: Technical Plan
- Lecture: Technical Plan, Budget and Schedule, Evaluation Plan



**Session 2**

- Activity: Drafting the Technical Plan

***Week 15 – Team conferences on Proposal Project***

**Session 1**

- Assignment: Evaluation Plan
- Lecture: Writing Letter of Transmittal, Executive Summary, Assembling the whole Proposal

**Session 2**

- Activity: Proposal presentation guidelines

***Week 16 – Team Proposal Presentations***

- Presentations – OPTIONAL

**Important due dates: Proposal Project due**