ENGINEERING FOUNDATIONS
Fall 2021

Meeting Space: Trexler 362

Time: Section A: M-W 2:20 pm – 3:50 pm
Section B: T-Th 1:10 pm – 2:40 pm

Instructor: Dana Hargrove
Email: dhargrove@roanoke.edu
Office Location: Trexler 270J
Office Hours: 12:30 pm – 2:00 pm W

Required Materials:

- Laptop/computer with Microsoft Office products
- Engineering Graph Paper
- Mechanical pencils
- Architect Scale

Instructional aspirations:

The goal of this course is to provide students with an introduction to the engineering profession, ethics and professional responsibility, engineering problem-solving, computing tools, technical writing skills, definition/identification/modeling of an engineering problem/system, teamwork, and professional communication. This introduction can be beneficial for all students as the 21st century STEM workplace demands include most of these traits/skills.

Expected learning outcomes: Successful students will be able to –

1. Compare and contrast the contributions of different types of engineers in the development of a product, process, or system.
2. Identify characteristics of a successful practicing engineer.
3. Identify and articulate holistic issues that impact engineering solutions, including social, global, environmental, economic, and ethical impacts of the solution.
4. Communicate engineering solutions clearly to diverse audiences.
5. Communicate effectively as a team member.

Attendance: Attendance will be taken at the beginning of every class meeting. If you arrive late it is your responsibility to make sure you are not marked absent in my grade book. Your fourth and each additional absence will result in a 2-point reduction in your final course grade. Please do not contact me with excuses about absences. You get three freebies so that I do not have to distinguish between excused and unexcused absences. College athletes will be afforded wiggle room; please come see me immediately if you are an athlete. If you should have an emergency that requires you to miss a large chunk of the course, please notify me ASAP.

Masks: The College has issued a mask mandate for the start of the semester that requires masks to be worn in indoor common spaces such as our classroom. You must wear a mask in this class. If you arrive without a mask, you will not be allowed to stay and may lose credit for attendance or in-class work. The Bookstore sells masks if you need to make a quick purchase. If the mandate is extended, you will be required to continue to wear a mask.

COVID Illness: If you have a temperature of 100.4 or higher or other COVID symptoms, don't come to class. Call Health Services IMMEDIATELY. Do not come to class or go to any public area on campus. In order for your absence to be excused, you must give Health Services permission to notify me that you have consulted them about COVID symptoms. If Health Services informs you that you should isolate and not attend class for multiple days, inform me so that we can make a plan to keep you current in the course. All absences caused by consultation with Health Services about coronavirus symptoms or isolation ordered by Health Services will be excused but you will need to do the work and graded assignments even if we extend a deadline for you.

Academic Integrity: Policies of academic integrity are enforced in all aspects of this course. It is the responsibility of the student to strictly adhere to the policies of Academic Integrity of Roanoke College.

Plagiarism and cheating are **unacceptable** and also violate RC policies. Being aware of others' such violations and not reporting it is also considered a contributing aspect of cheating.

"Academic Integrity" page on the RC website–
https://www.roanoke.edu/inside/a-z_index/academic_affairs/academic_integrity
Included in this page is an explanation of how violations of the College's academic integrity policy are handled.

GRADING:

Grades: Standard letter grades (A–F) are assigned according to the following scale for this course:
"A"(91–100), "B"(81–90), "C"(71 - 80), "D" (60–70), "F"(< 60).

Grades will be weighted according to the following percentages:

20% Team Project 1
20% Team Project 2
20% In-Class Assignments
10% Participation (MCSP Colloquium Series)
30% Team Project Final

LATE WORK POLICY
There will be a 10% deduction for late work after one day. Work turned in after one day will receive a maximum of 50% for your late work that has been turned in, and after one week you will not be able to receive any credit for that work, as it will receive zero points.
For a medical or other emergency, I will need timely notice via email and a face-to-face discussion (after the situation is handled) with corroboratory evidence provided by you.

The Writing Center @ Roanoke College, located on the Lower Level of Fintel Library (Room 15), offers free tutorials focused on writing projects and oral presentations for students working in any field. Writers and presenters at all levels of competence may visit the Writing Center at any point in their process—including brainstorming, drafting, organizing, editing, or polishing presentation skills—to talk with trained peer tutors in informal, one-on-one sessions. The Writing Center is open Sunday through Thursday from 4 to 9 PM. Simply stop in, or schedule an appointment at www.roanoke.edu/writingcenter. Questions? Email writingcenter@roanoke.edu or call 540-375-4949.

MCSP Colloquium Series: You are encouraged to attend at least 1 of the several talks as a part of the MCSP colloquia this semester. After attending, write a paper on your reflections of the talk to get full credit (1/2 page). The reflection papers are due within one week of the talk. MCSP credits will be factored in while determining the final grade. This particularly helps students who are on the cusp of a letter grade.

I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.

COURSE OUTLINE/SCHEDULE–*This schedule is subject to change.*

1st unit – ENGINEERING PROFESSIONALISM & ETHICS

Dates	Week	Topic
September	1	Introduction
	2	Engineering Design
	3	Communication Pathways
	4	Engineering Ethics and Innovation – ***Meet in Fintel Library***
	5	Team Project #1 Presentations

Team Project 1: Select an innovation of interest to your group. Write a Request for Proposal (RFP) to solicit the work selected from a *Client* perspective. Then, switching to the *Consultant* perspective, reverse engineer the process used in the innovation to satisfy the RFP. The group's task is to form an interview team and develop a PowerPoint presentation that identifies the various contributing disciplines, legal and ethical considerations involved, social/global/environmental/economic impact of the innovation, and future developments possible to win the work. Each group must deliver the presentation in a timed environment. Rubric to follow.

2nd Unit – ENGINEERING PRACTICE

Dates	Week	Topic
September	5 (cont.)	Reading Engineering Drawings
October	6	Engineering Drawing
	7	
	8	Fall Break
	9	Project Timeline and Budget
November	10	Team Project #2 Presentations

Team Project 2: Design and pitch a new Lego piece to be included in the Lego Collection. You must draw a dimensionally correct product, create a project timeline and budget in excel, and justify the expense to the Lego Creative Team. Each group must provide a one page summary of their creation and present the idea in a timed environment. Rubric to follow.

3rd Unit – ENGINEERING PROBLEM SOLVING

Dates	Week	Topic
November	10 (cont.)	Research and Design
	11	Project Identification
	12	Project Idea Draft Due
	13	In-Class Project Time
		Thanksgiving Break, No Class 11/22A and 11/23B
	14	Project: Presentation and Handout Review
December	15	Project: Final In-Class Time to Work on Projects and Review with Instructor

Team Project Final: Students will prepare a **proposal to seek funding for R&D** to create a market ready product or process. The proposal will be comprised of the following:

1. Report – structured as a business plan including the entirety of the Design Process.
2. "Shark Tank" Presentation – a PowerPoint presentation with any demonstrable prototypes, if desired, to gain buy-in.
3. Handout (11x17) – Commonly in industry a "placemat" or "brochure" is handed out with succinctly summarizes information covered in the presentation that attendees can take-away.

ENGS 191A - Final Exam: Block 7A – Tuesday, December 14th from 2:00pm – 5:00pm
ENGS 191B - Final Exam: Block 11 – Monday, December 13th from 2:00pm – 5:00pm