LIBERTY UNIVERSITY

Online · School of Engineering · Engineering

Introduction to Engineering I

ENGR-105

CG   Section 8WK   07/01/2018 to 12/31/2199   Modified 04/08/2022

🖥 Course Description

This course will introduce students to the engineering profession, the entrepreneurial mindset, and the study skills necessary to succeed in the rigorous course of study to achieve an engineering degree. The course introduces fundamental engineering concepts, including spreadsheets, dimensions and units, engineering communication, engineering ethics and the engineering design process. This is a required course for online engineering majors and also serves non-engineering students by exposing them to an overview of the engineering discipline.

Requisites

For information regarding prerequisites for this course, please refer to the [Academic Course Catalog (https://catalog.liberty.edu/)](https://catalog.liberty.edu/).

◎ Rationale

The degree programs at Liberty University are designed to develop Christ-centered men and women with the values, knowledge, and skills essential to positively influence their chosen profession in the current and evolving world. These programs prepare graduates for the thoughtful integration of work and life and to view their profession as a lifelong commitment to serving others. Within a few years of graduating, graduates will be able to advance in their professional career or graduate studies, be recognized as critical and creative thinkers exhibiting an aptitude for continuous learning, and display professional ethics and behavior consistent with foundational Christian principles. To that end, the objective of this course is to introduce students to the engineering professions and prepare them for success in achieving a degree in one of those fields.

📊 Course Learning Outcomes

Upon completion of this course the student will be able to:

A. Clearly articulate what an engineer is and what inspires them to pursue this profession (SOs: 1, 3, 4, 5, & 7).
B. Apply an entrepreneurial mindset that considers curiosity, connections, and creating value (SOs: 2, 3, 4, 5, & 7).
C. Put into practice positive academic strategies/productive behaviors necessary for academic success (SOs: 1, 2, 3, 4, 5, & 7)
D. Clearly articulate how their personalities and learning styles influences their educational experience and their participation as members of teams (SOs: 1, 3, 4, & 7).
E. Demonstrate the importance of cultivating intellectual dispositions that are essential to excellence of thought and sound engineering reasoning (SOs: 1, 2, 3, 4, 5, & 7).
F. Apply a Christian Worldview to engineering challenges in group exercises and team projects (SOs: 3, 4, 5, & 7).

Relation to Student Outcomes

SO	Outcome Description	Level	Demonstrate Proficiency
1	Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	I	Reading Assessments, Problem Sets

2	Ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	I	New Product Proposal Project
3	Ability to communicate effectively with a range of audiences	E	Discussion Boards, Case Studies, Design Your Own Plan Project, New Product Proposal Project
4	Ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	E	Reading Assessments, Problem Sets Discussion Boards, Case Studies, Design Your Own Plan Project, New Product Proposal Project
5	Ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	R	New Product Proposal Project
6	Ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	N	
7	Ability to acquire and apply new knowledge as needed, using appropriate learning strategies	E	Reading Assessments, Problem Sets Discussion Boards, Case Studies, Design Your Own Plan Project, New Product Proposal Project
	N = none; I = Introduced; R = Reinforced; E = Emphasized		

📘 Course Resources

Click on the following link to view the required resource(s) for the term in which you are registered: Liberty University Online Bookstore (https://bncvirtual.com/liberty)

Additional Materials for Learning

A. Computer with basic audio/video equipment
B. Internet access (broadband recommended)
C. Canvas recommended browsers (https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Canvas/ta-p/66)
D. Microsoft Word

☰ Course Assignments

Course Requirements Checklist

After reading the Course Syllabus and Student Expectations, the student will complete the related checklist found in the Course Overview.

Discussions (7)

Discussions are collaborative learning experiences. Therefore, the student is required to create a thread in response to the provided prompt for each forum. Each thread must be at least 250 words, providing citations as appropriate. In addition to the thread, you are required to reply to the threads o fat least two classmates. Each reply must be at least 125 words.

Quizzes (Reading Assessments) (7)

These Reading Assessments measure the student's preparation for engaging new course material. These are conducted online prior to the module/week when the subject will be discussed and are administered in a Quiz format.

Problem Set Assignments (6)

Problem Sets (PS) measure the student's application of course material after the subject matter has been presented in class. These are conducted in WebAssign and require applied critical thinking as well as subject matter comprehension.

Case Study: Ethics Assignment

Case Studies (CS) also measure the student's application of course material, but in a reflective writing format. Case Studies will include integration of biblical worldview with an understanding of course concepts.

Project Assignments (2)

There will be two projects in this course, one individual project and one team project:

- **Individual Project: Design Your Own Plan (DYOP) Assignment:** The student will develop a personal plan that maps out their path to successfully complete their degree program. This project will include integration of biblical worldview to the maximum extent possible, as well as focus on the attitudes, habits, and behaviors necessary to become a master student and life-long learner. This project will be completed in stages, with four writing assignments and creation of a graduation plan in spreadsheet format.
- **Team Project: New Product Proposal (NPP) Assignment:** The student will participate in a team project that creates a proposal for developing a new product, implementing the engineering design process and an entrepreneurial mindset. This project will also be completed in stages, with the final deliverable in poster format during the final week of class.

✔ Course Grading

Course Requirements Checklist	10
Discussions (7 at 25 pts ea)	175
Quizzes (Reading Assessments) (1 at 10 pts, 6 at 15 pts ea)	100
Problem Set Assignments (6 at 25 pts ea)	150
Case Study: Ethics Assignment	75
Design Your Own Plan Project Assignments (5 parts at 50 pts ea)	250
New Product Development Project Assignments (5 parts at 50 pts ea)	250
Total	1010

✳ Course Policies

🏛 Policies

Late Assignment Policy

Course Assignments, including discussions, exams, and other graded assignments, should be submitted on time.

If the student is unable to complete an assignment on time, then he or she must contact the instructor immediately by email.

Assignments that are submitted after the due date without prior approval from the instructor will receive the following deductions:

1. Late assignments submitted within one week after the due date will receive up to a 10% deduction.
2. Assignments submitted more than one week and less than 2 weeks late will receive up to a 20% deduction.
3. Assignments submitted two weeks late or after the final date of the course will not be accepted outside of special circumstances (e.g. death in the family, significant personal health issues), which will be reviewed on a case-by-case basis by the instructor.
4. Group projects, including group discussion threads and/or replies, and assignments will not be accepted after the due date outside of special circumstances (e.g. death in the family, significant personal health issues), which will be reviewed on a case-by-case basis by the instructor.

Disability Assistance

Students with a disability and those with medical conditions associated with pregnancy may contact Liberty University's Online Office of Disability Accommodation Support (ODAS) at LUOODAS@liberty.edu for accommodations. Such accommodations require appropriate documentation of your condition.   For more information about ODAS and the accommodations process, including how to request an accommodation, please visit https://www.liberty.edu/online/online-disability-accommodation-support/ (https://www.liberty.edu/online/online-disability-accommodation-support/). Requests for accommodations not related to disabilities or pregnancy must be directed to the Registrar's Office, which generally handles medical needs support.

If you have a complaint related to disability discrimination or an accommodation that was not provided, you may contact ODAS or the Office of Equity and Compliance by phone at (434) 592-4999 or by email at equityandcompliance@liberty.edu. Click to see a full copy of Liberty's Discrimination, Harassment, and Sexual Misconduct Policy (https://www.liberty.edu/media/1226/Liberty_University_Discrimination_Harassment_and_Sexual_Misconduct_Policy.pdf) or the Student Disability Grievance Policy and Procedures (http://www.liberty.edu/media/8021/Disability_Grievance_Procedures.pdf).

Course Attendance

In an effort to comply with U.S. Department of Education policies, attendance is measured by physical class attendance or any submission of a required assignment within the enrollment dates of the course (such as examinations, written papers or projects, any discussion posts, etc.) or initiating any communication with one's professor regarding an academic subject. More information regarding the attendance policy (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FOnline%2BAttendance%2Band%2BNon-Attendance&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbaf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613719138&sdata=%2BNBTsPOoXuHAPLflSQRugK7cRSuV6UyC7qD3agf3l2k%3D&reserved=0) can be found in the Academic Course Catalogs (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.liberty.edu%2Findex.cfm%3FPID%3D791&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbaf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=DjjhMiRBhnF%2B2ZJUC8eBd1OdNb26S9ADukODYsilXlA%3D&reserved=0). Regular attendance in online courses is expected throughout the length of the term. Students who do not attend within the first week of a sub-term by submitting a required academic assignment (such as the Course Requirements Checklist, an examination, written paper or project, discussion post, or other academic activity) will be dropped from the course. Students who wish to re-engage in the course are encouraged to contact Academic Advising to discuss their enrollment options. Students who begin an online course, but at some point in the semester cease attending, and do not provide official notification to withdraw, will be assigned a grade of "FN" (Failure for Non-Attendance (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FUnofficial%2BWithdrawals&data=02%7C01%7Caccollins2%40liberty

). Students wishing to withdraw from courses after the official start date should familiarize themselves with the withdrawal policy.

Grading Scale

A	B	C	D	F
900-1010	800-899	700-799	600-699	0-599

For courses with a Pass/NP final grade, please refer to the Course Grading section of this syllabus for the assignment requirements and/or point value required to earn a Passing final grade.

Add/Drop Policy

The full policy statement and procedures are published in the Policy Directory (https://wiki.os.liberty.edu/display/IE/Dropping+and+Adding+Online+Classes).

Honor Code

Liberty University comprises a network of students, Alumni, faculty, staff and supporters that together form a Christian community based upon the truth of the Bible. This truth defines our foundational principles, from our Doctrinal Statement to the Code of Honor. These principles irrevocably align Liberty University's operational procedures with the long tradition of university culture, which remains distinctively Christian, designed to preserve and advance truth. Our desire is to create a safe, comfortable environment within our community of learning, and we extend our academic and spiritual resources to all of our students with the goal of fostering academic maturity, spiritual growth and character development.

Communities are predicated on shared values and goals. The Code of Honor, an expression of the values from which our Doctrinal Statement was born, defines the fundamental principles by which our community exists. At the core of this code lie two essential concepts: a belief in the significance of all individuals, and a reliance on the existence of objective truth.

While we acknowledge that some may disagree with various elements of the Code of Honor, we maintain the expectation that our students will commit to respect and uphold the Code while enrolled at Liberty University.

Adherence to the principles and concepts established within facilitates the success of our students and strengthens the Liberty community.

The Code of Honor can be viewed in its entirety at http://www.liberty.edu/index.cfm?PID=19155 (http://www.liberty.edu/index.cfm?PID=19155).

📅 Schedule

When	Topic	Notes
Course Overview	Student Acknowledgements	Course Requirements Checklist
	Technology Integration Set-Up	Prepare: Cengage WebAssign
Module 1: Week 1	Learn	Read: 3 items Watch: 2 items Interact: 1 item Explore: 1 item

When	Topic	Notes
	Apply	Discussion: Getting Back into the School Mindset Problem Set: Moaveni Chapter 1 Assignment Quiz: Moaveni Chapter 1 Reading Assessment
Module 2: Week 2	Learn	Read: 2 items Watch: 2 items
	Apply	Discussion: Mindset & Grit Design Your Own Plan Project: Part 1 – Goal Setting Assignment Quiz: Moaveni Chapter 2 Reading Assessment
Module 3: Week 3	Learn	Read: 4 items Watch: 1 item Explore: 1 item
	Apply	Discussion: Grand Challenges for Engineering Design Your Own Plan Project: Part 2 – Community Building Assignment New Product Proposal Group Project: Reverse Engineering Lab Assignment Problem Set: Moaveni Chapter 3 Assignment Quiz: Moaveni Chapter 3 Reading Assessment
Module 4: Week 4	Learn	Read: 2 items Watch: 2 items
	Apply	Discussion: Crash Course Study Skills Design Your Own Plan Project: Part 3 – Academic Growth Assignment New Product Proposal Group Project: Innovation Canvas – Draft Assignment Problem Set: Moaveni Chapter 4 Assignment Quiz: Moaveni Chapter 4 Reading Assessment
Module 5: Week 5	Learn	Read: 2 items Watch: 1 item
	Apply	Peer-Review Discussion: Innovation Canvas Review & Feedback Design Your Own Plan Project: Part 4 – Personal & Spiritual Growth Assignment New Product Proposal Group Project: Grand Challenges Team Presentation Assignment Problem Set: Moaveni Chapter 5 Assignment Quiz: Moaveni Chapter 5 Reading Assessment
Module 6: Week 6	Learn	Read: 2 items Watch: 1 item

When	Topic	Notes
	Apply	Discussion: Time & Priority Management
		Design Your Own Plan Project: Part 5 – Graduation Plan Assignment
		New Product Proposal Group Project: Poster Design – Draft Assignment
		Problem Set: Moaveni Chapter 6 Assignment
		Quiz: Moaveni Chapter 6 Reading Assessment
Module 7: Week 7	Learn	Read: 4 items
		Watch: 1 item
	Apply	Peer-Review Discussion: New Product Proposal Group Project – Poster Design Review
		Ethics Case Study Assignment
		Problem Set: Moaveni Chapter 14, 18 Assignment
		Quiz: Moaveni Chapter 14, 18 Reading Assessment
Module 8: Week 8	Learn	Read: 1 item
		Watch: 1 item
	Apply	New Product Proposal Group Project: Final Poster Design & Presentation Assignment