Course Title: EGR 186 Introduction To Engineering Design
Term: Summer 2023
Instructor: TBA
Course Credit: 3
Mode of Instruction: Online

Course Description:

This course introduces the design process, problem-solving techniques, teaming skills, oral and written communication skills, and tools for success in academic and professional careers. By engaging in hands-on, meaningful projects, students understand how the material covered in class can be applied in their everyday lives.

Course Prerequisites:

MAT 125 Precalculus Mathematics

Learning Outcomes:

By the end of the course, the student should be able to:

A. Gain insights into the concepts and process of engineering design.

B. Know how to identify customer needs, establish design objectives, and translate these into engineering design specifications.

C. Improve important design skills of visualization, calculation, experimentation, and modeling.

D. Enhance the skills of teamwork, project management, communication, problem-solving and technical documentation.

E. Solve engineering design problems, while instilling the importance of creativity in developing innovative solutions.

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Course Material:

Mike Tooley BA, *Design Engineering Manual*, 2009.

Evaluation:

- 4 Team Projects [40%]
- Final Project Presentation [10%]
- Mid-term Exam [20%]
- Final Exam [30%]

Description of the Evaluation tasks:

Assignment/ Essay/ ... : During the term, students will be required to finish several evaluation tasks within due date. All the tasks are linked with specific course topics/outcomes and will adequately assess students' competence and learning outcomes. Students are encouraged to meet with instructor about these tasks at any point.

Mid-term/ Final Exams/ Quiz/... : There may be periodic quizzes given at the beginning of lecture sessions; the feedback from these quizzes will monitor the progress of the learners and help to set learning priorities. There will be mid-term exam/ final exam for the course. They are the basic criteria for the evaluation of students' learning outcomes and final grade.

Grading Policy:

Students are supposed to finish each online lecture. Prior to each class, students should finish the required readings. During the class time, students are encouraged to make use of all relevant online course resources and communicate with the instructor. Students' grades are accumulated based on the cumulative evaluations.

Students' letter grade will be assigned according to the following scale:

A+ 90-100	A 85-89	A- 80-84
B+ 77-79	B 73-76	B- 70-72
C+ 67-69	C 63-66	C- 60-62
D+ 57-59	D 53-56	D- 50-52
F < 50		

Academic Integrity:

Students must strictly adhere to the university's academic integrity rule; and all essays, exams and any other form of academic assignments must adhere to these rules. Any form of plagiarism, cheating, or misappropriation of materials will be considered a violation of academic integrity and will be punishable by the university.

Withdrawal from the Course(s):

Students will be able to apply for a transfer or withdrawal within 3 days of the starting date of the course. If a withdrawal is applied for within 3 working days, the tuition fee will be fully refunded. After 3 days, the tuition fee will not be refunded. If a withdrawal is applied for in the first two weeks, it will be recorded as W (Withdraw) on the course transcript. After this initial two-week period, the class will be recorded as F (Fail).

Tentative Schedule:

1	Introduction
2	The design process
3	Designing to ensure quality Solving the requirements problem
4	Design specification **Team project 1**

5	Product development
6	The business objective
7	The market opportunity
8	Design and materials **Team project 2**
9	Materials and the environment Materials and industrial design
10	Forces for change
11	New materials Advanced alloys
12	**Mid-term Exam**
13	Design and ergonomics
14	Personal factors Physical factors Environmental factors
15	Reliability and maintainability
16	Quality and reliability **Team project 3**
17	Designing capable components and assemblies
18	Product safety and legal liability
19	Project management
20	Contract clauses and their pitfalls Product liability and safety legislation **Team project 4**
21	Design techniques: electronics
22	Design techniques: mechanics
23	Design techniques: plastics
24	Final Project Presentation
25	**Final Exam**