BMEN 4389: SENIOR DESIGN PROJECT II

Spring 2025 ***F 1:00pm – 3:45pm*** ***SLC 1.102***

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Course Description

Project-based capstone course. Student groups design, build, and test a device that solves an open-ended biomedical engineering design problem. BMEN 4389 focuses on prototype construction and testing. (A prior course, BMEN 4388, focuses on background research and engineering analysis.) As a designated BMEN Writing-Intensive Course, BMEN 4389 also focuses on the refinement of students' engineering communications skills and their use of writing as a critical-thinking and learning tool.

Course Prerequisites

Pre-requisite:	BMEN 4388
Co-requisite:	None
Other Restrictions:	BMEN 4388 and 4389 must be taken in successive semesters

Program Educational Objectives

Biomedical Engineering Bachelor's graduates are expected to attain the following Program Educational Objectives within a few years after graduation:

- Careers that lead to leadership roles in biomedical engineering or related fields

  or

- Gain admission to graduate, professional, or health related programs

Course Learning Outcomes

This class will address the following learning outcomes:

- Develop project management skills: work breakdown structure, cost estimation, resource allocation, and scheduling. (SO 1)
- Build a working prototype, develop and conduct tests, and analyze and interpret the results to perform design iterations. (SO 6)
- Function in disciplinary or multi-disciplinary teams. (SO 5)
- Document, report and present project progress and final results. (SO 3)
- Identify, develop and apply the skills needed to successfully complete project tasks through independent research and study. (SO 7)
- Demonstrate and follow ethical behavior and practices in the design environment. (SO 4)

Course Topics

This course is a continuation of BMEN 4388 and focuses on building and testing a proof-of-concept prototype that demonstrates a solution to an engineering design problem. This course will emphasize many of the same concepts and skills introduced in BMEN 4388. Most of the work in the course will be completed outside of the classroom. The instructors will meet with project teams to discuss progress and will occasionally meet with the class as a whole to cover selected topics.

Textbooks and Materials

No textbook is required for this course. In most cases, students will need to research and collect information from sources relevant to their particular project. Textbooks and notes from previous courses will likely be useful additional resources. The course material will come from presentations and documents that will be distributed throughout the semester.

Grading Policy

The contribution of each item to the overall course grade is summarized in the following table. For deliverables submitted by the team, all members of the team are typically assigned the same score. Note that overall course grades reflect performance in all aspects of the course (as shown in the table) and are more than just a measure of project outcome or individual effort.

Item	% of Final Grade
Written Deliverables	35
Mandatory First Prototype	10
Peer Evaluations	20
Expo	15
Team Mentor Performance Evaluation	15
Client Evaluation	5
Total	**100**

It is important to note that individual performance that is far below expectations may result in a student's removal from a project team and/or an individual final course grade of F or I regardless of actual numerical grades. Such a grade could be assigned for reasons that include, but are not limited to, the following:

- Lack of meaningful participation in team activities
- Lack of meaningful contributions to the team's work
- Substantially unequal team member contributions
- Insubordination toward anyone involved in the project
- Unprofessional or unethical conduct (including actions while on project-related travel)
- Poor peer evaluations
- Actions that jeopardize the progress of the project team
- Substantially unfinished projects
- Incomplete or non-functional prototypes that resulted from a lack of effort
- Unacceptable or incomplete final documentation
- Misuse of sponsor provided data or equipment
- Failure to return sponsor-supplied equipment

Important Note: Students must complete the UTDesign Studio check-out procedure by 5:00 pm the day prior to the university grade submission deadline shown in the academic calendar. Failure to complete the UTDesign Studio check-out procedure will result in the assignment of a grade of Incomplete (I) until the procedure is satisfactorily completed.

Course Policies

Teams & Roles

Projects will be completed by students working in groups (teams). Team assignments will remain the same as in BMEN 4388.

Each team will have two advisors: a Client representing the Sponsor and a Team Mentor (TM) assigned by the instructor. The roles of the Client and Team Mentor are strictly advisory. These individuals will not lead the project effort, nor will they solve technical problems. It is ultimately the team's responsibility to manage and complete the project and provide the requested deliverables. Each team will also be assigned to a course instructor who will serve as their Engineering Director.

UTDesign Expo

At the end of the semester, a time will be scheduled for the presentation, demonstration, and evaluation of projects. All team members are required to attend and participate in all the events scheduled during this day. You should plan to be present for the entire duration of the event (approximately 10am – 5pm). The date for the UTDesign Expo will be announced.

Communication

You must use your official UTD email account for all emails related to this course. Email will also be used by those involved in the course to communicate with you. It is expected that messages sent to your official UTD email address will be received and read. You should check this email account at least daily so that information from your Client, Team Mentor, Engineering Director, and others is received and acted upon promptly.

This course will use both the UTD eLearning system and EduSourced, a web-based system designed for the activities in project-based courses. All key course documents and other materials will be available through one of these systems. Assignments (deliverables) will be submitted in EduSourced. Issues with EduSourced should be brought to the attention of the instructor. Support for eLearning is available through the eLearning Support Center.

Confidentiality & Intellectual Property

Non-disclosure agreements (NDA) and intellectual property (IP) agreements with sponsoring organizations signed during BMEN 4388 remain in effect for BMEN 4389.

You should always treat sponsor information with care, regardless of the existence of an NDA. In particular, students should make confidentiality requirements a priority when using computer resources (email, file storage, social media, etc.). Additionally, all publicly presented materials (presentations, hardware, etc.) must be cleared by the Sponsor first. If you have any questions about these matters, consult your Team Mentor or Engineering Director.

Teams should use EduSourced or Box (CometSpace) for secure storage of electronic documents related to their project. Web-based storage services such as Google Drive, Dropbox, etc. should not be used without written Sponsor approval.

Course Assignments & Deliverables

Late assignments will not be accepted without prior agreement of an Engineering Director. This policy is strictly enforced because it is an integral part of developing the skills expected in the professional community. Teams are advised to have a procedure in place to make sure that team deliverables are submitted on time. A late team deliverable will result in **no credit for all team members**. Note that computer problems, lack of network access, and extended upload times for large documents are not acceptable excuses for late submissions. Submitting deliverables well ahead of deadlines is the best way to avoid complications due to unexpected, last-minute problems. If you encounter any difficulties submitting a deliverable through *EduSourced*, you may email it to your Engineering Director before the submission deadline. This same policy applies to individual deliverables.

Due to the diversity of projects and activities in this course, students are expected to communicate to their Engineering Director any issues that they feel may affect their performance in this course. Examples of such issues include difficulties with team members or others involved in the project, lack of needed resources, etc. If your team feels that circumstances beyond your control will affect your ability to meet a deliverable date, you should consult with your Engineering Director in advance of the submission deadline to discuss the situation. Extensions will only be considered in rare circumstances and with proper justification.

Workload

This course will require you to work on a realistic and challenging engineering project. Consequently, you should expect to spend a considerable amount of time outside of class working on your project. **As a guideline, at least 10 hours of project work per week from each student is typically required for successful project completion.** You should be aware of this requirement and plan your schedule accordingly. Team members with significant extracurricular obligations (especially jobs) should be aware that they will need to be available to attend all required meetings and fully participate in all course activities.

Class Recordings

Unless the AccessAbility Resource Center has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved AccessAbility Resource Center accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Materials

The instructor will provide class materials (including slides and videos) that will be made available to all students registered for this class as they are intended to supplement the classroom

experience. These materials may be downloaded during the course; however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class or uploaded to other online environments except to implement an approved AccessAbility Resource Center accommodation. This includes all instructor-created videos and slides. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Attendance

In-person attendance at all scheduled class meetings and UTDesign scheduled activities is mandatory. Additionally, you are expected to attend and participate in all meetings with your Client, Team Mentor, Engineering Director, and project team. Separate weekly meetings with the Client and Team Mentor will be required in addition to a weekly team coordination meeting.

Survey

Students will be expected to complete a survey as part of a course assignment. The results of the survey will be used to help improve the UTDesign Program. Once data is collected, student names will be disassociated from the results.

Off-campus Course Activities

Projects in this course will likely involve an occasional need to travel to a sponsor's office or other location for meetings, presentations, site visits, etc. Students are expected to comply with all university policies related to off-campus travel. A link to these policies can be found in the following section. In general, travel reimbursements will not be provided.

Students are expected to conduct themselves with professionalism and comply with all university regulations when traveling or participating in activities at a sponsor's site. Additionally, students are expected to comply with all standard visitor policies and procedures when visiting a sponsor's site. Prior to a visit, you should discuss any special requirements with your Client.

Under no circumstances is a student obligated to participate in any off-campus activity which, in their judgment, is unsafe or violates their moral or ethical beliefs. In such circumstances, the student should politely state their preference to not participate. Additionally, sponsors are expected to treat all students equally and respectfully. Students should feel free to report any concerns to their Engineering Director.

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.