

# BMEN 4388: SENIOR DESIGN PROJECT I

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Fall 2016

R 1:00pm – 3:45pm

ECSS 2.102

<b>Instructors:</b>	Dr. Todd Polk (972) 883-3559 <a href="mailto:Todd.Polk@utdallas.edu">Todd.Polk@utdallas.edu</a>	Dr. Joe Pacheco (972) 883-4176 <a href="mailto:Joe.Pacheco@utdallas.edu">Joe.Pacheco@utdallas.edu</a>
<b>Office Hrs:</b>	By appointment Office - SPN 1.208	By appointment Office – BSB 13.641
<b>TA:</b>	Jon Craven <a href="mailto:jec042000@utdallas.edu">jec042000@utdallas.edu</a> Office Hours: TBA Office - UTDesign Studio (SPN)	

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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 4388 focuses on background research, engineering analysis and development of initial design concepts. As a designated BMEN Writing-Intensive Course, BMEN 4388 also focuses on the refinement of students' engineering communications skills and their use of writing as a critical-thinking and learning tool.

## 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 Objectives

- Recognize design needs, gather relevant information, formulate the problem, and conceptualize various solutions. (SO e)
- Develop project management skills: work breakdown structure, manufacturing plan, cost estimation, resource allocation and scheduling. (SO a)
- Carry out detailed component/system-level design, and make decisions using evaluation and analysis tools. (SO k)
- Function in disciplinary or multi-disciplinary teams. (SO d)
- Document, report, present project progress and final results. (SO g)
- Incorporate cost, regulatory, and environmental issues in design. (SO c)
- Demonstrate and follow ethical behavior and practices in the design environment. (SO f)
- Recognize and describe the global and societal impact of your design choices and solutions. (SO h)
- Collect and review relevant background data necessary to make proper design choices. (SO i)

## Course Prerequisites

Pre-requisite: BMEN 3330, BMEN 3350, ECS 3390  
Co-requisite: None  
Other Restrictions: BMEN 4388 and 4389 must be taken in successive semesters

## Course Topics

The course material will be focused on topics relevant to planning and executing a real engineering project for an external client. The following is a tentative list of the major topics that will be covered in this course: teamwork, engineering design, project management, communication and professionalism, codes and standards, safety, reliability, and ethical responsibilities.

## 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.

<b>Item</b>	<b>% of Evaluation</b>
Written Deliverables	25
Training Session Activities	15
Exam	15
Engineering Director Performance Evaluation*	25
Technical Manager Performance Evaluation*	20
<b>Total</b>	<b>100</b>

Input for the performance evaluations will be obtained from sponsors, teammates, Technical Managers, Engineering Directors, and project support staff that you interact with during the course of the project. It is important to note that individual performance that is below expectations may result in a student's removal from a project team and/or final grades of F or I. Examples of detrimental behaviors 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)
- Misuse of sponsor provided data or equipment
- Poor peer evaluations
- Actions which jeopardize the progress of the project team

\* For information on personnel roles and responsibilities, see the UTDesign Employee Handbook.

## **Course Policies**

### **Course Sequence Requirement**

Since a single project will be completed over the two courses, BMEN 4388 and 4389 must be taken in consecutive semesters. If you are enrolled in this course in the fall semester, you must take BMEN 4389 the following spring semester. Likewise, enrollment in BMEN 4388 in the summer semester requires you to take BMEN 4389 the following fall semester.

### **Communication**

You must use your official UTD email account for all email 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 the email address on record with the university will be received and read. You should check this email account at least daily so that information from project sponsors, the course instructor and others are received and acted upon in a timely manner.

All key course documents and other materials will be available on the UTD learning management system ([eLearning](#)) website. Most assignments will also be submitted through this system as well.

### **Course Assignments & Deliverables**

*No late assignments will be accepted without prior agreement of the course instructor.* 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 [eLearning](#), you may email it to a course instructor before the submission deadline.

Due to diversity of projects and activities in this course, students are expected to communicate to their course instructor any issues which 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 the course instructor in advance of the submission deadline to discuss the situation. Extensions will only be considered in rare circumstances and with proper justification.

Make-up exams will only be given only with prior approval and acceptable justification. If an exam is missed due to an unanticipated illness or other reason, the student must produce acceptable documentation of the reason that he/she was unable to attend the exam at the scheduled time (e.g., letter from a medical professional).

### **Workload**

This course will require students to work on realistic and challenging engineering projects. Consequently, students should expect to spend a considerable amount of time outside of class working on their project. A minimum time commitment of 10 hours per week of work outside of class time is expected. Students should be aware of this requirement and should plan their schedules accordingly. Students with significant extra-curricular obligations (especially jobs) should be aware that they will need to be available to fully participate in all course activities.

### **Computers, Cell Phones, Mobile Devices, etc.**

Laptop computers, tablets, cell phones, and similar devices may be used during class time only for course-related activities such as taking notes and participating in in-class activities. Use of these devices for any other purpose during class time is not permitted.

### **Classroom Polling**

This course uses a classroom polling software known as ResponseWare available from Turning Technologies. In order to participate in the polling activities, students must obtain a Turning License and create a Turning Point Cloud account. For this course, students do not need an RF-LCD device (hand-held clicker). See [eLearning](#) for more information on obtaining a license and setting up your account.

To participate in the polling sessions during class, students need to bring a compatible mobile device (smartphone/tablet/laptop) to class. If you do not have a suitable mobile device, please contact the instructor in advance. Please visit <http://www.utdallas.edu/elearning/resources> for more details.

Failing to bring a mobile device to class or non-functional devices (e.g., due to dead batteries) will result in a student receiving no credit for the day's in-class activities. There will be no make-up assignment given in these situations. Any non-ethical use of the ResponseWare software will be considered as an academic honesty violation.

### **Attendance**

Attendance at all scheduled class meetings is mandatory. Additionally, students are expected to attend and participate in all meetings with your Corporate Mentor, Technical Manager and project team.

### **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, students should discuss any special requirements with their Corporate Mentor.

***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 the course instructor.

## **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.*