BMEN 1208 Course Syllabus – The University of Texas at Dallas

Course Information
Course Number: 1208.101-110
Course Title: Introduction to Bioengineering II (2 Credits)

Term: Spring 2019

Course meetings:

Section	Day	Time	Room	Instructor (TA)
.101	Tuesday	8:30 am – 11:15 am	ML1 1.118	C. Meyer (Shichang)
.102	Tuesday	8:30 am – 11:15 am	ML1 1.122	C. Meyer (Arul)
.103	Tuesday	11:30 am – 2:15 pm	ML1 1.118	S. Levene (Swapnil)
.104	Tuesday	11:30 am – 2:15 pm	ML1 1.122	S. Levene (Kishan)
.105	Wednesday	10:00 am – 12:45 pm	ML1 1.118	S. A. Khoubrouy (Arul)
.106	Wednesday	10:00 am – 12:45 pm	ML1 1.122	S. A. Khoubrouy ('Joe')
.107	Thursday	10:00 am – 12:45 pm	ML1 1.118	C. Meyer (Shichang)
.108	Thursday	10:00 am – 12:45 pm	ML1 1.122	C. Meyer ('Joe')
.109	Thursday	1:00 pm – 3:45 pm	ML1 1.118	S. A. Khoubrouy (Swapnil)
.110	Thursday	1:00 pm – 3:45 pm	ML1 1.122	S. A. Khoubrouy (Kishan)

Professor Contact Information

Sections: 105,106, 109, 110
Instructor: Soudeh A. Khoubrouy, PhD
Email: sa.khoubrouy@utdallas.edu
Office location: BSB 13.530
Office phone number: 972-883-7252

Sections: 103, 104
Instructor: Stephen Levene, PhD
Email: stephen.levene@utdallas.edu
Office location: BSB 12.909
Office phone number: 972-883-2503

Sections: 101,102, 107, 108
Instructor: Clark Meyer, PhD
Email: cam140130@utdallas.edu
Office location: BSB 13.562
Office phone number: 972-883-4175

Office Hours (mostly held in ML1):
See eLearning for schedule as well as
by appointment *or*
https://utdallas.box.com/v/ML1schedule

TA Contact Information

Teaching Assistant: Shichang Li
Email: sxl134730@utdallas.edu
Office Hours: Thursdays 7-10 am

Teaching Assistant: Swapnil Dolui
Email: sxd165130@utdallas.edu
Office Hours: Mondays 2:30-5:30 pm

Teaching Assistant: Kishan Jayanand
Email: kxj180005@utdallas.edu
Office Hours: Fridays 2-5:00 pm

Teaching Assistant: Arul V. Ravichandran
Email: axr148130@utdallas.edu
Office Hours: Wednesdays 7-10 am

Teaching Assistant: Ximing 'Joe' Zhou
Email: Ximing.Zhou@UTDallas.edu
Office Hours: Tuesdays 5-8 pm

Please contact the instructor via email if the existing office hour schedules are unworkable for you so that reasonable accommodation can be made.

Course Pre-requisites, Co-requisites, and/or Other Restrictions
(Including required prior knowledge or skills)
Prerequisite:

BMEN1100 (Introduction to Bioengineering I)

Pre-requisites or co-requisites:

PHYS 2325/2125 (Mechanics and Heat) and MATH 2419 (Calculus II) or MATH 2414

Expected prior skills:

Basic study and problem-solving skills
Communication skills and teamwork
Ability to read and follow instructions
Basic Microsoft Office skills (Excel and Word)

Course Description

BMEN 1208 - Introduction to Biomedical Engineering (2 semester hours)
Project-based instruction. The purpose of this course is to give students a general understanding of the broad range of applications specific to the biomedical engineering profession. Course exercises include team-oriented competitions, lectures by various external biomedical engineering experts, and introductory materials associated with the discipline. Perform a competitive team design project. (2-1) Y

Student Course Learning Objectives/Outcomes

Course learning objectives followed by ABET classification of student outcome include:
1) Create an electromechanical device to meet specific design criteria – (SO 2)
2) Develop an ability to find technical information. – (SO 7)
3) Learn and apply fundamentals of various subfields of biomedical engineering to identify, formulate, and propose solutions to problems in a broad range of biomedical engineering subfields. – (SO 1)

These objectives will be achieved through individual, pair, and group work. Investment of time outside of class, both individually and as teams, will be required.

Required Textbooks and Materials
No textbook required.
Readings will be available on course's e-learning website.
Arduino Uno R3 – will be provided in class – replacements available from online/electronics stores
Miscellaneous additional parts for semester project (up to $20)

Suggested Optional Course Materials
(Recommended if you do not have easy access to campus computer lab)
Personal copy of SolidWorks Student Edition – academic, a 12-month license is available free
MATLAB student version (free) - http://www.utdallas.edu/oit/howto/matlab/
Arduino software (free download)

Assignments & Academic Calendar
(Topics, Reading Assignments, Due Dates, Exam Dates)

Course Dates	Main Topics	Sub-area of Bioengineering
Week 1 – January 14	Intro to: course, biomedical engineering, design process, semester project Matlab (1) – introduction	
Week 2 – January 21	Finding and documenting technical information; SolidWorks (1) – user interface and part creation	Medical Imaging
Week 3 – January 28	3D Printing; SolidWorks (2) – complex parts and simple assemblies	Biomechanics
Week 4 – February 4	Basic Electronics and Circuits (equipment and components)	Robotics
Week 5 – February 11	Microcontrollers (1) – basics and setup	Bioinstrumentation
Week 6 – February 18	Microcontrollers (2) – driving motors	Biosensors
Week 7 – February 25	SolidWorks (3) – gears and assemblies	Tissue Engineering
Week 8 – March 4	Matlab (2) – rational design and calculations, preliminary feedback, midterm review	Neuroengineering
Week 9 – March 11	Midterm Exam (Exam 1)	
Spring Break		
Week 10 – March 25	Grip Design Assessment and Design Time	Clinical Trials, Medical Device Regulation
Week 11 – April 1	Microcontrollers (3) – supplemental	Signal Processing
Week 12 – April 8	Class time to work on project	Careers in Bioengineering
Week 13 – April 15	SolidWorks (4): technical drawings; Final report writing	Biomaterials and Biocompatibility
Week 14 – April 22	Class time to work on designs and reports	Systems biology and systems engineering
Week 15 – April 29	Project performance evaluation; Report due end of week; Final exam review	
Finals – possible up to May 11	Final Exam (Exam 2)	

Grading Policy
(Including percentages for assignments, grade scale, etc.)

Assessment Type	Portion of Overall Grade
Participation	7%
Homework assignments	30%
Quizzes	10%
Tests (Exam 1 10%, Final Exam 18%)	28%
Team project	25%

7% Participation
Due to the practical and hands-on nature of the course, your attendance and participation are required. Absences may be excused only for university approved reasons. Please contact your instructor and TA in advance or as soon as possible after an emergency to arrange to make up material.

The TA will track attendance with elearning. To receive credit for participation you must be punctual and working on the course material throughout the class period.

30% Homework
Some homework assignments are individual, some are paired, and some are team. Homework is essential for developing understanding and for retaining the material.

10% Quizzes
Written quizzes will be given periodically to assess progress and comprehension of material.

28% Tests (2)
Comprehensive, cumulative tests will be given on week 9 and during Finals period. The midterm test will count for 10% and the final will count for 18%. Both will include practical, hands-on portions.

25% Team Project
Throughout the semester, progress milestones will checked. Failure to meet them incurs a 5% penalty on the project grade. Project performance evaluation will be done week 15. A written report for each team is due at the end of week 15. Individual scores may be adjusted based on team member assessments and instructor discretion.

Grade	Points	Grade	Points	Grade	Points	Grade	Points
A+	**97-100**	**B+**	**87-89.99**	**C+**	**77-79.99**	**D+**	**67-69.99**
A	**93-96.99**	**B**	**83-86.99**	**C**	**73-76.99**	**D**	**63-66.99**
A-	**90-92.99**	**B-**	**80-82.99**	**C-**	**70-72.99**	**D-**	**60-62.99**
						F	**<60**

Note: Grading policy subject to change.

Course & Instructor Policies
(make-up exams, extra credit, late work, special assignments, class attendance, classroom citizenship, etc.)

You may discuss background issues and general solution strategies with others, but the work you submit must be the work of just you and those you were to work with. Never use someone else's file for individual work – doing so will be considered a violation of academic integrity. Pair or group work files should only originate from members. All participants should be named on the assignment; non-participants should not be listed.

Make-up tests and quizzes are only accepted in cases of excused absence. Contact instructor in advance of absence or as soon as possible in cases of special circumstances.

Extra credit can be earned by including successful additional features on the project. See the project assignment description for details.

Late homework will be accepted with 20% off penalty per day late. Homework is due Monday night at 11:59 pm unless otherwise specified. Work should be submitted as PDF files unless otherwise specified.

Classroom citizenship – students are expected to stay focused on the task at hand during class time. Talking on cell phones is not permitted. Using cell phones in any form during quizzes or tests is not permitted.

Class attendance is expected and is essential for success in this course. Be on time and stay for the full duration.

As noted in the UT Dallas policies and procedures, use your UTD email account to contact the instructor and check this account daily for possible updates/course changes.

Academic integrity is essential for long-term success. Students are expected to do their own work.

Discussion is permitted on some assignments but copying or sharing files is never acceptable.

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.