BMEN 1208 Course Syllabus – The University of Texas at Dallas

Course Information
Course Number: 1208.101-111
Course Title: Introduction to Bioengineering II (2 Credits)

Term: Spring 2017

Course meetings:

Section	Day	Time	Room	Instructor
.101	Wednesday	10:00 am – 12:45 pm	ML1 1.118	Pacheco
.102	Wednesday	10:00 am – 12:45 pm	ML1 1.122	Pacheco
.103	Wednesday	1:00 pm – 3:45 pm	ML1 1.118	Meyer
.104	Wednesday	1:00 pm – 3:45 pm	ML1 1.122	Meyer
.105	Thursday	10:00 am – 12:45 pm	ML1 1.122	Pacheco
.106	Tuesday	4:00 pm – 6:45 pm	ML1 1.122	Meyer
.107	Thursday	1:00 pm – 3:45 pm	ML1 1.118	A. Khoubrouy
.108	Thursday	1:00 pm – 3:45 pm	ML1 1.122	A. Khoubrouy
.109	Tuesday	1:00 pm – 3:45 pm	ML1 1.122	Myers
.110	Tuesday	10:00 am – 12:45 pm	ML1 1.118	A. Khoubrouy
.111	Tuesday	10:00 am – 12:45 pm	ML1 1.122	A. Khoubrouy

Professor Contact Information
Instructor: Clark Meyer, PhD
Email: cam140130@utdallas.edu
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Instructor: Kathleen Myers, PhD
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Instructor: Soudeh A. Khoubrouy, PhD
Email: sa.khoubrouy@utdallas.edu
Office location: BSB 13.530
Office phone number: 972-883-7252

Instructor: Joe Pacheco, PhD
Email: joe.pacheco@utdallas.edu
Office location: BSB 13.641
Office phone number: 972-883-4176

Instructor Office Hours:
A. Khouboury: TBA
Meyer: TBA
Myers: Tuesdays, 12-1pm in ML1 1.110 and by appointment
Pacheco: Mondays, 10am – 11:45am in ML1 1.118

TA Contact Information
Teaching Assistant: Justin Abbott
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Teaching Assistant: Deandra D'Souza
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Teaching Assistant: Karam Kang
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Teaching Assistant: Chongjin 'Nick' Lee
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Teaching Assistant: Shichang Li
Email: sxl134730@utdallas.edu

TA Office Hours:
Monday-Thursday 4-7pm and Fridays 2:15-5pm

Additional office hours can be scheduled by request with significant notice. Classroom space in ML1 is also available outside of course hours for self-directed use of equipment.

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 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

Student outcomes followed by ABET classification include:
1) Apply various tools used by biomedical engineers (e.g. SolidWorks, Matlab, and microcontrollers). – (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
2) Create an electromechanical device to meet specific design criteria. – (c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and manufacturability, and sustainability.
3) Develop an ability to find technical information. – (i) A recognition of the need for, and ability to engage in life-long learning.
4) Learn and apply fundamentals of various subfields of biomedical engineering to identify, formulate, and solve problems in a broad range of biomedical engineering subfields. – (e) An ability to identify, formulate, and solve engineering problems.

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 online/electronics stores

Suggested Optional Course Materials
(Recommended if you do not have easy access to campus computer lab)
Personal copy of SolidWorks Student Edition – academic, 12 month license ~$140 (**2015** version)
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 – start of week	Main Topics	Sub-area of bioengineering
Week 1 – January 9	Intro to: course, biomedical engineering, design process, semester project; lab notebooks Matlab (1) - introduction	
Week 2 – January 16	Finding information and documenting information; SolidWorks (1) – user interface and part creation	Medical Device Regulation
Week 3 – January 23	3D Printing; SolidWorks (2) - complex parts and simple assemblies	Biomechanics
Week 4 – January 30	Basic Electronics and Circuits (equipment and components)	Robotics
Week 5 – February 6	Microcontrollers (1) – basics and setup	Bioinstrumentation
Week 6 – February 13	Microcontrollers (2) – driving motors	Biosensors
Week 7 – February 20	SolidWorks (3) – gears and assemblies	Tissue Engineering
Week 8 – February 27	Matlab (2) – rational design and calculations	Neuroengineering
Week 9 – March 6	Preliminary feedback, mid-term review, design time	
Spring Break – March 13th-18th		
Week 10 – March 20	Exam 1 and Project Design Review	Clinical Trials
Week 11 – March 27	Microcontrollers (3) – supplemental	Signal Processing
Week 12 – April 3	Class time to work on project	Clinical Engineering
Week 13 – April 10	SolidWorks (4): technical drawings; Final report writing	Biomaterials
Week 14 – April 17	Class time to work on designs and reports	Systems biology and systems engineering
Week 15 – April 24	Final presentation and project performance evaluation; Report due end of week	
Finals Week – May 2-May 8	**Final Exam**	

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

Assessment Type	Total portion of grade
Participation	10%
Homework assignments	30%
Quizzes	10%
Tests (Exam 1 10%, Final 15%)	25%
Team project (preliminary design review, presentation, final report)	25%

10% 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 in advance or as soon as possible after an emergency to arrange to make up material.

ResponseWare polls will be a part of most classes and will be used to provide feedback to the instructor. For these polls, there will be no penalty if you forget up to 2 times. For each additional occurrence, you will lose 2% points off your grade, up to 10%.

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. Attending a departmental seminar or distinguished lecture and generating a report of what was learned will be required.

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

25% Tests (2)
Comprehensive, cumulative tests will be given on week 8 and during Finals period. The midterm test will count for 10% and the final will count for 15%. The final will include practical, hands-on portions.

25% Team Project
In week 9, the instructor will meet with each team to assess their preliminary design. A presentation and 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+	87-89.9	C+	77-79.9	D+	67-69.9
A	93-96.9	B	83-86.9	C	73-76.9	D	63-66.9
A-	90-92.9	B-	80-82.9	C-	70-72.9	D-	60-62.9
						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. 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 work will be accepted with 20% penalty per day late. Homework is typically due via e-learning the day before next class. 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.

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 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.