



## **BME152 – Spring Biomedical Engineering Workshop**

### **A. GENERAL INFORMATION**

Name of the course: Spring Biomedical Engineering Workshop  
Code of the course: BME 152  
Academic Year: 2019 – 2020  
Semester: Spring Semester  
Student Standing: Junior  
College of: Engineering and Mathematical Sciences (CEMS)  
Department: Electrical and Biomedical Engineering  
Credits: 1  
Pre-requisites: BME151

Class: Monday 14.20 – 15.10 (50 min)  
Location: Lafayette Hall L300

Instructor: Dr. Juan Jose Uriarte  
Office: Votey 309A  
E-mail: [Juan.Uriarte@uvm.edu](mailto:Juan.Uriarte@uvm.edu)  
Office Hours: Monday 15.30 – 17.30 or by appointment

### **B. DESCRIPTION**

This course will provide an insight into multidisciplinary areas of biomedical engineering and introduce the concepts for professional ethics, societal responsibility, economic impact, technological risk and code of conduct. Ethical case studies will be presented to students as an engineering challenge, giving the students the opportunity to apply critical thinking and analytical skills that will help them in their own approaches to ethical decision-making in the future.

This course will also help to search Capstone Design projects, Industry Internship opportunities or research opportunities.

### **C. REQUIRED TEXTBOOK**

None. Lists of relevant reference texts, library resources and freely accessible Internet sites will be provided. Course materials will also consist of research articles and readings posted on the UVM Blackboard site.



**D. LEARNING OUTCOMES and OBJECTIVES**

After completing this course students will be able to:

1. Read, summarize, and discuss academic research articles.
2. Analyze complementary aspects as the ethical principles of biomedical research, innovation and intellectual property protection.
3. Recognize ethical conduct and professional accountability.
4. Effectively present using oral or written communication.

Table 1. Course learning objectives and their relationship with ABET outcomes and class assessment tools.

#	Course Learning Objective	Associated ABET Outcome	Assessment
1	<i>Have experience performing a literature search using resources available through UVM library</i>	7	A1 A2
2	<i>Have experience of contextual ethical conduct and professional accountability factors impacting the biomedical engineering discipline.</i>	4, 5	A3 A4 Final Written Report Final Oral Presentation
3	<i>Effectively present using oral or written communication in professional domain</i>	3	Final Written Report Final Oral Presentation

Table 2. ABET learning outcomes:

0 - little or no contribution, 1 - moderate contribution, 2 - high level of contribution

Outcome	Description	Contribution
<b>Outcome 1</b>	<i>An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.</i>	0
<b>Outcome 2</b>	<i>An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.</i>	0
<b>Outcome 3</b>	<i>An ability to communicate effectively with a range of audiences.</i>	2
<b>Outcome 4</b>	<i>An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.</i>	2
<b>Outcome 5</b>	<i>An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.</i>	2



<b>Outcome 6</b>	<i>An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.</i>	0
<b>Outcome 7</b>	<i>An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.</i>	0
<b>Outcome B1</b>	<i>Applying principles of engineering, biology, human physiology, chemistry, calculus-based physics, mathematics (through differential equations) and statistics.</i>	0
<b>Outcome B2</b>	<i>Solving bio/biomedical engineering problems, including those associated with the interaction between living and non-living systems.</i>	0
<b>Outcome B3</b>	<i>Analyzing, modeling, designing, and realizing bio/biomedical engineering devices, systems, components, or processes.</i>	0
<b>Outcome B4</b>	<i>Making measurements on and interpreting data from living systems.</i>	0

### **E. METHODOLOGY**

Students are expected to actively participate and discuss the class content, particularly, in those areas related to biomedical engineering research, ethics, code of conduct and professionalism. Course topics will be covered by lectures, team-based discussions and group presentations, while students are expected to read, ask questions, participate, perform background research, and keep up with the class.

UNIT 1: Scientific method

UNIT 2: Professional and ethical responsibility

### **F. SCHEDULE AND ASSIGNMENTS**

The following course schedule is anticipated, but some adjustments may be made as the course progresses.

<b>Week</b>	<b>Monday</b>	<b>Topics and Activities</b>	<b>Assignments Due</b>	<b>Grading (Points)</b>
1	13-Jan	Syllabus and Course Description		
2	20-Jan	No Class - MLK Holiday		
3	27-Jan	Scientific Method - Information		
4	3-Feb	Scientific Communication and General Public	Topics Selection	
5	10-Feb	Journal Club	A1- Collecting Information	50
6	17-Feb	No Class - Presidents' Day Holiday		
7	24-Feb	Database and Reference Manager	A2 - In Class activity starts	
8	2-Mar	Database and Reference Manager	A2- In Class activity ends	50
9	9-Mar	No Class - Spring Recess		
10	16-Mar	Ethics in Biomedical Engineering	A3 - CITI Online-Training	600



11	23-Mar	Ethics Case Report	A4- In Class - Discussion	50
12	30-Mar	Ethics - Case Report and Presentation	Written Report Oral Presentation	50 100
13	6-Apr	Ethics - Case Report and Presentation		
14	13-Apr	Ethics - Case Report and Presentation		
15	20-Apr	Ethics - Case Report and Presentation		
16	27-Apr	SEED Experience		
17	4-May	<b>Finals Week</b>	<b>No Exam</b>	
			Attendance / Participation	100
			<b>Total Points</b>	<b>1000</b>

**G. GRADING SYSTEM**

The final grade for the course will be determined by the distribution of 1000 points:

- Assignments 15% 150 points
- Ethics - CITI Online Training 60% 600 points
- Ethics – Final Oral Presentation 10% 100 points
- Ethics – Final Written Report 5% 50 points
- Attendance / Participation 10% 100 points

The number of points you earn directly determines your letter grade; there will be no rounding!

A: 931 to 1000 points	A-: 900 to 930 points	
B+: 870 to 899 points	B: 830 to 869 points	B-: 800 to 829 points
C+: 770 to 799 points	C: 730 to 769 points	C-: 700 to 729 points
D: 600 to 699 points	F: <600 points	

**H. ATTENDANCE AND PARTICIPATION**

- Students are expected to read materials provided prior to class, attend, and be attentive.
- Class attendance will be checked regularly.
- Student must be in the audience for all of the projects/presentations. Failure to do so will result in reduction on his/her project/presentation and Attendance/Participation grades.
- Late work will not be accepted without a legitimate excuse or illness. Written proof may be required.

**I. COURTESY REMINDERS**



The classroom is a learning environment. Please avoid distractions for yourself and others.

- Please turn off your cell phone during class. Do not keep your phone on your desk.
- No food is allowed in the classroom.
- Drinks are allowed, but they must have secure lids.
- Please come to class clean and free of odors and dress in a way that is appropriate for all class activities and is respectful, non-distracting and non-offensive to others.

#### **J. INCLUSIVE LEARNING ENVIRONMENT**

This classroom is a place where you will be treated with respect. I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

#### **K. COURSE EVALUATION**

All students are expected to complete an evaluation of the course at its conclusion. The evaluations will be anonymous and confidential, and the information gained, including constructive criticisms, will be used to improve the course.

#### **L. ADDITIONAL INFORMATION**

Please refer to the **ADDITIONAL INFORMATION APPENDIX**, where you can find more information about, Student Learning Accommodations, Religious Holidays, Attendance, Academic Integrity, Grade Appeals, Code of Student Conduct, FERPA Right Disclosure, Health and Safety at UVM and in keeping with University Policies.