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Office Hours: TBD

**Teaching Fellow:** TF Name: TBD  
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Office: TBD  
Office Hours: TBD

**Textbook:** None, but suggested readings will be given from references such as:  
Design of Biomedical Devices and Systems, by Paul King & Richard Fries  
The Biomedical Engineering Handbook, by Joseph D. Bronzino (Editor)

**Class Schedule:** MWF11 and ( W 12 or W 1 or Th 1 or F 1 )

**Classroom:** TBD

**Recitation:** TBD

**Prerequisites:** none

**Website:** <https://umd.blackboard.com>

**Clickers:** You will be required to purchase a “clicker” for this class, which you must bring to every lecture. Details will be given on the first day of class.

## COURSE OBJECTIVES

*This course provides a non-technical introduction to the role of electrical and computer engineering in modern medicine, by presenting an overview of the types of biomedical devices currently used to diagnose and treat medical conditions. All aspects of the process of bringing a new product or technology to market are examined and discussed, and the roles of government, industry, as well as financial, legal, ethical and social considerations are critically explored. Taking this class will improve your awareness of:*

1. *Scientific and technical basics related to medical devices.*
2. *The capabilities and limitations of modern technology in the medical field.*
3. *The path traveled to convert an idea for a medical device into reality.*
4. *The evaluation process for experimental/clinical data.*
5. *Ethical considerations in the medical device field.*
6. *Teamwork and group dynamics.*
7. *The importance of good written and oral communication skills.*

## Course Topics

1. Introduction to the state of the medical device industry in the USA and the rest of the world.
2. Classic Clinical Diagnosis Devices (Electrocardiogram, Electroencephalogram, Sphygmomanometer, and Oximeter)
3. Personal Diagnosis Devices (heart monitors, blood sugar monitors)
4. Modern Medical Imaging Technology (Ultrasound detection, Magnetic Resonance Imaging (MRI), Positron Emission Tomography, X-rays, Computed tomography (CT) or Computed Axial Tomography (CAT) Scanner)
5. Standard Therapeutics and Life-extending technologies (Laser surgery, LASIK procedure, Radiation therapy)
6. Emerging Therapeutics and Life-extending technologies (DNA therapy, Nanoparticle directed drug delivery)
7. Electrical processes in the body/brain and related current/emerging treatments (ECT, TMS for treatment of depression and headaches, epilepsy monitoring and intervention, Pacemakers)
8. The role of non-technical factors in the medical device industry (government regulation, insurance company policies, ethics, finances)
9. The developmental path for new devices in the medical industry.
10. Future trends in the medical device industry.

## GRADING POLICY:

### Team Grades

Oral presentations	15%
Written presentation	15%

### Individual Grades

Class Participation	10%
Homework / Papers	20%
Midterm Exam	20%
Final Exam	20%

Please note that the grading in this course will be based on relative performance. Therefore the widely held belief that there is a default grading scale such that an average of 90.0% equals an "A," between 80.0% and < 90.0% equals "B," etc. does not apply to the grading of this course.

## Academic Integrity

You may collaborate on the homework, but all submitted work must be solely your own. Please refer to the University's Code of Academic Integrity at

<http://www.studenthonorcouncil.umd.edu/code.html#>

You will be held accountable for adherence to this code.

**Attendance** is expected. If you miss class you are responsible for obtaining any of the information covered that day.

**Exams** will be held during the regular lecture time. In the event the University dismisses classes for a day on which the exam is scheduled, then the exam will be given on the very next class meeting.

**Homework** assignments are due at the beginning of the class period on the due date. It is recommended that homework be typed using a word processing software. Homework that is poorly legible will not be graded. Late homework will not be accepted, except in unusual circumstances, such as due to ill health, upon submission of sufficient documentary evidence. Late homework will not be accepted, once the solutions are posted, under any circumstances.

## Accommodations

Religious observances: Students shall be given an opportunity whenever feasible to make up in a reasonable time any academic assignment that is missed due to individual participation in religious observances. It is the student's responsibility to inform the instructor of any intended absences for religious observances *in advance*.

Disabilities: The University has a legal obligation to provide appropriate accommodations for students with disabilities. If you have a university registered special need related to a disability, please inform the instructor *as soon as possible* to arrange accommodations.

## Academic Assistance

If you are experiencing difficulties in keeping up with the demands of your classes and schedule, contact the Learning Assistance Services, 2201 Shoemaker Building, 301-314-7693, or on the web at <http://www.counseling.umd.edu/LAS/> Their educational counselors can help with time management, reading, note taking, and exam preparation skills.

**Courtesies:** You can help make the classroom conducive to learning if you:

1. Arrive for class on time
2. Do not prepare to leave until the instructor indicates the lecture is over
3. Silence your cell phone