BME / ECE 335 – Biosensors and Instrumentation

Term – Fall 2018 (201809)

CourseSpaces – http://coursespaces.uvic.ca/course/view.php?id=49927

Instructor
Dr. Poman So
Phone: 250-472-4224
E-mail: Poman.So@UVic.CA

Office Hours
Days: Tuesday and Wednesday
Time: 09:30 – 10:30
Location: EOW 417

Course Objectives
An introduction to and overview of the field of biomedical sensors and instrumentation.

Learning Outcomes
a) Describe various types of bio-signals and their physiological origins.
b) Explain the electronic circuits and devices used in biomedical equipment.
c) Explain, compare and evaluate sensors, transducers, and electrodes.
d) Explain depolarization and repolarization of the heart.
e) Interpret ECG signals and develop ECG signal processing circuits.
f) Describe the evoked potentials in EEG and EMG.
g) Explain ultrasound propagation and compare various ultrasound imaging modes.
h) Describe modern physics and its applications in biomedical engineering.
i) Describe the physics of medical imaging.
j) Explain imagining technologies such as x-ray, CT, and MRI.
k) Design and evaluate PCB modules.

Syllabus
A study of the basic principles of biomedical electronics and measurement with emphasis on instruments and systems for biomedical data acquisition and processing. Topics will include electrocardiography (ECG), electroencephalography (EEG), medical ultrasound, magnetic resonance imaging (MRI), and x-ray computed tomography (CT).

Lectures
A-Section: A01, CRN 10433 / 10932
Days: TWF
Time: 08:30 – 09:20
Location: ELL 162

B-Sections: B01 — B02

See the class schedule listing at the end of this course outline for details

Location: ELW A321

Required Text
Author: Webster
Publisher: Wiley
Year: 2009
Assessment
Assignments: 20% (10 × 2%) Due Dates: TBA, see CourseSpaces for details
Labs: 20% (4 × 5%)
Tests: 60% (4 × 15%) Dates: 26/09, 17/10, 7/11 and 5/12

Note:
1. The required textbook is your main source of reference for this course. Material in the book will not be reproduced in the course notes. Students are expected to attend all classes in this course and to take their own notes. See http://web.uvic.ca/calendar2018-09/undergrad/info/regulations/attendance.html for attendance requirements.
2. Failure to complete all laboratory requirements will result in a grade of N being awarded for the course.
3. The aggregate grade of the tests must be a passing grade (≥ 30%) to pass the course.
4. Plagiarism detection software may be used to aid the instructor and/or TAs in the review and grading of some or all of the work you submit (http://www.uvic.ca/library/research/citation/plagiarism/index.php).

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Undergraduate Calendar. https://web.uvic.ca/calendar2018-09/undergrad/info/regulations/grading.html

There will be no supplemental examination for this course.

Note to students: Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the Chair of the Department by email or the Chair’s Assistant to set up an appointment.


Policy on Inclusivity and Diversity: https://web.uvic.ca/calendar2018-09/general/policies.html

Standards of Professional Behaviour: You are advised to read the Faculty of Engineering document Standards for Professional Behaviour, which contains important information regarding conduct in courses, labs, and in the general use of facilities. https://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the entry in the current Undergraduate Calendar for the UVic policy on academic integrity. https://web.uvic.ca/calendar2018-09/undergrad/info/regulations/academic-integrity.html

Equality: This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or
confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the Resource Centre for Students with a Disability located in the Campus Services Building.

The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

**Course Lecture Notes:** Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.
### Biosensors and Instrumentation - 10433 - BME 335 - A01

Associated Term: First Term: Sep - Dec 2018  
Registration Dates: Jun 18, 2018 to Sep 21, 2018  
Levels: Graduate, Law, Undergraduate

Main Campus  
Lecture Schedule Type  
Face to Face Instructional Method  
1.500 Credits  
View Catalog Entry

#### Scheduled Meeting Times

<table>
<thead>
<tr>
<th>Type</th>
<th>Time</th>
<th>Days</th>
<th>Where</th>
<th>Date Range</th>
<th>Schedule Type</th>
<th>Instructors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every Week</td>
<td>8:30 am - 9:20 am</td>
<td>TWF</td>
<td>Elliott Building 162</td>
<td>Sep 05, 2018 - Dec 05, 2018</td>
<td>Lecture</td>
<td>Poman Pok Man So (P)</td>
</tr>
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</table>

### Biosensors and Instrumentation - 10434 - BME 335 - B01

Labs meet on 4 specified weeks  
Associated Term: First Term: Sep - Dec 2018  
Registration Dates: Jun 18, 2018 to Sep 21, 2018  
Levels: Graduate, Law, Undergraduate

Main Campus  
Lab Schedule Type  
Face to Face Instructional Method  
0.000 Credits  
View Catalog Entry

#### Scheduled Meeting Times

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<tbody>
<tr>
<td>Every Week</td>
<td>4:30 pm - 7:20 pm</td>
<td>T</td>
<td>Engineering Lab Wing A321</td>
<td>Sep 25, 2018 - Sep 25, 2018</td>
<td>Lab</td>
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<tr>
<td></td>
<td>4:30 pm - 7:20 pm</td>
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### Biosensors and Instrumentation - 10435 - BME 335 - B02

Labs meet on 4 specified weeks  
Associated Term: First Term: Sep - Dec 2018
Biosensors and Instrumentation - 10436 - BME 335 - B03

Labs meet on 4 specified weeks

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Class Schedule Listing

First Term: Sep - Dec 2018
Jun 05, 2018

Sections Found

Biosensors and Instrumentation - 10932 - ECE 335 - A01
Associated Term: First Term: Sep - Dec 2018
Registration Dates: Jun 18, 2018 to Sep 21, 2018
Levels: Graduate, Law, Undergraduate

Main Campus
Lecture Schedule Type
Face to Face Instructional Method
1.500 Credits
View Catalog Entry

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