# Department of Electrical and Computer Engineering

## COURSE OUTLINE

# ELEC / BME 434 – BIOPHOTONICS

**Term - SPRING 2015** (201501)

http://www.ece.uvic.ca/~taolu/elec434


**Instructor**

Dr. Tao Lu
Phone: 250-721-8617
E-mail: taolu@uvic.ca


**Office Hours**

Days: Monday
Time: 14:30-17:30
Location: EOW321

**Lectures**

**A**-Section(s): A01 / CRN 21098/23708
A02 /CRN 21099
Days: Monday/Thursday
Time: 11:30-12:50
Location: ECS 130

**Required Text**

Title: Introduction to Biophotonics
Author: Paras N. Prasad
Publisher: Wiley-Interscience
Year: 2003

**References:**

Title: An Engineering Introduction to Biotechnology
Author: J. Patrick Fitch
Publisher: SPIE Press
Year: 2002

Title: Introduction to Biomedical Imaging
Author: Andrew Webb
Publisher: John Wiley & Sons, Inc.
Year: 2003

**Assessment:**

| | |
|---|---|
| Assignments: | 15% |
| Mid-term | 20% |
| Project presentation: | 15% |
| Project report: | 15% |
| Final | 35% |

Date: Feb. 5, 2015

**Note:** Failure to complete all laboratory requirements will result in a grade of N being awarded for the course.

**Due Dates for Assignments:**
Two weeks after each assignment is handed out.

**The final grade obtained from the above marking scheme will be based on the following percentage-to-grade point conversion:**

| Passing Grades | Grade Point Value | Percentage for Instructor Use Only | |
|---|---|---|---|
| A+<br>A<br>A- | 9<br>8<br>7 | 90 – 100<br>85 – 89<br>80 – 84 | |
| B+<br>B<br>B- | 6<br>5<br>4 | 77 – 79<br>73 – 76<br>70 – 72 | |
| C+<br>C | 3<br>2 | 65 – 69<br>60 – 64 | |
| D | 1 | 50 – 59 | |
| **Failing Grades** | **Grade Point Value** | **Percentage for Instructor Use Only** | **Description** |
| E | 0 | 0 - 49 | Fail, *Conditional supplemental exam.<br>(For undergraduate courses only) |
| F | 0 | 0 – 49 | Fail, no supplemental. |
| N | 0 | 0 – 49 | Did not write examination, Lab or otherwise complete course requirements by the end of term or session; no supplemental exam. |

**Assignment of E grade will be at the discretion of the Course Instructor.*

The rules for supplemental examinations are found on page 80 of the current 2014/15 Undergraduate Calendar.

| Term in which E Grade Was Obtained | Application Deadline for Supplemental Exam | Supplemental Exam Date |
|---|---|---|
| First term of<br>Winter Session (Sept – Dec) | February 28 in the following term | First week of following May |
| Second term of<br>Winter Session (Jan – Apr) | June 30 in the following term | First week of following September |
| Summer Session<br>(May – Aug) | October 31 in the following term | First week of following January |

Deferred exams will normally be written at the start of the student's next academic term; i.e., approximately 4 months following the deferral of the exam.

**Course Description**

1. Course Objectives

   Develop skills on applying photonics technologies to biomedical related works.

2. Learning Outcomes

   Understand photonics concepts as well as devices and basics of biology; Be familiar with biophotonics applications such as bioimaging and optical biosensors.

3. Syllabus

   Fundamentals of light and matter, basics of biology, fundamentals of light-matter interactions, principles of lasers, current laser technology and nonlinear optics, photobiology, bioimaging and optical biosensors, microarray technology for genomics and proteomics, flow cytometry, light-activated therapy, tissue engineering with light, laser tweezers and laser scissors, nanotechnology for biophotonics, biomaterials for photonics.

**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 ECE Chair by email or the ECE Chair's Secretary eceasst@uvic.ca to set up an appointment.*

**Accommodation of Religious Observance**

See http://web.uvic.ca/calendar2014/GI/GUPo.html

**Policy on Inclusivity and Diversity**

See http://web.uvic.ca/calendar2014/GI/GUPo.html

**Standards of Professional Behaviour**

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

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult

http://web.uvic.ca/calendar2014/FACS/UnIn/UARe/PoAcI.html for the UVic policy on academic integrity.