Catalog Data: EEC 515 Biosensors, Bioelectronics and BioMEMS (3-0-3)
Prerequisite: Graduate standing or permission of instructor.
This course is an introductory course for graduate students to be exposed to the field of biosensors, bioelectronics and bioMEMS. The course is designed for students from different disciplines of engineering, science and related fields. It surveys various areas of nanotechnology, including immobilization of biological components to transducers, electrochemical, optical and piezoelectric biosensors, sensor fabrication, miniature sensors and other sensors for biomedical applications, biofuel cells, bioMEMS, and related topics.

Textbook: Class notes; Biosensors, by Cooper and Cass, Oxford 2004 (optional)

References: Introduction to bioanalytical sensors, by Cunningham, John-Wiley 1998

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Course Outline:
1) Immobilization of biological components to transducers, (week 1)
2) Principal performance characteristics, (week 2)
3) Electrochemical, optical and piezoelectric biosensors, (week 3 – week 5)
4) Sensor fabrication, (week 6)
5) Applications, (week 7 – week 8)
6) Biofuel cells (week 9 – week 10)
7) BioMEMS (week 11 – week 12)
9) Related topics (week 13 – week 14)

A discussion on the related research literature will be conducted following the lecture part of each area.

Grading:
Midterm 15%
Final 15%
Oral presentation 20%
Written report 50%