ELEN 489 Special Topics In BioSensors

Time and Location: Spring 2006
Tu, Th 9:35-10:50, Zachry 223A

Instructor: Dr. Arum Han, Department of Electrical and Computer Engineering
Office Hours: Tu 11-12
Office: 312B Zachry
Email: arum.han@ece.tamu.edu

Class Handouts

References: B. R. Eggins, Chemical Sensors and Biosensors, Wiley, 2002

Objectives: Biosensors are devices that combine a biologically sensitive element with a physical or chemical transducer to detect the presence of specific biological compounds in a given external environment. They are applied in medical research and clinical diagnosis, food and environmental testing, and biotechnology applications. Through this course, students will learn the basic sensing principles and sensing elements (chemical, biochemical, optical, semiconductor) and various application examples such as disease/cancer detection, bacteria detection, metabolism sensing, and DNA detection. Recent developments in miniaturized biosensors (BioMEMS) will be taught and biosensors utilizing new sensing concepts such as living bacteria or cells, and nanotechnology will be also discussed.

Topics: Biosensing transducers – Electrochemical, transistor, photometric, optical Biosensing elements – Ionic recognition, molecular recognition Biosensors – Disease/cancer detection, metabolism sensing, DNA detection, living biosensors, miniaturized biosensors, sensors using nanotechnology

Grading: Homework & Attendance 20%, Midterm 25%, Term Paper 20%, Presentation 10%, Final 25%

Term Paper: Each student will choose a topic in biosensors together with the instructor and do a literature survey. The literature survey should cover the background, past research, and current status in the selected area (Due Apr. 25). A 10 minute class presentation on the surveyed topic from each student will be held toward the end of term.