I. General Course Objectives

This course deals with the production, analysis, processing and reconstruction of medical images. Imaging modalities covered include conventional X-rays and radionuclides. Radiation detectors. Ultrasonic scanning. Computed tomography (CT). Magnetic resonance imaging (MRI). Also, basic concepts in medical image processing and analysis will be introduced. A course project will allow students to explore real world applications of the course material.

The main goal of the course is to expose the students to medical imaging methods which leads to the following objectives:

♦ Learn the different methods and modalities used for medical imaging.
♦ Understand the engineering models used to describe and analyze medical images.
♦ Apply these tools to different problems in medical imaging.

II. Term Project

The term project requires the student to either 1) research a specific problem in medical image processing, or 2) explore applications of medical imaging to a specific organ and/or disease. If the first project is chosen, the student should review an existing algorithm for medical image processing, demonstrate its use, and suggest possible avenues for improving it. If the second project is chosen, the student should review what information can be obtained from each imaging technique for a specific organ/disease, identify the latest research thrusts within that area, and give a recommendation for what imaging steps would be best for a new patient with that disease. The results will be shared with the class in a 10 minute presentation and in a written report. The report must include: a cover page; an Introduction; main concept; results and conclusions. Also, the report must be printed with a 12 pts of time new roman font and 1.5 spacing (10-15 pages).

III. Grading

The final grade will be based on:
1. Item Project  10%
2. Midterm exams  40% (25% - Theory and 15% for Labs).
3. Final exam  50%

IV. Exam Dates:


V. References: