ECE 467 INTRODUCTION TO BIOMEDICAL IMAGING

Syllabus

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Course Description

In view of the rapid developments in imaging technology, biomedical imaging has become a very active area of high technology. This course is an introduction to fundamentals of biomedical imaging systems. The emphasis of this course will be principles of medical imaging and image processing--from how medical images are obtained to how they are used.

Course Goals

1. To expose students to the world of biomedical imaging with emphasis on principles, approaches and application of modern imaging systems, including modern biomedical imaging modalities of x-ray imaging and computed tomography (CT), ultrasound, magnetic resonance imaging (MRI), and optical imaging.

2. This course will also focus on concept and application of image quality, image reconstruction, and image processing in biomedical imaging fields.

Recommended Textbook and references


References: Please check SIUC blackboard to download and print out lecture handouts.


Prerequisites by topic

ECE 355 or consent of the Instructor. Signal and image processing, basic physics, basic statistics, basic programming.
Instructional Objectives

Students should be able to:
1. Understand the general meaning and applications of biomedical imaging systems.
2. Understand basic principles of different biomedical imaging modalities.
3. Understand the concepts of image quality, signal and noise, image processing, and image reconstruction.
4. Use a programming language or MATLAB to perform basic image simulation and image reconstruction.

Grading

Grades will be computed based on the following:
- Homework (10%)
- Exam #1 (30%)
- Exam #2 (30%)
- Projects (20%) (Medical image processing, 3D image simulation)
  - 1 final project (10%) (3D image reconstruction)

Please note:
1. No cheating allowed.
2. The exams will focus on the lecture notes to help students understand principles of biomedical imaging.
3. The grading scheme will be strictly followed. There will be NO exceptions.
4. All assignments should be turned in promptly. Late homework/report will be penalized 10% per day.