

UNIVERSITY OF DELAWARE
Department of Mathematical Sciences
Math 567-010 — Mathematics of Medical Imaging — Spring 2010
109 Colburn Lab — Tuesday, Thursday 3:30-4:45 pm

Instructor

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Course Communication: Sakai

Textbook

Introduction to the Mathematics of Medical Imaging, Second Edition, by Charles Epstein, SIAM Publications ISBN 978-0-89871-642-9 (first edition published by Pearson Hall (2003) ISBN 0-13-067548-2 is also good)

Course Description, Assignments and Grading

- This course provides a self-contained introduction to the mathematical methods in medical imaging. No technology has had a more positive and profound effect on our lives than advances in medical imaging and in no technology is the role of mathematics more pronounced. X-ray tomography, ultrasound, positron emission tomography and magnetic resonance imaging have fundamentally altered the practice of medicine. At the core of each modality is a mathematical model to interpret the measurements and a numerical algorithm to reconstruct an image. While each modality operates on a different physical principle and probes a different aspect of our anatomy or physiology, there is a large overlap in the mathematics used to model the measurements, design reconstruction algorithms and analyze the effects of noise. In this course we provide a tool kit, with detailed operating instructions,

to work on the sorts of mathematical problems which arise in medical imaging.

- Your **evaluation will be based solely on take-home assignments. No in-class exams will be given.** Therefore, it is important that you work independently on the assignments. You may discuss your ideas with your classmates but the write-up must be your own work.
- Attendance and participation in class is crucial. I will not take attendance (It is 500 level course !) but if you are not committed there is no reason to take this class. Active participation in class discussion will affect for good your final grade.
- Grading will be roughly based on $A^- \geq 90\%$, $B^- \geq 80\%$, $C^- \geq 70\%$, $D^- \geq 60\%$, $F < 60\%$.

Office hours

Mondays, Wednesdays, Fridays 10:00-11:00 am or by appointment.

Electronic Communication

The Web page for this course is listed on the top of the first page. Copies of handouts available for downloading as course announcements will be posted on **Sakai**. Particularly important messages will be e-mailed to you directly. In addition, you may send me e-mails with questions regarding the course if necessary.

Academic Honesty

The University has explicit rules on academic honesty that will be strictly enforced in class. See for details

<http://www.udel.edu/stuguide/09-10/code.html#honesty>