Bioengineering 4001. Biotransport

Lecture: T, H / 12:25-1:45 PM WEB L103
Lab: MTW / 2:00-5:00 selected weeks, MEB 2565
Website: https://utah.instructure.com/courses/482889

Instructor: Rick Rabbitt, 4527 SMBB, Office Hrs. After Class or by Apt.
   r.rabbitt@utah.edu

Assistant: TBD by semester.

Textbook: None Required. Comprehensive notes and completed problem sets posted.

References: G. Truskey, F. Yuan, D. Katz. Transport Phenomena in Biological Systems
   T. F. Weiss. Cellular Biophysics
   R. B. Bird. Transport Phenomena

Prereq.: Linear Algebra, ODEs, Physics, Computational Methods, Physiology

Description: Intermediate level course covering transport phenomena in biological systems using quantitative and mathematical approaches. Topics include compartmental modeling and analysis, electrochemical diffusion, convective transport, biofluid mechanics, wave propagation and impedance matching. Concepts are applied to physiology and biomedical devices.

Evaluation / Grading:
   3 in class exams 60% (45% best 2, 15% worst 1)
   3 homework assignments 30% (25% best 2, 5% worst 1)
   1 lab video or extended abstract 10%

General Policy: All examinations and assignments must be completed in accordance with the Student Code:
   http://www.regulations.utah.edu/academics/6-400.html Additional college of engineering guidelines can be found here: http://www.coe.utah.edu/appeals. Materials disclosed to the instructor for evaluation must be the original work of the student.

HW: All assignments must be submitted electronically in PDF.

Exams: 3 open book, open note, open computer, open web, 1 hour each.

Homework Policy: 3 homework assignments are required. Students are expected to be proficient in computational methods (Mathematica, MatLab or similar) and to complete their homework assignments using computer. Professional presentation quality in addition to technical content will constitute part of the homework grade, hand-written work is not considered acceptable. Homework will be due at the beginning of class on the due date. Late homework will not be accepted since solutions will be posted on the due date.

Lab Policy: Participation in laboratory experiments is required. 1 formal lab report is required. All students are expected to participate in the collection of data. Data analysis should be done using computer (Mathematica, MatLab or similar) and appropriate statistical analysis should be included. Presentation in addition to technical content will constitute part of the grade. Lab report format can be an extended abstract (BMES format, individual report) or a group video (groups of 3).