

2008 Biomedical Engineering PhD Written Candidacy Exam

The exam will be held on June 16 from 9 AM to 1 PM. Students wishing to take the exam must complete the form and return it to the main office (to Ms. Natalia Broz) by Wed., May 28.

This exam fulfills the math requirement for the candidacy exam; students will be eligible for candidacy after passing this exam and successfully completing their candidacy proposal (committee signing all the forms) and completing 45 credits (most students) or 15 credits (post-MS students).

The exam will be partially closed-book

Two books + 3 pages of notes

Study material

Previous exams will be available through the main office. Please note that more recent exams are likelier to be a better reflection of what will be offered. Also, in 2005 and 2006 there was a section of “straight-forward” problems that will not be on this year’s exam, which will be most similar to that given in 2007 (i.e., word problems).

Topics

Generally what is covered in Biosimulation I/II with questions similar to those in exams (and some problem sets) assigned in those courses.

1. Translating a modeling problem given in words to a mathematical expression using principles of dimensional analysis and scaling of variables.
2. Applying basic principles of approximation (i.e., binomial approximation, Taylor series, etc.) to simplify mathematical expressions to generate approximate analytical solutions.
3. Applying scaling to help reduce model complexity for solution.
4. Evaluating the solutions of common 1st and 2nd order linear ODEs found after neglecting higher order terms.
5. Applying the basic methods of qualitative analysis using 2nd order linear ODE systems.
6. Applying linearization and qualitative analysis for systems of nonlinear differential equations.
7. Applying basic concepts in probability to modeling stochastic problems in biology and basic applied problems relevant to biomedical research.

If you have any questions about the exam, please contact Dr. Bahrad Sokhansanj at:
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For administrative questions, please contact Ms. Natalia Broz at:

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