Math 490N/Biol 595N: Topics for Final Exam

Friday, May 7, 1:00–3:00, in REC 122.

NOTES:

The Final Exam is cumulative, thus, topics from the Midterm Test list are to be added to the list below.

Kandel's book on Neural Systems is on reserve in the Math Library.

Robinson's book on Dynamical Systems is on reserve in the Math Library.

Biology for all

There will be essay questions about some of the topics below.

- Gap junction connections between neurons
- Synaptic connection between neurons
- Blood oxygen level (BOLD) measures of brain activity
- Central Pattern Generators (CPG's)
- Basic biology from the papers and presentations by the class

Math for all

There will be a question or questions about interpretation or construction of graphs concerning the topics below.

- Modelling gap junction and synaptic connections between neurons
- Integrate-and-fire models
- Periodic orbits in the phase plane

Biology for biological scientists (Biol 595N)

- Parkinson's disease

Math for mathematical scientists (Math 490N/Math 598)

- Definitions and theorems on stability, fixed points, limits sets
- Theorems on linearization
- Definitions and theorems on periodic orbits, the Poincaré Bendixson Theorem