December 9, 2008

Master of Science Degree in Mathematical Biology

Completion of this professional Master of Science (M.S.) degree is expected within two years of full-time study.

Requirements for the M.S. Degree in Mathematical Biology:

- 45 hours of approved coursework. A list of required courses and approved elective courses appears below.
- Master's Thesis. (Requirements regarding the format and writing of a Master's Thesis may be found in the Graduate School Handbook.)
- Oral defense of thesis.

Required Courses:

- Ordinary and Partial Differential Equations: 615*, 616*, 617 *
- Numerical Methods in Scientific Computing: 606, 607
  (Advanced students may choose the two-quarter sequence 707/727, 708/728)
- Biology: A new, comprehensive course in biology that will serve as prerequisite to all elective biology courses (no biology prerequisite is required for this course): 2 quarters, 600-level
- Modeling in Mathematical Biology (Math 865*, Friedman, Kao)
- Statistics: 610 and 623
  (Students may instead choose the three-quarter sequence 620, 621, 622)

Elective Courses:

The following list provides examples of approved coursework that may be used to fulfill the 45-credit-hour requirement; this list is not inclusive.

Mathematics is applicable to many different aspects of biology, and new applications are continually being found. In order to allow students to choose the directions in which they wish to apply themselves, we have listed several options as electives. We fully expect that students will take the appropriate prerequisites associated with the courses they choose, and students will be advised accordingly.

- Biology Biochem 613-615
  BME 600
  EEOB 617, 714, 881 (seminar course)
  Mol Gen 605-608, 640, 700-701
  PCMB 622-623, 630-631
- Statistics 632 Stochastic processes
  773 Statistical computing
  881-882 (Topics in Mathematical Statistics; e.g., Phylogenetics)
  883 Statistical Methods for Analyzing Genetic Data
- Mathematics: Advanced PDE >800

Numerical Methods in Scientific Computing 709, 729
Algebra >600
Analysis >600
Probability >700

A student may ask to use other courses to satisfy the coursework requirement. The request should be made by letter to the M.S. Coordinator, who will bring it before the Graduate Studies Committee for approval.
Students are encouraged to participate in tutorials and in the graduate summer program at the Mathematical Biosciences Institute.
*** denotes new or revised courses**

SAMPLE SCHEDULE – for students ready to take Math 615

Autumn	Winter	Spring	Summer
Year 1:			
Math 615	Math 616	Math 617	begin thesis
BIO	BIO	elective	MBI program
Year 2:			
elective	Math 607	Math 606	
Stat 610	Stat 623	Math 865	

SAMPLE SCHEDULES - deferring Math 615 until second year

(some students may use the first year to prepare for Math 615)

(1) Statistics in year one:

Autumn	Winter	Spring	Summer
Year 1:			
BIO	BIO	elective	begin thesis
Stat 610	Stat 623	elective	MBI program
Year 2:			
Math 615	Math 616	Math 617	
elective	Math 607	Math 865	
		Math 606	

(2) Numerical analysis in year one:

SAMPLE SCHEDULE -

Autumn	Winter	Spring	Summer
Year 1:			
BIO elective	BIO Math 607	elective Math 606	begin thesis MBI program
Year 2:			
Math 615 Stat 610	Math 616 Stat 623	Math 617 Math 865	