

## **Syllabus: BIOL / ENST 4170 - Population Ecology**

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Class: MWF 11-12  
Lecture: Life Sciences 118  
Discussion: McDonnell Hall 212, 312, 412, 433  
Lab: Natural Science Learning Center

Course Description: This course examines the ecological factors that cause fluctuation and regulation of natural populations and emphasizes the utility of mathematical models to assess the dynamics of populations. The course will include lectures, discussions and computer labs using the programming language MATLAB. Emphasis is placed on principles as applied to conservation and management. Topics include assessing extinction risk of rare species, invasion dynamics of exotic species, demographic and environmental stochasticity, metapopulation dynamics, structured populations, the role of species interactions, and micro-evolutionary processes. Prerequisites: Calculus (Math 131 and 132) and Bio 381.

Grade: 2 exams (each worth 15%), participation (20%), computer lab assignments (25%), 1<sup>st</sup> draft of paper (5%), final paper (20%).

Book (recommended): Quantitative Conservation Biology by Morris and Doak

Computer labs are due at the beginning of the next computer lab. Late assignments will not be accepted.

Class schedule

August 26- Lecture- Intro to population growth

August 28- Lecture- Intro to population growth

August 31- Lecture- Intro to population growth

September 2- Discussion

September 4- Lecture- Population viability analysis

September 7- No Class- Labor Day

September 9- Discussion

September 11- Computer Lab

September 14- Lecture- Structured populations

September 16- Discussion

September 18- Computer Lab

September 21- Lecture- Stochasticity

September 23- Discussion

September 25- Computer Lab

September 28- Lecture- Density dependence

September 30- Discussion

October 2- Computer Lab

October 5- Lecture- Life history strategies

October 7- Discussion

October 9- Computer Lab

October 12- Lecture- Harvesting

October 14- Lecture- Invasive species

October 16- No Class- Fall Break

October 19- Lecture- Metapopulations- **topic for paper due**

October 21- Discussion

October 23- Computer Lab

October 26- Lecture- Optimal foraging

October 28- Discussion

October 30- **Exam 1**

November 2- Lecture- Evolution and population dynamics

November 4- Discussion

November 6- Lecture- Disease

November 9- Computer Lab

November 11- Discussion

November 13- Computer Lab

November 16- Lecture- Competition- **1<sup>st</sup> draft of paper due**

November 18- Discussion

November 20- Computer Lab

November 23- Lecture- Population cycles and outbreaks

November 25- No Class- Thanksgiving

November 27- No Class- Thanksgiving

November 30- Lecture- Species interactions

December 2- Discussion

December 4- Computer Lab

December 7- Computer Lab help day

December 13- **papers due**

December 16 10:30 AM - 12:30 PM- **Exam 2**