ECCB 689 Special Topics in

Evolutionary Ecology and Social Behavior

Fall 2026 · Tues / Thurs 1:15 – 2:30 PM

Why do animals sacrifice themselves for others? What drives microbial warfare? What determines how harmful a parasite becomes? Why do organisms age? This course gives students the conceptual and analytical tools to address questions like these.

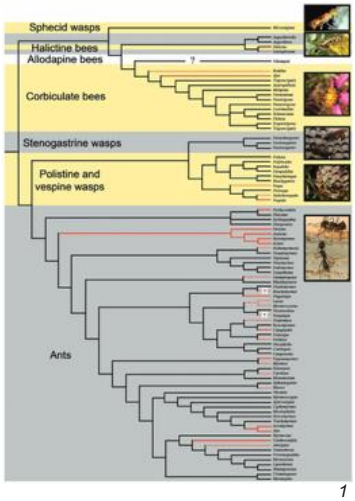
About this course

This course offers an integrative treatment of modern evolutionary biology, built around primary literature and combining general theory and foundational concepts with hands-on mathematical modeling. Topics are drawn from across the tree of life, from microbes and social insects to birds and mammals.

The course emphasizes the formulation of testable hypotheses and the critical evaluation of theoretical and empirical work. By the end of the course, students will be able to understand recent advances in evolutionary theory in their historical context, communicate evolutionary arguments clearly, and apply evolutionary reasoning to problems in ecology, behavior, health, and conservation.

Topics include

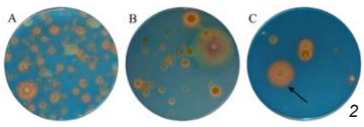
- Natural selection & adaptation
- Social evolution & altruism
- Sex allocation theory
- Life history evolution & aging
- Evolutionary game theory
- Parental care & cooperative breeding
- Evolution of infectious diseases
- Microbial ecology & evolution
- Evolutionary ecology & conservation
- Evolutionary medicine & public health



1

major transitions in evolution

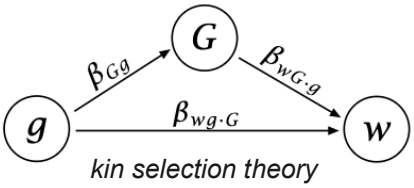
parental care



2

cooperation in microbes

senescence in animals



kin selection theory

Prerequisites: Graduate classification or permission of instructor. Basic analytical skills expected. Students from ecology, biology, conservation biology, entomology, animal science, microbiology, mathematical and computational biology, and related fields are welcome.

For more information, contact

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socialevoeco.github.io/#teaching

1. Hughes et al 2008 2. Majewska et al 2024