Fall 9-1-2021

BIOB 506.01: OBE Core Course

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BIOB 506 EE Core Course II **Fall 2021**

Instructors

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Office Hours:	W, 11-11:50 AM	T Th, 11-11:50 AM	By arrangement

Times: Lectures - 8:30-9:50 AM, T Th, LA103B

Discussion - TBD

Moodle: https://moodle.umt.edu/course/view.php?id=46617#section-4

Course Description: A primary goal of the OBEE core course series is to give students a foundation of understanding of the fundamental concepts and approaches in a given field. Historically this has been divided into three semester-long courses on (1) Genetics & Evolution, (2) Ecology, and (3) Organismal Form & Function. We are now condensing this sequence into two semesters, merging aspects of each together into a narrative that spans core topics in ecology, evolution, and organismal biology. Conversance for this course means the ability to discuss, at an informed but not necessarily expert level, classical and current research in physiological ecology, community ecology, co-evolution, and community phylogenetics. Topics related to community ecology – the primary component of the course – include competition, predator-prey interactions, mutualisms, disease ecology, community organization, null models of community assembly, metacommunities, and species diversity. Lectures will alternate between theoretical foundations and empirical tests of theory. Discussion sections are designed to allow students to investigate and present "cutting-edge" concepts related to the core lecture topics, and to discuss current research incorporating those concepts.

Grading:

20% *Mini-lecture and paper discussion*

> In discussion periods, students will present a 15 min lecture on a topic not covered by the instructors, and lead a discussion of a related paper

> Lectures and papers should be discussed with the instructor by the Friday before the assigned discussion period

20% *Mid-term exam (Oct. 28)*

25% *Final Proposal*

> Proposals are due on Nov. 30

> We will distribute guidelines for the proposal

10% *Proposal Review*

> Review panels will be during the last weeks of classes

> We will distribute guidelines for the written and oral review

25% *Participation*

Book: Gotelli, N.J. 2008. A Primer of Ecology. 4thed. Sinauer Associates, Inc., Sunderland, MA.

Readings: Readings for lectures will be posted to Moodle.

Policy: We will consider extensions on assignments if you discuss the reason for your request IN PERSON before the due date.

The University's Academic Policies and Procedures are described at https://catalog.umt.edu/academics/policies-procedures, including important dates regarding course registration.

Accessibility Syllabus Statement:
The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, ode@umontana.edu, or visit www.umt.edu/disability for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.
Any questions please contact me.

Date	Topics	Instructor
Aug. 31	Course objectives and structure	W
Sept. 2	Climate variability hypothesis and overdispersion	B
Sept. 7	Receiving environmental signals: G-proteins and signal cascades	B
Sept. 9	Life in air and water I: drag	B
Sept. 14	Life in air and water II: lift	B
Sept. 16	Niches	W
Sept. 21	Competition models I	W
Sept. 23	Competition models II	W
Sept. 28	Empirical competition research	W
Sept. 30	Simple predator prey models	W
Oct. 5	Complex predator prey models	W
Oct. 7	Empirical predator direct effects	W
Oct. 12	Empirical predator indirect effects	W
Oct. 14	Spatial population and community models I	W
Oct. 19	Spatial population and community models II	W
Oct. 21	Disease ecology	Dr. Angie Lewis
Oct. 26	Community assembly and coexistence	W
Oct. 28	**Mid-Term Exam**	
Nov. 2	Non-equilibrium community structure	W
Nov. 4	Food webs I	W
Nov. 9	Food webs II	W
Nov. 11	**Veterans Day**	
Nov. 16	Conflict and antagonistic co-evolution	J
Nov. 18	Co-evolution between species	J
Nov. 23	Community phylogenetics & evolution	J
Nov. 25	**Thanksgiving**	
Nov. 30	Food web diversity / stability data (Proposals due)	W
Dec. 2	Neutral theory in ecology	W
Dec. 7	Final projects	W
Dec. 9	Final projects	W

Topic	Learning outcome
Climate variability hypothesis and overdispersion	Understand how abiotic and biotic factors influence anatomy and physiology
Receiving environmental signals	Understand the functions G-proteins and signal cascades
Life in air and water I: drag	Understand how anatomy and fluid dynamics influence drag
Life in air and water II: lift	Understand how anatomy and fluid dynamics influence lift
Niches	Understand the origin and history of niche theory
Competition models I	Understand interference competition models
Competition models II	Understand resource competition models
Empirical competition research	Understand how competition theory is applied in the field
Simple predator prey models	Understand two-species predator prey models
Complex predator prey models	Understand multi-species predator prey models
Empirical predator effects	Understand how pred-prey theory is applied in the field
Spatial population and community models I	Understand the history and development of spatial models
Spatial population and community models II	Understand how complex spatial processes are modeled
Disease ecology	Understand the key components of disease models and their application
Community assembly/coexistence	Understand empirical tests of species coexistence
Mutualisms	Understand theory and empirical studies of mutualisms
Conflict and antagonistic co-evolution	Understand the drivers of antagonistic co-evolution
Co-evolution between species	Understand other, non-antagonistic drivers of co-evolution
Community phylogenetics & evolution	Understand evolutionary analyses of community structure
Non-equilibrium community structure	Understand non-equilibrium community models
Food webs	Understand food web theory and applications
Food web diversity / stability data	Understand the historical debate over diversity and stability
Neutral theory in ecology	Understand the theory and applications of neutral models