Instructors:
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Office Hours: By appointment with either professor

Lectures: Monday 3-5 pm; Friday 10-11am

Course Description and Objectives:
A primary goal of the OBEE core course series is to foster conversance in the fundamental concepts and approaches of a given field. Conversance for this course means the ability to discuss, at an informed but not necessarily expert level, classical and current research in several major subdisciplines of evolutionary biology and evolutionary genetics. We will begin by walking through the foundation concepts of population and quantitative genetics (aka ecological genetics) in the pre-genomic era, and then move on to the use of molecular data to investigate short and long-term evolution (population genomics and phylogenetics). Finally, we will explore the forefront of research into the processes of adaptive evolution and speciation, two subfields that have wrestled with long-standing questions that are being viewed from new perspectives in the post-genomic era. We will necessarily operate at a variety of levels, with the aim of providing both novice and advanced students the opportunity to enhance their knowledge and skills.

Learning Outcomes - This course will provide a foundational understanding of the key conceptual issues in Evolutionary Biology and Evolutionary Genetics. It will cover fundamental concepts and approaches, both classic and contemporary, while providing you with a basic entrée into the primary literature. A basic fluency in Evolution and Genetics will allow you to: 1) appreciate and evaluate major advances, challenges and opportunities in this area; 2) interact with a broad range of scientists (from visiting speakers to new collaborators); and 3) broaden the scope of your own research.

Course Web Site: Materials for the course will be posted on the course Moodle site site:
https://moodle.umt.edu/

Required Materials:
Text: A textbook is NOT required for this course, but the following references will likely be useful for this course and beyond:

Connor, J.K. and D.L. Hartl. 2004. A primer in ecological genetics. Sinauer Associates. Sunderland MA.
Graur, D. and W-H. Li 2000. Fundamentals of Molecular Evolution. Sinauer Associates. Sunderland MA.
Hartl, D.L. and A.G. Clark. 2007. Principles of Population Genetics. Sinauer Associates. Sunderland MA.

Required readings will be provided as pdf files on the course Moodle site.

Point Allocation
Exams – 400 points; 40% of total grade; 200 pts for each of 2 exams
Final project – 300 points; 30% of total grade
Participation – 300 points; 30% of total grade

Grading Scale A [1000 - 900 pts], B [899 - 800], C [799 - 700], D [699 - 600], F [< 599])
Plus/minus grades may be assigned.

Exams(40%): There will be two (2) open-book/take-home exams. Questions on these exams will be similar in format to those on the written component of OBEE comprehensive exams. However, we emphasize that this course is not intended to be a direct preparation for comps; every committee is unique, and some students will get no evolution or genetics questions at all at their comps and others will be tested at a much higher level. However, exam questions will be designed to test the kinds of fundamental knowledge and synthetic/critical thinking skills that comps question are likely to also demand. These exams will be scheduled for ~Week 7-8 and Finals week, and will roughly divide the course content. Further details of exam format will be given during the week prior to the exam.

Final project (30%): "Nothing in biology makes sense except in the light of evolution" (Dobzhansky 1973), so we will ask you to make sense of some aspect of their own thesis research/organism from an evolutionary perspective. This project will be in the form of a research proposal, but will be delivered as a ~15 minute oral presentation rather than a written document. The presentations will be during the final week of class (more info when we get closer).

Participation (30%): The final component of your grade will be based on various aspects of class participation. First, the course is structured to alternate formal lectures with discussions of both classic and contemporary literature (see lecture schedule on Moodle). These literature discussions will be student led and each of you will be assigned one discussion to lead. Given the current enrollment, we will have to have some co-led sessions. While leading these discussions, you will first give a brief overview (~15 min.) the paper and the topic it addresses, and then you will facilitate the following discussion by presenting targeted discussion questions to the class. Half of your participation points will be based on the quality of your paper overview and your ability to facilitate the discussion. We will provide written guidance on leading discussion to help you prepare. The second half of your participation points will come your participation in the discussions you are not personally leading. When you are not leading the discussion, you will be required to submit via moodle a concise statement that 24 hours before the scheduled discussion that includes 1.) an aspect of the paper you found confusing or unclear, and 2.) a brief critique or suggestion for improvement of the study. We will collate these responses and given them to the discussion leader to aid in guiding the discussion. Because discussions only work when people actually speak, you will also have the opportunity to earn points through your verbal participation in the class discussions.