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ANTY 418.01: Evolution and Genetic Variation in Human Populations

Meradeth H. Snow

University of Montana - Missoula, meradeth.snow@umontana.edu

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**Anthropology 418: Evolution and Genetic Variation in Human Populations
Spring Semester 2019**

Instructor:

Dr. Meradeth Snow

Meradeth.snow@umontana.edu

Office Hours: 2-5pm Mondays in 219 Social Sciences & by appointment

Class Information:

11-12:20pm Tuesdays and Thursdays in Social Sciences 252.

Textbook & Readings:

1. Mielke, JH, Lyle W. Konigsberg, and John H. Relethford. *Human Biological Variation*. 2nd Edition. Oxford University Press; New York, NY.
 - Listed as Mielke in syllabus readings
2. Supplemental readings will be posted on the course Moodle site. These will provide material for discussion in class and are required reading. Please note, you should read each article critically: they are chosen more to make you *think*, and not for memorization.

The Purpose of Anthropology 418:

The goal of this course is to examine biological explanations for how variation arises among humans, as well as how studies of human variation influence society both past and present. We will consider genetic, phenotypic, sex, and behavioral differences among humans, as well as the theory, methods, and ethics involved in scientific studies of humans. Through the course students will be expected to explain human variation from a biological perspective, understand, interpret and react to current and future human biological studies and research. Students are also expected to complete written work on a specific topic of interest and intelligently discuss multiple topics and readings related to human variation studies.

Grades:

Exams:

Midterm Exam: 25%

Final Exam: 25%

Research Paper

Outline: 5%

In-class presentation: 5%

Research Paper: 20%

Problem Set: 10%

Participation: 10%

~OR~

Lecture Presentation

Draft/Outline: 5%

Presentation itself: 25%

Online Materials:

This course will have a significant portion of the required materials posted to Moodle. It is advised that you regularly check this resource to ensure you are up-to-date on what you might need. Also, please note that your professor is not responsible for any trouble accessing the site that may arise, especially the night before an exam.

Examinations:

The midterm exam will be primarily made up of term identifications, short answer, and short essay questions. The final exam will be entirely composed of multiple choice questions, unless changes are made due to student input and performance.

The midterm exam will test your knowledge and understanding of material covered from the start of class through Week 7. The final exam will test your knowledge and understanding of material covered during weeks 8-15, including the presentations of student papers. Although the final is not technically cumulative, many concepts are, and you may find terms and examples from the first half of the class helpful on the final exam.

Research Paper:

You are allowed to select to complete either a research paper or carry out a guest lecture for this portion of your grade. Topic selection for the latter must be made by the first day of the second week of classes.

Your research paper will be written on a topic of your choice—something of interest to you within the realm of human biological variation, including all topics covered in this course. You are encouraged to talk to your instructor about your topic to ensure that it is suitable. You should have your topic chosen by the midterm, and a significant amount of research completed before you turn in your outline.

The paper is composed of three parts: your outline, in-class presentation, and the paper itself. Detailed instructions can be found on Moodle in the document labeled Research Paper Instructions. You are able, and indeed encouraged, to bring early drafts of your paper to Dr. Snow for comments and feedback.

Lecture Presentation:

In lieu of writing a research paper, this option will involve selection one of the lecture topics (excluding lab weeks, population genetics lectures, or review/movie weeks), and preparing a 1 hour 20 minute lecture to give to your fellow students. You may not work as a group unless the number of lectures covered is the same as the number in your group. Your choice of this option, as well as which lecture you want to cover, must be submitted to Dr. Snow by the first day of the second week of classes.

Completing this assignment will involve creating an outline or mock lecture that is due at least one week prior to your assigned lecture date, and obtaining approval from Dr. Snow about the depth and scope of your lecture. Completing this draft earlier is to your benefit, should any major changes be required.

The lecture itself should resemble a typical lecture in class. It can be augmented by short videos or other activities, however the topic must be covered for the remaining students to a satisfactory level. Dr. Snow is available to aid in completing this assignment, so do not hesitate to seek aid.

Problem Set:

The problem set assigned to you will be distributed via Moodle and will cover information presented during the first half of the course. You will be asked to apply formulas and reason out problems applicable to human variation studies. A practice problem set will be distributed prior to this for you to complete and which will be solved during week 6. You will be graded on your work, how well it is labeled, your explanations, and the answers you obtain. You are welcome to seek help from your Professor, but I warn against using other students as sources of help—group work often leads to group-wide point loss. This problem set may take quite a bit of time; do not wait until the last minute to begin.

Participation:

The participation portion of the class will be based on your contribution to classroom discussions that will take place throughout the semester. These will be primarily composed of answering written questions which will then be discussed as a group. Your attendance and thoughtful and respectful analysis of the assigned readings for the classroom discussion will be counted toward your grade. Several weeks will also have small assignments that will accompany the reading—these will be announced widely in class.

Graduate Students:

Graduate students who enroll in this course will be expected to uphold higher standards of academic performance. In order to facilitate this, several requirements must be met: the final paper for the course will be expected to be 50% longer than that of the undergraduate students, with twice as many sources (16-20pgs in length, 20-30 sources). It will be graded to a higher standard commensurate with graduate work. Additionally, graduate students will be expected to carry the course's lab work to the next level, beyond that of the undergraduates, which will entail sequencing and analyzing their own DNA.

Make-up or Missed Exams:

Exams will **not** be re-administered unless approval is obtained at least 24 hours prior to the exam, with a legitimate excuse (such as health reasons, with a doctor's confirmation). If you miss an exam you must contact your professor within 24 hours, with a documented excuse, in order to obtain permission to take the exam. If you know you will miss an exam ahead of time you must make an appointment at least **two weeks** in advance to take it early.

Late Assignments:

Assignments submitted after the due date will **not** be accepted unless you have a documented, legitimate excuse and have contacted your instructor within **24 hours** of the due date. Please contact your instructor well in advance if you know there will be a problem submitting your assignment. Email submissions will never be accepted.

How to Succeed in ANTY418:

Those students who have completed my courses successfully often display similar tendencies. I highly recommend taking these into account when assessing what grade you hope to achieve in the course. These include:

- 1) Attend every lecture and take notes on the material.
- 2) Ask questions when confused about a topic or concept, either in class or during office hours, well before an exam.
- 3) Complete readings before class, annotating or taking notes while reading.
- 4) Participate in discussions of the material, either in class or with the TA/Professor.
- 5) Maintain a positive, self-motivated attitude.

Code of Academic Conduct:

With regard to academic dishonesty, this class has a zero-tolerance policy and will promptly deal with any acts of academic dishonesty (cheating, plagiarism, or unauthorized help on assignments, etc.) according to university policy. For further information on what falls into these categories see: http://life.umt.edu/vpsa/student_conduct.php. If you have questions or concerns, please feel free to contact your professor.

Students with Disabilities:

Students with disabilities may request reasonable modifications by contacting your instructor. The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). “Reasonable” means the University permits no fundamental alterations of academic standards or retroactive modifications. For other options see <http://www.umt.edu/disability>.

| Week | Date | Topic | Reading & assignments | |
|-------------|-------------|--------------|---|---|
| 1 | 1 | 1/10 | Syllabus & Introduction to Course | Course Syllabus |
| 2 | 2 | 1/15 | Refresher on basic genetics I | Mielke Chap. 2 |
| | 3 | 1/17 | Refresher on basic genetics II | Mielke Chap. 9 Paper or Lecture? |
| 3 | 4 | 1/22 | mtDNA and Y-Chromosome Migrations | Mielke Chap. 13 |
| | 5 | 1/24 | Molecular Clock | |
| 4 | 6 | 1/29 | First Peoples Film | |
| | 7 | 1/31 | Ancient DNA | |
| 5 | 8 | 2/5 | Next Generation Sequencing | |
| | 9 | 2/7 | Review of HWE and Chi-squared | Mielke Chap. 3 |
| 6 | 10 | 2/12 | Population Genetics I | Mielke pg. 256-258 |
| | 11 | 2/14 | Population Genetics II | |
| 7 | 12 | 2/19 | Review Practice Problem Set | Review PPS before class! |
| | 13 | 2/21 | Review for midterm | |
| 8 | 14 | 2/26 | MIDTERM EXAM | |
| | 15 | 2/28 | Laboratory Exercises (DNA extraction) | Meet in 250B |
| 9 | 16 | 3/5 | Laboratory Exercises (PCR) | Meet in 250B |
| | 17 | 3/7 | Laboratory Exercises (Electrophoresis) | |
| 10 | 18 | 3/12 | Signs of Selection | |
| | 19 | 3/14 | Disease Selection | Problem Set DUE |
| 11 | 20 | 3/19 | Epigenetics | |
| | 21 | 3/21 | Human Microbiome | |
| 12 | - | 3/26 | Spring Break | No Class |
| | - | 3/28 | Spring Break | No Class |
| 13 | 22 | 4/2 | DNA Sequence Day | Outline DUE |
| | 23 | 4/4 | Human Heritability | |
| 14 | 24 | 4/9 | Evolution of Attractiveness | Mielke pg. 147-155 |
| | 25 | 4/11 | Body Doubles: the twin experience film | |
| 15 | 26 | 4/16 | Forensic Applications | |
| | 27 | 4/18 | Peopling of the New World | Milke pg. 222-225 |
| 16 | 28 | 4/23 | Student Presentations | |
| | 29 | 4/25 | Review for final exam | Paper DUE |
| | | 5/2 | FINAL EXAM 8-10am in our regular classroom | |

*Small changes to this syllabus may be made but will be announced widely!