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BIOB 375.01: General Genetics

James D. Driver

University of Montana - Missoula, jim.driver@umontana.edu

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BIOB 375 General Genetics Spring Semester 2019

**Instructor Dr. Jim Driver. Office ISB 017 Electron Microscopy Laboratory,
Phone – 243-4669, email – jim.driver@mso.umt.edu
Classroom FOR 305. Lecture times - Tu Th 11:00am – 12:20 pm
Office Hour – Wednesdays 11:00am – 12:00 pm or by appointment**

Genetics: A Conceptual Approach by Benjamin A. Pierce, 6th Edition (the 5th edition would be OK). This textbook is required. You may purchase or RENT it from outside vendors (like Amazon).

INTRODUCTION: BIOB 375 is a 3 credit-hour class that will focus on the **molecular genetics of eukaryotes**. The first part of the class will focus on molecular genetics, gene structure and gene regulation. Our course will have two major components. First, students will acquire a mechanistic understanding of particular genetic phenomena (e.g., DNA replication and repair, gene silencing, *cis*- and *trans*-regulation), and in the process, gain knowledge about experimental tools used to acquire that understanding. Second, students will learn how these tools and this understanding are used to address questions on the leading edge of development, behavior, microbiology, neuroscience, evolutionary, and cellular biology. To give but a couple of examples: gene copy number can influence cancerous cells and susceptibility to HIV infection; microbial components of the human gut microbiome have an effect on gene expression in the host, so apparently diet can have a direct effect on which genes are turned on and which are turned off.

LEARNING OUTCOMES: Biology 375 will emphasize biological principles, scientific concepts, and experimental design. Learning outcomes are that you will thoroughly understand the mechanisms of inheritance, develop a firm grasp of the fundamental principles of gene structure and gene expression and gain experience in reading primary literature that uses genetics to address fundamental biological questions. Genetics is a problem-based science. Assignments and exams will be designed to encourage students to synthesize subject matter, not simply to test their ability to recall details.

Lecture quizzes and exams: There will be 3 lecture exams; two exams during the semester and a 1/2 comprehensive final. There will be 4 short quizzes given during the semester. There will also be one short writing assignment as described below.

Quiz Schedule:

Quiz 1 Thursday January 24th

Quiz 2 Thursday February 21st

Quiz 3 Thursday April 4th

Quiz 4 Thursday April 18th

Exam Schedule:

Exam 1 Tuesday February 7th.

Exam 2 Tuesday March 12th.

Final Exam May 2nd, 8:00am – 10:00am

Written assignment:

Topic due by Monday March 11th. Send to Dr. Driver at jim.driver@mso.umt.edu.

Paper due by 5pm Monday April 8th.

Each student will choose a topic on genetics that has an impact on human health for a 2 page single-spaced paper including references. This paper is to be directed to a public audience of non-scientists. You will attempt to illustrate your topic in a way that will help the audience understand the science behind the topic. As microbiologists or health professionals you must be able to clearly explain a genetic disease and

its transmission, pathology, and treatments to a public that might not understand these topics or may have been misled by other information outlets (see - The Internet). The paper will be graded on clarity of writing, suitability for the target audience, scientific accuracy, and quality of the writing (grammar, spelling, clarity of descriptions, etc.). Please cite a minimum of 2 references at the end of the one page paper. Since the internet is a common resource for all types of research (or pseudo-research) make sure to back up your information with primary research papers from leading journals.

The paper may be emailed to jim.driver@mso.umt.edu and Shelby Cole, shelby.cole@umconnect.umt.edu or if necessary handed in after class or placed in my mailbox in HS 104. **Late papers will be penalized 10% for every day late.**

Grading

Grades for this course will be based on 2 semester exams (100 points each) and a final exam (200 points, 1/2 comprehensive), 4 quizzes (50 points each) and a short writing assignment (150 points possible). The following grading scheme will be used:

100-90% = A, 89.9-80% = B, 79.9-70% = C, 69.9-60% = D, <60% = F

If you are taking this class as Pass/No Pass the University requirement for a Passing grade is the equivalent of a "C" (70%) or higher cumulative average on exams and assignments.

Classroom attendance, make-up exams.

Please attend class on a regular basis. Disruptive behavior such as talking or disturbing other students by leaving lecture early is not acceptable. If you expect to leave class early, please tell me before class begins. **Make-up exams will be permitted only with compelling and supported reasons.** Make-up exams will be scheduled at the convenience of the instructor.

Instructor's policy for accommodating disabilities

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

Instructor's policy on academic honesty and plagiarism.

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code.