BI311 Genetics
Spring 2014, 4 credits

Instructor:
Dr. Dee Denver
Associate Professor
Department of Integrative Biology
Office: Cordley 2000
Phone: 541-737-3698
Email: denvedee@science.oregonstate.edu
Office Hour: Thursdays, 3:00-4:00pm (or by appointment)

Teaching Assistant (TA):
Emily Weiss
Office: Cordley 2106
Email: weissem@science.oregonstate.edu
Office Hour: Wednesdays, 9:00-10:00am (or by appointment)

Lecture Room and Time:
Lecture sessions are three times per week: MWF, 3:00 – 3:50 pm, GLFN AUD.

Recitation Sessions:
Recitation sections meet once per week, including the first week of class, and attendance is required. These sessions will be led by the TA. During these sessions students will learn genetics concepts through practice problem sets, lecture review, and discussions designed by the TA, work in teams to solve and turn in recitation reports (details below).

Required Textbook:
Daniel L. Hartl. Essential Genetics: A Genomics Perspective. 6th Ed. Jones and Bartlett Publishers, Sudbury, MA. Reading assignments and homework problems will come from this textbook, and from other sources (provided on Blackboard).

Genetics on the Web. The textbook has an accompanying website that provides supplemental learning tools (http://biology.jbpub.com/Hartl/EssentialGenetics/6e). Here you will find supplementary and complimentary resources to help you learn genetics concepts and solve problems.

Additional Materials:
Lecture slides will be posted on Blackboard as PDF files the day before class. Blackboard will also be used for posting additional reading assignments and homework problems. On Friday evenings, Dr. Denver will also post his “Genetics Newsletter” that will review the past week’s material, highlight areas that should be emphasized during your study, share recent items in the news about genetics and genomics, and provide suggested homework problems (and the answers from last week).
Course Overview:
Genetics is a fundamental area of biology that affects virtually all life phenomena. Having a solid basic understanding of genetic processes is essential to success in later biological coursework, and in all life and health sciences careers. Genetics is a field that requires abstract thinking skills as well as quantitative mathematical skills. There are also many different genetic perspectives, such as the perspective of the “molecular geneticist” versus that of the “population geneticist” – this course will provide an interdisciplinary perspective, synthesizing approaches and viewpoints to provide a unified view of this important biological discipline. The genomics revolution has made the study of genetic processes one of the hottest fields in the life sciences. We are now able to quickly and cheaply sequence complete genomes from a variety of organisms – this is already transforming and will continue to transform the life and health sciences. This course will bring together “classical genetics” and “next generation genetics”.

Learning Outcomes:
• Apply knowledge in classical transmission genetics to questions related to genes in individuals and populations.
• Describe the molecular architecture of genes, genomes and chromosomes.
• Describe the effects of mutations on gene functions and phenotypes.
• Identify the basic tools and experimental approaches used by scientists to understand genetic processes and dissect gene function.

Suggestions for Your Success:
• The single most important thing you can do to succeed in this course is attend and be actively engaged in lectures and recitations, then review and outline the material presented.
• Overview (at least skim the main points and figures) the assigned reading before coming to lecture.
• Do the homework, even though it’s not worth points. Carefully re-work through problems that you initially got incorrect. The questions appearing on the midterms and final exam will be very similar to the assigned homework problems.
• Interact with other students in the class and the instructors about the course material. Form study groups. The more time you spend talking about genetics, the more you will understand genetics.
• The powerpoint slides on Blackboard are outline guides. They are provided to help facilitate your learning process during and after class, but are NOT a substitute for coming to and actively learning in class.
• I am happy to help you with problems you might have with the course material during my regular weekly office hours (Thu 3:00 – 4:00 pm) or by appointment. However, if you do not attend the lectures and recitations, DO NOT show up to office hours expecting a review.

Examinations and Grading:
Recitation Reports: 15% of final grade
Midterm Exam 1: 25% of final grade
Midterm Exam 2: 25% of final grade
Comprehensive Final: 35% of final grade
Recitation Reports:
During recitation, students will work in groups to solve problems. Answers to these problems will be turned in as reports during recitation – every student (NOT team) will be required to turn in a report. Answers to the problem sets will be discussed at the end of the recitation. Grading will be based on report completion and effort.

Exams:
The Midterm Exams will be held during a regularly scheduled 50-minute period in the regular lecture auditorium. See the syllabus for exact dates. Both conceptual and problem-based questions will appear on the Midterm Exams and the Comprehensive Final Exam. Some questions will require a calculator – bring a calculator to all exams. Cell phones and other interpersonal communication are not allowed and must be turned off during all lectures and exams. The exams will cover material from the lectures, reading assignments, in-class and recitation discussions, and the assigned homework.

Grades will be finalized only after all of the points for the course are completed. A plus/minus rating system will be used. Anyone who: earns 90% of the possible points will earn at least an A-grade, earns between 80-89% of the points will receive at least a B-grade, earns between 70-79% of the points will receive at least a C-grade, earns between 60-69% of the points will receive a D-grade. Anyone earning less than 60% of the total points is in danger of failing the course.

University and Departmental Policies

Classroom Behavior:
The classroom should be a place of dignity, civility and respect. At OSU, a number of behaviors, such as reading the paper and always being late for class, are considered disruptive behaviors. For the sake of all students taking the class, talking during lectures should be kept to a bare minimum, cell phones and pagers should be turned off before entering the classroom. See:
http://oregonstate.edu/admin/stucon/disruptivebehavior.htm

Ethical Behavior:
Students are expected to be honest and ethical in their academic work. Academic dishonesty, such as cheating or plagiarism, will not be tolerated and students will be subject to disciplinary processes outlined in the Student Conduct Regulations (http://oregonstate.edu/admin/stucon/achon.htm).

Students with Disabilities:
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098
# Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic(s)</th>
<th>Chapter(s)</th>
<th>Instructor(s)</th>
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<tbody>
<tr>
<td><strong>Week 1</strong> (Mar 31, Apr 2, 4)</td>
<td>The logic of molecular genetic analysis</td>
<td>1, 6</td>
<td>Denver</td>
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<tr>
<td><strong>Week 2</strong> (Apr 7, 9, 11)</td>
<td>Transmission genetics</td>
<td>2</td>
<td>Denver</td>
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<tr>
<td><strong>Week 3</strong> (Apr 14, 16, 18)</td>
<td>Probability, pedigrees, chromosome dynamics</td>
<td>3, 5</td>
<td>Denver</td>
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<tr>
<td><strong>Week 4</strong> <strong>Monday Apr 21</strong></td>
<td><strong>Midterm Exam #1</strong> <em>(covers Weeks 1-3)</em></td>
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<td><strong>Week 4</strong> (Apr 23, 25)</td>
<td>Linkage &amp; mapping; epistasis</td>
<td>4, 1, 2</td>
<td>Denver</td>
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<tr>
<td><strong>Week 5</strong> (Apr 28, 30, May 2)</td>
<td>Mutation; DNA repair; cancer genetics</td>
<td>12, 13</td>
<td>Denver</td>
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<td><strong>Week 6</strong> (May 5, 7, 9)</td>
<td>Genetics of bacteria and viruses; gene regulation</td>
<td>7, 8, 9</td>
<td>Denver</td>
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<td><strong>Week 7</strong> Monday May 12</td>
<td><strong>Midterm Exam #2</strong> <em>(covers weeks 4-6)</em></td>
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<td><strong>Week 7</strong> (May 14, 16)</td>
<td>Population genetics</td>
<td>14</td>
<td>Denver</td>
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<td><strong>Week 8</strong> (May 19, 21, 23)</td>
<td>Evolutionary genetics</td>
<td>14</td>
<td>Denver</td>
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<td><strong>Memorial Day Mon May 26</strong></td>
<td><strong>Holiday – no class</strong></td>
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<tr>
<td><strong>Week 9</strong> (May 28, 30)</td>
<td>Genomics &amp; Special Topics</td>
<td>10</td>
<td>Denver</td>
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<tr>
<td><strong>Week 10</strong> (Jun 2, 4, 6)</td>
<td>Genomics &amp; Special Topics</td>
<td>10</td>
<td>Denver</td>
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**Comprehensive Final Exam**  
Friday June 13, 9:30 am  
GLFN Auditorium