Biological Sciences 50—Genetics and Genomics  Fall 2005
Course Information

DESCRIPTION

Analysis of genes and genomes with an emphasis on function, transmission, mutation and evolution, with examples from animals, plants, bacteria and fungi. Discusses classical and current methods of gene and genome analysis including genetic, molecular, quantitative and bioinformatic approaches. In addition to lecture, mandatory weekly sections will be held. Sections will alternate between laboratory exercises and discussions in which lecture material, chapter problems and student investigations into a variety of human genetic disorders will all be explored.

A major feature of the weekly sections is the Human Genetic Disorder Research Project (HGDRP), a semester-long investigation by students into a variety of diseases which culminates in a December symposium where speakers intimately involved with the disorders studied during the semester gather to discuss topical issues with the class. This unique approach serves to bridge the conceptual topics covered during lectures with the real and dramatic life consequences of genetic disorders.

Lecture Time:  Monday, Wednesday, and Friday from 12:10pm—1:00pm
Lecture Place:  Science Center Hall C
Section Times:  Tuesday, Wednesday, Thursday, or Friday 2:10pm—5:00pm.
Each student will be assigned to one three-hour timeslot and will attend section at that time every week.
Section Places:  Science Center 413c or 413d

REQUIRED TEXTS

Available for purchase at the Harvard COOP:
• Two (2) composition notebooks with sewn-in pages (not spiral bound) for lab. These notebooks are often sold with a black-and-white or green-and-white marble cover.

Available for purchase at Gnomon Copy (in Harvard Square at 1304 Mass Ave):
• Biological Sciences 50 Genetics and Genomics Fall 2005 Section Manual

GRADING POLICIES

Every effort is made to grade BS50 objectively and fairly. Grades will be based on 3 hourly exams, a final exam, laboratory work, and the HGDRP. Two formulae will be used to calculate your final grade; you will automatically receive the higher of the two grades.

Grade Formula 1:
20% HGDRP
15% Laboratory Assignments
35% Highest 2 Hourly Exams
30% Final Exam

Grade Formula 2:
20% HGDRP
15% Laboratory Assignments
40% All 3 Hourly Exams
25% Final Exam

Grade formula 1 takes into consideration that poor performance on a single hourly exam can be compensated for by good performance on the final exam. Grade formula 2 rewards students who perform consistently well on hourly exams by reducing the contribution of the final exam.

In exceptional cases, input from your teaching fellow regarding attendance and effort in section will be considered for borderline grades. However, all final grade decisions are made by the course faculty.
**HOURLY EXAMS: NO MAKE-UP HORLY EXAMS WILL BE GIVEN.** If you miss an exam for any reason, your final grade will be based on Grade Formula 1. Any student requiring special arrangements for examinations should contact Dr. Nancy Huang.

**LABORATORY GRADE:** Laboratory grades will be based on pre-lab and in-lab portions of your lab notebook, as well as post-lab data analysis and discussion questions.

**HUMAN GENETIC DISORDER RESEARCH PROJECT GRADE:** The HGDRP grade will be based on 3 short written articles, one oral presentation, a final quiz on the semester’s topics, and a final review article.

**PRACTICE PROBLEMS:** There are no graded problem sets for BS50. However, students will periodically be given recommended practice problems from the textbook and from previous years’ exams. Exams are primarily problem based, so it is STRONGLY RECOMMENDED that students work these problems in earnest. Part of each section will also be dedicated to problem solving.

**PREREQUISITES**

There are no course prerequisites. However, a strong background in chemistry and general biology is recommended.

**WEB PAGE INFORMATION**

The BS50 web page can be found at [www.courses.fas.harvard.edu/~bs50/](http://www.courses.fas.harvard.edu/~bs50/)

Bookmark this page for easy and frequent access. Consider the web page a critical tool for course preparation and communication throughout the semester. The main page will be updated frequently with course-related announcements and reminders. Hyperlinks will include:

- **Syllabus:** Lecture topics and reading assignments
- **Lecture:** Lecture videos
- **Problems:** Suggested problems to work through in section and on your own
- **Exams:** Schedule for exams, review sessions, and exam answer keys
- **Labs:** Lab schedule
- **HGDRP:** HGDRP schedule and instructions, and links to useful resources
- **Teaching Staff:** Contact information for teaching staff
- **Forum:** Discussion forum for questions on course material – checked frequently by course TFs
- **Links:** Useful links for the labs and HGDRP assignments

**WHERE TO GO WITH PROBLEMS IN BS50**

**Most problems:** See your teaching fellow for problems involving the lecture and section material.

**Lectures you missed:** Lectures in BS50 are taped and can be viewed on the course website.

**Lecture handouts:** Extra lecture handouts are available outside of Science Center 407.

**Administrative concerns:** For questions about section assignments, grading, exams, the course website, and other course concerns, contact Dr. Nancy Huang.

**Other:** In addition to your teaching fellows, Dr. Fixsen and Dr. Huang are happy to discuss course matters or biology in general with you. Feel free to contact them throughout the course if you are in need of assistance. Relevant contact information is listed below:

**Faculty:**

Dr. William Fixsen 5-2926  fixsen@fas.harvard.edu  51 Brattle Street

**Preceptor:**

Dr. Nancy Huang 4-7925  nhuang@fas.harvard.edu  Science Center 407

(617-384-7925 from off campus)
## SYLLABUS, BIOLOGICAL SCIENCES 50

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<td>Inheritance of simple genetic differences</td>
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<td>Section orientation; meiosis continued</td>
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<td>The genome as docking sites: regulatory elements in DNA</td>
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<td>Analyzing biological processes: mutational dissection</td>
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<td>Sex in flies and humans</td>
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**Winter Recess:**    Dec. 21 to Jan. 2  
**Reading Period:**    Jan. 3 to Jan. 13  
**Final Exam Review:** Jan. 15 (Sunday)  
**Final Exam:**        Jan. 18 (Wednesday)
More Course Information

Sections: Laboratory and Discussion
Weekly BS50 sections are mandatory and include both laboratory and discussion components. Laboratories provide the opportunity to learn common genetic techniques and to develop analytical skills that are crucial to all scientific investigation. Discussions provide the opportunity to review material, practice problem solving, and learn about human genetic disorders.

You will meet with the same TF each week, but the main activity of section will alternate between laboratory exercises and the Human Genetic Disorder Research Project (HGDRP). Every section will include problem solving.

Sections meet once a week, for three hours. This semester, sections are offered at these times:
- Tuesdays 2:10 – 5:00pm
- Wednesdays 2:10 – 5:00pm
- Thursdays 2:10 – 5:00pm
- Fridays 2:10 – 5:00pm

Electronic sectioning will be open from Wednesday, September 21 to Sunday, September 25. During this time, students must go to http://www.section.fas.harvard.edu and give their preferences for section times. Students will receive their section assignments by email on or before Wednesday, September 28. Requests to change section must be addressed to Preceptor Nancy Huang, and will only be considered for academic reasons. Once sections start the week of October 3, all section assignments are final.

Human Genetic Disorder Research Project and Symposium:
Each student will be assigned a human genetic disorder to research. Over the course of the semester, each student will write three short articles (3-4 pages each) and give one presentation (7-10 minutes) to their section on their assigned disorder. At the end of the semester, students will participate in a panel discussion with experts on their disorder (physicians, researchers, patients and/or family members). Finally, students will revise and compile their three short articles into a comprehensive review article (9-12 pages).

Section Attendance:
Because section is an integral part of BS50, section attendance is mandatory. You must attend your assigned section. Section starts promptly at 2:10pm. TFs are under no obligation to repeat instructions for tardy students and may consider their assignments to be late.

In rare instances, a student may switch sections for one week.
- You must contact your TF in advance about making a switch
- Your TF may grant the request if he/she finds the reason to be valid. Your TF is not obligated to let you attend another section.
- Valid reasons include illness, family emergencies, and athletic commitments that take a student out of town. Being busy with work from another class is NOT a valid reason.
- You will be required to provide documentation (i.e. a note from UHS, a senior tutor, or the team coach).
- Your TF will make arrangements for you to attend another section during that same week.

In extremely rare instances, a student may end up missing section without prior TF approval.
- Absences will only be excused for unforeseen circumstances such as illness or family emergencies. You must contact your TF as soon as possible. Documentation will also be required (i.e. a note from UHS or a senior tutor).
- If possible, your TF will make arrangements for you to attend another section during that same week.
- If an absence is not excused, the student will receive no credit for work done in section that week (i.e. no makeup of the lab and no credit for the lab report based on that week’s work).

Laboratory Safety:
- No food or drink in the labs. Food and drink is allowed in the small entrance hall just outside the labs.
- No bare feet. Students are encouraged to wear closed-toe shoes to lab.
- Gloves are to be worn for all hazardous chemicals.
• No mouth pipetting is allowed.
• Any accidents (spills, breakage, etc) or injuries (cuts, burns, light-headedness, etc) should immediately be reported to the TF.
• If there is a fire alarm, stop working, turn off any Bunsen burners, and follow your TF down the stairs and out the building. Once outside, your TF will take attendance.

Cleaning up:
All students must clean up before they leave lab:
• Properly dispose of all waste in the trash, sink, glass waste, or hazardous waste. Please check that the waste buckets on the benches are emptied.
• Put glassware next to the sink.
• Reusable supplies that need to be cleaned or refilled (used velvets, dropper bottle, gel trays, etc) should be left on the front bench.
• Supplies that don’t require attention (pipetmen, replica-plating devices, test tube racks, etc) may be left on the bench.
• Tidy the benches, push in chairs, etc.
• Wash your hands before leaving lab.

Late Assignments:
All lab assignments and HGDRP written assignments are due at the beginning of section. Assignments not turned in at the beginning of section will be considered late. Late assignments will only be accepted for three calendar days and will be penalized at 20% off per calendar day.

Collaboration / Working in groups:
Two fundamental principles of science are collaboration and honesty. You are encouraged to discuss your lab results with your lab partner(s) and other members of the class. You may also work together to do research for the HGDRP assignments and to discuss your findings. However, you must write your own lab reports and HGDRP assignments. Even small sections copied from outside sources and other students are dishonest and considered plagiarism. Material that shows evidence of plagiarism will receive no credit and will be sent to the Administrative Board. Consult the Handbook for Students or Writing with Sources (chapter 3, Misuse of Sources) for more complete College policy. If you have any questions about plagiarism specific to BS50, please ask your TF or Nancy Huang.

Exam Grades and Re-grades:
To maximize consistency, each BS50 exam question is graded by a single grader. As a result, it generally takes 7-10 days for exams to be returned. Once all exams are graded, the answer key will be posted on the course website. The answer key will detail how partial credit was awarded.

If you feel that your exam was graded unfairly, you may discuss the possibility of a re-grade with your TF. If (and only if) your TF approves, you may submit your exam to the preceptor for a re-grade. Please note that your entire exam will be re-graded, so you may lose points as well as gain points.

Valid reasons for a re-grade include:
• Grading was not consistent with the partial credit answer key.
• Answer is different from the answer key, but consistent with the stated question.

To prevent students from altering an exam and then submitting it for a re-grade, some of the graded exams are photocopied before being returned to students. Any cases of academic dishonesty will immediately be referred to the Administrative Board.

Additional Resources:
• The Bureau of Study Counsel offers peer tutoring to students at a cost of $4/hour (http://bsc.harvard.edu/tutor.html).
• The Writing Center provides individual consultations on writing assignments, such as the HGDRP, free of charge (http://bsc.harvard.edu/tutor.html).