



**EHSC 8450
Genome Technologies
Spring 2009 Syllabus**

Course Information

Instructor: Travis C. Glenn
Office Location: 140 EHS
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Email: TravisG@uga.edu
Office Hours: By appointment

Course Meeting Time and Location

Building: Environmental Health
Room: 207

Day: M/W
Time: 10:30 - 11:45 am

Textbooks and Other Required Course Material

Reading materials will be given in class, e-mailed, and posted to web sites or ftp sites. Specific directions will be given in class and/or via e-mail.

Course Description

Lecture course covering the development and use of new high throughput molecular genetic tools. Provides detailed insight for applications, acquisition of instrumentation, and use of genomic assays. Intended to provide relevant training for students that will establish laboratories and make use of genomic information.

Pre-requisites: BIOL 1103 or 1107, and 1104 or 1108 (or equivalent); and GENE (BIOL) 3200 or EHSC 4700/6700 or EHSC 4710/6710 (or equivalent) (i.e., 1 year introductory biology, and a course in genetics or biochemistry), or permission of the instructor

Course Learning Objectives

Upon successful completion of this course, the student should be able to:

- Compare, contrast and evaluate genome technologies to achieve varying goals.
- Locate and critically evaluate studies using genome technologies from the current literature.
- Acquire instrumentation for use in a collaborative research environment.
- Write an equipment grant proposal.

Course Requirements for Grading Purposes

Grades will be assigned according to: 40% tests, 10% class participation (33% of this grade is lost per unexcused absence), 20% proposal, 20% presentation, 10% final exam (optional). The final exam is cumulative. Students who are happy with their course average prior to the final exam may elect to not take the final by notifying the instructor by the last day of class.

Students will be required to give one 45 minute presentation that details a recently published genomic technology or application of a technology relevant to the course materials. Each student will also select 2-4 publications (focusing on peer-reviewed publications) covering the technology and lead a discussion of those publications.

Students will also develop a slightly abbreviated USDA style proposal (1.5 line spacing; 1” margins; 11 or 12 pt. font).

Grading Policy

Grades will be assigned on a normalized 90% = A-, 80% = B-, 70%= C-, 60%= D- scale. Modifications to the grading policy and/or dates of quizzes, projects, etc. will be discussed in class & confirmed by an e-mail announcement.

Make-Up Policy

Examinations may be made up through prior arrangement with the instructor or, in the case of unforeseen circumstances (e.g., medical emergencies), through arrangement with the instructor on the first business day following the emergency (an e-mail at the student’s first reasonable opportunity to communicate the emergency is expected).

Attendance Policy

See the class participation portion of the Course Requirements for Grading Purposes (above).

Students with Disabilities

Students with disabilities who require reasonable accommodations to participate in course activities or meet course requirements should contact the instructor.

Topical Outline

Date	Topic	Notes
1/12	Syllabus, NSF MRI Introduction	
1/14	Agilent seminars – S175 Coverdell	Last day for drop/add w/o W grade
1/19	No Class	
1/21	NSF MRI	
1/26	Job seminars, Presentation skills & elements;	w/6010 students
1/28	Elements of USDA, NSF, & NIH Proposals	Proposal Assigned
2/2	DNA Sequencing - Sanger, 454, Solexa, Solid	
2/4	publications	
2/9	Hands-on DNA Sequencing Exercise	Proposal Abstract due
2/11	Inside Applied Biosystems Capillary Sequencers	At Riverbend Lab
2/16	DNA Sequencing – Helicos, Complete Genomics, Pacific BioSystems, NanoPore Sequencing	Test 1
2/18	Publications & web sites	
2/23	Major components of eukaryotic genomes	
2/25	publications	1 st Review of Proposals

3/2	Genome Mapping	
3/4	publications	Test 2
3/9	No Class	Spring Break
3/11	No Class	Spring Break
3/16	Transcriptomes & Sequence Capture	
3/18	publications	Final Review of Proposals
3/23	Applications of Microarrays for Plant Pathology	Tom
3/25	publications	
3/30	Disease Ecology	Sydney
4/1	publications	Test 3
4/6	Molecular mechanisms of biofilm formation	Bhabesh
4/8	publications	
4/13	Resistance Genes	Suchita
4/15	publications	
4/20	BioInformatics – Geneious	
4/22	BioInformatics - BioPython	
4/27	Laboratory Design & Equipment Acquisition	Test 4
4/29	Final review	Return all grades (except final)
	Final Exam –	Optional

General Disclaimers

The course syllabus is a general plan for the course; deviations are likely and will always be announced to the class by the instructor.

University Honor Code, Academic Honesty, and Safety Policies

All academic work must meet the standards contained in “A Culture of Honesty.” All students are responsible to inform themselves about those standards before performing any academic work. Please see: <http://www.uga.edu/honesty/index.html>

Collaboration is encouraged during most of the class, but, individual assignments, quizzes, tests, etc. should represent each student’s own work. In particular, any text appearing in any assignment that is not originally composed by the student for this class must be cited appropriately. Additionally, all university policies regarding lab safety are to be followed; students endangering the safety anyone will be dismissed from class.

TOPICAL OUTLINE

- Animal Genomes – Structure, Function, and Biochemistry
- Animal Transcriptomes – Structure, Function, and Biochemistry
- Bacterial Cloning and Libraries
- Genome Mapping
- Sanger-Sequencing
- Capillary Electrophoresis
- Parallelization, Pooling and Automation
- Next Generation Sequencing
- Single Nucleotide Polymorphism – Discovery and Genotyping
- BioInformatics and Computational Resources
- Microarrays: Direct and Indirect Uses
- Hybridization and Sequence Capture
- Laboratory Design
- Equipment Acquisition and Maintenance
- Technological Horizons – What's Next?