PCB 4666/6667 Human Genomics

Spring, 2026
Format: Online Asynchronous, 3 Credits

Instructor: Jennifer Drew, PhD
Microbiology and Cell Science

jdrew@ufl.edu

Student hours on Zoom 9 – 10am on Thursdays (see Canvas for Zoom link)

Teaching Assistant: Korrie James, MS
Microbiology and Cell Science

korriejames@ufl.edu

Student hours on Zoom 5 – 6pm on Tuesdays (see Canvas for Zoom link)

Course Description

Increasingly, researchers and health care providers are mining the genome to uncover the basis of disease susceptibility and treatment. Genome-based strategies are used for the detection, treatment, and prevention of many diseases. This course will discuss the field of genomics, how genome sequence data is obtained and analyzed, and most importantly, what can be learned from an individual's genome.

Course Learning Objectives

At the conclusion of this course, the student will be able to:

1. Analyze how the genome, and in particular genomic variation, influences human traits, including disease susceptibility and treatment response.
2. Identify, evaluate, and synthesize key published studies in human genomics
3. Design, conduct, and interpret human genomics research studies
4. Demonstrate how current genomic technologies enable personalized medicine
5. Discuss ethical, social, and clinical implications of genomic medicine.

Course Overview and Purpose

This course will discuss the field of genomics, how genome sequence data is obtained and analyzed, and most importantly, what can be learned from an individual's genome. Students will work with anonymous human genome data and conduct a small analysis of associations between genetic variants and the diet. The course will address cutting-edge research in epigenetics, pharmacogenomics, molecular diagnostics, and the microbiome. The course will also include timely topics such as GMO's, stem cells, genetic testing and genome editing. This course will reinforce fundamental concepts in molecular biology and genetics.

We are in the era of precision medicine, which began with the sequencing of the human genome and is based on the analysis of individual genomes. It is important for life science majors to understand the

basic structure and function of the human genome and how that information is studied, interpreted, and applied.

Course Prerequisites

PCB4666: BSC2010 and BSC2011 AND at least ONE of the following: PCB3134, PCB4522, BCH4024, BCH3025

PCB6667: MS or PhD student in life sciences

Textbooks, Learning Materials, and Supply Fees

Genetics From Genes to Genomes by Goldberg and Fischer 8th Edition. Published by McGraw Hill, 2025.

This book is also offered at a more reasonable price as part of the UF All Access initiative.

Specific Reading assignments are available in modules.

All other required readings and works are available in Canvas.

Required Technology & How to Obtain the Technology

The University of Florida expects students to acquire computer hardware and software appropriate to their degree program. Students are expected to have ongoing computer and internet access.

Most computers can meet the following general requirements.

A student's computer configuration should include:

- Webcam
- Microphone
- Physical keyboard
- Broadband connection to the internet and related equipment (cable/DSL modem)
- Microsoft Office Suite installed (provided by the university)

Late assignments will not be accepted due to technical errors or malfunctions.

Computing labs are available on campus at these locations: https://cals.ufl.edu/current-students/studentresources/computer-lab.

Technical & Digital Literacy skills

Minimum Technical Skills

To complete your tasks in this course, you will need a basic understanding of:

- Operating a computer and using word processing software
- Using the learning management system
- Using email with attachments
- Creating and submitting files in commonly used word processing program formats

- Downloading and installing software
- Using spreadsheet programs
- Using presentation and graphics programs
- Recording presentations
- Using apps in digital devices
- Using web conferencing tools and software

Minimum Digital Literacy Skills

Furthermore, you should be able to:

- Use online libraries and databases to locate and gather appropriate information
- Use computer networks to locate and store files or data
- Use online search tools for specific academic purposes, including the ability to use search criteria, keywords, and filters
- Analyze digital information for credibility, currency, and bias (e.g., disinformation, misinformation)
- Properly cite information sources
- Prepare a presentation of research findings

Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. https://helpdesk.ufl.edu/ | 352-392-4357

Weekly Course Schedule

Tentative - Subject to change

Week	Topic	Assessment	Due Dates
1	Intro to Structure and Function of Genome (Mol Bio Bootcamp)	Quiz	Jan 18
2	Overview of classical genetics and single gene disorders (Mendelian Genetics Bootcamp)	Quiz Mol mechanism of disease assignment	Jan 25
3	Genetic Technology - biotech and sequencing	Quiz	Feb 1
4	Bioinformatics and Biocuration	Quiz Bioinformatics activity Exam 1	Feb 8 Feb 9 – 12
5	Genetic disease: complex and common disorders	Quiz	Feb 15
6	Advanced Genomics Research Techniques and Tools	Quiz	Feb 22

Week	Topic	Assessment	Due Dates
		Genomic analysis activity	
7	Epigenomics	Quiz	Mar 1
8	Cancer	Quiz Discussion board Exam 2	Mar 8 Mar 9 - 12
9	Genomics of Immunity	Quiz	Mar 22
10	Genetic disease: Detection and Diagnostics	Quiz	Mar 29
11	Genetic disease: Genetic-Based Treatment	Quiz Gen testing/treatment assignment	Apr 5
12	Genetic disease: Alzheimer's Disease	Quiz Discussion Board	Apr 12
13	Precision Medicine	Quiz Exam 3	Apr 19 Apr 20 -22

Grading Policy

Course grading is consistent with UF grading policies.

Course Grading Structure

[Required, methods by which students will be evaluated and their grade determined.]

Assignment Type		Percent of Final Grade
Quizzes (15 total)	1 per week due by Sunday night; proctored with Honorlock; 2 drops	16%
Exams (3 total)	4 day window; proctored with Honorlock; 1 optional final exam to replace in-term exam	36%
Assignments	individual assignments and discussion boards	48%
Total		100%

Grading Scale

Grade rounding will be done as outlined below (for example, a final grade of 81.95 is a B-)

It is recommended that you use your own calculations during the semester to get an estimate of your grade.

Grade	Percentage
A	93.0 - 100
A-	89.0 – 92.99
B+	86.0 – 88.99

Grade	Percentage
B	82.0 – 85.99
B-	79.0 – 81.99
C+	76.0 – 78.99
C	72.0 – 75.99
C-	69.0 – 71.99
D+	66.0 – 68.99
D	62.0 – 65.99
D-	59.0 – 61.99
E	58.99 and below

Academic Policies and Resources

Academic policies for this course are consistent with university policies. See https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

Campus Health and Wellness Resources

Visit https://one.uf.edu/whole-gator/topics for resources that are designed to help you thrive physically, mentally, and emotionally at UF.

Please contact UMatterWeCare for additional and immediate support.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Privacy and Accessibility Policies

- Honorlock
  - Honorlock Privacy Policy
  - Honorlock Accessibility
- Instructure (Canvas)
  - Instructure Privacy Policy
  - Instructure Accessibility
- Zoom
  - Zoom Privacy Policy
  - Zoom Accessibility

Honorlock Proctoring

Online Proctoring: Honorlock is an online proctoring service that allows students to take quizzes and exams on-demand 24/7. There are no scheduling requirements. You will need a laptop or desktop computer with a webcam, a microphone, and a photo ID. Honorlock requires Google Chrome browser; furthermore, the Honorlock extension must be added to Chrome. For further information, FAQs, and technical support, please visit Honorlock. *A* room scan will be included in the Honorlock setup process. Please contact the instructor if there are concerns and alternative arrangements need to be made.