



College of Liberal Arts and Sciences

Department of Biology

PCB 3063-2C92 PHPB: *Genetics*

Spring 2022 – 4 credits

INSTRUCTOR CONTACT INFORMATION:

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COURSE DESCRIPTION: This course uses an online/face-to-face hybrid model, with some face-to-face lectures and some online/remote group activities; modality for each date is listed the course schedule included in this syllabus. In PCB3063, we will survey chromosome structure and replication, genetic linkage and mapping, regulation of gene expression, epigenetics, genetic mutation, genetics of cancer, and the principles of genetic engineering. Applications of bioinformatics and genetics to modern biological and problems, and the ethical implications of genetics are discussed.

LECTURE HALL: Lectures will be on Tuesday and Thursday
Section 2C92 (PHPB): Keene-Flint Hall 155, 4:05pm – 6:00pm

ONLINE ACTIVITIES: This course has a hybrid design with in-person lectures and remote/online activities. The dates for remote learning are listed in the course schedule table below. You can access the Zoom links in canvas using the *Zoom Conferences* tab. The Canvas site will serve as the course website.

OFFICE HOURS:

- In-person: Thursdays 11:45a – 1:15p in Carr Hall room 510. ***In-person and no appointment needed.***
- Online/Zoom: Thursdays 1:30p – 3:00p. ***Appointment only.*** Make your appointment and access the meeting link through the *Canvas Calendar*.

REQUIRED TEXTBOOKS:

- Klug, WS, MR Cummings, CA Spencer, MA Palladino, and D Killian. 2019. *Concepts of Genetics*, 12th ed. Pearson, New York. Your textbook is provided as an e-text. **Purchase Text through UF All Access.**
- Additional course readings may be available on Canvas and Course Reserves (ARES)

LAPTOP REQUIREMENT: You will need a laptop for bioinformatics activities, and for remote group project activities held online using Zoom. You will need a laptop to access your text book and for project activities.

PREREQUISITES: [BSC 2011](#) & [BSC 2011L](#) (or equivalent, w/ minimum grades of C), & general chemistry.

COURSE OBJECTIVES - By the end of this course, students will:

- ***Build Foundational Knowledge:*** Students will be able to describe the historical foundations for the field and discoveries of genetics.
- ***Apply Course Material:*** Students will be able to use core knowledge of genetics to critically analyze scientific research literature, and in popular culture and the public discourse.
- ***Link Content Between Courses:*** Be able to make connections between research in genetics and quantitative analysis in other natural and social science coursework.
- ***Synthesize Research with Practice:*** Students will be able to synthesize core knowledge of genetics with current and emerging research in the biological and social sciences.
- ***Familiarize students with genetics questions on college admissions tests (GRE, MCAT).*** Exam questions and course content will help students prepare for college admissions exams.

NOTE: This syllabus is subject to change at the discretion of the instructor.

COURSE SCHEDULE:

WEEK	TUESDAY	THURSDAY
1: Jan. 4 & 6	NO CLASS – DROP/ADD	L01: Cell Cycle; Read CH1, CH2; Orientation Quiz.
2: Jan. 11 & 13	L02: Mendel I – Gene Theory; Read CH3	L03: Mendel II – Inconsistencies; Pre-lecture Quiz: CH 4
3: Jan. 18 & 20	L04: Morgan I – Chromosomal Theory Pre-lecture Quiz: CH 5	L05: Morgan II – Sex Linkage; Pre-lecture Quiz: CH 7
4: Jan. 25 & 27	L06: Chromosomal Mutations Pre-lecture Quiz: CH 8	L07: Extranuclear Inheritance; Pre-lecture Quiz: CH 9
5: Feb. 1 & 3	<i>Exam 1 review and Project 1 (E/G) orientation</i>	Midterm Exam 1 – in the lecture hall
6: Feb. 8 & 10	NO CLASS – UF HOLIDAY	ONLINE ACTIVITY-Zoom. NO FACE-TO-FACE Guest lecturer Tara Cataldo (library research) L08 (video): DNA Repl.; Pre-lecture Quiz: CH 10, 11
7: Feb. 15 & 17	L09: Transcription Pre-lecture Quiz: CH 13	L10: Translation Pre-lecture Quiz: CH 14 & 15 (DNA Repair)
8: Feb. 22 & 24	L11: Regulation I - Prokaryotes Pre-lecture Quiz: CH 16	ONLINE ACTIVITY-Zoom. NO FACE-TO-FACE Group Ethics Presentations: A online discussion activity
9: Mar. 1 & 3	L12: Regulation II – Eukaryotes Pre-lecture Quiz: CH 17	ONLINE ACTIVITY-Zoom. NO FACE-TO-FACE Group Ethics Presentations: B online discussion activity
10: Mar. 8 & 10	SPRING BREAK	
11: Mar. 15 & 17	L13: Regulation III – Epigenetics Pre-lecture Quiz: CH 19	ONLINE ACTIVITY-Zoom. NO FACE-TO-FACE <i>Project 2 (G/M – group project) Orientation activity</i> <i>Exam 1 review and Project 1 (E/G) orientation</i>
12: Mar. 22 & 24	Midterm Exam 2 – in the lecture hall	L14: DNA Technologies; Pre-lecture Quiz: CH 20, 21
13: Mar. 29 & 31	ONLINE ACTIVITY-Zoom. NO FACE-TO-FACE Guest lecture Dr. Miro-Herrans (Bioinformatics I)	L15: Population Genetics Pre-lecture Quiz: CH 26
14: Apr. 5 & 7	ONLINE ACTIVITY-Zoom. NO FACE-TO-FACE Guest lecture Dr. Miro-Herrans (Bioinformatics II)	L16: Genetics of Cancer Pre-lecture Quiz: CH 24
15: Apr. 12 & 14	L17: Genome Editing & Gene Therapy Reading Assn (no quiz): ST1, ST5	<i>Exam 3 review and G/M Project Support</i>
16: Apr. 19 & 21	ONLINE ACTIVITY-Zoom. NO FACE-TO-FACE Bioinformatics Poster Session online discussion activity	NO CLASS - READING DAY
Finals week	Final Exam – in the lecture hall • Section 2C92: 4/26/2022, Time TBD in Keene-Flint 155	

Course Grading Scale			
93.00-100% (A)	83.00-86.99% (B)	73.00-76.99% (C)	63.00-66.99% (D)
90.00-92.99% (A-)	80.00-82.99% (B-)	70.00-72.99% (C-)	60.00-62.99% (D-)
87.00-89.99% (B+)	77.00-79.99% (C+)	67.00-69.99% (D+)	0-59.99% (E)

GRADE BREAK DOWN:

Pre-Lecture Reading Quizzes (MyLab)	15 %
Discussions/ Peer-Evaluations	9 %
Exams (3)	36 %
Project work	40 %
Ethics in Genetics	<u>20% total</u>
Genetics in Medicine	<u>20% total</u>
Total	100 %

COURSE CONTENT AND TEXT CHAPTER FOR EACH LECTURE MODULE:

MODULE I: GENETIC INHERITANCE

INTRODUCTION TO HEREDITY

Historical-Cultural Perspectives on Genetics and Evolutionary Theories (CH 1)

PATTERNS OF INHERITANCE

Chromosome Transmission During Cell Division and Sexual Reproduction (CH 2)

Mendelian Inheritance (CH 3)

Non-Mendelian Inheritance (CH 4)

Genetic Mapping and Linkage (CH 5, 7)

Chromosomal Changes (CH 8)

Extranuclear Inheritance (Ch 9)

MODULE II: MOLECULAR GENETICS

MOLECULAR STRUCTURE & REPLICATION OF THE GENETIC MATERIAL

Molecular Structure of DNA and RNA (CH 10)

DNA Replication and Recombination (CH 11)

MOLECULAR PROPERTIES OF GENES

Gene Transcription, RNA Modification, Translation of mRNA, DNA repair (CH 13, 14, 15)

Gene Regulation: Prokaryotic and Eukaryotic Regulation, Epigenetics (CH 16, 17, 19)

MODULE III: GENETIC TECHNOLOGIES

GENETIC TOOLS AND METHODS

Population and Evolutionary Genetics (CH 26)

Molecular and Bio-Technologies (CH 20)

Genomics: Genomics and Bioinformatics (CH 21)

GENETIC ANALYSIS OF INDIVIDUALS AND POPULATIONS

Genetics Basis of Cancer (CH 24)

Gene Editing and Gene Therapy (ST1, ST5)

COURSE AND UNIVERSITY POLICIES:

ATTENDANCE: Attendance to lectures (L01-L17) is not mandatory, but strongly recommended. Attendance is required for all group activities and guest lectures, which will be held online using Zoom, and there will be **no face-to-face meetings for these online group activities**. These dates are indicated on the course schedule in this syllabus. All other meeting times, we will meet face-to-face in the lecture hall.

ASSIGNMENTS: Requirements for class attendance and make-up exams, assignments, and other work in this course is consistent with university policies. Your assignments should be professionally presented with well-organized ideas and materials. Written assignments must be typed (double-spaced, 12-point font, 1-inch margins). Please proofread your work. Late work is not accepted, unless approved by the instructor using the policy outlined in this syllabus. All assignments will be submitted through canvas.

- *MyLab PreLecture reading quizzes* are **due at 9:30am**. Late quizzes can be taken at any time and are worth up to 50% and are due by 4/19/2022 at 11:00pm. Pre-lecture reading quizzes will cover the reading assignment and will due **before class**.
- For Ethics in Genetics (EG) Projects and Discussions, no late work will be accepted:
 - Group project materials will be submitted to the Discussion Board by **9:30am** on the due date.
 - Ethics Discussions, based on student projects. Two 200-250 word posts are due per student (1 reply and 1 rebuttal). Discussion question replies are **due at 11:00p** on the due date. Reply rebuttals will be due **the next day at 11:00p**.
- For Genetics in Medicine (GM) and Discussions, no late work will be accepted:
 - All individual bioinformatics (BI) worksheets and related BI participation quizzes are **due at 11:00pm** on the due date.
 - All poster project materials will be submitted by **9:30am** on the due date. Materials: 7-minute video of your poster presentation, formatted reference list and related text (project title, group #, group

- members names, etc...).
- Poster Peer-Evaluations are **due at 11:00p** on the due date.
- For both projects (EG and GM), individual self-evaluations are **due at 11:00pm** on the due date and are required to receive *ANY* group points for that particular project. Self-evaluations are to report your contribution to your group project and to evaluate the work of your group members.
- For both projects (EG and GM), group project participation checklists are **due at 11:00pm** on the due date. This checklist will be an inventory of the work done toward your project. You will compile the list as a group and note which group member did which task. All members of your group will sign off on the inventory/checklist. This is submitted through Canvas Assignments.

EXAMS: Exams will be 70 minutes, will be multiple choice, and will cover the lectures, readings, and pre-lecture quizzes for a module. No make-up exams will be given without prior permission or without documentation of illness or injury. There are three exams; one for each module – so they are not cumulative. Practice exams materials will be provided.

Missed exam policy: Make up exams are only offered for students with documentation of the excusable nature of their absence from the exam time. In all cases (without exception), send documentation of the excusable nature of your absence to the Dean of Student's office (DSO), and they will verify your excuse. You will work with the DSO to have the DSO **send me and your TAs a letter** on your behalf requesting a make-up exam, and verifying the excusable nature of your absence. You are responsible to verify that I have received the DSO letter, to meet all deadlines for your make up request, and to confirm your make-up date and time. The DSO letter is *only* a request, I still make the final decision. There are different policies for foreseeable and unforeseeable missed exams.

- Unforeseeable and documented medical emergency: If you miss an exam due to an unforeseeable medical emergency, I will schedule you to take the exam within one (1) week of your return to campus. **PLEASE DO NOT SEND ME YOUR DOCTORS NOTE** – to protect your privacy do not send me a long email detailing your personal situation. I will need to receive the DSO letter within 5 business days of the original exam date, and we will need to schedule a date/time for the make up **within 5 days of the original exam date**.
- Foreseeable and documented schedule conflicts: Any change to your exam time must be scheduled **two (2) weeks before the exam date**. I will also need the DSO letter by 2 weeks before the exam date. If you have a foreseeable conflict with a scheduled exam time/date (due to a sporting event, another exam at the exact same time, a required university event) we will schedule for you to take the exam **before the exam date** – *exams will not be taken after the original exam date*.

ACCOMMODATIONS FOR STUDENTS THROUGH THE DISABILITY RESOURCE CENTER:

Students requesting accommodation for disabilities must first register with the [Disability Resource Center \(DRC\)](#) - The DRC will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodations. Students should contact the DRC and complete this process as early as possible in the term for which they are seeking accommodations.

UF STUDENT HONOR CODE: UF students are bound by the Honor Pledge which states, “We, the members of the UF community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at UF, the following pledge is either required or implied, “On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

[The Honor Code](#) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obliged to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor in this class.

ONLINE COURSE EVALUATION PROCESS: Students will be using the course evaluation system called GatorEvals. Students can complete their evaluations through the email they receive from GatorEvals, in their Canvas course menu under [GatorEvals](#).

STUDENT ASSISTANCE AND EMERGENCIES: University support services are available to students who are experiencing significant distress and/or personal emergencies. As appropriate please contact:

- [Counseling and Wellness Center \(CWC\)](#): or (352) 392-1575
- University Police Department: (352) 392-1111 or 9-1-1 for emergencies.
- [U Matter, We Care](#): If you or a friend is in distress, or please contact umatter@ufl.edu or (352) 392-1575 so that a team member can reach out to the student.
- Sexual Assault Recovery Services (SARS): Student Health Care Center, (352) 392-1161.

ACADEMIC RESOURCES: [Library Support](#): For various ways to receive assistance with respect to using the libraries or finding resources. LibGuides are websites to help you find information about a specific area of study or even a specific class.

- [Teaching Center: Broward Hall](#), call (352) 392-2010 or (352) 392-6420 for general study skills and tutoring.
- [Writing Studio](#): 302 Tigert Hall, call (352) 846-1138 for help with papers.
- [E-learning Technical Support](#): call (352) 392-4357 (select option 2), e-mail Learning-support@ufl.edu,
- [Career Connections Center](#): Reitz Union, call (352) 392-1601 for career assistance and counseling.

STUDENT COMPLAINT PROCESS: The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

- Information for [residential courses](#)
- Information for [online courses](#)

COURSE EXPECTATIONS:

Reading: Please complete reading assignments and reading quizzes designated in the syllabus or otherwise assigned by the instructor *prior to the class meeting*. Your responsibility is to be prepared to engage in large and small-group discussions. You are encouraged to take notes and/or highlight text while reading to assist you in contributing to class discussions and assignments.

GatorLink E-mail:

Students are required to have and use their GatorLink account (@ufl.edu) for all UF related e-mail functions. Official university communications are sent to students at this email address. You are responsible for staying informed and current with all correspondence sent to you over the listserv.

Instructor and TA's may take *up to 48 hours* (longer over weekends) to return your emails. Please do not wait until the last minute to complete your assignments because it may not be possible for you to reach us quickly to assist you. We will aim to reply to your emails within 24 hours.

Canvas Website:

Students are required to use the canvas website. Additional course readings, information about assignments, and course-related announcements will be posted on this website. Check Announcements for update and reminders. Use the Canvas Calendar Application to sign up for online office hours.

Special requests for individual students:

I cannot grant special requests, favors or privileges to individual students. I have a fair and generous set of policies to begin with that apply to *all* students. I do not offer extra credit, particularly for individual students. Before you make a special request, read the syllabus carefully, and figure out how your particular request would be applied to all of the students in the class.

Requesting letters of recommendation:

I have had up to 1400 students in a semester, and as many as 2000 individual students in a year. I say “no” to many requests for letters of recommendation, so only the very top students that have shown leadership, class citizenry (helped out classmates, encouraged others to participate), and high-level content learning (top grades on assignments and exams) throughout the semester will be considered. If I agree to write a letter to support your application I will need: your transcript, your personal statement and a draft of the letter (you will write it as if you were me) including the information you would like me to address such as how long we have known

each other, the class you were in, what grade you got in the class, and any distinguishing accomplishments that you achieved *in my class*.

Disputes over assignment grades:

It is important that you keep up with your grades, and check them over right away. If you believe your work has been graded incorrectly, you will need to request a regrade from your TA by email within 1 week of the time you receive the grade (this time may be reduced for final exams and projects). Be prepared to refer to textbook pages or lecture slides where your answer came from. Once 1 week has passed, your original grade will not be changed.

Rules of engagement and communication:

Mature and respectful behavior is expected from all members of our class in all interactions with instructors, guest presenters, and other students. Side conversations, sleeping, and reading other course material (or *The Alligator*, etc.) are not appropriate and may negatively impact your learning.

To protect the First Amendment rights of students to speak in class and express their differing views, I ask that you limit your discourse during our class activities to respectful and welcoming tones, behaviors, language and actions – and whenever possible, use published scientific data to bolster your opinions. I also expect you to be open to opinions, ideas, and scientific data that differ from your own views and beliefs, understanding that all fact-based opinions are welcome in the class and that differing perspectives are valued.

Your email and face-to-face discourse with your TAs and instructor will be polite, professional, and respectful at all times. Make sure your requests of our time are requests, and not demands.

If anyone in our class is abusive or harassing toward you, please bring this to my attention or to your TA's attention, and we will address it with the Student Conduct & Conflict Resolution Office (SCCRO), or you can contact the SCCRO directly. The SCCRO is there to help us, and to protect *all students*, including students accused of abusive behavior. Working with the SCCRO does not mean a student is necessarily "in trouble." It means that behaviors are disrupting student learning or content delivery, and are beyond my training, capability, or time and labor constraints to address.

Technology:

Technology may contribute to active learning, and may serve as a distraction. Use of computers/tablets should be limited to note-taking, assigned readings, and in-class exercises. Emailing, texting, and social media should be limited to before and after class and during breaks during in-class sessions. There are legitimate reasons to have a cell phone in the classroom (on call responsibilities, family emergencies, etc.), and they may also serve as a distraction. Please balance these needs appropriately. You will be asked to put away technology if you have been found to be a distraction.

Covid Pandemic Precautions and Courtesies:

UF'S COVID POLICY IS SUBJECT TO CHANGE BASED ON CHANGING PANDEMIC CONDITIONS. The following is the current UF Covid Precaution Policy UF Policy articulated by Associate Provost Chris Hass:

"In response to COVID-19, the following practices are in place to maintain your learning environment, to enhance the safety of our in-classroom interactions, and to further the health and safety of ourselves, our neighbors, and our loved ones. You [students, faculty, staff and visitors] are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated. Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators."

Thank you for supporting your fellow Gators as they balance health, comfort, and other considerations in their decision to wear or not to wear a mask. For all students that visit my office hours in Carr Hall room 510, I prefer that we both properly (over nose and mouth) wear a mask in my office, and I will meet with one student

at a time in my office.

Students Recording Lectures:

Students are allowed to record video of “class lectures” only for the following allowable purposes:

- (1) for personal educational use.
- (2) in connection with a complaint to the university.
- (3) as evidence in, or in preparation for, a criminal or civil proceeding.

All other purposes are prohibited. Specifically, **students may not publish recorded lectures without the written consent of the instructor**. Publication without permission of the instructor is prohibited.

To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section.

Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Students are allowed to record video of class lectures. A “class lecture” students are allowed to record is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. All other purposes are prohibited.

A “class lecture” does not include: lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.