

PCB 3063 - Genetics - Fall 2023

(Section 0002) Tues & Thurs 10:30–11:50 pm (VAB-132)

3 credit hours

Instructor: Dr. Cynthia Bayer

Office Hours (BIO 202D): Tues & Thurs 12 noon – 2:00 pm

Communication: Webcourses *Inbox & Announcements*

or by appointment

Course Description: This general Genetics course will cover the basic concepts of transmission (classical) genetics and molecular genetics. Transmission genetic principles include chromosome dynamics during cell division, disorders of chromosome segregation in humans, Mendelian and non-Mendelian inheritance of characters, sex determination, pedigree analysis, and eukaryotic gene mapping. Molecular genetic principles include DNA structure and replication, storage and expression of genetic information, regulation of gene expression, mutation and repair, epigenetics, and biotechnology.

Course Prerequisites: This is an upper division course for students who have completed two semesters of Chemistry (CHM 2045 and CHM 2046) and earned a grade of C or higher in Biology 1 (BSC 2010C).

Student Learning Outcomes: Successful Genetics students will demonstrate a broad understanding of the basic principles of Genetics, demonstrate an ability to use information in new situations to solve problems, and be able to draw connections between concepts. Students will be expected to:

- **Demonstrate** how the inheritance of alleles and characters correlates with chromosome dynamics during cell division.
- **Apply** the principles of Mendelian and non-Mendelian inheritance of characters to a variety of pedigrees and be able to distinguish between different modes of inheritance.
- **Calculate** the genetic distance between linked genes using the concepts underlying gene mapping in eukaryotes.
- **Define** an allele at the molecular level and as a unit of inheritance.
- **Deduce** connections and **distinguish** between the cellular processes of DNA replication, transcription and translation.
- **Compare** and **contrast** the control of gene expression in bacteria and eukaryotes.

Students will be evaluated on meeting these objectives via participation in lecture discussion and group activities, online homework and quizzes, 4 in-person lecture exams and a comprehensive final exam.

Academic Activity - Course Expectations:

- To meet the registrar's requirement for documentation of your participation in this course, please complete the **Syllabus Expectations Quiz**, found in our Webcourse Quiz section, by **5:00 pm Friday, August 25**. Failure to do so will result in a delay in the disbursement of your financial aid.
- All students will receive credit for completion of the Syllabus Expectations Quiz.

REQUIRED Textbook: Participation in my online course *Achieve*, which contains graded quizzes, homework, and the electronic textbook *Pierce Genetics: A Conceptual Approach, 7th ed.* Instructions to **Opt-In to First Day Access** to *Achieve* by **Friday, Aug 25** are located in the **Introduction & Getting Started** page in Webcourses. You may also purchase an optional loose-leaf print textbook at the UCF Bookstore.

iClicker is also integrated with *Achieve* at no extra cost: I will use *iClicker* daily for class points. You are required to participate with the free *iClicker Student* app on a smartphone, tablet, or laptop. See the ***iClicker* Instructions** page in Webcourses to link my *iClicker* course to your *Achieve* account by Friday, **Aug 25**.

Course website:

Access our course website at Webcourses@UCF. You will find links to the **Syllabus, Weekly Modules, Achieve Homework & Quizzes, Active Learning Exercises, End-of-Chapter Assessments, and Grades**. Within the **Weekly Modules** you will find **Chapter PowerPoints** for you to download or print and bring to lecture. These PowerPoint slides are sized to be legible when printed at 6 slides per page.

Course Grade: 60% = Best 3 out of 4 Lecture Exams (100 points/exam)
 20% = Required Final Exam (100 points)
 15% = *Achieve*: Homework & Quizzes
 5% = *iClicker* points

- Students are responsible for keeping track of their own grades and identifying issues within 2 weeks of any grade posting in Webcourses.
- Letter grades for the semester will be awarded according to the scale below. Letter grades will adhere to this percentage range with no exceptions. There will be **no curving** of final grades.

A = 90-100% B = 80-89% C = 70-79% D = 60-69% F = 59% and below

Lecture Exams: There will be 4 lecture exams, each worth 100 points. Exams will be based on assigned readings, *Achieve* Homework & Quizzes, Active Learning Exercises, recommended End-of-Chapter Assessments, and material covered in lecture, including notes and diagrams that are not included in the PowerPoint files posted in Webcourses. Therefore, students who routinely skip lectures will be at a significant disadvantage. The lowest score of the 4 lecture exams will be dropped automatically.

Final Exam: All students are required to take the COMPREHENSIVE (covering all material from the semester) Final Exam, worth 100 points. The Final Exam will be given in our lecture classroom, CB2-201 according to the UCF Final Exam Schedule for Fall 2023, on **Tues Dec 5, 10:00 am - 12:50 pm**.

***Achieve*: Homework & Quizzes** are assigned for each chapter, and together make up **15%** of your course grade. Due dates are listed in the *Achieve* course and in our Webcourse Weekly Modules. A 25% penalty will be deducted from any assignment submitted up to 3 days after the due date. After that time, you will not receive any credit. Homework (unlimited attempts, hints provided) and Quizzes (1 attempt, no hints) will be automatically graded and synched to Webcourses gradebook. **BE SURE TO SELECT THE SUBMIT BUTTON AT THE END OF THE QUIZ TO SUBMIT ALL ANSWERS.** The lowest grade of all quizzes will be dropped automatically. The lowest grade of all homework assignments will be dropped automatically.

iClicker points earned from class participation and graded questions each day will comprise **5%** of your course grade. For each class period, 3 points are earned for participation (= answering at least 75% of the questions) plus additional points for graded questions (1 point for each correct answer and 0.25 point for each incorrect answer). Only a subset of questions will be graded each day. The 3 lowest *iClicker* day scores will be dropped automatically.

End-of-Chapter Assessments are listed in Webcourses as recommended practice and review for each chapter. You will not submit answers or receive credit but are strongly encouraged to complete these problems for a better understanding and review of the concepts discussed in lecture.

Active Learning Exercises: These occasional exercises provide an opportunity for students to work together or individually on a worksheet in class to reinforce critical concepts. Student understanding will be assessed via *iClicker*.

Taking Exams:

- Exam questions will be multiple choice. You will use scantrons provided by me.
- You need to bring a #2 pencil and your UCF ID number to fill in the scantron.
- You **MUST** show your UCF ID card to a proctor when you turn in your exam and scantron.
- You may **NOT** use a phone or calculator during any exam.
- If you arrive **within 15 minutes** after the start of an exam, you will be allowed to take the exam. However, you must turn in the exam paper at the scheduled end of the exam period. You will not be allowed extra time unless a documentable emergency has occurred (see below).

Excused Missed Exams:

- If an exam is missed due to an official, documented, University-accepted absence, a make-up exam will be permitted. Excused absences include special curricular requirements (*e.g.* field trip, professional conference), official UCF business at which your presence is required (*e.g.* university sponsored team event), U.S. Military-related business (*e.g.* Reserve Duty), legal obligation (*e.g.* jury duty).
 - You must provide documentation with your name and date affected **1 week prior** to exam date.
 - Students are responsible for arranging with me a time to take the makeup exam so that it is completed before exam solution keys are released to all students.
- A make-up exam **may** be permitted if any other legitimate* documented reason that circumstances beyond your control prevented you from taking the exam (including, but not limited to, your hospitalization, death in the immediate family)
 - *If I approve the absence based on your documentation from an appropriate authority (doctor, police, judge, etc.) **provided within 24 hours of the missed exam**, I will arrange a time and place for a make-up exam. THE MAKE-UP EXAM MAY INCLUDE SHORT ANSWER QUESTIONS IN ADDITION TO MULTIPLE CHOICE.*
 - A doctor's note must be on letterhead with a contact phone number and must indicate that a medical condition was treated or that a medical procedure or hospitalization occurred. (*A note stating that you visited the UCF Health Center is not acceptable documentation of a major illness preventing you from taking an exam.)

Unexcused Missed Exams: If a student misses an exam for an unexcused event (*e.g.*, forgetting there was an exam, arriving >15 min late, vacations, family gatherings) or *cannot provide acceptable documentation*, then they will receive a zero grade for that exam. The first zero grade will be dropped as the lowest scoring exam. Any additional zero exam grades due to unexcused absences will count towards the course grade.

No Excused iClicker points: The three lowest *iClicker* day scores (out of 23 total days for this semester) will be dropped for every student. Therefore, no *iClicker* day scores will be excused for any reason.

Reviewing Exams:

- Scantrons & exams will NOT be returned to students. Exam solution keys will be posted in Webcourses.
- You may request a printout of your exam score sheet (with all correct and incorrect responses indicated) during office hours **within 2 weeks** of an exam grade being posted in Webcourses.
 - You may review your exam only during the 2 week window.
 - You must resolve **any** grade concerns within the 2 week window.

Classroom Conduct: Because of the challenges inherent with a class of this size, **please be sure to**

- arrive and depart on time
 - refrain from talking during class
 - silence cell phone
- A student who fails to follow these basic courtesy rules will be asked to leave.

- Laptops are allowed for course-related use only. If I receive complaints that your online viewing activities or entertainment streaming interferes with other students' ability to concentrate and learn in this classroom, I will have to prohibit ALL laptop use in the classroom.

In-Class Recording: Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording classroom activities other than class lectures, including but not limited to class discussion (except when incidental to and incorporated within a class lecture), academic exercises involving student participation, test or examination administrations, and private conversations is prohibited. Recordings may not include the image or voice of other students in the class, may not be used as a substitute for class participation and class attendance, and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct as described in the Golden Rule.

Academic Integrity: As reflected in the UCF creed, integrity and scholarship are core values that should guide our conduct and decisions as members of the UCF community. Plagiarism and cheating contradict these values and are serious academic offenses. Students enrolled at UCF are expected to familiarize themselves and uphold the standards of academic behavior defined in the University's *Rules of Conduct* (Section UCF-5.008) in the Golden Rule handbook <http://goldenrule.sdes.ucf.edu>.

Students are prohibited from engaging in **Academic Misconduct:**

1. Unauthorized assistance: Using or attempting to use unauthorized materials, information or study aids in any academic exercise unless specifically authorized by the instructor of record. The unauthorized possession of examination or course-related material also constitutes cheating.
2. Communication to another through written, visual, electronic, or oral means: The presentation of material which has not been studied or learned, but rather was obtained through someone else's efforts and used as part of an examination, course assignment, or project.
3. Commercial Use of Academic Material: Selling of course material to another person, student, and/or uploading course material to a third-party vendor without authorization or without the express written permission of the university and the instructor. Course materials include but are not limited to class notes, Instructor's PowerPoints, course syllabi, tests, quizzes, labs, instruction sheets, homework, study guides, handouts, etc.
4. Falsifying or misrepresenting the student's own academic work.
5. Plagiarism: Using or appropriating another's work without any indication of the source, thereby attempting to convey the impression that such work is the student's own.
6. Multiple Submissions: Submitting the same academic work for credit more than once without the express written permission of the instructor.
7. Helping another violate academic behavior standards.
8. Soliciting assistance with academic coursework and/or degree requirements. The solicitation of assistance with an assignment, lab, quiz, test, paper, etc., without authorization of the instructor of record or designee is prohibited. This includes but is not limited to asking for answers to a quiz, trading answers, or offering to pay another to complete an assignment. It is considered Academic Misconduct to solicit assistance with academic coursework and/or degree requirements, even if the solicitation did not yield actual assistance (for example, if there was no response to the solicitation).

Students are prohibited from **Possessing and/or Providing False and Misleading Information and/or Falsification of University Records:**

1. Withholding related information or furnishing false or misleading information (oral or written) to University officials, university and non-university law enforcement officers, faculty or staff.

2. Possession, use or attempted use of any form of fraudulent identification.
3. Forgery, alteration or misuse of any University document, material, file, record or instrument of identification.
4. Deliberately and purposefully providing false or misleading verbal or written information about another person.
5. Falsification, distortion, or misrepresentation of information during an investigation, the Student Conduct Review Process, including knowingly initiating a false complaint.

Unauthorized Use of Websites and Internet Resources: There are many websites claiming to offer study aids to students, but in using such websites, students could find themselves in violation of academic conduct guidelines. These websites include (but are not limited to) Quizlet, Course Hero, Chegg Study, and Clutch Prep. UCF does not endorse the use of these products in an unethical manner, which could lead to a violation of our University's Rules of Conduct. They encourage students to upload course materials, such as test questions, individual assignments, and examples of graded material. Such materials are the intellectual property of instructors, the university, or publishers and may not be distributed without prior authorization. Students who engage in such activity could be found in violation of academic conduct standards and could face course and/or University penalties. Please let me know if you are uncertain about the use of a website so I can determine its legitimacy.

Unauthorized Distribution of Class Notes: Third parties may attempt to connect with you to sell your notes and other course information from this class. Distributing course materials to a third party without my authorization is a violation of our University's Rules of Conduct. Please be aware that such class materials that may have already been given to such third parties may contain errors, which could affect your performance or grade. If a third party should contact you regarding such an offer, I would appreciate your bringing this to my attention. We all play a part in creating a course climate of integrity.

Responses to Academic Dishonesty, Plagiarism, or Cheating: Students should also familiarize themselves with the procedures for academic misconduct in UCF's student handbook, *The Golden Rule* handbook <http://goldenrule.sdes.ucf.edu>. UCF faculty members have a responsibility for students' education and the value of a UCF degree, and so seek to prevent unethical behavior and respond to academic misconduct when necessary. Penalties for violating rules, policies, and instructions within this course can range from a zero on the exercise to an "F" letter grade in the course. In addition, an Academic Misconduct report could be filed with the office of Student Conduct and Academic Integrity <https://scai.sdes.ucf.edu> which could lead to disciplinary warning, disciplinary probation, or deferred suspension or separation from the University through suspension, dismissal, or expulsion with the addition of a "Z" designation on one's transcript.

Being found in violation of academic conduct standards could result in a student having to disclose such behavior on a graduate school application, being removed from a leadership position within a student organization, the recipient of scholarships, participation in University activities such as study abroad, internships, etc.

Let's avoid any potential misconduct or penalty by demonstrating values of honesty, trust, and integrity. No grade is worth compromising your integrity and moving your moral compass. Stay true to doing the right thing: take the zero, not a shortcut.

Time commitment: For most students striving for B grades or higher, I recommend scheduling 9 hours per week for engaging with this course. Your background knowledge/experience and other variables may require you to spend additional time. Please plan accordingly by scheduling time on your calendar now. Several factors influence student academic performance and long-term learning. Active engagement in all course activities (e.g., lecture and *iClicker* polling, textbook readings, *Achieve* homework and quizzes, End-

of-Chapter assessments, classroom Active Learning exercises) will contribute to your learning and to your success in this course.

Course Accessibility and Inclusion: It is my goal that this class be an accessible and welcoming experience for all. UCF and I consider the diversity of our students, faculty, and staff to be a strength and critical to our educational mission. UCF expects every member of the university community to contribute to an inclusive and respectful culture for all in its classrooms, work environments, and at campus events. Dimensions of diversity can include sex, race, age, national origin, ethnicity, gender identity and expression, intellectual and physical ability, sexual orientation, income, faith and non-faith perspectives, socio-economic class, political ideology, education, primary language, family status, military experience, cognitive style, and communication style. The individual intersection of these experiences and characteristics must be valued in our community.

If there are aspects of the design, instruction, or experiences within this course that result in barriers to your inclusion or accurate assessment of achievement, please notify me to discuss reasonable options or adjustments. You may also want to contact SAS <http://sas.sdes.ucf.edu> (Ferrell Commons 185; 407-823-2371) to talk about academic accommodations.

Help & SARC: Please ask for help if you need it! I am here to answer your questions. Additionally, help is available through SARC (Student Academic Resource Center, Howard Phillips Hall, Room 113: 407-823-5130; <http://sarc.sdes.ucf.edu>). SARC provides students with free individual and small-group tutoring for Genetics with Supplemental Instruction (SI). Students can attend Academic Success Workshops to improve study skills & strategies.

Students can also schedule an appointment with **Academic Coaching and Engagement (ACE)** coaches <https://academicsuccess.ucf.edu/sarc/ace/>. These are free one-on-one academic coaching appointments (in person or on Zoom) where a ACE coach will guide students through learning time management skills, study strategies, stress management and other academic skills.

Transfer Center: The Transfer Center <https://connect.ucf.edu/transfer-connect/transfercenter/> is the hub for all transfer students on-campus to get assistance, meet with their Success Coaches, access opportunities and educational experiences, and interact with fellow transfer students.

Deployed Active-Duty Military Students: Students who are deployed active-duty military or National Guard personnel and require accommodation should contact their instructors as soon as possible after the semester begins and/or after they receive notification of deployment to make arrangements.

UCF Cares: UCF and I care not only about your academic success, but also your overall well-being. Please visit UCFcares.com <http://cares.sdes.ucf.edu/> if you are seeking resources or support, or if you are worried about a friend or classmate. Free services and information are included for a variety of student concerns, including but not limited to alcohol use, bias incidents, mental health concerns, sexual harassment or assault, and financial challenges. You can also e-mail ucfcares@ucf.edu with questions or for additional assistance. You can reach a UCF Cares staff member Student Care Services, <http://scs.sdes.ucf.edu>, Ferrell Commons 142, between 8 a.m. and 5 p.m. by calling 407-823-5607.

If you are in immediate distress, please call Counseling and Psychological Services (CAPS), Counseling Center 101 <http://caps.sdes.ucf.edu> to speak directly with a counselor 24/7 at 407-823-2811 or call 911.

Academic Services and Resources: A list of available academic support and learning services is available at [UCF Student Services](#). Click on "Academic Support and Learning Services" on right-hand side to filter.

Non-Academic Services and Resources: A list of non-academic support and services is also available at UCF Student Services. Click on "Support" on the right-hand side to filter.

All Biology majors are automatically enrolled in the **Welcome to UCF Biology** Webcourses page. Be sure to explore this valuable resource frequently for links to a wide range of UCF and Biology Department-specific information.

Campus Safety: Emergencies on campus are rare, but if one should arise in our class, we will all need to work together. Everyone should be aware of the surroundings and familiar with some basic safety and security concepts.

- In case of an emergency, dial 911 for assistance.
 - Every UCF classroom contains an emergency procedure guide posted on a wall near the door. Please make a note of the guide's physical location and consider reviewing the online version at http://emergency.ucf.edu/emergency_guide.html.
 - Familiarize yourself with evacuation routes from each of your classrooms and have a plan for finding safety in case of an emergency.
 - If there is a medical emergency during class, we may need to access a first aid kit or AED (Automated External Defibrillator). To learn where those items are located in any building, see <http://www.ehs.ucf.edu/AEDlocations-UCF> (In our building VAB, they are located on the 1st floor next to room 116.)
 - To stay informed about emergency situations, sign up to receive UCF text alerts by going to my.ucf.edu and logging in. Click on "Student Self Service" located on the left side of the screen in the tool bar, scroll down to the blue "Personal Information" heading on your Student Center screen, click on "UCF Alert", fill out the information, including your e-mail address, cell phone number, and cell phone provider, click "Apply" to save the changes, and then click "OK."
 - If you have a special need related to emergency situations, please speak with me during office hours.
 - Consider viewing this video [You CAN survive an active shooter](#) about how to manage an active shooter situation on campus or elsewhere.
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COVID-19 and Flu Illness:

- Students who are experiencing symptoms of COVID-19 or Influenza or have tested positive for COVID-19 or Influenza should follow the guidance of their physician.
- Dr. Bayer may choose to wear a mask during lecture based on transmission levels in the community. Students may wear a mask or not based on their personal decision and risk analysis.
- Whether in attendance or not, all students will be expected to be fully aware of all information presented in class.

Genetics Schedule 2023

Aug 22: Introduction & *Chapter 2* Chromosomes & Cellular Reproduction

Aug 24: *Chapter 2* Chromosomes & Cellular Reproduction

Fri, Aug 25 11:59pm
DROP/SWAP deadline

Aug 29: *Chapter 3* Basic Principles of Heredity

Aug 31: *Chapter 3* Basic Principles of Heredity

Sep 05: *Chapter 4* Sex Determination & Sex-linked Characteristics + *AL Ex #1 (Mitosis & Meiosis)*

Sep 07: *Chapter 4 & Chapter 5* Extensions & Modifications of Basic Principles

Sep 12: *Chapter 5* Extensions & Modifications of Basic Principles

Sep 14: EXAM 1 (Chapters 1, 2, 3, 4, 5)

Sep 19: *Chapter 6* Pedigree Analysis & *Chapter 7* Linkage, Recombination & Gene Mapping

Sep 21: *Chapter 7* Linkage, Recombination & Gene Mapping & *Chapter 8* Chromosome Variation

Sep 26: *Chapter 8* Chromosome Variation + *AL Ex #2 (Three-point Testcross)*

Sep 28: *Chapter 10* DNA: The Chemical Nature of the Gene

Oct 03: *Chapter 10* DNA: The Chemical Nature of the Gene & *Chapter 11* Chromosome Structure

Oct 05: *Chapter 11* Chromosome Structure

Oct 10: EXAM 2 (Chapters 6, 7, 8, 10, 11)

Oct 12: *Chapter 12* DNA Replication

Oct 17: *Chapter 12* DNA Replication + *AL Ex #3 (DNA Replication Bubble)*

Oct 19: *Chapter 13* Transcription

Oct 24: *Chapter 13* Transcription

Oct 26: *Chapter 14* RNA Molecules & RNA Processing & *Chapter 15* Genetic Code & Translation

Fri, Oct 27 11:59pm

Oct 31: *Chapter 15* Genetic Code & Translation + *AL Ex #4 (Transcription/Translation)*

WD deadline

Nov 02: EXAM 3 (Chapters 12, 13, 14, 15)

Nov 07: *Chapter 16* Control of Gene Expression in Bacteria

Nov 09: *Chapter 17* Gene Expression in Eukaryotes

Nov 14: *Chapter 17* Control of Gene Expression in Eukaryotes + *AL Ex #5 (Gene Expression)*

Nov 16: *Chapter 18* Gene Mutations & DNA Repair

Nov 21: *Chapter 19* Molecular Genetic Analysis & Biotechnology

Nov 23: **Thanksgiving - No classes**

Nov 28: *Chapter 19* Molecular Genetic Analysis & Biotechnology

Nov 30: EXAM 4 (Chapters 16, 17, 18, 19)

Dec 05: Comprehensive FINAL EXAM (Tuesday 10:00am- 12:50pm)

Note that the instructor reserves the right to make changes to the syllabus or other aspects of the course at any time. These changes will be announced in class and in Webcourses.