

Welcome to BICD 100 - Genetics!

Course Information

Course Description	This course aims to explore concepts of genetics as they apply to how information is stored, utilized, and inherited in life. Fundamental concepts include gene and chromosome structure, phenotype, chromosome segregation and recombination, gene expression, random mutation, epigenetics, genomic variation, and natural selection. We will learn these concepts by studying their roles in biological systems and will apply our understanding of these concepts to explain and predict a wide range of biological and real-life phenomena including human health, biodiversity, and agriculture.
Credits	4 credits, approximately 12 hours per week which includes pre-class work, lecture, homework, discussion section, and additional studying/practice.
Class times	Class: M/W/F, 9am-9:50am, SOLIS 107. Lectures are podcast. Discussion sections (various sections and locations *attend your registered section*) Sections are not recorded.
Materials	No textbook (I provide reading guides using free, online sources) Codon Learning (online program for practice/feedback, access through Canvas) \$35 iClickers (physical or app, you can buy used physical iClickers and they are often used in other classes)
Instructor	<p>Dr. Lisa McDonnell, lmcdonnell@ucsd.edu https://biology.ucsd.edu/research/faculty/lmcdonnell.html</p> <p>I will only send communication via my UCSD email address or Canvas. I do my best to reply within 24 hours Mon-Fri.</p> <p>I love genetics and look forward to discussing ideas and questions with you!</p> <p>Office hours: Most Thursdays 12-1pm, HSS 8025 (see course schedule)</p>
Teaching & Instructional Assistants (IAs)	<p>Josef Urrete, TA jurrete@ucsd.edu Luther Ela, IA lela@ucsd.edu Tina Le, IA ttl003@ucsd.edu</p>



BROAD LEARNING GOALS

- **Collaborate** with fellow students and the teaching team to learn concepts in genetics
- **Apply knowledge** of genetics concepts to analyze & explain data, make predictions, solve problems, and **construct scientific arguments** based on evidence and reasoning

More detailed learning objectives will be provided in each class and on Codon Learning. You can also [find a list of objectives that are common in this course here](#).

Course Schedule & Format

[Course schedule](#) (also please check Canvas on a regular basis)

Lectures are in-person unless otherwise noted. Lectures are podcast. Discussion sections are in-person, attend your registered section.

See below for more info on how class and section time are used.

Office hours. Typically Thursdays 12-1pm, 8025 HSS (HSS building, 8th floor), unless otherwise noted (see [course schedule](#)).

Tests #1, #2, and Final Exam

- Test #1, Fri Oct 27, 6-7:50pm, SOLIS 107, covering concepts weeks 0-3
- Test #2, Fri Dec 1, 6-7:50pm, SOLIS 107, covering concepts weeks 4-7
- Final Exam, Wed Dec 13, 8am-10:59am, location on campus (room TBD), cumulative

See below for more info on tests.

Overall Course Expectations

What you can do to support your success in the course:	What I will do to support your success in the course:
Read the syllabus and stay current with course information	Be prepared and bring my enthusiasm for teaching to each session
Keep up with class material, assignments, practice questions, homework	Respond to emails within one working day*, answer questions during office hours and provide timely feedback on assignments / submissions.
Contribute to the learning environment with	Establish a learning environment with

fairness, cooperation, and professionalism	fairness, cooperation and professionalism, and will take action if these principles are violated.
Treat your classmates, instructional assistants and myself honestly and ethically	Treat you honestly and ethically, and will address any concerns you might have
Commit to excel with integrity ¹ . Have the courage to act in ways that are honest, fair, responsible, respectful & trustworthy.	Uphold integrity standards and create an atmosphere that fosters active learning, creativity, critical thinking, and honest collaboration.
Manage your time, so you can stay on track with the course and complete tasks on time	Only assign work that is vital to the course, and will work to meet the standard credit hour allotment for the course.

1. Please read UC San Diego’s [Policy on Integrity of Scholarship](#) and take the [integrity pledge!](#)

* I am happy to answer questions that are not already addressed in class, on Canvas, or in the syllabus. Please check these resources first.

Teaching Philosophy

My philosophy is rooted in research on how people learn. This course is designed to encourage problem solving, collaboration, frequent feedback, and the development of self-regulated learning and metacognitive skills (planning, practice, reflection on performance and adapting). I strive to create an environment for everyone to learn together and construct a shared understanding of the material. My goal is to promote critical thinking such that you can apply your knowledge outside of class and can share it with others.

We will focus on developing an understanding of fundamental concepts as they apply to different examples. Therefore, tests will include questions that are based on solving problems in new contexts (analysis, applying knowledge, generating ideas, justifying with reasoning). *We will not* focus on memorization. Questions on tests will be based on the learning objectives.

Human interaction and communication are very important and helpful when learning! I encourage you to take advantage of all the course components, and please attend class, office hours and discussion sections to engage with me, the IAs, and one another!

Course Materials and Tools

Text/Readings

I do not require a textbook for this course. I will provide an optional reading guide that are sourced from free, online material. If you are comfortable with online resources, you can use the ones I recommend throughout the quarter (and/or others you find). If you prefer a textbook, the Klug (“Essentials of Genetics”) is recommended, and you can find almost all of the relevant topics using the index/table of contents. You may also use older editions of the Klug textbook. Please note that I will not be referring to certain pages/chapters in the Klug textbook.

Codon Learning

We are using Codon Learning to engage in pre- and post-class practice of the learning objectives, as well as develop metacognitive skills. The cost to use this platform is \$35. Instructions on how to sign up will be provided on Canvas. Students with financial aid will be able to have the cost covered as you would with a course textbook.

iClicker – OPTIONAL. I will ask clicker-style questions to provoke thinking, practice, and discussion, but not require an iClicker.

Assignments and Grading

Bolding indicates flexibility to accommodate for illness/emergencies (elaborated in section below). Please see the course schedule/Canvas for due dates.

IF YOU JOIN THE CLASS LATE there are no extended deadlines (unless it says below to get in touch). This is a 10-week course, designed with work scheduled during the first two weeks to engage in learning the material in a timely fashion. Late adds are still encouraged to complete the work for learning, but there are no points awarded for late work except where noted below.

Assignment	Points	Explanation
Syllabus Quiz	2	Review of the syllabus and course components is an important step in understanding the course organization. You will have two attempts at this quiz, the highest score accepted. If you join late, please get in touch.
Pre-Course Review (Codon Learning)	2	This is a set of questions on Codon Learning. The objectives, and questions, are meant to review <u>pre-requisite</u> concepts. If you are struggling with these concepts, <i>please</i> ask questions during office hours and review the material posted on Canvas under the Pre-Course Review module. You have two attempts to receive full points on this review quiz. If you join late, please get in touch.
Class participation	3	Participation in at least 80% of class sessions will be awarded 5 points. Less than 80%, the points will be moved to the weight of the homework. Class participation is largely based on completing (completing, not correctness) 75% or more of the iClicker questions asked on any given

		<p>day. I give points for this because thinking and receiving feedback are really important for learning, so I value our time and work <i>together</i> in class.</p>
<p>Pre-class Question Assignments on Codon Learning (including the “Welcome to Codon” Assignment)</p>	6	<p>Pre-class assignments are assigned on Codon Learning. The purpose is to facilitate pre-class learning by testing understanding of the objectives for the week at an <i>introductory</i> level. You receive full points for each question if you get it correct on the first or second attempt (and subsequent attempts receive points with 10% deductions per attempt). I recommend you do one attempt, do some pre-class learning/reading/Q&A, then take the second attempt.</p> <p>To accommodate for missed assignments because of illness, emergency, adding the course late, etc., the two lowest pre-class assignment scores will be dropped. For this reason, there are no late pre-class assignments accepted and there are no make-ups for missed assignments. Late adds – missed assignments can count as lowest scores dropped.</p>
<p>Homework</p>	6	<p>Homework questions are typically at a higher difficulty level than pre-class questions. The purpose is to practice applying knowledge of course concepts and to solve problems. You will be asked to upload your completed homework to GradeScope on Canvas. Homework is due at 8am on Mondays. Homework will be scored on a three-point scale: 0 (not done or minimal effort), 1 (effort, but incomplete or multiple errors), 2 (complete and thinking is largely on the right track). To accommodate for missed homework because of illness, emergencies, adding the course late, etc., the two lowest homework scores will be dropped. For this reason, there are no late homework assignments accepted and no make-up homework. Late adds – missed assignments can count as lowest scores dropped.</p>
<p>Post-Class Practice (Study Paths on Codon Learning)</p>	9	<p>On the Codon Learning site you will have access to a Study Path prior to each test and the final exam. The study path contains a set of “prep” questions and a practice test. These are designed to practice applying both your introductory and higher-level understanding of concepts, and practice solving problems in preparation for upcoming tests. The study path will populate with questions after you complete each associated pre-class assignment. The prep questions can be done over time, spaced out, on a question-by-question basis. The practice test is meant to be done in one sitting (give yourself at least one hour to complete).</p> <p>Part of the study path is graded for correctness: for the prep questions you have two attempts on each question to get full points, subsequent attempts will be worth points but 10% less each attempt). Completion of the practice test is full points regardless of correctness.</p> <p>There are three study paths set-up in the course: one before test #1, #2, and the final exam. The highest scoring Study Path will be worth 5 points, and the second highest worth 4 points, and the lowest study path score is</p>

		dropped. Because they can be completed over multiple days, and the lowest path score is dropped, late study paths are not accepted.
Discussion section participation	5	Discussion sections are designed to engage in collaborative problem solving to clarify and deepen understanding of the course concepts. **attend you registered section*** During the section, a portion of time will be used to discuss <i>some</i> problems from the previously completed homework, and the remaining time will be used to work on a <i>new</i> problem distributed during section. If you attend and engage meaningfully in collaborative problem solving in at least 7 or more sections out of the 10 offered , you will be given 5 points. If you do not attend at least 7 sections, the 5 points be moved to the weight of the final exam. I highly encourage you to attend!
Test #1, #2, and Final Exam	67	<u>Tests are in-person.</u> Tests are a combination of multiple choice/answer, and short answer. Please see the course schedule and Canvas for dates and topics covered. The final exam is cumulative. Practice problems are posted on Canvas (in addition to the Codon Learning Study Path!) You may bring a one page, double-sided, notes page of typed or hand-written notes to the tests and final exam (we will call these test notes). <u>These will be collected.</u> They must be your own work – if test notes from two or more students are the same/unusually similar, your test will receive a score of 0. We will review best practices on how to create these in class. Please see below on grading to understand weighting of tests and how a missed test that receives a grade of 0 will be accommodated.
Total	100	
Bonus opportunities	1 point on final course score	At the start and end of the course a course outcomes assessment will be released on Canvas (this is NOT Codon Learning work). The assessment is to help us know if the course objectives are being met, and what incoming knowledge students bring to the course. Completion of each assessment by the posted due dates will be awarded 0.5 bonus points on the final course score (0.5 each assessment, so a max of 1 bonus point). If you add the class late and miss the pre-assignment, please get in touch.

Grading Scale

90%-100% A (A-, A or A+)
75%-89% B (B-, B, or B+)
65%-74% C (C-, C, or C+)
50-64% D
<50 F

Tests/Final Exam Grading

- If both of your test #1 and #2 scores are higher than your final exam score, the highest of test #1 or 2 is worth 20%, lowest worth 10%, and final exam worth 37%. See example Student A below.
- If your final exam score is higher than BOTH test #1 and #2, the final exam worth 67% and tests #1 and #2 are both worth 0. See example Student D and E below.
- If one of your test scores (e.g., test #1) are lower than the final exam, I will score in the following way:
 - If your other test score (test #2) is higher than your final exam score, I will take 5% of the missed or lowest test and place it on the other test to make that test worth 25% of your grade. The remaining 5% will be added to your final exam score, which will be worth 42% of your grade. See Student B and C below.

Consider the examples of 5 students below:

Student	Test 1 score (%)	Test 2 score (%)	Final exam score (%)	Then, the weighting for course points looks like (percentage are % of total course points out of 100)
Student A	74	81	71	T1 10%; T2 20%; final exam 37%
Student B	65	77	74	T1 0%; T2 25%; final exam 42%
Student C	84	0	70	T1 25%; T2 0%; final exam 42%
Student D	55	63	82	T1 0%; T2 0%; final exam 67%
Student E	0	0	79	T1 0%; T2 0%; final exam 67%

Summary of accommodations for illness and emergencies

Review the descriptions of the course work above and how flexible policies are built in almost every part of the course to accommodate for illness and emergencies resulting in a missed assignment or test. Because there is built-in flexibility there are **no make-ups or late work accepted unless posted above**. Late work counts as a zero. If you are unable to submit something on time because of illness or emergency you are still encouraged to do the work and ask for feedback.

What if I add the course late and I couldn't complete an assignment on time?

The missed work will receive a score of 0 and fall under the flexible policies noted above (except partial points for the syllabus quiz and the pre-course review, see above). There are no late make-up assignments.

What if I am feeling sick on a test day?

Do not attend class or tests if you are ill. See flexible policy and how it accommodates missed tests due to illness.

What if I miss the final exam because of illness or an emergency?

In the case of a missed final exam, you will be asked to provide documentation to both me and the Dean of Academic Affairs and/or Student Affairs of your college. Upon receipt of documentation, it will be determined if you can receive a grade of “Incomplete” (“I”). Students with an incomplete will have the opportunity to take a final exam at a later date – set by the instructor. **You must have a passing grade in the course to be eligible for an Incomplete** (in addition to the approved reason and documentation noted above). **You must have taken at least test #1 and/or test #2 in order to be eligible for an “Incomplete”** (in addition to documentation).

Recommended Weekly Workflow ~12 hours per week:**1. Pre-class learning ~1-2 hours per week**

There is no assigned textbook. I post a reading guide that refers you to online sources to review some core ideas/concepts related to the learning objectives each week. You are not tested on specific items in the reading – this is simply a tool to engage with background-level material. I also recommend you review the class slides for the upcoming week. It is important to engage in pre-class learning: start to understand the basics of the upcoming learning objectives and identify where you are feeling stuck. In class we *elaborate* on the basics, so doing the pre-class learning will make class more useful.

Pre-Class Assignment on Codon Learning

I recommend you try it once, do some pre-class learning (see reading/review of slides above) and then do the second attempt. Make note of what you felt confused on to see if these are clarified during class/discussion section.

2. Attend class ~ 3 hours

Lectures will expand on the learning objectives with examples, questions, and discussion.

3. Attend office hours ~ 1 hour. Attending office hours even if you don't have immediate questions can be very helpful. You may hear something other students ask that sparks a question, or helps you reflect on your understanding. Of course if you have questions – please ask! I'm also happy to talk about non-course material: research, graduate school, other topics!**4. Homework problem set ~1-2 hours**

Most weeks there is a homework problem set (see course schedule). *I recommend you start the homework at the beginning of each week*, and work on it throughout the week as we progress through lectures.

5. Attend discussion section 1 hour

Time to review some of the homework problems, as well as work in groups on a new problem. New problems will often involve applying your genetics knowledge to make sense of some data/information and drawing conclusions. These problems are excellent practice for the types of thinking you will be asked to do on tests.

6. Study Path on Codon Learning (prep/practice questions) ~1 hour per week

This is a chance to revisit the concepts covered in each class in preparation for the upcoming test. You can access these practice questions after you have completed the pre-class work.

7. Additional study time - variable

Genetics is largely based on application of knowledge and problem solving. This requires time to think, practice, and seek help! Do not rely on cramming. Spaced practice is ideal.

Example calendar for one week

This is just a suggestion to see how spacing and timing of preparation, homework, practice could occur. I realize everyone has different, competing priorities. Please reach out if you ever want to talk about time management or study strategies!

Note that both the Homework and Pre-class Assignment are due Monday morning. Please plan your time/schedule accordingly.

Mon	Tues	Wed	Thurs	Fri	Weekend
Class		Class		Class	
Start homework that is due <i>next</i> Monday				Finish homework that is due on Monday	
Attend your discussion section					
Attend office hours (Instructor and IA office hours will be occurring at various times)					
			Work on pre-class learning for next week that is due on Monday		

Academic integrity

<https://students.ucsd.edu/academics/academic-integrity/index.html>

Integrity of scholarship is essential for an academic community. The University expects that both students and faculty will honor this principle and in so doing protect the validity of University intellectual work. For students, this means that all academic work will be done by the individual(s) to whom it is assigned, without unauthorized aid of any kind. In this course, we need to establish a set of shared values. Following are values* adopted from the [International Center for Academic Integrity](#), which serve as the foundation for academic integrity.

	As students we will.....	As the teaching team we will.....
Honesty	<ul style="list-style-type: none"> • Honestly demonstrate your knowledge and abilities according to expectations listed in the syllabus or in relation to specific assignments and exams • Communicate openly without using deception, including citing appropriate sources 	<ul style="list-style-type: none"> • Give you honest feedback on your demonstration of knowledge and abilities on assignments and exams • Communicate openly and honestly about the expectations and standards of the course through the syllabus and in relation to assignments and exams
Responsibility	<ul style="list-style-type: none"> • Complete assignments on time and in full preparation for class • Show up to class on time and be mentally and physically present • Participate fully and contribute to team learning and activities 	<ul style="list-style-type: none"> • Give you timely feedback on your assignments and exams • Show up to class on time and be mentally and physically present • Create relevant assessments and class activities
Respect	<ul style="list-style-type: none"> • Speak openly with one another while respecting diverse viewpoints and perspectives • Provide sufficient space for others to voice their ideas 	<ul style="list-style-type: none"> • Respect your perspectives even while we challenge you to think more deeply and critically • Help facilitate respectful exchange of ideas
Fairness	<ul style="list-style-type: none"> • Contribute fully and equally to collaborative work, so that we are not freeloading off of others on our teams • Not seek unfair advantage over fellow students in the course 	<ul style="list-style-type: none"> • Create fair assignments and exams and grade them in a fair and timely manner • Treat all students and collaborative teams equally
Trustworthiness	<ul style="list-style-type: none"> • Not engage in personal affairs while on class time • Be open and transparent about what we are doing in class <p>Not distribute course materials to others in an unauthorized fashion</p>	<ul style="list-style-type: none"> • Be available to all students when we say we will be • Follow through on our promises • Not modify the expectations or standards without communicating with everyone in the course

Courage	<ul style="list-style-type: none"> • Say or do something when we see actions that undermine any of the above values • Accept the consequences of upholding and protecting the above values 	<ul style="list-style-type: none"> • Say or do something when we see actions that undermine any of the above values • Accept the consequences of upholding and protecting the above values
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** This class statement of values is adapted with permission from Tricia Bertram Gallant Ph.D.*

All course materials are the property of the instructor, the course, and the University of California, San Diego and **may not** be posted online, submitted to private or public repositories, or distributed to unauthorized people outside of the course.

Any work associated with the course is expected to be done by you, the enrolled student, and you alone. Discussing overall concepts is a great way to help in learning, but it is not permitted to discuss question answers or share answers.

I take academic integrity very seriously. Any suspected instances of a breach of academic integrity will be reported to the Academic Integrity Office for review and possibly given a score of 0.

Regrades

If a grading error has been made, you should submit a re-grade request via GradeScope. Students who submit items for re-grading understand that **the instructor may re-grade the entire test/homework and the score may go up or down**. Regrade requests may not be processed until the end of the quarter, and at that time there will be no regrades for a student with an A or A+.

Accessibility

<http://disabilities.ucsd.edu> | osd@ucsd.edu | 858-534-4382

Any student with a disability is welcome to contact me early in the quarter to work out accommodations to support their success in this course. Students requesting accommodations for this course due to a disability should work through the Office for Students with Disabilities (OSD). Instructors will receive Authorization for Accommodations Letters from the OSD online portal. Whenever possible, we will use universal designs that are inclusive. If you have feedback on how to make the class more accessible, please get in touch!

Inclusion

It is our goal to create a learning environment that supports diversity of thought, perspective, experience, and identities. We encourage all of you to participate in discussion and contribute to the field from your perspective. If you have feedback on how to make the class more inclusive, please get in touch!

Office of Equity, Diversity, and Inclusion:

858.822.3542 | diversity@ucsd.edu | <https://diversity.ucsd.edu/>
<https://students.ucsd.edu/student-life/diversity/index.html>

<https://regents.universityofcalifornia.edu/governance/policies/4400.html>

Resources for Support and Learning

<p>Learning and Academic Support</p>	
<p><u>Ask a Librarian: Library Support</u> <i>Chat or make an appointment with a librarian to focus on your research needs</i></p> <p><u>Course Reserves, Connecting from Off-Campus and Research Support</u> <i>Find supplemental course materials</i></p> <p><u>First Gen Student Success Coaching Program</u> <i>Peer mentor program that provides students with information, resources, and support in meeting their goals</i></p> <p><u>Office of Academic Support & Instructional Services (OASIS)</u> <i>Intellectual and personal development support</i></p>	<p><u>Writing Hub Services in the Teaching + Learning Commons</u> <i>One-on-one online writing tutoring and workshops on key writing topics</i></p> <p><u>Supplemental Instruction</u> <i>Peer-assisted study sessions through the Academic Achievement Hub to improve success in historically challenging courses</i></p> <p><u>Tutoring – Content</u> <i>Drop-in and online tutoring through the Academic Achievement Hub</i></p> <p><u>Tutoring – Learning Strategies</u> <i>Address learning challenges with a metacognitive approach</i></p>
<p>Support for Well-being and Inclusion</p>	
<p><u>Basic Needs at UCSD</u> <i>Any student who has difficulty accessing sufficient food to eat every day, or who lacks a safe and stable place to live is encouraged to contact: foodpantry@ucsd.edu basicneeds@ucsd.edu (858) 246-2632</i></p> <p><u>Counseling and Psychological Services</u> <i>Confidential counseling and consultations for psychiatric service and mental health programming</i></p>	<p><u>Community and Resource Centers Office of Equity, Diversity, and Inclusion</u> <i>As part of the Office of Equity, Diversity, and Inclusion the campus community centers provide programs and resources for students and contribute toward the evolution of a socially just campus (858).822-.3542 diversity@ucsd.edu</i></p> <p><u>Get Involved</u> <i>Student organizations, clubs, service opportunities, and many other ways to connect with others on campus</i></p>

<p><u>Triton Concern Line</u> <i>Report students of concern: (858) 246-1111</i></p> <p><u>Office for Students with Disabilities (OSD)</u> <i>Supports students with disabilities and accessibility across campus</i></p>	<p><u>Undocumented Student Services</u> <i>Programs and services are designed to help students overcome obstacles that arise from their immigration status and support them through personal and academic excellence</i></p>
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Health and Well-Being Statement

Students may experience stressors that impact academics and personal well-being. These can include academic stress and pressure, relationship challenges, mental health, drugs and alcohol, identities, finances, and other factors. If you are experiencing stress and concerns it is courageous to seek help! If your stressors are academic, please contact me and I am happy to discuss solutions. I would also encourage you to reach out to the Dean of Academic Affairs for your college. For additional stressors UCSD offers a variety of resources, some of which you can find here: <https://vcsa.ucsd.edu/student-success/student-well-being.html>

Subject to Change Policy

The information contained in the course syllabus may be – under certain circumstances (e.g., to enhance student learning) – subject to change with reasonable advance notice, as deemed appropriate by the instructor. Any changes are announced on Canvas (please be sure to have your notifications settings on to receive updates/emails/announcements).

Letter of Recommendation Policy

If you think you may want me to write you a letter of recommendation (or any other instructor), please consider what a good letter would contain and how your actions in the course demonstrate the qualities you will want highlighted in a letter. When students ask me for a letter of recommendation, I ask them to write to me about how they demonstrated critical thinking, leadership, collaboration, and professionalism. I will be specifically looking for examples of these qualities *that I would have observed* during class and office hours. Be sure to actively participate in the discussions, talk to me during class and office hours, ask questions, offer your own ideas and interpretations of what we are covering, bring interesting facts/papers that are connected to the material we are studying. If you don't actively show the qualities that are needed to write a good letter, it will be hard for me to write a letter that is meaningful and useful.

Technical Support

For help with accounts, network, and technical issues:

<https://acms.ucsd.edu/contact/index.html>

For help connecting to electronic library resources such as eReserves and e-journals:

<https://library.ucsd.edu/computing-and-technology/connect-from-off-campus/>

Campus Policies

- [UC San Diego Principles of Community](#)
- [UC San Diego Policy on Integrity of Scholarship](#)
- [Religious Accommodation](#)
- [Nondiscrimination and Harassment](#)
- [UC San Diego Student Conduct Code](#)