

BILCD100 – Genetics

Summer I, 2022

RCLAS: Use zoom link below for every lecture

<https://ucsd.zoom.us/j/95358948399>

[Meeting ID: 953 5894 8399](#)

M-Th and 12:30pm-1:50pm

Course Description

BICD100. Genetics (4 quarter units) is an introduction to the principles of heredity emphasizing diploid organisms. Topics include Mendelian inheritance and deviations from classical Mendelian ratios, pedigree analysis, gene interactions, gene mutation, linkage and gene mapping, reverse genetics, population genetics, and quantitative genetics. Prerequisites: BILD 1.

Instructor

Instructor: Corinne Moeller-McCoy, PhD Candidate

Email: cmoeller@ucsd.edu; *Please include BICD100 in the subject line*

Course Website: canvas.ucsd.edu

Login: UC San Diego Active Directory credentials

Instructional Assistants (IAs):

Qinqing Gong: q5gong@ucsd.edu; OH: T, 6-8PM

Katherine Nguyen: k5nguyen@ucsd.edu; OH: Th, 6-8PM

Michelle Chiew: mhchiew@ucsd.edu; OH: M/W, 2-3PM

Yufei Deng: y9deng@ucsd.edu; OH: M/F, 11AM-12PM

Office Hours

My office hours are optional and will take place via zoom 2-3PM every Tuesday and Friday. Please stick around after class on Tuesday or arrive on Friday to go over questions related to the problem set, lectures, readings, discussion, etc. Office hours may also be made by appointment.

IA/TA

Section A01: Yufei Deng

Section A02: Michelle Chiew

Section A03: Katherine Nguyen

Section A04: Katherine Nguyen

Section A05: Qinqing Gong

Inclusion Statement

I am committed to creating a learning environment that supports diversity of thought, perspective, experience, and identities. Professional courtesy and sensitivity are

especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me early in the semester so that I may make appropriate changes to my records. It is my hope that in this course we will develop a supportive learning community that will foster rich discussions through the sharing of personal ideas, experiences, and relationships to course material. Honesty, listening for understanding, a willingness to share your ideas, and respect for self and others are basic guidelines that can help create a positive learning environment. Your participation and feedback is important to the success of the course and I welcome your thoughts throughout the semester on how we might improve class processes that will encourage effective communication and dialogue.

Course Expectations

What I expect of you	What you can expect of me
<p>Be informed. Read this syllabus carefully and completely so you understand the course structure and expectations.</p> <p>Be attuned. Keep up with readings and lab assignments, as each one builds on the previous one.</p>	<p>Enthusiasm. To be prepared for each class and to bring my enthusiasm for teaching to each lecture, lab, and office hour meeting.</p> <p>Responsiveness. To respond to emails within 24 hours. For those that know me already, you know that I usually respond faster than this. Emails received on weekends or while I'm traveling may take longer.</p>
<p>Ethical. A good attitude and maintenance of honest and ethical principles towards me, your classmates, and the execution of the course. Please read UC San Diego's Principles of Community and Conduct Code.</p> <p>Integrity. An honest, fair, responsible, respectful, trustworthy, and courageous effort on all academic work and collaboration. Please read UC San Diego's Policy on Integrity of Scholarship. Then, take the integrity pledge!</p>	<p>Timely feedback. To make every effort to return graded assignments within one week of the submission date and to post solutions or code as soon as is reasonably possible after the submission date.</p>
<p>Be flexible. This course may be affected by the remote format or unavoidable emergencies, necessitating last-minute rescheduling.</p>	<p>Reasonable accommodation and understanding for student situations that arise; however, I will not make exceptions for one person that are not available to every other person in the course.</p>

Course Learning Outcomes

Genetics is important, interesting, and fundamental for modern biology. Genes are basic units of biology and inheritance for ALL life forms. This course will introduce and explore gene discovery and related studies, and their use in analysis and manipulation of biological function. We will also explore how genes are inherited and the importance of genetic variation in populations. We will use quantitative classical and modern approaches (problem solving) to predict genetic outcomes. At the end of this course, students will be able to:

1. Summarize genetic techniques, and explain applications of the methods to real life
2. Apply knowledge of genetics concepts to analyze and explain data, make predictions, and solve problems
3. Learn to find, read, and evaluate scientific literature

Course Materials and Tools

Text/Readings/Other Material

Essentials of Genetics (10th Edition) is optional. Problem set, lecture, discussion, midterm and final questions will draw largely on material presented in class.

CANVAS: Learning Management System

Login: UC San Diego Active Directory credentials

Course Format

Summer Session 2022 is offered as remote instruction. You can access the campus notice [here](#). This class will take place in a hybrid format, which means that you will engage with some elements in real-time (synchronous), and other elements at your own pace (asynchronous), within due dates. We are all learning how to adapt to this format and will be facing this challenge together. We will do our best to engage all of you as a community of scientists. Lectures, discussion and office hours will be synchronous and take place via the scheduled class time on zoom. Some lectures will be cut short so that you may complete an assignment related to lecture at your own pace (asynchronously).

It is essential that you attend real-time Lectures, Office Hours and Discussion Sections to stay connected and earn extra credit active participation points!

All problem sets, lecture questions, midterm and final are open note, open computer. Discussion time may be used to review problem set and lecture questions. Extra credit may be earned if you are an active participant during lecture.

If your score on the final is better than the midterm, it can replace your midterm grade

Grading Information

Summary of Grade Criteria

Course Component	Points	Weight
LECTURE	430	43%
Course Introduction	10	
Research Assignments (7 @ 30 points each)	210	
Problem Sets (5 @ 40 points each)	200	
Final Reflection	10	
DISCUSSION SECTION	270	27%
Bio-interactives (8 @ 25 points each)	200	
Altering Mendelian Ratios WS	20	
Recombination WS	20	
Pop-Quiz (3 @ 10 points each)	30	
QUIZZES & EXAMS	300	30%
Midterm	100	
Final	200	
TOTAL	1000	

Grading Scale

Grading Scale							
A+	98% - 100%	B+	88% - <80%	C+	78% - < 80%	D	60% - < 70%
A	92% - < 98%	B	82% - < 88%	C	72% - < 78%	F	0% - < 60%
A-	90% - < 92%	B-	80% - < 82%	C-	70% - < 72%	<i>Grades will not be curved</i>	

Grading Procedure and Feedback

This course will not be graded on a curve, it is on an absolute scale, out of 1000 points, described above. You are therefore responsible for every point you earn.

Please feel free to work on the problem sets together, review them in discussion, bring them to my office hours, and bring them to your IA/TA's office hours. Some of the problem set questions will be reviewed in discussion.

Attendance and Participation

Given the current circumstances, attendance and participation is not mandatory, but is strongly encouraged. Essential material for the course will be covered during lecture and extra credit points may be earned.

Extra Credit

There will be an opportunity to earn extra credit during lecture. If you are an active participant and engaged in answering the practice questions, you may earn 1 extra credit point per lecture.

Late or Missing Assignments

Deadlines described below must be adhered to. Please contact me ASAP if deadlines cannot be met. If I do not hear from you, late or missing assignments will receive a zero.

Course Schedule

REVIEW THIS SCHEDULE OFTEN TO ENSURE DEADLINES ARE MET.

Week	Day	Date	Lecture		Section
			Lecture	Assignment, Activities, Due Dates	
1	M	6/27	L1	Introduction; Who Are We?; Genetics Central Dogma; DNA and chromosomes Mitosis/Meiosis	A01: 2-2:50PM A02: 3-3:50PM
	Tu	6/28	L2	Introduction to Mendelian genetics Phenotype; Dihybrid Cross; Probabilities	A03: 3-3:50PM A04: 4-4:50PM A05: 5-5:50PM
	W	6/29	L3	Pedigrees Chi Squared Test Different Types of Dominance	Research Assignment #1 Due A01: 2-2:50PM A02: 3-3:50PM
	Th	6/30	L4	Modification of Mendelian ratios Epistasis; Complementation, Pleiotropy	Bio-Interactive #1 Due Research Assignment #2 Due A03: 3-3:50PM A04: 4-4:50PM A05: 5-5:50PM
			L5		

				X-linked genes and sex determination; X-linked mutations			
	Sun 7/3				Problem Set #1 Due Altering Mendelian Ratios WS Due		
2	M 7/4	July 4 Holiday					Discussion Canceled
	Tu 7/5		L5 L6	Dosage compensation Chromosome aberrations; Imprinting; Penetrance	Research Assignment #3 Due Bio-Interactive #2 Due	A03: 3-3:50PM A04: 4-4:50PM A05: 5-5:50PM	
	W 7/6		L7	Maternal Effect; Chromosomal Variation		A01: 2-2:50PM A02: 3-3:50PM	
	Th 7/7		L8	Gene mapping: recombination and linkage	Research Assignment #4 Due	A03: 3-3:50PM A04: 4-4:50PM A05: 5-5:50PM	
	Sun 7/10				Bio-Interactive #3 Due Research Assignment #5 Due Problem Set #2 Due		
	M 7/11			MIDTERM		Midterm to be submitted by 11:59PM	Discussion Canceled
3	Tu 7/12		L9	Three-point mapping		A03: 3-3:50PM A04: 4-4:50PM A05: 5-5:50PM	
	W 7/13		L10	Bacterial genetics: mutations, conjugations	Recombination WS Due	A01: 2-2:50PM A02: 3-3:50PM	
	Th 7/14		L11	Bacterial and Phage Genetics, Restriction Enzymes	Bio-Interactive #4 Due	A03: 3-3:50PM A04: 4-4:50PM A05: 5-5:50PM	
	Sun 7/17				Problem Set #3 Due		
4	M 7/18		L12	DNA Structure; DNA mutations;		A01: 2-2:50PM A02: 3-3:50PM	

	Tu 7/19		L13	Experiments on mutagenetic compounds; Discovery of genetic material		A03: 3-3:50PM A04: 4-4:50PM A05: 5-5:50PM
	W 7/20		L14	Quantitative traits, QTL Mapping	Bio-Interactive #5 Due	A01: 2-2:50PM A02: 3-3:50PM
	Th 7/21		L15	GWAS	Research Assignment #6 Due	A03: 3-3:50PM A04: 4-4:50PM A05: 5-5:50PM
	Sun 7/24				Research Assignment #7 Due Bio-Interactive #6 Due Problem Set 4 Due	
5	M 7/25		L16	Regulation of gene expression - prokaryotes		A01: 2-2:50PM A02: 3-3:50PM
	Tu 7/26		L17	Cancer genetics		A03: 3-3:50PM A04: 4-4:50PM A05: 5-5:50PM
	W 7/27		L18	Developmental, Population and Evolutionary genetics; Modern genetics	Bio-Interactive #7 Due Bio-Interactive #8 Due Problem Set 5 Due	A01: 2-2:50PM A02: 3-3:50PM
	Th 7/28			Final: L1-18	Final to be submitted by 11:59PM	Discussion Canceled

UC San Diego Principles of Community

The University of California, San Diego is dedicated to learning, teaching, and serving society through education, research, and public service. Our international reputation for excellence is due in large part to the cooperative and entrepreneurial nature of the UC San Diego community. UC San Diego faculty, staff, and students are encouraged to be creative and are rewarded for individual as well as collaborative achievements.

To foster the best possible working and learning environment, UC San Diego strives to maintain a climate of fairness, cooperation, and professionalism. These principles of

community are vital to the success of the University and the well being of its constituents. UC San Diego faculty, staff, and students are expected to practice these basic principles as individuals and in groups.

[Click here for the complete UC San Diego Principles of Community in English and Spanish.](#)

Student Resources for Support and Learning

ACADEMIC SUPPORT

Geisel Library	Research tools and eReserves
Content Tutoring with the Teaching + Learning Commons	Drop-in and online tutoring through the Academic Achievement Hub
Supplemental Instruction with the Teaching + Learning Commons	Peer-assisted study sessions through the Academic Achievement Hub to improve success in historically challenging courses
Writing Hub Services in the Teaching + Learning Commons	Improve writing skills and connect with a peer writing mentor
Learning Strategies Tutoring	Address learning challenges with a metacognitive approach
OASIS	Intellectual and personal development support
Student Success Coaching Program	Peer mentor program that provides students with information, resources, and support in meeting their goals
Academic Integrity	Policy on Academic Integrity of Scholarship and strategies to excel with integrity
Technical Support	Assistance with accounts, network, and technical issues

STUDENT RESOURCES

Basic Needs	Provides access to food, housing, and financial resources
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Counseling and Psychological Services (CAPS)	Provides services like confidential counseling and consultations for psychiatric services and mental health programming
Community Centers	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
Counseling and Psychological Services	Individual, group, couples, and family psychotherapy services for registered undergraduate and graduate students
Office for Students with Disabilities	Documents students disabilities, provides accessibility resources, and reasonable accommodations
Triton Concern Line	Report students of concern at (858) 246-1111

Additional Optional Information

Subject to Change Policy

The information contained in the course syllabus, other than the grade and absence policies, may be—under certain circumstances such as mutual agreement to enhance student learning—subject to change with reasonable advance notice, as deemed appropriate.

Letter of Recommendation Policy

If you would like a letter of recommendation, a minimum grad of a B must be earned. I also encourage you to come office hours, engage in active class participation and demonstrate qualities that may be included in a LOR. Please provide a month notice prior to LOR deadline submission.

Technology Policy

This is an online course, and therefore online resources are available to you for integrated questions, problem sets, the midterm and final.