

Course Administration:

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Associate Professor of Cellular and Molecular Medicine, Vice-chair Genetics GIDP, Member Cancer Biology GIDP

Schedule: MWF, 2p – 3p

Public Calendar (subscription): [iCal](#)

Location: Rm. 442/443, Health Sciences Innovation Building (HSIB)

Format: This class is scheduled to be taught as FLEX IN-PERSON.

Zoom: [990 589 4378](#), pwd: mendel

Overall course objectives and expected learning outcomes:

The function of genes lies at the heart of heritability and variation in biology. Understanding genetic mechanisms and genetic interactions is essential to understanding foundational concepts like developmental biology, cell physiology, evolution, and disease. But much of what is known about genetic mechanism is well advanced over the basics enumerated by Mendel and other early luminaries. This course covers advanced concepts in gene function, genetic interactions, and genetic analyses and manipulations that are commonly in use in research laboratories, or that go awry in human disease.

Course progress:

The course will consist of readings, assigned for discussion or background for each class meeting. You are required to complete these readings prior to the class in which they will be discussed. Generally on Fridays, students will receive the upcoming week's homework assignment. Students are strongly encouraged to read through these questions before lectures, so that the homework questions can help direct the discussion to those areas where they need clarification. Homework is due one the following week, generally at the beginning of the Monday class. There will be a final exam in the form of a final paper.

There are two "data blitzes" scheduled, wherein each student will – alone or in a small group – present the key findings of an assigned paper, in particular the relevance of the paper's findings to the topic at hand.

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Class	Date	Topic	Instructor	Hwk out	Hwk due	
1	Aug 24, (Mon)	Introduction/meiosis	Ellis	1		
2	Aug 26, (Wed)	Complementation/epistasis	Ellis			
3	Aug 28, (Fri)	Mutation	Maggert	2		
4	Aug 31, (Mon)	Allelomorphy	Maggert		1	
5	Sep 2, (Wed)	Suppressor/synthetic lethal	Maggert			
6	Sep 4, (Fri)	Gene conversion I	Ellis	3		
	Sep 7, (Mon)	Labor Day				
7	Sep 9, (Wed)	Gene conversion II	Ellis		2	
8	Sep 11, (Fri)	Double strand break repair	Ellis	4		
9	Sep 14, (Mon)	Synthesis-dependent strand	Ellis		3	
10	Sep 16, (Wed)	Modern mad meiosis	Ellis			
11	Sep 18, (Fri)	VDJ rearrangement	Ellis	5		
12	Sep 21, (Mon)	Somatic hyper-rec/class switch	Ellis		4	
13	Sep 23, (Wed)	Yeast mating types	Maggert			
14	Sep 25, (Fri)	Sex determination flies & worms	Maggert	6		
15	Sep 28, (Mon)	Dosage compensation	Maggert		5	
16	Sep 30, (Wed)	Tissue and temporal I	Maggert			
17	Oct 2, (Fri)	Tissue and temporal II	Maggert	7		
18	Oct 5, (Mon)	Enhancer traps/mosaics	Maggert		6	
19	Oct 7, (Wed)	Robustness/canalization/buffering	Maggert			
20	Oct 9, (Fri)	Sex determination in human I	Ellis	8		
21	Oct 12, (Mon)	Sex determination in human II	Ellis		7	
22	Oct 14, (Wed)	X chromosome inactivation I	Ellis			
23	Oct 16, (Fri)	X chromosome inactivation II	Ellis	9		
24	Oct 19, (Mon)	Data blitz Ellis style	Ellis		8	
25	Oct 21, (Wed)	Chromosome structure	Maggert			
26	Oct 23, (Fri)	Mitotic segregation	Maggert	10		
27	Oct 26, (Mon)	Aberrations	Maggert			

Class	Date	Topic	Instructor	Hwk out	Hwk due	
28	Oct 28, (Wed)	Segmental aneuploidy, Balancers	Maggert		9	
29	Oct 30, (Fri)	Inverse Dose	Maggert			
30	Nov 2, (Mon)	Aneuploidy	Maggert	11		
31	Nov 4, (Wed)	Telomeres	Ellis		10	
32	Nov 6, (Fri)	Telomeres	Ellis			
33	Nov 9, (Mon)	Telomeres	Ellis			
	Nov 11, (Wed)	Veterans Day				
34	Nov 13, (Fri)	Data blitz Maggert style	Maggert	12	11	
35	Nov 16, (Mon)	Intro to human pop genetics	Ellis	Final Paper		
36	Nov 18, (Wed)	Inbreeding and parental relatedness	Ellis			
37	Nov 20, (Fri)	Somatic cell mosaicism	Ellis			
38	Nov 23, (Mon)	Somatic mutations I	Ellis		12	
39	Nov 25, (Wed)	Somatic mutations II	Ellis			
	Nov 27, (Fri)	Thanksgiving Recess				
40	Nov 30, (Mon)	Transposable elements I	Maggert			
41	Dec 2, (Wed)	Transposable elements II	Maggert			
42	Dec 4, (Fri)	Transposable element regulation	Maggert			
43	Dec 7, (Mon)	Heterochromatin	Maggert			
44	Dec 9, (Wed)	Position effect variegation	Maggert			
	Dec 11, (Fri)				Final Paper	

hedule:

Policies:**Grading:**

Standard letter grades will be given. The grade will be based 50% on homework, and 25% on the final paper, 25% class participation. There will be twelve 20-point homework assignments, 120 points for the final paper, and 120 points for class participation. Final grade will be calculated thus:

A: 90%-100%

B: 80%-89%

C: 70%-79%

D: 60%-69%

E: 59% and below

Group/Joint Work:

Working with others in the class is encouraged. If you work with others, either turn in a single assignment indicating co-authors, or turn in individual answers disclosing the extent of the collaboration through acknowledgement.

Flex In-Person:

We will be meeting remotely until the University notifies us that in-person meetings may commence.

We will meet by Zoom to discuss readings, genetic concepts, work on problems, and learn.

Cameras are required to be active during the class (except as noted below). When the COVID-19 situation permits teaching on campus, students will be allowed to join the HSIB classroom. Currently, the room capacity is sufficient for all students and instructors to be present and still maintain social distancing.

Until that time, meetings will be synchronous (i.e., Zoom sessions will be held at the same times as the course normally would). Class participation credit will not be given for asynchronous content; even if the class sessions are recorded, viewing them is not an acceptable alternative to attendance in-person or via Zoom.

If pandemic conditions warrant, the University may require that we return to remote operations. If that is the case, we will notify you by D2L Announcement and email that we are moving to remote operations.

After the Thanksgiving holiday, we are scheduled to move to remote teaching. That means that we will meet exclusively by Zoom.

Classroom Safety:

Face coverings are required in the classroom. As directed by the University of Arizona's Administrative Directive, face coverings must cover the nose, mouth, and chin, and are required to be worn in all learning spaces at the University of Arizona (e.g., in classrooms, laboratories and studios). Any student who violates this directive will be asked to immediately leave the learning space, and will be allowed to return only when they are wearing a face covering. Subsequent episodes of non-compliance will result in a Student Code of Conduct complaint being filed with the Dean of Students Office, which may result in sanctions being applied. The student will not be able to return to the learning space until the matter is resolved.

Physical distancing is required during our in-person class meetings, consistent with CDC guidelines, including restricted seating to increase physical distancing

The Disability Resource Center is available to explore face coverings and accessibility considerations if you believe that your disability or medical condition precludes you from utilizing any face covering or mask option. DRC will explore the range of potential options as well as remote course offerings. Should DRC determine an accommodation to this directive is reasonable, DRC will communicate this accommodation with your instructor.

If you feel sick, or may have been in contact with someone who is infectious, stay home. Except for seeking medical care, avoid contact with others and do not travel. Notify your instructors if you will be missing an in person or online course. Campus Health is testing for COVID-19. Please call (520) 621-9202 before you visit in person. Visit the University of Arizona COVID-19 page for regular updates.

Course recordings may be made. Zoom will request your permission prior to logging in. If you do not wish to be identified, grant permission, turn off your camera, change your name on the screen, and contact the instructor explaining the situation.

Advising:

If you have questions about your **academic progress** this semester, or your chosen degree program, please note that advisors at the Advising Resource Center can guide you toward university resources to help you succeed.

If you are experiencing **unexpected barriers to your success in your courses**, please note the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office can be reached at 520-621-2057 or DOS-deanofstudents@email.arizona.edu.

If you are facing **physical or mental health challenges** this semester, please note that Campus Health provides quality medical and mental health care. For medical appointments, call (520-621-9202). For After Hours care, call (520) 570-7898. For the Counseling & Psych Services (CAPS) 24/7 hotline, call (520) 621-3334.

Final Notes:

No course content is knowingly offensive. It is, however, quite flabbergastingly awesome.

For students registered with the Disability Resource Center (<https://drc.arizona.edu/students/connect>), reasonable accommodations will be made based on consultation with the DRC.

The information contained in the course syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructors.