

GENETICS 3020H CK²: Fundamental Genetics

MWF 8:00 am - 8:50 am

Poole A105

Instructor: Dr. Haiying Liang
Email: hliang@clemson.edu
Office: 108 Biosystems Research Complex
Office hours: By appointment via email

Required Text: Concepts of Genetics, 12th Edition. Klug, Cummings, Spencer, Palladino.

E-book is also available on-line
(<http://www.masteringgenetics.com/site/register/new-students.html>)

Required On-Line Package: MasteringGenetics - Access code is included with new books or can be purchased separately.

(<http://www.masteringgenetics.com/site/register/new-students.html>)

Course ID: MGENLIANG64619

Prerequisites: BIOL 1100 with C or better OR Approval of Instructor

Critical Thinking Student Learning Outcomes

This class is a Clemson Thinks² (CT²) course –developed to increase and enhance your critical thinking skills.

- (1) Explore complex challenges associated with sustainable landscape design, installation and maintenance.
- (2) Analyze sustainable design problems using multiple lenses and perspectives.
- (3) Extrapolate from one conceptual context to others in the sustainable landscape.
- (4) Develop creative solutions to complex challenges.
- (5) Communicate complex ideas effectively.

Academic Honesty: From Clemson academic regulations: "As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form."

"When, in the opinion of a faculty member, there is evidence that a student has committed an act of academic dishonesty, the faculty member shall make a formal written charge of academic dishonesty, including a description of the misconduct, to the Associate Dean of Undergraduate Services. The reporting person may, at his/her discretion, inform each involved student privately of the nature of the alleged charge. In cases of plagiarism (I.B.2.) instructors may use, as an option, the Plagiarism Resolution Form available from the Office of Undergraduate Studies."

Plagiarism: You are responsible for understanding what constitutes plagiarism. For more information, use the following resource:

<http://www.clemson.edu/academics/integrity/plagiarism.html>

First offense: F on the assignment

Second offense: F in the course and student may be suspended in accordance with university policy

Classroom Etiquette: In general, respect one another – courses cost money. Please turn off cell phones and iPods (or other knockoffs) unless online activities directed by the instructor is to be used. If the instructor is not in class by 8:00 am, you are expected to wait 15 minutes before leaving.

Attendance: Attendance is mandatory. 1 unjustified missed class=2 points reduction in the exam.

Grading: Course grades are based on the following:

1. Four equally weighted exams (70%)
2. Mastering Genetics Homework (15%)
3. Oral presentation and essay (10%)
3. Pre- and Post-online CK test (5%)

Makeup exams will **ONLY** be given for a University excused absence: University activity, funeral services, military duty, court attendance, or an illness/injury. Students must notify the professor **prior** to the exam, if possible, or **within 24 hours** of missing the exam. Students must provide written documentation to the instructor as soon as possible. Exams must be completed within **7 days** of the initial exam date or a grade of 0 will be given.

Each student is required to do a 15-20 mins oral presentation and turn in a 2-page essay (single space, due a week after oral presentation by email in Word) on a research paper related to the chapter the student is randomly assigned to. There will be a reduction of 5 points for each day after the deadline. The oral presentation and the essay will be graded as follow:

Presentation Items		Points
Category	Scoring criteria	
Organization (10 points)	Background information is relevant and prepares audience well for understanding the rest of the presentation	5
	Information is presented in a logical sequence.	5
Content (16 points)	Introduction is attention-getting, lays out the problem well, and establishes a framework for the rest of the presentation.	3
	Technical terms are well-defined in language appropriate for the targeted audience.	2
	Presentation contains accurate information.	5
	Appropriate amount of materials is prepared, and points made reflect well their relative importance.	4
	There is an obvious conclusion summarizing the presentation.	2
Presentation (15 points)	Speaker maintains good eye contact with the audience and is appropriately animated (e.g. gestures, moving around, etc.)	3
	Speaker uses a clear, audible voice.	3

	Delivery is poised, controlled, and smooth.	3
	Visual aids are well prepared, informative, effective, and distractive.	5
	Length of presentation is within the assigned time limits	5
Answering questions (9 points)	Engage the audience	3
	Show knowledge about the subject.	3
	Information is well communicated	3
	Total	50

Essay Items	Points
Background and rationale for the research	5
Objectives	5
Rationale	5
Methods	5
Results	5
Conclusions	5
Discussion (Critical Thinking): possible future avenues, weaknesses/disputes, alternate methodology/interpretation of data	13
Quality of writing (spelling, grammar)	5
Formatting (2-3 pages, single spaced, 12 point font, 1" margins)	2
Total	50

Homework will be due on exam days by 11:59pm. The online system will automatically cut off at that time. Incomplete work is not counted by the system.

Each student is required to participate in at least two online meetings (one hour per meeting) with Chinese students for information exchange (topics include culture awareness, student life, research work, and paper discussion, language learning, etc.)

Web materials & your responsibility: The slides used in **most** lectures are posted on the Canvas for this course. Warning: these image files tend to be large. I will often contact you by email using your Clemson email address (via listserv). You are responsible for all assignments and announcements sent by email.

Note to Students with Physical or Learning Disabilities: Students with disabilities who need accommodations should make an appointment with Dr. Arlene Stewart, Director of Disability Services, to discuss specific needs within the first month of classes. Students should present a Faculty Accommodation Letter from Student Disability Services when they meet with instructors. Student Disability Services is located in Suite 239 Academic Success Building (656-6848; sds-1@clemson.edu). Please be aware that accommodations are **not retroactive** and new Faculty Accommodation Letters must be presented each semester. I encourage students with disabilities to meet with me to discuss appropriate accommodations that might prove helpful. We will make use of the CU Proctoring Center – please see the instructions at their website (<http://www.clemson.edu/campus-life/campus-services/sds/test-center.html>) for rules and regulations.

Free, drop-in tutoring is available for this class through the Academic Success Center! Tutoring should be used to discuss course materials and ask questions but not as a replacement for

class or office hours. To maximize the benefit from tutoring, come fully prepared with your book, notes, and other class materials. For details on policies and drop-in session information, please see the ASC website at www.clemson.edu/asc.

Title IX (Sexual Harassment): Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in any complaint process, etc.) in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>. Mr. Jerry Knighton is the Clemson University Title IX Coordinator. He also is the Director of Access and Equity. His office is located at 111 Holtzendorff Hall, 864.656.3181 (voice) or 864.565.0899 (TDD).

Important dates:

Aug 20, Mon - Aug 21, Tue, Late enrollment
Aug 22, Wed, Classes begin
Aug 28, Tue, Last day to register or add a class or declare Audit
Sep 4, Tue, Last day to drop a class or withdraw from the University without a W grade
Sep 11, Tue, Last day to apply for December graduation
Oct 12, Fri, Last day for instructors to issue midterm evaluations
Oct 26, Fri, Last day to drop a class or withdraw from the University without final grades
Nov 5, Mon - Nov 6, Tue, Fall break
Nov 7, Wed, Registration for spring and summer terms begins
Nov 21, Wed - Nov 23, Fri, Thanksgiving holidays
Dec 6, Thu - Dec 7, Fri, Classes meet; exams permitted in labs and one-hour courses only
Dec 10, Mon - Dec 14, Fri, Examinations
Dec 17, Mon, 9:00 A.M.--Deadline to submit candidate grades
Dec 19, Wed, 9:00 A.M.--Deadline to submit other grades
Dec 19, Wed, Candidates for graduation may access grades
Dec 19, Wed, Doctoral Hooding at the Brooks Center
Dec 20, Thu, Graduation

LECTURE OUTLINE

NOTE: DATES AND CHAPTERS ARE TENTATIVE AND SUBJECT TO CHANGE.

<u>Date</u>	<u>Lecture Topic</u>	<u>Reading Assignment</u>
Aug 22 W	Introduction	Ch. 1
Aug 24 F	Mitosis & Meiosis	Ch. 2
Aug 27 M	Mitosis & Meiosis	Ch. 2
Aug 29 W	Mendelian Genetics	Ch. 3
Aug 31 F	Mendelian Genetics	Ch. 3
Sep 3 M	Extension of Mendelian Genetics	Ch. 4
Sep 5 W	Extension of Mendelian Genetics	Ch. 4
Sep 7 F	Chromosome mapping in eukaryotes	Ch. 5
Sep 10 M	Chromosome mapping in eukaryotes	Ch. 5
Sep 12 W	Genetic analysis & mapping in bacteria & phages	Ch. 6
Sep 14 F	Genetic analysis & mapping in bacteria & phages	Ch. 6
Sep 17 M	Sex determination and sex chromosomes	Ch. 7
Sep 19 W	Exam 1 (Ch. 1-6)	
Sep 21 F	Sex determination and sex chromosomes	Ch. 7
Sep 24 M	Chromosome mutations	Ch. 8
Sep 26 W	Chromosome mutations	Ch. 8
Sep 28 F	Extranuclear inheritance	Ch. 9
Oct 1 M	Extranuclear inheritance	Ch. 9
Oct 3 W	DNA structure and analysis	Ch. 10
Oct 8 M	DNA replication and recombination	Ch. 11
Oct 10 W	DNA replication and recombination	Ch. 11
Oct 12 F	DNA organization in chromosome	Ch. 12
Oct 15 M	DNA organization in chromosome	Ch. 12
Oct 17 W	Genetic code and transcription	Ch. 13
Oct 19 F	Genetic code and transcription	Ch. 13
Oct 22 M	Translation and proteins	Ch. 14
Oct 24 W	Exam 2 (Ch. 7-13)	
Oct 26 F	Translation and proteins	Ch. 14
Oct 29 M	Mutation, repair, and transposition	Ch. 15
Oct 31 W	Mutation, repair, and transposition	Ch. 15
Nov 2 F	Regulation of Gene Expression in prokaryotes	Ch. 16
Nov 5-6 M/T	Fall Break	
Nov 7 W	Regulation of Gene Expression in eukaryotes	Ch. 17
Nov 9 F	Posttranscriptional Regulation in eukaryotes	Ch. 18
Nov 12 M	Epigenetics Regulation of Gene Expression	Ch. 19
Nov 14 W	Recombinant DNA technology	Ch. 20
Nov 16 F	Exam 3 (Ch. 14-19)	
Nov 19 M	Genomic Analysis	Ch. 21
Nov 21-23	Thanksgiving break	
Nov 26 M	Appl of genetics engineering & biotech	Ch. 22
Nov 28 W	Development Genetics	Ch. 23
Nov 30 F	Cancer Genetics	Ch. 24
Dec 3 M	Quantitative Genetics and Multifactorial Traits	Ch. 25
Dec 5 W	Population and Evolutionary Genetics	Ch. 26
Dec 7 F	Special topics in modern genetics (CRISPR-Cas and Genome Editing)	

Final Examination: (Ch. 20-26, Special topics)

Dec. 13, Thursday, 11:30 am - 1:00 pm, Poole A105

*Guidelines for rescheduling a final exam can be found at
<http://www.registrar.clemson.edu/html/examSched.htm>