

## Genetics (BISC 679)

**Instructor:** Dr. Ryan Garrick, office: Room 508 Shoemaker Hall, e-mail: [rgarrick@olemiss.edu](mailto:rgarrick@olemiss.edu)

**Class time & location:** **Mon, Wed, Fri: 9:00–9:50am, Bishop Hall Rm. 209.** Regular attendance is expected. Use of **cell phones** not permitted, including sending text messages. Please turn them off during class. Use of **laptop computers** for note-taking is fine, but it is not appropriate to be facebookering, or twitting, etc.

**Required text:** **Essentials of Genetics 8/E.** Authors: William S. Klug, Michael R. Cummings, Charlotte Spencer & Michael A. Palladino. ISBN-13: 9780321803115. Publisher: Benjamin Cummings, San Francisco, California.

**Office hours:** **Mon 10:15-11:30am, Wed 1:30-2:45pm (no appointment necessary).** If you can not meet during scheduled office hours, an appointment will need to be made by email. Please include the following: (1) BISC 336 in the subject line, (2) what you would like some help with in the main text of the email (that way I can be better prepared), and (3) your first and last name at the end of the message. You should receive a response from me within 24 hours.

**Description:** A study of current genetics, including form, function, regulation and utility. This course is designed to present an overview of genetics for Biology majors. Students are expected to become familiar with form and function of genetic material, modes of inheritance and change. Prerequisites: Grade of a C or better in BISC 160, BISC 161, BISC 162 and BISC 163.

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**Blackboard:** Log on at [www.olemiss.edu](http://www.olemiss.edu). This is the first place to look for any information regarding the course during the semester, including syllabus, announcements, grades, etc. I will post my **PowerPoint slides** the evening prior to the lecture, but they **will deliberately have missing keywords, incomplete bullet points, and some slides omitted**. You will be notified of modifications through your registered email address on Blackboard, and in class.

**Grading: Exams: 100 points.** There will be 3 exams during the semester plus the end-of-semester final exam. **They are worth 25 points each (20 points for multiple choice questions + 5 points for take-home / open-book short answer questions).** For all exams, the following standard grading scheme applies: 90-100 = A, 80-89 = B, 70-79 = C, 60-69 = D, < 60 = F. However, I *may* adjust these thresholds slightly downwards (i.e., only to your benefit), depending on overall performance of the class. The +/- grading scheme will be used.

**Exams:** Bring your **student ID, #2 pencil, a calculator, and one Scantron form # F-289** to every exam (I will not provide these). The Scantron form # F-289 (1/2 page, red print) can be purchased at the Bookstore in the Student Union. **Other than calculators, no electronic devices are allowed to be turned on during exams.** This includes cell phones, computers, i-pads, etc. Exam grades will be posted as soon as possible. If you suspect that a question was graded improperly, you have one week from the date of test return to contact me about it. **Exam dates are non-negotiable;** make-up exams are not given except (1) in the event of *serious illness*, in which case a medical doctor's letter is required, or (2) if you have a documented school function, in which case you will need to provide

documentation *before* the day of the exam. Make-up exams must be taken at a date and time chosen by me, generally within 1–2 days of the original exam date.

**Cheating:** An amazingly bad idea. Cheaters will be assigned a zero for the test in question.

**Genetics in the news:** Each week, I will present a brief (~5 min) overview of some recently-reported genetics research that was covered by science writers in the popular press (e.g., BBC, Discovery, NY Times etc). Part of the reason for doing this is to keep you guys up to date with what's going on, and to highlight the diversity of genetics research. Also, owing to the 3 x 50min format for BISC 336 this semester, nearly every week there will be a lecture in which material from two different chapters in *Essentials of Genetics* is dealt with. In these cases, Genetics in the news (indicated by the ⓘ symbol, below) should help mark a transition between different topics. I'll try to find a story that is relevant to the topics being covered. Note that 'Genetics in the news' material will not be posted on PowerPoint slides on Blackboard, but may be included on exams.

**Students with disabilities:** University policy provides for reasonable accommodations to be made for students with verified disabilities on an individualized and flexible basis. It is the responsibility of any student to contact the Office of Student Disability Services (662-915-7128). SDS will then provide the student with an Instructor Notification of Classroom Accommodations form. You will need to provide me with this documentation *before* the day of the exam.

<i>Date</i>	<i>Topic(s)</i>	<i>Chapter(s)*</i>
<b>Week 1.</b> Aug 25	<i>Introduction</i>	1
Aug 27	<i>Mitosis &amp; Meiosis</i>	2
Aug 29	<i>Mitosis &amp; Meiosis; ⓘ; Mendelian Genetics</i>	2, 3
<b>Week 2.</b> Sep 01	<b>LABOR DAY (no class)</b>	
Sep 03	<i>Mendelian Genetics</i>	3
Sep 05	<i>Modification of Mendelian Ratios</i>	4
<b>Week 3.</b> Sep 08	<i>Modification of Mendelian Ratios; ⓘ; Sex Chromosomes</i>	4, 5
Sep 10	<i>Sex Chromosomes</i>	5
Sep 12	<i>Chromosome Mutations</i>	6
<b>Week 4.</b> Sep 15	<i>Chromosome Mutations; example Exam 1 questions (review)</i>	6
Sep 17	<b>EXAM 1 (Ch. 1–6). Bring Scantron form F-289</b>	
Sep 19	<i>Linkage &amp; Mapping (eukaryotes)</i>	7
<b>Week 5.</b> Sep 22	<i>Recap on Exam 1; Linkage &amp; Mapping (eukaryotes)</i>	7
Sep 24	<i>More Mapping (bacteria, phage)</i>	8
Sep 26	<i>More Mapping (bacteria, phage); ⓘ; DNA Structure &amp; Analysis</i>	8, 9
<b>Week 6.</b> Sep 29	<i>DNA Structure &amp; Analysis</i>	9
Oct 01	<i>Recombinant DNA Technology</i>	17
Oct 03	<i>Recombinant DNA Technology; DNA Replication &amp; Recombination</i>	17, 10

<b>Week 7.</b>		
Oct 06	<i>DNA Replication &amp; Recombination</i>	10
Oct 08	<i>DNA Replication &amp; Recombination ; ①; Chromosome Structure &amp; DNA Organization</i>	10, 11
Oct 10	<i>Chromosome Structure &amp; DNA Organization</i>	11
<b>Week 8.</b>		
Oct 13	<i>Chromosome Structure &amp; DNA Organization; Example Exam 2 questions (revision)</i>	11
Oct 15	<b>EXAM 2 (Ch. 7–11 &amp; 17). Bring Scantron form F-289</b>	
Oct 17	<i>Genetic Code &amp; Transcription</i>	12
<b>Week 9.</b>		
Oct 20	<i>Recap on Exam 2; Genetic Code &amp; Transcription</i>	12
Oct 22	<i>Translation &amp; Proteins</i>	13
Oct 24	<i>Translation &amp; Proteins; ①; Gene Mutation, Repair &amp; Transposition</i>	13, 14
<b>Week 10.</b>		
Oct 27	<i>Gene Mutation, Repair &amp; Transposition</i>	14
Oct 29	<i>Regulation of Gene Expression</i>	15
Oct 31	<i>Regulation of Gene Expression; ①; Genomics, Bioinformatics &amp; Proteomics</i>	15, 18
<b>Week 11.</b>		
Nov 03	<i>Genomics, Bioinformatics &amp; Proteomics</i>	18
Nov 05	<i>Applications &amp; Ethics of Genetic Engineering</i>	19
Nov 07	<i>Applications &amp; Ethics of Genetic Engineering; Example Exam 3 questions (revision)</i>	<b>19</b>
<b>Week 12.</b>		
Nov 10	<b>EXAM 3 (Ch. 12–15 &amp; 18–19). Bring Scantron form F-289</b>	
Nov 12	<i>Population &amp; Evolutionary Genetics</i>	22
Nov 14	<i>Recap on Exam 3; Population &amp; Evolutionary Genetics</i>	22
<b>Week 13.</b>		
Nov 17	<i>Population &amp; Evolutionary Genetics</i>	22
Nov 19	<i>Conservation Genetics</i>	23
Nov 21	<i>Conservation Genetics</i>	23
<b>Week 14.</b>		
Nov24-28	<b>THANKSGIVING (no class)</b>	
<b>Week 15.</b>		
Dec 01	<i>Developmental Genetics</i>	20
Dec 03	<i>Developmental Genetics; ①; Genetics of Cancer</i>	20, 16
Dec 05	<i>Genetics of Cancer</i>	16
<b>Finals.</b>		
<b>Dec 10 8:00am</b>	<b>EXAM 4 (Ch. 16, 20 &amp; 22–23). Bring Scantron form F-289</b>	

\* From Klug et al. (2013) – check Blackboard for additional reading material that I will upload as PDF files or URL links, and please regularly look for other ‘announcements’