Biology 3453 - Genetics
Dr. Robert J. Wiggers, Dept. Biology

Instructor: Dr. Robert Wiggers, Dept. Biology
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Office hours: MTWRF 9 – 10:30 am; (all office hours via ZOOM); by appointment via ZOOM

Class Time & Place: online, asynchronous

Course Description: Four semester hours, three hours lecture, three hours lab per week. An introduction to modern genetic principles including inheritance patterns, chromosome structure and function, gene expression and regulation, DNA replication and repair, and the behavior of genes in populations. Required lab fee.

Pre-requisites: BIOL 1306 & 1106, 1307 & 1107, CHEM 1311 & 1111, 1312 & 1112
Co-requisites: Bio 3053

Credit Hour Justification. BIOL 3453 “Genetics” (4 credits lecture, 0 credits lab) spans 15 weeks as a fully online experience. The lecture and lab (BIOL 3053) must be taken concurrently. The grades for lecture exams, lecture homework, and lab assignments are combined into one single grade for the course. Students are required to complete assignments based on readings in the textbook and D2L content modules, including homework assignments on the publisher supported web platform “Mastering Genetics”. They are required to complete significant reading to complete both lab and lecture assignments. Students must complete periodic exams over the course content. Successful completion of all elements for the course requires at least 12 - 15 hours of student work each week.

Program Learning Outcomes: PLO #1 – Knowledge; PLO #3 – Critical Thinking

Student Learning Outcomes:

- SLO – 1: Apply Mendel’s rules in the analysis of inheritance patterns (PLO #1, #3).
- SLO – 2: Describe the structure & function of chromosomes & the processes of molecular biology (PLO #1)
- SLO – 3: Be familiar with, understand the principles behind, and know the potential and limitations of, the tools and techniques of recombinant DNA technology and biotechnology (PLO #1).
- SLO – 4: Calculate the genetic parameters of a population, as well as predict the effect of evolutionary forces on the population (PLO #1, #3)

Course Requirements: Four major exams; 20 homework assignments. These homework assignments are accessed via the publishers supported website “Mastering Genetics”; reading – you are expected to read each chapter assigned in the course calendar.

What you need for this course:

- Access to D2L: It is here that you will find the course units, content modules, and exams.
- The required text: Concepts of Genetics, 12th edition; Klug, Cummings, Spencer, Palladino; Access to the Publisher Mastering Genetics website. Text and access are available in a package: ISBN 9780135194157
- Technology Requirement: As you have elected to enroll in an online course, it is your responsibility to acquire a consistent, stable, dependable computer and internet connection with which to complete the assignments for the course by the deadlines indicated on the Semester Calendar. It is not the responsibility of the instructor to provide additional time for assignments or exams or an alternative means of completing the course due to technological issues on your part. Just as it is your responsibility to acquire and maintain adequate transportation to attend a face-to-face course, it is your responsibility to secure the technological means to participate in and complete this course. If you are having technical issues with D2L, please call the student help line at 936-468-1919 or e-mail at d2l@sfasu.edu; live support is available from 8 am CST to 5 pm CST, Monday through Friday. For general technical issues, you may call the Technical Help Desk at 936-468-4357; they are available M – F from 8 am to 5 pm.
### Course Calendar & Content – In Brief

<table>
<thead>
<tr>
<th>Topics</th>
<th>Chapter</th>
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<tbody>
<tr>
<td>Mendelian Genetics</td>
<td>3</td>
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<tr>
<td>Extensions of Mendelian Genetics</td>
<td>4</td>
</tr>
<tr>
<td>Sex Determination &amp; Sex Chromosomes</td>
<td>7</td>
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<tr>
<td>Chromosome Mapping In Eukaryotes</td>
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**EXAM 1: September 17; tentative topics – chapters 3, 4, 7, 5**

<table>
<thead>
<tr>
<th>Topics</th>
<th>Chapter</th>
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<tbody>
<tr>
<td>Chromosome Mutations: Variation in Number and Arrangement</td>
<td>8</td>
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<tr>
<td>DNA Structure &amp; Analysis</td>
<td>10</td>
</tr>
<tr>
<td>DNA Organization in Chromosomes</td>
<td>12</td>
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<tr>
<td>DNA Replication &amp; Recombination</td>
<td>11</td>
</tr>
<tr>
<td>The Genetic Code &amp; Transcription</td>
<td>13</td>
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<tr>
<td>Translation &amp; Proteins</td>
<td>14</td>
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**EXAM 2: October 15; tentative topics – chapters 8, 10, 11, 12, 13, 14**

<table>
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<tr>
<th>Topics</th>
<th>Chapter</th>
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<tbody>
<tr>
<td>Gene Mutation, DNA Repair, &amp; Transposition</td>
<td>15</td>
</tr>
<tr>
<td>Regulation of Gene Expression in Bacteria</td>
<td>16</td>
</tr>
<tr>
<td>Regulation of Gene Expression in Eukaryotes – This topic covers three text chapters: 17 “Transcriptional Regulation In Eukaryotes”; 18 “Posttranscriptional Regulation In Eukaryotes”; 19 “Epigenetic Regulation Of Gene Expression”</td>
<td>17, 18, 19</td>
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**EXAM 3: November 12; tentative topics – chapters 15, 16, 17, 18, 19**

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<tr>
<th>Topics</th>
<th>Chapter</th>
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<tr>
<td>Recombinant DNA Technology - This topic covers three text chapters: 20 “Recombinant DNA Technology”; 21 “Genomic Analysis; 22 “Applications Of Genetic Engineering And Biotechnology”</td>
<td>20, 21, 22</td>
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<tr>
<td>Cancer Genetics</td>
<td>24</td>
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<tr>
<td>Population &amp; Evolutionary Genetics</td>
<td>26</td>
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**EXAM 4: December 6; tentative topics – chapters 20, 21, 22, 24, 26**

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On the next pages is a detailed course calendar spelling out what is expected each week. All times are central time.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topics</th>
<th>What You Should Be Doing… All due dates and times are Central Time.</th>
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</thead>
</table>
| Week of August 23 | • Begin Mendelian Genetics D2L module and text ch. 3  
• Begin Extensions of Mendelian Genetics D2L module and text ch. 4 | • Read the course syllabus and calendar; Establish access to “Mastering Genetics”  
• Begin reading D2L modules “Mendelian Genetics” and “Extensions Of Mendelian Genetics”  
• Begin reading chapter 3 & 4; begin associated Mastering Genetics Homework assignments  
• Studying for exam 1 (Sept. 17) |
| Week of August 30 | • Continued: Extensions of Mendelian Genetics (module and chapter)  
• Begin Sex Determination & Sex Chromosomes D2L module and text ch. 7 | • Continue reading chapters 3 & 4; continue working associated Mastering Genetics homework; continue associated modules  
• Begin D2L module “Sex Determination & Sex Chromosomes”  
• Begin reading chapter 7; begin associated Mastering Genetics homework |
| Week of Sept. 6 | • Continued: Sex Determination & Sex Chromosomes (module and chapter)  
• Begin Chromosome Mapping In Eukaryotes D2L module and text ch. 5 | • Continue reading chapters 3, 4, 7; continue associated Mastering Genetics homework.  
• Begin D2L module “Chromosome Mapping In Eukaryotes”  
• Begin Reading chapter 5; begin associated Mastering Genetics homework |
| Week of Sept. 13 | • Finish Chromosome Mapping In Eukaryotes  
• EXAM 1: FRIDAY SEPT. 17; covers chapters 3, 4, 7, & 5  
• Begin Chromosomal Mutations: Variation In Number And Arrangement D2L module and text ch. 8 | • Complete readings of chapters 3, 4, 7, and 5 and associated D2L modules  
• Complete Mastering Genetics Homework assignments associated with above chapters by 10 pm, Thursday September 16  
• **Exam 1 opens at 12:01 am Sept. 17 and closes at 10 pm same day.**  
• Begin reading D2L module “Chromosomal Mutations: Variation In Number And Arrangement”  
• Begin reading ch. 8 and begin associated Mastering Genetics homework |
| Week of Sept. 20 | • Finish Chromosomal Mutations: Variation In Number And Arrangement  
• Begin DNA Organization & Analysis D2L module and text ch. 10  
• Begin DNA Organization In Chromosomes D2L module and text ch. 12 | • Continue reading chapter 8; continue associated Mastering Genetics homework  
• Begin D2L Module “DNA Structure & Analysis”  
• begin reading ch. 10 and begin associated Mastering Genetics Homework  
• Begin D2L module “DNA Organization In Chromosomes”  
• Begin Reading chapter 12; begin associated Mastering Genetics homework |
| Week of Sept. 27 | • Finish DNA Organization In Chromosomes  
• Begin DNA Replication & Recombination D2L module and text ch. 11 | • Continue reading chapters 8, 10, 12; continue associated Mastering Genetics Homework.  
• Begin D2L module “DNA Replication And Recombination”  
• Begin reading chapter 11; begin associated Mastering Genetics homework |
| --- | --- | --- |
| Week of Oct. 4 | • Finish DNA Replication & Recombination  
• Begin The Genetic Code & Transcripton D2L module and text ch. 13 | • Continue reading chapters 8, 10, 12, 11; continue associated Mastering Genetics homework  
• Begin D2L module “The Genetic Code And Transcription”  
• Begin reading chapter 13; begin associated Mastering Genetics homework |
| Week of Oct. 11 | • Finish The Genetic Code & Transcription  
• Begin Translation & Proteins D2L module and text ch. 14  
• **EXAM 2: FRIDAY, OCT. 15: covers chapters 8, 10, 12, 11 & 13** | • Complete reading chapters 8, 10, 12, 11, & 13  
• Complete Mastering Genetics homework assignments associated with chapters 8, 10, 12, 11, & 13 BY 10 PM, THURSDAY, OCT. 14  
• **Exam 2 opens at 12:01 am Oct. 15 and closes at 10 pm same day**  
• Begin D2L module “Translation And Poteins”  
• Begin reading ch. 14 and begin associated Mastering Genetics homework |
| Week of Oct. 18 | • Finish Translation & Proteins  
• Begin Gene Mutation, DNA Repair, & Transposition D2L module and text ch. 15 | • Continue reading ch. 14 and working associated Mastering Genetics homework  
• Begin D2L module “Gene Mutation, DNA Repair, & Transposition”  
• Begin reading ch. 15 and working on associated Mastering Genetics homework |
| Week of Oct. 25 | • Finish Gene Mutation, DNA Repair, & Transposition  
• Begin Regulation Of Gene Expression In Bacteria D2L module and text ch. 16 | • Continue reading chapters 14 & 15; continue working associated Mastering Genetics homework  
• Begin D2L module “Regulation Of Gene Expression In Bacteria”  
• Begin reading ch. 16 and working associated Mastering Genetics homework |
| Week of Nov. 1 | • Finish Regulation of Gene Expression In Bacteria  
• Begin Gene Regulation In Eukaryotes D2L module and text chapters 17, 18, & 19 | • Continue reading chapters 14, 15, & 16; continue working associated Mastering Genetics homework  
• Begin D2L module “Gene Regulation In Eukaryotes”  
• Begin reading chapters 17, 18, 19; begin working associated Mastering Genetics homework |
| Week of Nov. 8 | • Finish Gene Regulation In Eukaryotes  
• **EXAM 3: FRIDAY, NOV. 12:** covers chapters 14, 15, 16, 17, 18, & 19  
• Begin Recombinant DNA Technology D2L module and text ch. 20, 21, & 22 | • Complete reading chapters 14, 15, 16, 17, 18, & 19; complete all associated Mastering Genetics homework assignments by 10 PM, NOV. 11  
• **Exam 3 opens at 12:01 am Nov. 12 and closes at 10 pm same day.**  
• Begin module “Recombinant DNA Technology”  
• Begin reading ch. 20, 21, 22; begin associated Mastering Genetics homework |
|---|---|---|
| Week of Nov. 15 | • Continue Recombinant DNA Technology  
• Begin Cancer Genetics D2L module and text chapter 24 | • Continue reading ch. 20, 21, & 22; continue working associated Mastering Genetics homework  
• Begin module “Cancer Genetics”  
• Begin reading ch. 24; begin associated Mastering Genetics Homework. |
| Week of Nov. 22 | • Thanksgiving Break; No assigned modules | • Continue reading ch. 20, 21, 22, 24; continue working associated Mastering Genetics homework |
| Week of Nov. 29 | • Begin and finish Population & Evolutionary Genetics D2L module and text ch. 26 | • Continue reading ch. 20, 21, 22, 24; continue working associated Mastering Genetics homework  
• Begin D2L module “Population And Evolutionary Genetics”; Begin reading ch. 26; begin associated Mastering Genetics homework |
| Week of Dec. 6 | • All readings should be completed.  
• All Mastering Genetics homework is due by 10 PM, Tuesday DEC. 7  
• **Exam 4: WEDNESDAY Dec. 8.** Covers chapters 20 (Recombinant DNA Technology), 21 (Genomic Analysis), 22 (Applications Of Genetic Engineering And Biotechnology), 24 (Cancer Genetics), and 26 (Population & Evolutionary Genetics).  
• **EXAM 4 OPENS AT 12:01 am on DECEMBER 8 AND Closes AT 10 pm SAME DAY** |
Grading

**Homework.** Homework assignments are associated with each chapter. These assignments are accessed via Pearson’s “Mastering Genetics” website; there is a Pearson’s “My Lab and Mastering” widget on the D2L homepage for this course (lower right corner); all access to Mastering Genetics should go through this widget. You should have purchased access with your text or you can purchase access from the Mastering Genetics site itself. Due dates for each assignment are indicated in the “Assignment List” on the Mastering Genetics site. Grading policy is also spelled out on this site. Each homework will be graded and contribute equally to your homework grade. Your homework grade will constitute 35% of your final BIO 3453 course grade.

**Exams.** There are 4 exams scheduled; this includes a NON-COMPREHENSIVE FINAL (it covers material from exam 3 until the end of class). Each exam is worth 100 points. All exams will be a mix of multiple choice, T/F, and matching. All exams, including the non-comprehensive “final” will open at 12:01 am on the scheduled day. They will close at 10 pm on the same day. Once you begin, you will have 75 minutes to complete the exam.

Your score will be immediately posted on D2L once you finish the exam. If you miss an exam you must notify me within 24 hours. Make up exams will only be allowed for University approved absences (illness with documentation, University sponsored outing, death in the family, etc.)

Your scores on the (4) exams will be averaged to give you an “exam score”; this will constitute 40% of your BIO 3453 course grade.

**Lab.** Your laboratory grade will consist of worksheets (see laboratory syllabus) and three lab homework assignments found on Mastering Genetics. A detailed explanation of these can be found in the laboratory syllabus. Your laboratory grade will constitute 25% of your BIO 3453 course grade.

**IF YOU MISS A DUE DATE:** See syllabus section regarding SFA’s class attendance and absence policy.

**Course Grade Calculation:** To determine your final course grade for BIO 341, the following weighting will be used:

\[(\text{Homework average})(0.35) + (\text{Exam average})(0.40) + (\text{Lab grade})(0.25)\]

<table>
<thead>
<tr>
<th>Final Percentage</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>90 – 100%</td>
<td>A</td>
</tr>
<tr>
<td>80 – 89%</td>
<td>B</td>
</tr>
<tr>
<td>70 – 79%</td>
<td>C</td>
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<tr>
<td>60 – 69%</td>
<td>D</td>
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<tr>
<td>0 – 59%</td>
<td>F</td>
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Expectations for Students in BIO 3453 online

1. **Technical Preparation:** The technical nature of the course demands preparation on your part. Students should submit all assignments early enough to account for technical difficulties. In the event of a technical catastrophe (e.g. the university's main fiber optic line gets severed, a hurricane floods telecommunications hubs in Houston, the D2L server goes down, etc.—all of these things have happened), please do not inundate the Biology Department with phone calls. I will communicate with the class as soon as is technically possible.

2. **This course is not self-paced.** It is your responsibility to read and analyze the information in each module, participate in the module activity, and complete any pertinent assignments by the due date(s). This course demands a high degree of student involvement. You are not sitting in a lecture hall listening to me three hours each week. Instead, you must discipline yourself to (a) devote the time you normally would spend in the classroom to being logged in to this online class and digesting the week's material, and (b) study a respectable amount in addition to the "in-class" time. Most universities recommend that for every hour a student spends learning in the classroom, he/she spend three hours studying outside of class. Thus, as this is a three-hour course, you should expect to spend roughly nine hours a week reading, analyzing, synthesizing, studying, and completing assignments. Online learning is far more active than traditional lectures and requires much more self-discipline.

3. **You should be logging onto D2L on a regular basis.** In addition to the detailed course calendar, all assignments are entered into the D2L calendar.

4. **Due dates are firm.** Late assignments are not accepted. Once an assignment or exam is closed, it will not be re-opened (see excused absence explanation above regarding make-up exams). The only exceptions are a natural disaster and / or an SFA closing.

**E-mail & phone policy**

I will be periodically communicating with you via e-mail. I use your student accounts & addresses for this purpose. It is your responsibility to check your e-mail regularly and, if you have your student account forwarded to some secondary account, to be certain that this is not full and can receive any messages (the relevant University policy can be read here).

**Class Attendance**

You can find SFA’s official policy regarding absences here. Below is a relevant excerpt:

“At the discretion of the instructor, students may be excused from attendance for reasons such as health, family emergencies, or student participation in approved university-sponsored events. When possible, students should notify their instructors in advance about absences. Students are responsible for providing documentation in a timely manner to the instructor for each absence. The instructor determines whether such documentation is satisfactory.”

The pertinent applications in BIOL 3453 are:

- **YOU MISS AN EXAM DUE TO ONE OF THE ABOVE - DESCRIBED CIRCUMSTANCES:**
  - Within 24 hours of a missed exam, you must notify me. I will ask for documentation to validate your absence. This may include a note indicating you visited a medical facility, a letter from a family member indicating a family emergency, etc.
  - Unless such documentation can be provided, no make up exam will be allowed.
  - When a make up exam is warranted, it will be made available AT THE INSTRUCTORS EARLIEST CONVENIENCE.

- **Mastering Homework Assignments are open for several weeks before being due**
  - If you know you are going to be absent on a due date for a University sponsored outing, TURN IN THE ASSIGNMENT EARLY
  - Being ill on the day an assignment is due IS NOT AN EXCUSED ABSENCE, as you had weeks to complete the assignment. Don’t wait till the last minute to turn in assignments.
  - DUE DATES ARE FIRM AND WON'T, EXCEPT IN THE CASE OF A NATURAL DISASTER OR SCHOOL CLOSING, BE EXTENDED.
Academic Integrity

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

The University's definitions of academic dishonesty as well as penalties for violations can be found in the larger Student Code Of Conduct.

Withheld Grades
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. You may read the complete policy here.

Students with Disabilities
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

Acceptable Student Behavior
Classroom behavior should not interfere with the instructor's ability to conduct the class or the ability of other students to learn from the instructional program. Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed. You may read the student code of conduct here.
Student Mental Health

SFASU values students’ mental health and the role it plays in academic and overall student success. SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

On-campus Resources:
SFASU Counseling Services
www.sfasu.edu/counselingservices
3rd Floor Rusk Building
936-468-2401

SFASU Human Services Counseling Clinic
www.sfasu.edu/humanservices/139.asp
Human Services Room 202
936-468-1041

Crisis Resources:
Burke 24-hour crisis line 1(800) 392-8343
Suicide Prevention Lifeline 1(800) 273-TALK (8255)
Crisis Text Line: Text HELLO to 741-741