

**SAM HOUSTON STATE UNIVERSITY**  
**Department of Biological Sciences**  
**2017-Spring Semester**

**COURSE SYLLABUS**  
**BIOL 3450**  
**Introductory Genetics (CRN 20561)**  
**Credit Hours: 4**

Instructor: Madhusudan Choudhary  
Office: LDB 100A  
Research lab: LDB 100  
Office Hours: MTWRF: 8:00 AM-9:30 AM or by appointment  
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Blackboard and Email: I will communicate with the class using email via Blackboard (BB). I want you to check your email regularly. Also, Syllabus, lecture power points, assignments, labs, and other information including announcements will be posted on the Blackboard.

Time & Location: Lecture BIOL 3450 01 (CRN 20561): Tuesday and Thursday, 09:30-10:50, LDB 207

Lab Sections:

BIOL 3450 02 (CRN 22863), Tuesday 12:00-01:50, LDB 130  
BIOL 3450 03 (CRN 22864), Tuesday 02:00-03:50, LDB 130  
BIOL 3450 04 (CRN 22866), Tuesday 04:00-05:50, LDB 130  
BIOL 3450 05 (CRN 22868), Tuesday 06:00-07:50, LDB 130  
BIOL 3450 06 (CRN 22869), Thursday 12:00-01:50, LDB 130  
BIOL 3450 07 (CRN 22870), Thursday 02:00-03:50, LDB 130

**Course Objectives: The primary objectives of this course are to provide:**

- 1. Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories)**
- 2. Learning to analyze and critically evaluate ideas, arguments, and points of view**
- 3. Learning to apply course material (to improve thinking, problem solving, and decisions)**

**Course Description:** Genetics deals with the study of heredity and genetic variation. All organisms transmit their genes and inherited traits to offspring, resulting in the pattern of genetic inheritance that connects all life forms through time. With the discovery of Mendelian inheritance and the recent discovery of molecular biology in this century, our understanding of the mechanisms by which organisms organize, express, and pass genes to offspring has grown spectacular. In this course, we will examine different areas of Genetics: the central dogma of molecular genetics; molecular structure of DNA, RNA, and Proteins; molecular processes- replication, transcription, and translation; DNA recombination and repair, gene function, gene regulation, Microbial genetics- transformation, conjugation, and transduction; Mendelian laws of heredity and extension and modification of Mendelian laws; techniques of identifying genes of interest and of mapping those genes to chromosomes, chromosome structure; and genetics of some human diseases. We will also explore various genetic technologies, which impact medicine, agriculture, forensics, and basic research in biology, as well as highlight many ethical and societal challenges in applying these technologies to human.

**Academic Community Engagement Activity:** The course includes a portion of the Academic Community Engagement (ACE) activity. Students will form a team and choose genetic principles to connect with human genetic disease, outline genetic methods to diagnose and treatment for that specific disease. Each team will first discuss the topic with Instructor or Teaching Assistant, and then prepare power point presentation, survey, chart or video games. Students will contact appropriate avenue in Huntsville community, where they will present their activities. These avenues include students' club, high school, middle school, University departments, Huntsville Library or students' dormitory. At the end of the presentation, students will collect responses from the attendees and write a two page report on the impacts and reflections of their activities. A maximum 50 points of the total 550 points can be scored on this portion of the course.

**Prerequisites:** Minimum grade of C in BIOL 1311/1111, BIOL 1313/1113, BIOL 2440, CHEM 1311/1111, 1312/1112

**Text Book:** *iGenetics: A Molecular Approach*. Peter J. Russell. ISBN: 978-0-321-56976-9; 3<sup>rd</sup> Edition

Reading assignments will be posted to Blackboard as well as presented in class. Anything in the assigned reading is fair game on exams. This textbook comes with access to additional online exercises and tutorials that will be useful for understanding basic concepts ([www.geneticsplace.com](http://www.geneticsplace.com)). Up to 5 lectures can be posted on the blackboard, and these lectures are either replacement for the classroom lectures or additional lectures that I may not be able to cover in the class.

**Lab Manual:** Genetics lab manual will be purchased at Eagle Graphics.

**Attendance:** Class attendance is mandatory for this course. Also, students are expected to arrive in the class at right time, since late entry interrupts the class. The University requires that roll be taken.

**Make-up exam or assignment policy:** Make-up exams will not be offered, however your grade for the missing exam will be proportionately adjusted based on the final exam (that is cumulative). Make every effort not to miss an exam. Exam format will include both multiple choice and short answer questions.

**Bring a Scantron 882-E form and number-two pencils to each exam.**

I will assign homework as needed. Not all homework will be turned in for credit, and no homework assignment will be worth more than 10 points. Homework assignments will consist of problems that you are likely to see on exams, and therefore it helps you to do them and have them ready to discuss or turn in. Only hard copies of homework assignments will be accepted. I will allow homework to be made up if provided with an appropriate documentation of the excuse, or if given advanced warning that the class will be missed.

**Grading:** Grades will be determined from the following activities including final exam (all cumulative).

First Lecture Exam:	February 16*	50 pts
Second Lecture Exam:	March 28*	50 pts
Third Lecture Exam:	April 27*	50 pts
Home-Class Activities		80 pts
Attendance		20 pts
Lab Poster/Lab Report		80 pts
Pre-lab and post labs		60 pts
Lab notebook		10 pts
Academic Community Engagement Project		50 pts
Final Exam: May 9		100 pts

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<b>Total</b>	<b>550 pts</b>
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\*Tentative dates are subject to change.

Grades will be assigned as follows: 90-100% = A, 80-89% = B, 70-79% = C, 60-69% = D, < 60% = F. A curve will only be applied if the class average is well below a “C”. No grade will be decreased due to any curve.

**Laboratory:** Labs will meet in LDB 130. Lab will begin on **January 24 and January 26** at which point you will receive a syllabus for the laboratory. The last lab will meet on **May 2 and May 4**. Laboratory attendance is mandatory.

**Holidays/Important Dates:**

**January 19:** Class begins

**February 2:** Last day to drop without a “Q” and receive 100% refund.

**March 13-17:** Spring Break

**April 14:** Good Friday

**April 26:** Last Day to drop with a “Q” Grade

**May 5:** Last day of Instruction

**May 9:** Final Examination: LDB 207

**Academic Honesty:**

All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The university and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

**Visitors in the classroom:**

Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar's Office.

**Students with Disabilities:**

It is the policy of the university that no otherwise qualified disabled student shall, solely by reason of his/her handicap, be excluded from participation in, or denied benefits of, or is subject to discrimination under any academic or Student Life program or activity. Disabled students may request help with academically related problems stemming from individual disabilities by contacting their instructor, school/department chair, or by contacting the university Chair of the Committee for Continuing Assistance for Disabled Students/ Director of Counseling Center (located in Lee Drain Annex, phone 936-294-1720).

A student with a disability is encouraged to register with the university Counseling Center, as well as contacting their instructor about assistance needs. Accommodation cannot be made until the student has initiated the request with the Counseling Center. Every semester that the student desires accommodations, it is the student's responsibility to complete a Classroom Accommodation Request Form at the Counseling Center and follow the stated procedure in notifying faculty. Accommodations for disabled students are decided upon documentation and need on a case-by-case basis by the Counseling Center. All requests are handled with confidentiality according to university procedures.

**Religious Holy Days Policy:**

Section 51.911(b) of the Texas Education Code requires that the university excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University Policy 861001 provides procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). This request must be made in the first 15 days of the semester or the first 7 days of a summer session in which the absence(s) will occur. The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed.

<b>Date</b>	<b>Lecture</b>	<b>Topic</b>
January 19	1	Course Introduction/Syllabus
January 24	2	Introduction to Genetics
January 26	3	DNA-The Genetic Material
January 31	4	DNA-The Genetic Material
February 2	5	DNA Replication
February 7	6	DNA Replication
February 9	7	Gene Functions
February 14	8	Gene Functions
<b>February 16</b>	<b>First Exam</b>	
February 21	9	Gene Expression-Transcription
February 23	10	Gene Expression-Transcription
February 28	11	Gene Expression-Translation
March 2	12	Gene Expression-Translation
March 7	13	DNA Mutation, DNA Repair, and Transposons
March 9	14	DNA Mutation, DNA Repair, and Transposons
March 14	Spring Break	
March 16	Spring Break	
March 21	15	Biotechnology-Gene Cloning and Sequencing
March 23	16	Biotechnology-Gene Cloning and Sequencing
<b>March 28</b>	<b>Second Exam</b>	
March 30	17	Mendelian Genetics
April 4	18	Chromosomal Basis of Inheritance
April 6	19	Extension of Mendelian Genetic Principles
April 11	20	Variation in Chromosome Structure and Number
April 13	21	Variation in Chromosome Structure and Ploidy
April 18	22	Genetics of Bacteria and Bacteriophages
April 20	23	Genetics of Bacteria and Bacteriophages
April 25	24	Regulation of Gene Expression
<b>April 27</b>	<b>Third Exam</b>	
May 26	25	Regulation of Gene Expression
April 2	26	Genetics of Cancer
<b>May 4</b>	<b>Review</b>	