

SAM HOUSTON STATE UNIVERSITY
Department of Biological Sciences
Fall 2017 Semester

COURSE SYLLABUS

BIOL 4096.3: Special Topics in Undergraduate Biology (CRN 83275)
BIOL 5391.1: Advance Molecular Genetics (CRN 83271)

Instructor: Madhusudan Choudhary
Office: LDB 100A; Lab LDB 100A
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Email: mchoudhary@shsu.edu
Office Hours: MON, WED, and FRI (08:00-10:00 AM)

Location: LDB 220
Time: Wednesday, 5.00-7.50 PM
Credit Hours: 3

Blackboard and Email: I will communicate with the class using email via Blackboard (BB). I want you to check your email regularly. Also, syllabus, reading assignments, and other information including announcements will be posted on the Blackboard.

Course Objectives:

- **Learning to analyze and critically evaluate ideas, arguments, and points of view:** Gain an understanding of the scope of genetic research. From this understanding you will learn how scientist approach and address research questions and conduct scientific processes.
- **Developing skill in expressing myself orally or in writing** Be able to deliver a comprehensive discussion on a scientific paper to peers and defend your point of view.
- **Learning to apply course material (to improve thinking, problem solving, and decisions)**
Develop the skills to listen and gain insights from a professional discussion and evaluation of scientific works and research papers.

Course Description: This course is designed for graduate students from the departments of Biological Science, Forensic Science and Chemistry. The course will cover advance topics related to prokaryotic and eukaryotic genetics. Discussion on special topics include Chromosome structure and Genome architecture, DNA super-coiling and chromatin condensation, DNA replication, Transcription, Post-transcriptional modifications, RNA editing, Translation, post-translational modifications, Gene- regulation mechanisms, Cloning and Expression vectors, construction of genomic and cDNA libraries, construction of random and targeted mutagenesis, gene transfer techniques, Analysis of genetic variation for forensic data: application of different techniques including different types of polymerase chain reactions, Application and analysis of gene expression microarray and Protein array. Tentative articles will be posted on the blackboard. Everyone is required to read papers and able to present and discuss the issues related to the papers.

Students will design, prepare, and present their own research proposal based on hypothesis- driven scientific knowledge. The emphasis will be given on how to articulate and test scientific hypothesis. They will evaluate proposals by critiquing individual proposal and then defending your point of view in panel discussion. Finally, students will submit a formal proposal for the grade.

Holidays/Important Dates: August 26: Class begins

September 4: Labor Day

September 8: Twelfth Class day, Last day to drop without a “Q” and receive 100% refund

November 17: Last day to drop fall Semester courses without grade of F. Students will be allowed to drop (Q-drop) no more than five classes during their academic career at Sam Houston State University. Classes that are dropped prior to the 12th class day will not be included in this calculation.

November 22-24: Thanksgiving Holiday

December 1: Last class day

December 6 (7:30 PM-9:30 PM): Final Examination: LDB 220

Grading: 90-100 =A, 80-89 = B, 70-79 = C, and 60-69 = D

Paper presentation and Discussion 100 pts

Draft Proposal (Peer Evaluation) 50 pts

Final Grant Proposal 50 pts

Mid Term Exam 100 pts

Final Exam 100 pts

Total 400 pts

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 Holiday's 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.

BIOL 5391.01/BIOL 4396.03
Advance Molecular Genetics

Date	Activity	Topics	Assignment
August 23	Syllabus and Discussion	Central Dogma of Mol. Biology-Revisited	M. Choudhary
August 30	Closed	Harvey	
September 6	Discussion	Genetic material, Genes, and genome: Structure and Architecture	Everyone
September 13	Discussion	Expanding Genetic Code	Everyone
September 20	Discussion	Replication: Model and Mechanism	Everyone
September 27	Presentation	Methods and Predictions of the expected results	Individual
October 4	Discussion	Transcription and its Control Mechanism	Everyone
October 11	Discussion	Post-Transcriptional Control	Everyone
October 18	Presentation	References/Budget Mid-Term Exam	Individual
October 25	Discussion	Translation Control Mechanism Small Regulatory RNAs, micro RNAs, Antisense RNAs	Everyone
November 1	Discussion	Post-translational modification and Glycosylation	Everyone
November 8	Discussion	Epigenetics RNA Editing/Chromatin structure/chemical modification	Everyone
November 15	Discussion	The Dark Matter of the Genome: Innovation of Biological Diversity	Everyone
December 29	Panel Discussion	Grant Proposal Review	Everyone
December 6	Final Exam	Grant Submission	