BIOL 490/CHEM 490: Introduction to Biotechnology

Course Syllabus Spring 2016

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Course Description

This course will explore the principles and applications of DNA science with special reference to recombinant DNA technology. This course is highly recommended for students focusing career in medical field. Prerequisite: Junior or Senior Standing.

Required Textbooks/Resources

William Thieman and Michael Palladino. *Introduction to Biotechnology* (3rd Edition), Benjamin Cummings Publishing Company, 2012. ISBN: 9780321766113

Student Outcomes

The primary objective of this course is to examine the basic concepts of biotechnology and the methods used in the manipulation of nucleic acids (DNA and RNA). The course is supplemented with laboratory exercise and demonstrations that illustrate the basic concepts and techniques of biotechnology. Bioethical issues relating to this new technology will also be discussed.
After taking this course, the students will know and/or be able to do the following:

- Describe the foundations of biotechnology
- Demonstrate the steps of recombinant DNA technology and genetic engineering
- Manipulate DNA with restriction enzymes
- Construct recombinant vectors with novel properties
- Amplify DNA by polymerase chain reaction
- Identify a person based on DNA profile
- Test for the presence of genetically modified foods
- Identify ways in which biotechnology is used to help cure human diseases
- Outline the ethical implications of biotechnology
- Justify the importance of bioremediation

Student Learning Outcomes

- Write and explain organic reactions, stereochemistry, and processes in biological and environmental systems
- Use essential equipment to perform chemistry experiments in the laboratory

Tentative Course Schedule

The course schedule is a tentative schedule and is subject to change based on the needs of the course. Students will be notified prior to changes being made.

Week	Lecture	Lab
1	Introduction; Chapter 1: The Biotechnology Century and Its Workforce	Lab Safety; Introduction to Lab
2	Chapter 2: An Introduction to Genes and Genomes	Bioinformatics
3	Chapter 3: Recombinant DNA Technology and Genomics	Restriction Enzymes
4	Chapter 4: Proteins as Products	SDS-PAGE, Column Filtration
5	Exam 1	
6	Chapter 5: Microbial Biotechnology	Intro to Biotech Micro Part 1
7	Chapter 6: Plant Biotechnology; Chapter 7: Animal Biotechnology	Intro to Biotech Micro Part 2; Intro to Plant Biotech
8	Chapter 8: DNA Fingerprinting and Forensic Analysis	Intro To Forensics, PCR
9	Chapter 9: Bioremediation	Bioremediation Part 1
10	Exam 2	Bioremediation Part 2
11	Chapter 10: Aquatic Biotechnology	Bioremediation Part 3
12	Chapter 11: Medical Biotechnology	Gene Detection and Therapy; ELISA
13	Chapter 12: Biotechnology Regulations	
14	Chapter 13: Ethics and Biotechnology	
15	Final Exam	

Course Requirements and Means of Evaluation

Your grade in this course will be based on:

Exams (3 @ 150 points each)	= 450 points
Lab Assignments (5 @ 30 points each)	= 150 points
Lab Reports (3 @ 100 points each)	= 300 points
Total	**= 900 points**

Grading Scale

90-100%	A
80-89%	B
70-79%	C
60-69%	D
0-59%	F

Attendance and Participation

Students are expected to attend ALL lab sessions. If you are unable to make it to the lab, notify the instructor PRIOR to class starting and schedule a time and day to make up the lab. Pre-lab and post-lab assignments will not be graded for labs missed and not rescheduled.

Disability Accommodations

Students with disabilities may request reasonable accommodations through the A&M-Texarkana Disability Services Office by calling 903-223-3062.

Academic Integrity

Academic honesty is expected of students enrolled in this course. Cheating on examinations, unauthorized collaboration, falsification of research data, plagiarism, and undocumented use of materials from any source constitute academic dishonesty and may be grounds for a grade of 'F' in the course and/or disciplinary actions. For additional information, see the university catalog.

A&M-Texarkana Email Address

Upon application to Texas A&M University-Texarkana an individual will be assigned an A&M-Texarkana email account. This email account will be used to deliver official university correspondence. Each individual is responsible for information sent and received via the university email account and is expected to check the official A&M-Texarkana email account on a frequent and consistent basis. Faculty and students are required to utilize the university email account when communicating about coursework.

Drop Policy

To drop this course after the census date, a student must complete the Drop/Withdrawal Request Form, located on the University website (http://tamut.edu/Student-Support/Registrar/Dropping.html) or obtained in the Registrar's Office. The student must submit

the signed and completed form to the instructor of each course indicated on the form to be dropped for his/her signature. The signature is not an "approval" to drop, but rather confirmation that the student has discussed the drop/withdrawal with the faculty member. The form must be submitted to the Registrar's office for processing in person, email Registrar@tamut.edu, mail (7101 University Ave., Texarkana, TX 75503) or fax (903-223-3140). Drop/withdraw forms missing any of the required information will not be accepted by the Registrar's Office for processing. It is the student's responsibility to ensure that the form is completed properly before submission. If a student stops participating in class (attending and submitting assignments) but does not complete and submit the drop/withdrawal form, a final grade based on work completed as outlined in the syllabus will be assigned.