

BIOL 1414 (4:3:3)

Introduction to Biotechnology

Department of Biology

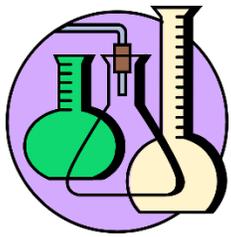
Division of Arts and Sciences

SOUTH PLAINS COLLEGE

Levelland Campus

Spring 2020

Megan Keith
Instructor of Biology



COURSE INFORMATION SHEET
BIOL 1414- INTRODUCTION TO BIOTECHNOLOGY I
SPRING 2020

Instructor: Dr. Megan Keith
Office: Science Building S132
Email: mkeith@southplainscollege.edu

Office Hours: Mon. 8:15AM – 9:15AM
Tues. 2:30PM – 3:30PM
Wed. 8:15AM – 9:15AM
Thurs. 9:30AM – 11:30AM
Fri. 8:30AM – 11:30AM

Lecture: TR 1:00PM – 2:15PM (S181)
Lab: R 2:30PM – 5:00PM (S197)

Course Description: Overview of classical genetics, DNA structure, the flow of genetic information, DNA replication, gene transcription, and protein translation. Principles of major molecular biology and genetic engineering techniques, including restriction enzymes and their uses, major types of cloning vectors, construction of libraries, Southern and Northern blotting, hybridization, PCR, DNA typing. Applications of these techniques in human health and welfare, medicine, agriculture and the environment. Introduction to the human genome project, gene therapy, molecular diagnostics, forensics, creation and uses of transgenic organisms and cloning and of the ethical, legal, and social issues and scientific problems associated with these technologies.

Course Implementation:

Prerequisite: None
Credit: Four semester hours

Required Textbook: Introduction to Biotechnology, 4th ed. by Thieman and Palladino. ISBN: 9780134650197

Lab Manual: NONE- lab write-ups will be made available for each exercise

Other required materials: Laboratory notebook or composition book

Course Objectives:

- A. To define biotechnology and discuss ethical concerns surrounding this emerging field.
- B. To introduce basic biotechnology principles through an integrated approach.
- C. To understand common techniques related to cloning, manipulating and sequencing DNA, transformation, forensics, etc. and to gain experience with these techniques in a laboratory.
- D. Learn to perform an independent research project and write a scientific paper.

Online Course Content

- Blackboard is the primary source for all course information.
- **Students need to access Blackboard daily.** Firefox or Safari are recommended.
- Specific course materials available include: PowerPoint lectures, messages and announcements from the professor, study aids, assignments, quizzes, etc.

SPC Email

Each student has an SPC email account and should check it regularly. Instructors and the administration will use this email address to contact the student.

Building Renovation

How might this affect you?

Policies, Procedures, and Rules

This course will be conducted according to the policies and procedures of the South Plains College Student Handbook and General Catalog.

Attendance-

- Punctual and regular lecture and lab attendance is required of all students.
- Open door policy: if you do arrive late, quietly take your seat. You may not make up quizzes or other work. Excessive tardiness will not be tolerated and may result in withdrawal from the course (**3 late arrivals exceeding 10 minutes = 1 unexcused absence**).
- In the case of unexcused absence, the student will receive a 0 for the work submitted that day and it is the student's responsibility to obtain missed notes from classmates.
- When unavoidable situations such as illness, weather, an official college-sponsored trip, or a death in the family causes absence, the student may make up the missed class work as long as documentation can be provided. The student will have one week from the date the makeup work is assigned to turn it in for credit.
- The student may be administratively withdrawn from the course when absences become excessive (**4 unexcused absences or more**) AND the minimum course objectives cannot be met. The instructor is required to initiate a student's administrative withdrawal when the student has missed every class period for two weeks excluding holidays.
- Should a student, for any reason, delay in reporting to a class after his/her official enrollment, absences will be attributed to the student from the first meeting of the class. A student who does not attend a class by the 12th day of classes will automatically be dropped from the course and receive a grade of "X".

Hazardous Weather Policy- South Plains College rarely cancels classes due to weather. Students should plan accordingly to be able to attend all classes and arrive at SPC Levelland safely. Announcements concerning cancellations and/or delays are made on local television, radio and MySPC.

Assessment

Final grades for the course will be calculated on a weighted scale: three exams + final paper over independent research (70%), assignments (online or hard copy- 10%), and quizzes (online or hard copy- 20%).

Letter Grade	Course Average*
A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

***Course Average:** Calculated by the average of the three grades indicated. If a student's final average *is less than* one half a percentage point away from the next higher letter grade, the instructor will consider giving the higher letter grade.

Exams

- Each major exam will cover material from BOTH lecture and lab.
- The exam format may include multiple-choice questions, short answer questions, and diagrams to draw and/or label.
- Each exam score is recorded as a percent score (number correct out of the total possible) with 100% being the maximum score.
- The final paper takes the place of a traditional final exam as it requires you to draw from knowledge gained throughout the semester and apply it to compiling information for a scientific publication. This paper will be due by noon on the first day of finals to allow enough time for grading. (continued on next page)

- Students should **NOT** miss exams! Any student who misses an exam will have a 0 score entered for that exam. I will only consider allowing a student to make up an exam if they have contacted me **before** the exam has been given AND they can show documentation for an event that qualifies as an excused absence.

Quizzes

- Weekly quizzes will be conducted on Blackboard. Quizzes will cover both lecture and lab material from that week. Quizzes will open late Thursday or early Friday and will be due by midnight the next Tuesday.
- Students will be given a set amount of time to finish the quiz. Quizzes **CANNOT** be made up if missed for any reason.
- Quizzes have already been scheduled and are listed in your syllabus.

Assignments

- Assignment include (but are not limited to) reading and interpreting information from case studies, navigating various online databases that apply to course topics, searching for articles or publications related to course topics, etc.

Academic Integrity

It is the aim of the faculty of South Plains College to foster a spirit of complete honesty and a high standard of integrity. The attempt of any student to present any work as their own which he or she has not honestly performed is regarded SPC as a most serious offense and renders the offender liable to serious consequences, possibly suspension. Failure to comply with this policy will result in an F for the assignment and can result in an F for the course if circumstances warrant.

- **Plagiarism** violations include, but are not limited to, the following:
 1. Turning in a paper that has been purchased, borrowed, or downloaded from another student, an online term paper site, or a mail order term paper mill;
 2. Cutting and pasting together information from books, articles, other papers, or online sites without providing proper documentation;
 3. Using direct quotations (three or more words) from a source without showing them to be direct quotations and citing them; or
 4. Missing in-text citations.
- **Cheating** violations include, but are not limited to, the following:
 1. Obtaining an examination by stealing or collusion;
 2. Discovering the content of an examination before it is given;
 3. Using an unauthorized source of information (notes, textbook, text messaging, internet, apps) during an examination, quiz, or homework assignment;
 4. Entering an office or building to obtain unfair advantage;
 5. Taking an examination for another;
 6. Altering grade records;
 7. Copying another's work during an examination or on a homework assignment;
 8. Rewriting another student's work in Peer Editing so that the writing is no longer the original student's;
 9. Taking pictures of a test, test answers, or someone else's paper.



Electronic Devices

- ALL electronic devices should be silenced inside the classroom. Devices that may be out during lecture include laptops, tablets, and in *special circumstances*, cell phones.
- Should a device become disruptive to other students, the student may be asked to put it away or dismissed from class and/or the course.
- **Phones and smartwatches must be put away during exams. Electronics must be left inside of the testing room if a student leaves for any reason (restroom break, etc.) before the exam is complete. Earbuds should not be worn at any time during class.**

Privacy

The federal law guaranteeing student privacy is the policy of this instructor as well as that of SPC. This means that I will not discuss your grade with anyone other than YOU.

Student Code of Conduct Policy: Any successful learning experience requires mutual respect on the part of the student and the instructor. Neither instructor nor student should be subject to others' behavior that is rude, disruptive, intimidating, aggressive, or demeaning. Student conduct that disrupts the learning process or is deemed disrespectful or threatening shall not be tolerated and may lead to disciplinary action and/or removal from class.

Diversity Statement: In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

Disability Statement: Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office at Levelland (Student Health & Wellness Office) 806-716-2577, Reese Center (Building 8) 806-716-4675, or Plainview Center (Main Office) 806-716-4302 or 806-296-9611.

Nondiscrimination Policy: South Plains College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Vice President for Student Affairs, South Plains College, 1401 College Avenue, Box 5, Levelland, TX 79336. Phone number 806-716-2360.

Title IX Pregnancy Accommodations Statement: If you are pregnant, or have given birth within six months, Under Title IX you have a right to reasonable accommodations to help continue your education. To [activate](#) accommodations you must submit a Title IX pregnancy accommodations request, along with specific medical documentation, to the Director of Health and Wellness. Once approved, notification will be sent to the student and instructors. It is the student's responsibility to work with the instructor to arrange accommodations. Contact the Director of Health and Wellness at 806-716-2362 or [email cgilster@southplainscollege.edu](mailto:cgilster@southplainscollege.edu) for assistance.

Campus Concealed Carry: Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in South Plains College buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to

Penal Code (PC) 46.035 and South Plains College policy, license holders may not carry a concealed handgun in restricted locations. For a list of locations and Frequently Asked Questions, please refer to the Campus Carry page at: <http://www.southplainscollege.edu/campuscarry.php>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all South Plains College campuses. Report violations to the College Police Department at 806-716-2396 or 9-1-1.

ALiCE Active Shooter Response Training Sessions are made available to students throughout each semester.

Note: The instructor reserves the right to modify the course syllabus and policies, as well as notify students of any changes, at any point during the semester.

Tentative Course Schedule

Date	Lecture Topic	Assignment	Laboratory Topic
January 14	What is Biotechnology?- Ch. 1		Lab Safety and CHP Laboratory Skills and Metric Scale
January 16	Careers in Biotechnology	Quiz 1	Introduce Case Studies
January 21	Genes & Genomes: A Review- Ch. 2.1 - 2.4		Kool-Aid Chromatography
January 23	Genes & Genomes: A Review- Ch. 2.5 - 2.8	Case Study #1 Quiz 2	Introduce Independent Research Project
January 28	Recombinant DNA Technology & Genomics- Ch. 3		Recombinant Plasmid Exercise
January 30	Proteins as Products- Ch. 4	Case Study #2 Quiz 3	Restriction Digestion of Lambda DNA- Day 1
February 4	Microbial Biotechnology- Ch. 5.1 - 5.4		Introducing RNAi by Feeding- Day 1 Bacterial Transformation- Day 1
February 6	Microbial Biotechnology- Ch. 5.5 - 5.8	Case Study #3	Restriction Digestion of Lambda DNA- Day 2
February 11	EXAM 1		Independent Project- Day 1 GMO Detection by PCR- Day 1
February 13	Plant Biotechnology- Ch. 6.1 - 6.3		Bacterial Transformation- Day 2
February 18	Plant Biotechnology- Ch. 6.4	Case Study #4	Introducing RNAi by Feeding- Day 2
February 20	Animal Biotechnology- Ch. 7.1 - 7.2	Quiz 4	GMO Detection by PCR- Day 2
February 25	Animal Biotechnology- Ch. 7.3 - 7.4	Case Study #5	Introducing RNAi by Feeding- Day 3 Independent Project- Day 2
February 27	The Anatomy of a Scientific Publication- Publishing your Research	Quiz 5	WORK ON INDEPENDENT RESEARCH PAPER- BRING COMPUTER
March 3	DNA Fingerprinting & Forensic Analysis- Ch. 8.1 - 8.4		GMO Detection by PCR- Day 3 Independent Project- Day 3
March 5	DNA Fingerprinting & Forensic Analysis- Ch. 8.5 - 8.6	Quiz 6	Intro to Bioinformatics

March 10	Bioremediation- Ch. 9.1 - 9.5		NO LAB
March 12	NO CLASS	Case Study #6 Quiz 7 Independent Assignment	
March 16-20	SPRING BREAK		
March 24	Bioremediation- Ch. 9.6 - 9.7		Open Lab- I am available for help on your independent assignment or your research paper.
March 26	EXAM 2		
March 31	Aquatic Biotechnology- Ch. 10.1-10.4		Nature's Dice: Genetic Screening
April 2	Aquatic Biotechnology- Ch. 10.5-10.6	Case Study #7	
April 7	Medical Biotechnology- Ch. 11.1-11.4	Quiz 8	Quantitative ELISA
April 9	Medical Biotechnology- Ch. 11.5-11.6 Immunological Applications	Case Study #8	
April 14	Biotechnology Regulations- Ch. 12	Quiz 9	NO LAB
April 16	NO CLASS	Case Study #9 Independent Assignment	
April 21	Ethics & Biotechnology- Ch. 13.1-13.2		CRISPR Independent Project-Day 6
April 23	Ethics & Biotechnology- Ch. 13.2-13.3	Case Study #10 Quiz 10	
April 28	Biotechnology in the News		WORK ON INDEPENDENT RESEARCH PAPER- BRING COMPUTER
April 30	EXAM 3		
May 4-7	FINALS WEEK- FINAL RESEARCH PAPER DUE May 4th by noon.		

Important Dates:

The last day to drop a course is April 23rd.

May Graduation application deadline- March 10th.

I will not have office hours on:

February 21

March 12-13

April 16-17