

# Microbiology 421, Biotechnology

## Fall, 2016

Life Science II, Room 430  
9:35-10:50 am Tuesdays and Thursdays

**PROFESSOR:** Dr. Douglas Fix  
**OFFICE:** Life Science II Room 139  
**OFFICE HOURS:** Open or by appointment  
**PHONE:** 453-2767  
**E-MAIL:** dfix@1siu.edu

### TEXTBOOK

Biotechnology, David P. Clark and Nanette J. Pazdernik, 2011 or 2015, Academic Press.

### COURSE OBJECTIVES

**To develop an understanding of the principles of modern biotechnology.**

Students will develop an understanding of molecular biotechnology currently applied in industry, medicine and agriculture.

### ATTENDANCE:

Attendance is not required but *very strongly* suggested. The information to be presented in this course cannot be learned simply by reading the textbook. Listening and taking good notes in lecture are critical to your ability to succeed in this course. Extra-credit points MAY be given at random for attending students.

### GRADES

**Three hourly exams (100 points each) and a final exam (150 points)** will be given during the semester (see Lecture Schedule for dates). **The final exam will be a comprehensive exam.** Your lowest hourly exam score, or an equivalent percentage of the 150 points final exam, will be dropped. **NO EARLY OR MAKEUP EXAMS WILL BE GIVEN. If you miss one of the exams during the semester, that exam will be your dropped one.** There will also be several online quizzes totaling 50 points (five to ten points each). The final letter grade will be based on a curve determined using the total points obtained. Therefore, the total points available are:

Hourly exams: 100 points each (x3)  
Final exam: 150 points  
Quizzes: 50 points  
Dropped exam: -100 points  
Total points possible: 400 points

**ON EXAM DAYS:**

1. After the first student has finished the exam and left the classroom, exams will no longer be given out to latecomers.
2. Instructors may reseal you.
3. No resource materials such as print materials and electronic devices may be open or operated during the test.
4. Once an exam has started, you may not leave your seat without permission from an instructor until you have finished the exam.

**TIPS FOR SUCCESS:**

- Read and review textbook material before class
- Attend lectures
- Listen
- Take notes
- Review your notes and compare with the textbook
- Rewrite your notes to better organize the information and help you to learn
- DO NOT GET BEHIND!

**ADDITIONAL REQUIRED INFORMATION:**

**Safety Instructions:** Instructor will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency.

**Academic Dishonesty Policy:** Students may be subject to disciplinary proceedings resulting in an academic penalty or disciplinary penalty for academic dishonesty. Academic dishonesty includes, but is not limited to, cheating on a test, plagiarism, or collusion. Refer to the Student Conduct Code plagiarism policy.

**ADA Statement for Students Requiring Special Accommodations:** As per Section 504 of the Vocational Rehabilitation Act of 1973 and the American Disabilities Act (ADA) of 1990, if accommodations are needed, inform your instructor as soon as possible.

**Syllabus Attachment:** Additional information can be found in the Syllabus Attachment.

## Lecture Schedule

Date/Day	Topic	Chapter
08/23 T	Introduction, Model systems in biotechnology	1
08/25 R	DNA replication in vivo and in vitro, PCR-based technology	4
08/30 T	Chemical synthesis of DNA and DNA sequencing technology	4
09/01 R	DNA sequencing technology, continued	4
09/06 T	Antisense RNA-related technology	5
09/08 R	RNAi-related technology	5
09/13 T	Ribozyme and riboswitch-related technology	5
09/15 R	Antibody engineering	6
09/20 T	Vaccine technology	6
09/22 R	<b>Hourly Exam 1 (Chapters 1,4,5,6)</b>	
09/27 T	Genome mapping and sequencing	8
09/29 R	DNA microarrays	8
10/04 T	Protein identification by mass spectrometry	9
10/06 R	Protein tagging for purification and interaction studies	9
10/11 T	<b>Fall Break</b>	
10/13 R	Protein expression	10
10/18 T	Protein expression	10
10/20 R	Protein engineering	11
10/25 T	Environmental Biotechnology	12
10/27 R	<b>Hourly Exam 2 (Chapters 8,9,10,11,12)</b>	
11/01 T	Pathway engineering	13
11/03 R	Pathway engineering	13
11/08 T	Transgenic plant and plant biotechnology	14
11/10 R	Transgenic plant and plant biotechnology	14
11/15 T	Transgenic animals	15
11/17 R	Transgenic animals	15
11/22 T	<b>No Class</b>	
11/24 R	<b>Thanksgiving Break</b>	
11/29 T	Gene therapy	17
12/01 R	Gene therapy	17
12/06 T	<b>Hourly Exam 3 (Chapters 13,14,15,17)</b>	
12/08 R	Review	
12/15 R	<b>8:00-10:00 am - Final Comprehensive Exam</b>	

## IMPORTANT DATES \*

<u>Semester Class Begins:</u> .....	<b>08/22/2016</b>
<u>Last day to add full-term course</u> (without Dean's signature): .....	<b>08/28/2016</b>
<u>Last day to withdraw from the University with a full refund:</u> .....	<b>09/02/2016</b>
<u>Last day to drop a full-term course for a credit/refund:</u> .....	<b>09/04/2016</b>
<u>Deadline to apply to graduate at the end of this term:</u> .....	<b>09/16/2016</b>
<u>Last day to drop a full-term course (W grade, no refund):</u> .....	<b>10/30/2016</b>
<u>Final examinations:</u> .....	<b>12/12–12/16/2016</b>
<u>Commencement:</u> .....	<b>12/17/2016</b>

*Note: For more detailed information on the above deadlines, please visit <http://registrar.siu.edu/calendars>. For add/drop dates that apply to shorter-than-full-term courses, please look at the Schedule of Classes search results at <http://registrar.siu.edu/schedclass/index.html>.*

## FALL SEMESTER HOLIDAYS

Labor Day Holiday 09/05/2016  
Fall Break 10/08—10/11/2016  
Veterans Day Holiday 11/11/2016  
Thanksgiving Vacation 11/23—11/27/2016

## WITHDRAWAL POLICY ~ Undergraduate only

Students who officially register for a session must officially withdraw from that registration in a timely manner to avoid being charged as well as receiving a failing grade for those classes. An official withdrawal must be initiated by the student, or on behalf of the student through the academic unit, and be processed by the Registrar's office. For the proper procedures to follow when dropping courses and when withdrawing from SIU visit: <http://registrar.siu.edu/students/withdraw.html>

## INCOMPLETE POLICY~ Undergraduate only

An INC grade may be assigned when, for reasons beyond their control, students engaged in passing work are unable to complete all class assignments for the course. An INC must be changed to a completed grade within one full semester (undergraduates), and one full year (graduate students), from the close of the term in which the course was taken or graduation, whichever occurs first. Should the student fail to complete the remaining course requirements within the time period designated, the incomplete will be converted to a grade of F and such grade will be computed in the student's grade point average. *For more information visit:*

<http://registrar.siu.edu/grades/incomplete.html>

## REPEAT POLICY

An undergraduate student may, for the purpose of raising a grade, enroll in a course for credit more than once. For students receiving a letter grade of A, B, C, D, or F, the course repetition must occur at Southern Illinois University Carbondale. Effective for courses taken Summer 2013 or later, only the most recent (last) grade will be calculated in the overall GPA and count toward hours earned.

This policy will be applied to all transferrable credit in that only the last grade will be used to calculate grade point average. Only those courses taken at the same institution are considered repeats under this policy. *See full policy at*

<http://registrar.siu.edu/students/repeatclasses.html>

## GRADUATE POLICIES

Graduate policies often vary from Undergraduate policies. To view the applicable policies for graduate students, please refer to the graduate catalog at <http://gradschool.siu.edu/about-us/grad-catalog/index.html>

## DISABILITY POLICY

Disability Support Services provides the required academic and programmatic support services to students with permanent and temporary disabilities. DSS provides centralized coordination and referral services. To utilize DSS services, students must contact DSS to open cases. The process involves interviews, reviews of student-supplied documentation, and completion of Disability Accommodation Agreements.

<http://disabilityservices.siu.edu/>

## PLAGIARISM

Student Conduct Code [http://srr.siu.edu/student\\_conduct\\_code/](http://srr.siu.edu/student_conduct_code/)  
Guidelines for Faculty <http://pvcaa.siu.edu/common/documents/Plagiarism/Guide%20to%20Preventing%20Plagiarism.pdf>

## SAFETY AWARENESS FACTS AND EDUCATION

Title IX makes it clear that violence and harassment based on sex and gender is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find the appropriate resources here:

<http://safe.siu.edu>

## SALUKI CARES

The purpose of Saluki Cares is to develop, facilitate and coordinate a university-wide program of care and support for students in any type of distress—physical, emotional, financial, or personal. By working closely with faculty, staff, students and their families, SIU will continue to display a culture of care and demonstrate to our students and their families that they are an important part of the community. For Information on Saluki Cares: call(618) 453-1492, email [siucares@siu.edu](mailto:siucares@siu.edu), or <http://salukicare.siu.edu/index.html>

## SIU's EARLY WARNING INTERVENTION PROGRAM (EWIP)

Students enrolled in courses participating in SIU's Early Warning Intervention Program might be contacted by University staff during a semester. More information can be found at the Core Curriculum's Overview webpage: <http://corecurriculum.siu.edu/program-overview/>

## EMERGENCY PROCEDURES

We ask that you become familiar with **Emergency Preparedness @ SIU**. Emergency response information is available on posters in buildings on campus, on the Emergency Preparedness @ SIU website, and through text and email alerts. *To register for alerts visit:* <http://emergency.siu.edu/>

## INCLUSIVE EXCELLENCE

SIU contains people from all walks of life, from many different cultures and sub-cultures, and representing all strata of society, nationalities, ethnicities, lifestyles, and affiliations. Learning from and working with people who differ is an important part of education as well as an essential preparation for any career. *For more information visit:* <http://www.inclusiveexcellence.siu.edu/>

## LEARNING AND SUPPORT SERVICES

Help is within reach. Learning support services offers free tutoring on campus and math labs. To find more information please visit the Center for Learning and Support Services website:

*Tutoring :* <http://tutoring.siu.edu/>

*Math Labs* <http://math.siu.edu/courses/course-help.php>

## WRITING CENTER

The Writing Center offers free tutoring services to all SIU students and faculty. To find a Center or Schedule an appointment please visit:

<http://write.siu.edu/>

## AFFIRMATIVE ACTION & EQUAL OPPORTUNITY

Our office's main focus is to ensure that the university complies with federal and state equity policies and handles reporting and investigating of discrimination cases. *For more information visit:* <http://diversity.siu.edu/#>

## MILITARY COMMUNITY

There are complexities of being a member of the military community and also a student. Drill schedules, calls to active duty, complications with GI Bill disbursement, and other unforeseen military and veteran related developments can complicate academic life. If you are a member of the military community and in need of accommodations please visit Veterans Services at <http://veterans.siu.edu/>

*Additional Resources:*

**ADVISEMENT:** <http://advisement.siu.edu/>

**SIU ONLINE:** <http://online.siu.edu/>

**SALUKINET:** <https://salukinet.siu.edu/>

**MORRIS LIBRARY HOURS:** <http://www.lib.siu.edu/>