

MICR/MBMB 421: Biotechnology
Spring 2018- Syllabus
T/R 9:35-10:50 LSII Rm 430
Department of Microbiology
Southern Illinois University at Carbondale

Instructor: Dr. Kelly Bender, Life Science II, Room 106
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Office Hours: 11:00 am -12:00 pm T/R or by appointment

Objectives: To develop an understanding of the principles of modern biotechnology. Students will develop an understanding of genetic engineering, systems biology, and synthetic biology currently applied in industry, agriculture, and medicine.

Text: These are not required, but will be the source material for lectures:

- 1) *BROCK BIOLOGY OF MICROORGANISMS*, 15th edition, 2017, Michael T. Madigan, Kelly S. Bender, Daniel H. Buckley, W. Matthew Sattley, and David A. Stahl (Pearson).
- 2) *BIOTECHNOLOGY*, 2011 or 2015, David P. Clark and Nanette J. Pazdernik (Academic Press).

Additional journal articles may be assigned for some of the lecture topics and these will be announced in class at least a week prior of the associated lecture.

Grading: Your grade in MICR 421 is based on: three hourly 100 point exams (300 points total), a final comprehensive exam (200 points), five pop/take home quizzes (each worth 5 points with the lowest score dropped; 20 points), and attendance and participation points (20 points). *Your lowest hourly exam score or 50% of your final exam score will be dropped (along with your lowest quiz score) to make the total points for the course 440.* Exams will be a mixture of objective (multiple choice/true-false), short-answer, and essay questions. **NO MAKE-UP QUIZZES OR EXAMS WILL BE GIVEN.** For optional extra credit (**maximum 30 points**), students may give a 20 minute presentation on a preapproved biotech topic of their choice at the end of the semester (directions for grading criteria for these presentations will be provided after spring break).

Hourly exams x 3	300 points
5 point quizzes x 5	20 points (drop lowest)
Final exam	200 points
Attendance/participation	20 points
<u>Dropped hourly exam or 50% of final</u>	<u>-100 points</u>
Total	440 points

100-90% (440-394 pts) = A; 89-80% (393-350 pts) = B; 79-70% (349-306 pts) = C;
69-60% (305-262 pts) = D; ≤59% (≤261 pts) = F.

Class behavior: No cell phone use (calls or texting) is permitted during class unless you are looking up material pertaining to the lecture. Phones should also be in silent mode during class. This may seem like common courtesy to most students, but unfortunately it has to be pointed out to some. Although I should not need to remind Jr., Sr., and grads of this: **Students who earn a good grade in classes typically have a nearly perfect attendance record.**

MBMB/MICR 421 Schedule

Date	Lecture	Topic	Chapter ¹
01/16 T	1	Introduction, model systems, some products of value	1, BBOM ² 12
01/18 R	2	Obtaining/isolating genes of interest and cloning	3,4 BBOM 12
01/23 T	3	Problems with expressing foreign genes	2,10, BBOM 12
01/25 R	4	Verifying product expression/production- Insulin	3,8,9 BBOM 12
01/30 T	5	Fermentation and industrial microbiology	external material
02/01 R	6	Genome mining: novel enzymes	12, BBOM 12
02/06 T	7	Pathway engineering: novel drugs	13, BBOM 12
02/08 R	8	Pathway engineering: biofuels	13, BBOM 12
02/13 T		Hourly Exam 1	(lectures 1-7)
02/15 R	9	Environmental biotechnology	12,13
02/20 T	10	Ti-plasmid and transgenic plants	15, BBOM 12
02/22 R	11	Plant Biotechnology	15, BBOM 12
02/27 T	12	Transgenic animals	16, BBOM 12
03/01 R	13	Biotechnology and animals	16, BBOM 12
03/06 T	14	Immune technology and therapeutics	6, BBOM 12
03/08 R	15	Gene therapy and RNA technology	5,8,17, BBOM 12
03/13 T		Spring Break	
03/15 R		Spring Break	
03/20 T	16	CRISPR and potential for gene therapy	17, BBOM 12
03/22 R		Hourly Exam 2	(lectures 8-15)
03/27 T	17	Systems biology: DNA seq and metagenomics	4,8,12 BBOM 9
03/29 R	18	Systems biology: transcriptomics and proteomics	8, BBOM 9
04/03 T	19	Systems biology: proteomics and metabolomics	9, BBOM 9
04/05 R	20	Synthetic biology and biosensors	7,11,13 BBOM 9
04/10 T	21	Stem cell technology	18
04/12 R	22	Regulations and bioethics	24
04/17 T	23	Extra Credit Presentations	
04/19 R	24	Extra Credit Presentations	
04/24 T	25	Extra Credit Presentations	
04/26 R	26	Extra Credit Presentations	
05/01 T		Hourly Exam 3	(lectures 16-26)
05/03 R		Review and evaluations	(all lectures)
Week of May 7th – 11th Comprehensive Final Exam, date determined 3rd week			

¹Only certain material from the assigned chapters will be covered

²BBOM: *Brock Biology of Microorganisms, 15th edition*

Syllabus Attachment

Spring 2018

MISSION STATEMENT FOR SOUTHERN ILLINOIS UNIVERSITY CARBONDALE

SIU embraces a unique tradition of access and opportunity, inclusive excellence, innovation in research and creativity, and outstanding teaching focused on nurturing student success. As a nationally ranked public research university and regional economic catalyst, we create and exchange knowledge to shape future leaders, improve our communities, and transform lives.

IMPORTANT DATES *

Semester Classes Begin:01/16/2018
Last day to add full-term course (without Dean's signature):01/21/2018
Last day to withdraw from the University with a full refund:01/26/2018
Last day to drop a full-term course for a credit/refund:01/28/2018
Last day to drop a full-term course (W grade, no refund):04/01/2018
Final examinations:05/07–05/11/2018

The Final exam schedule will be posted the third week of class.

Please verify the above dates with the Registrar calendar and find more detailed information on deadlines at <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.php>

SPRING SEMESTER HOLIDAYS

Martin Luther King, Jr.'s Birthday Holiday 01/15/2018
Spring Vacation 03/10—03/18/2018

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/withdrawal.php>

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.php>

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.php>

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/>

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

See the Student Conduct Code <http://srr.siu.edu/student-conduct-code/>

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

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, or <http://salukicare.siu.edu/>

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/>

STUDENT MULTICULTURAL RESOURCE CENTER

The Student Multicultural Resource Center serves as a catalyst for inclusion, diversity and innovation. As the Center continues its work, we are here to ensure that you think, grow and succeed. We encourage you to stop by the Center, located in Grinnell Commons, to see the resources available and discover ways you can get involved on the campus. Visit us at <http://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/>

DIVERSITY

Southern Illinois University Carbondale's goal is to provide a welcoming campus where all of our students, faculty and staff can study and work in a respectful, positive environment free from racism and intimidation. 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, and 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/>

SIU ONLINE: <https://online.siu.edu/>

Need help with an issue? Please visit SALUKI SOLUTION FINDER at <http://solutionfinder.siu.edu/>