

MICR/MBMB 460: Bacterial and Viral Genetics

Instructor: Dr. Bethany Rader

Class Meeting: MWF 10:00-10:50 AM

Office: Lindegren, Rm 34

Class Location: LS III Rm 1059

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Email: bethany.rader@siu.edu

Office Hours: Mondays 11:00am – 1:00pm, or by appointment

Course Objectives:

This course is designed to present you with a historical perspective and current knowledge of bacterial and phage genetics and genetic regulation. The study of bacteria and phages not only led to the initial discovery and understanding of DNA, RNA and proteins and how they are regulated, but continues to define new roles for these molecules, identify new genetic regulatory pathways, and develop new genetic tools used from biotech to medicine. In addition, knowledge of these subjects has led to great progress in understanding the process of human bacterial and viral diseases, and how we treat these diseases. But, perhaps more important is that this knowledge has in part created the field of Molecular Biology, a field that is used in some form by most scientists at the bench, and most likely impacts you in some way on a daily basis.

Course website:

All course material (except reading materials) will be available through Desire2Learn (<https://mycourses.siu.edu>).

Course readings:

There will be no required text for this class due to the fact that there are few comprehensive texts written at the appropriate level. However, I will be lecturing from the text: ‘Molecular Genetics of Bacteria’, 4rd Edition, Snyder and Champness, 2013. Therefore reading assignments outlined on the schedule below are from ‘Molecular Genetics of Bacteria’. Please note that readings are assigned as chapters, but I will not cover all the material in the chapter. My lectures are comprehensive and exams and quizzes will cover lecture material. There are other texts available that can be used as additional resources, including the ones listed below. However it should be noted that these texts do not cover all the material in as much depth as ‘Molecular Genetics of Bacteria’, or my lectures.

Other useful texts:

Chaudhuri, K. (2014). *Microbial Genetics*. New Delhi: TERI.

Clark, D., and Pazdernik, N. (2013). *Molecular Biology* (2nd ed.). Waltham, MA: Elsevier Inc.

Foster, J.W., and Slonczewski, J.L. (2017). *Microbiology: An Evolving Science* (4th ed). New York, NY, W. W. Norton & Company.

Lecture slides:

Lecture slides will be available for download as powerpoint slides from the course website immediately before the lecture. I work on my lecture slides right up to the moment I come to class so they will usually be posted ~ 5-10 minutes before lecture.

Office hours:

My office hour will be held on Mondays after class from 11am – 1. If you are not free at this time, you may schedule an appointment to meet with me at another time. You may also email me with questions or comments (bethany.rader@siu.edu). **When emailing please include “MICR/MBMB 460” in the subject**

line. This ensures that I will see your email. I will try to answer your email in within 24 hours; however, I do not always check my email in the late evenings or weekends. For students in Springfield, I am happy to talk on the phone or skype, just please make an appointment by email first as I am not always in my office and don't leave skype open when not in use.

Grading policy:

Grading will be based solely on exam and quiz scores on a typical 10-percentage point grading scale. Your total number of points will be based on the 3 best exam scores out of the 4 exams and the 10 point quizzes.

Hourly Exams: 300 points (Best three exam scores out of four 100 point exams)

Online quizzes: 100 points

Total: points 400 points

Grading Scale:

90-100% (400 – 360 points) = **A**

80-89% (359 – 320 points) = **B**

70-79% (319 – 280 points) = **C**

60-69% (279 – 240 points) = **D**

59-0% (239 - 0 points) = **F**

Attendance:

I do not take attendance for this class. As an upper level undergraduate, or graduate student, the responsibility to attend class is yours alone. Keep in mind that there is a strong correlation between higher grades and attending lecture.

Online Quizzes: There will be ten multiple choice quizzes worth 10 points each posted in the D2L “Quizzes” folder on the Wednesday night indicated in the class schedule and will be available to complete through the following Sunday night at 11:59pm. You will be able to make 1 attempt at each quiz and will be limited to two hours to complete the quiz. The quizzes correspond to lecture material. You may use all available resources, and can work in groups. Because you have 5 days to complete each quiz, there will be **NO make-up quizzes**.

Exams:

Exams will encompass material covered in lecture and are 100 points each. I will announce in class (and on the lecture slides) exactly what material will be covered by the exams as the exams draws close. Exams are a combination of short answer questions that encompass the majority of points and “choose the answer” questions, which encompass the minority of points per exam. Questions will fall into two categories I like to call “regurgitation” and “application”. Regurgitation questions test your memory and application questions test your ability to take the information learned (lecture material) and apply it to a novel situation. To help you study for the exams there will be a general study guide and a practice exam with a key posted for each exam. I always include at least 4 extra credit question on each exam. There will be **NO make-up exams**. If you miss an exam, it will be considered your drop exam.

Final Exam:

There is **NO** final exam for this class.

Classroom Etiquette:

Please be respectful of your fellow students. This includes arriving on time and staying until the end of lecture. Arriving late and leaving early can be disruptive. No cell phone use (calls or texting) is permitted during class. 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. If an emergency arises step outside the classroom to use your phone. Phones (along with tablets and computers) may be used in class to take notes and look up material related to class.

Students with disabilities:

If you think you need accommodation for a disability, please let me know at your earliest convenience. Some aspects of the course may be modified to facilitate your participation and progress. As soon as you make me aware of your needs we can work with Disability Support Services (DSS, 618-453-5738, <http://disabilityservices.siu.edu/>) to help us determine the appropriate academic action. Any information provided is private and confidential and will be treated as such. ***When it comes to accommodations for the exams and final, I require at least 5 days notice prior to the exam date. This ensures enough time to make the proper arrangements.***

Final note:

The material on the syllabus is fluid and may fluctuate some during the term. This is due to the ever-changing nature of scientific research and information, my desire to add and present material that is relevant, useful and exciting, and the fact that the pace at which I present the material changes each time I teach Micro 460. Therefore please note that as the term progresses, the syllabus will not be strictly followed, and ANY information on the syllabus, **with the exception of the exam dates**, is subject to change. Any changes that are made to the syllabus as the course proceeds will be announced in class.

Important Class Dates!!!

08/20/18	First day of class
09/03/18	Labor Day: NO CLASS
09/17/18	EXAM 1
10/19/18	EXAM 2
10/28/18	Last possible day to drop a full-term course (no refund)
11/12/18	EXAM 3
12/07/18	EXAM 4

Semester Breaks!!!!

09/03/18	Labor Day
11/17/18 – 11/25/18	Thanksgiving Break

Preliminary Class Schedule

Lecture	Date	Topic	Reading
1	8/20	Welcome! Intro and DNA structure	Chapter 1
2	8/22	Chromosomal Replication	Chapter 1
3	8/24	Transcription	Chapter 2
4	8/27	Transcription/translation	Chapter 2
5	8/29	Translation Quiz 1	Chapter 2
6	9/31	Proteins and secretion	Chapter 2,14
-	9/3	Labor Day – No Class	-
7	9/5	FUNDamentals in genetic analysis	Chapter 3
8	9/7	Fundamentals continued	Chapter 3
9	9/10	Plasmids	Chapter 4
10	9/12	More plasmids Quiz	Chapter 4
-	9/14	Review for Exam 1	-
-	9/17	EXAM 1	-
11	9/19	Conjugation	Chapter 5
12	9/21	Conjugation and Transformation	Chapter 5/6
13	9/24	Transformation	Chapter 6
14	9/26	Transduction and Bacteriophages Quiz	Chapter 7
15	9/28	T4 phage: Transduction Mapping	Chapter 7
16	10/1	T4 phage: Recombination Mapping and Deletion Mapping	Chapter 7
17	10/3	T4 phage Complementation Mapping, Intro to λ Quiz	Chapter 7/8
18	10/5	λ Continued	Chapter 8
19	10/8	λ Continued	Chapter 8
20	10/10	CRISPR and Phage toxins Quiz	Chapter 8
21	10/12	Transposable Elements	Chapter 9
22	10/15	Other Mobile Elements	Chapter 9
-	10/17	Review for Exam 2 Quiz	-
-	10/19	EXAM 2	-
23	10/22	Recombination	Chapter 10
24	10/24	Recombination	Chapter 10
25	10/26	DNA Mutagenesis and Repair	Chapter 11
26	10/29	DNA Mutagenesis and Repair	Chapter 11
27	10/31	Regulation of Expression – Lac Quiz	Chapter 12
28	11/2	Regulation of Expression – Trp	Chapter 12
29	11/5	Regulatory RNAs	Chapter 12
30	11/7	Regulatory RNAs Quiz	Chapter 12
-	11/9	Review for Exam 3	-
-	11/12	EXAM 3	-
31	11/14	Global Regulation – cAMP	Chapter 13
32	11/16	Global Regulation – Nitrogen and TCS	Chapter 13
-	11/19	Thanksgiving Break – No Class	-
-	11/21	Thanksgiving Break – No Class	-

-	11/23	<i>Thanksgiving Break – No Class</i>	-
33	11/26	Global Regulation – Heat Shock	Chapter 13
34	11/28	Global Regulation - Regulation of virulence Quiz	Chapter 13
35	11/30	Global Regulation - Regulation of symbiosis	Chapter 13
36	12/3	Global Regulation – Regulation of biofilm formation	TBD
-	12/5	Review for Exam 4 and Evaluations Quiz	-
-	12/7	Exam 4	-

Syllabus Attachment

Fall 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:.....**08/20/2018**
Last day to add full-term course (without Dean's signature):**08/26/2018**
Last day to withdraw from the University with a full refund:.....**08/31/2018**
Last day to drop a full-term course for a credit/refund:.....**09/02/2018**
Last day to drop a full-term course (W grade, no refund):.....**10/28/2018**
Final examinations:**12/10–12/14/2018**

Note: 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>

FALL SEMESTER HOLIDAYS

Labor Day Holiday 09/03/2018
Thanksgiving Break 11/17—11/25/2018

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/#>

DISABILITY SUPPORT SERVICES

SIU Carbondale is committed to providing an inclusive and accessible experience for all students with disabilities. Disability Support Services coordinates the implementation of accommodations. If you think you may be eligible for accommodations but have not yet obtained approval please contact DSS immediately at 618-453-5738 or disabilityservices.siu.edu. You may request accommodations at any time, but timely requests help to insure accommodations are in place when needed. Accommodations and services are determined through an interactive process with students and may involve consideration of specific course design and learning objectives in consultation with faculty.

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/>

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 the Student Services Building Room 140, to see the resources available and discover ways you can get involved on the campus. *Visit us at* <https://smrc.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) 453-2461, email siucares@siu.edu, or <http://salukicare.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>

MORRIS LIBRARY HOURS: <http://libguides.lib.siu.edu/hours>

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

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

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>

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/>

CENTER FOR 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/>

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/>

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

PLAGIARISM

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