

## BIOL 830P: Foundations in Microbiology

**Term:** Spring 2024

**Course Credits:** 3

**Course Delivery:** Online -  
Asynchronous

**Instructor:** Dr. Gregory J. Pec

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**Phone:** 308.865.8410

**Office hours (link to schedule appointments on Canvas homepage):** Mondays 10 AM – 12 PM, Wednesdays 12 PM – 1 PM and Fridays 10 AM – 12 PM Central Time, or by appointment. Please take advantage of office hours to check-in, ask questions, or follow-up on anything you would like to understand better. Email should be used judiciously to address questions pertaining to course administration/scheduling or urgent matters. I respond to messages as quickly as I can, generally within 24-48 hours. Direct issues related to the course content should be posted to the Canvas forum described below.

**Course Description:** Topics are studied which are not assigned or covered in other courses in the department. The format of this course will vary depending on the topic of instruction and the needs of students. Topics in Botany Topics in Fresh Water Biology Topics in Vertebrate Biology Topics in Invertebrate Biology Topics in Nebraska Flora Topics in Physiology. Total Credits Allowed: 18.00.

**Course Information:** This course offers an in-depth exploration of the fundamental principles and concepts that govern the study of microorganisms, including bacteria, viruses, fungi, and protozoa. This course will cover the history of microbiology, microbial morphology and physiology, microbial metabolism, microbial molecular biology and genetics, and ecology, including topics in clinical and applied microbiology.

**Course Learning Objectives:** At the completion of the course, students will be able to: (1) Understand the basic principles and historical development of microbiology; (2) Define key terms and concepts related to microbiology; (3) Explore the structure, morphology, and classification of microorganisms (bacteria, viruses, fungi, protozoa); (4) Understand the basic cellular structures of bacteria and eukaryotic microorganisms; (5) Examine the factors influencing microbial growth; (6) Understand the principles of microbial genetics, including DNA replication, transcription, translation, and genetic regulation; (7) Explore genetic variation and mechanisms of gene transfer in microorganisms; (8) Investigate the mechanisms by which microorganisms cause diseases; (9) Study host-pathogen interactions and the immune response; (10) Explore the role of microorganisms in natural environments; (11) Understand microbial interactions and their impact on ecosystems; (12) Examine the practical applications of microbiology in various fields, such as medicine, industry, and environmental science; (13) Understand the importance of microbiology in public health; (14) Explore topics related to infectious diseases, epidemiology, and disease prevention; (15) Emphasize the importance of ethical conduct and safety practices in microbiological research and applications; (17) Apply scientific reasoning to evaluate experimental results and draw conclusions.

### Required Texts and Materials

**Required Text:** Willey, Joanne. Prescott's Microbiology. Twelfth Edition. 2022. ISBN: 9781264088393.

### Required Technology

- As an online course, access to an up-to-date computer and Canvas several times a week is required (checking in daily is encouraged).
- An updated PDF reader will also be needed to read course materials.
- You may need to use software, such as Microsoft Word, Excel, or PowerPoint or another equivalent.
- Microsoft365 software is available to UNK students for free download.
- Ability to use search engines (for example, [Google Scholar](#) or [the Calvin Library search engine](#)) to locate scholarly works is expected of graduate students. If you are not already comfortable with this, I encourage you to reach out to me or the [Natural Sciences Librarian](#) at Calvin Library for assistance.
- For issues with Canvas or other technologies associated with your university account, please contact the [University technology help desk](#).

## **Course Organization**

### **Canvas**

For this class we will use an online course management system called Canvas. Course information, updates, and related information, etc. will be posted here. I have also created a forum in Canvas for asking/answering questions about course information.

### **Participation**

The more students are engaged in a course, the more they tend to get out of it. I encourage you to spend at least a little time each day with course material or activities though I recognize this is not always possible.

### **Communication**

Please check course announcements in Canvas frequently. This the primary way I will communicate. Please feel free to reach out to me at any time via Canvas messages, email, or office phone. I will respond as quickly as possible, usually within 24-48 hours. Emails sent after 3 pm (CST) on Fridays will be answered by the following Monday. If sending an email or leaving a voicemail, please be sure to include BIOL 820 in the subject (email) or message (voicemail) so I can prioritize responding to it.

### **Course Structure and Assessment**

All work is due by 11:59 PM Central Time on the date listed in Canvas and on the course schedule, unless otherwise indicated. This course consists of recorded information sessions, reading assignments, and online discussion boards. All materials for each week will be posted on Canvas. This is not a self-paced course. You will be expected to keep up with the pace of the course, and the course structure is designed to help with this. If this is your first distance class, you will find that these classes can be fast paced. Understandably, everyone in this class has several commitments other than this class. Nonetheless, as a student who has registered for this class, it is your full responsibility to ensure that you can meet the requirements and commit the needed time for this course. Students are responsible for all material covered, even for assignments that are missed. If you start to fall behind, it may be difficult to catch up. Please do not hesitate to contact me.

**Information Sessions:** Audio/video information sessions, accompanying presentations, and supplementary resources will be posted on Tuesdays to Canvas.

### **Assignments:**

**Discussion Boards (D):** Discussion boards will begin on Tuesdays and run through to Monday of the following week. Students will be expected to respond to the discussion question(s) and to other students' comments. This will allow us to talk about the information sessions and answer any questions that students might have. There will be a total of 4 weeks of discussion, each week being worth 10 points (40 points total). Participation marks will be based on the following criteria:

- For the initial post, you will reply to the question(s) posted by Friday (5 points).
- The second part of the assignment is to respond to another of your classmates' postings by expanding on what they have written. These responses are due by the following Monday (5 points).

Further details will be provided for each discussion board assignment. In addition to this weekly mechanism for student participation, please become familiar with all other such policies on attendance found in the [University Graduate catalog](#).

**Mini-Assignments (mA):** There will be 2 small assignments done throughout the semester to reinforce introduced concepts, encourage critical thinking, research skills, and effective communication on controversial topics in microbiology. Instructions will be posted on Canvas.

**Presentation (P):** There will be 1 oral presentation assignment done throughout the semester to deepen understanding of advanced microbiological topics and enhance communication of scientific information effectively. Instructions will be posted on Canvas.

**Quizzes (Q):** There will be 14 timed quizzes done throughout the semester to evaluate understand and retention of information. Each quiz will have two attempts. Instructions will be posted on Canvas.

### Basis for final grade

Assessment	Points
Discussions (4 @ 10 points each)	40
Mini assignments (2 @ 25 points each)	50
Quizzes (14 @ 10 points each)	140
Presentation (1 @ 50 points)	50
<b>Total</b>	<b>280</b>

Grades will be assigned using the standard grading scale for the Department of Biology, as follows: A (93-100%), A- (90-92%), B+ (88-89%), B (83-87%), B- (80-82%), C+ (78-79%), C (73-77%), C- (70-72%), D+ (68-69%), D (63-67%), D- (60-62%), and F (below 60%).

### Course Policies and Resources

I take my role as your instructor very seriously; I care about how well you do in this course and that you have a challenging and rewarding experience. It is my commitment to you to respond individually to the work you submit in this class and to return your work promptly.

### Grading Policy

Scores for each assignment will be posted on the course Canvas page. If you think there was a grading error or do not understand the feedback you receive on graded work, please contact me as soon as possible. If you would like me to regrade your work, requests should be made within three days after the graded work has been returned to you. Regrade requests may result in a lower grade.

### Late Work Policy

As a student enrolled in this course, one of your responsibilities is to submit course work on time. With that said, I recognize there may be times when you are unable to complete or submit these tasks by their due dates. To accommodate this, late assignments will be accepted up to 3 days late. If more than 3 days late, the submission will not be accepted and a grade of 0 (zero) will be recorded for that assignment. Course work will not be accepted late unless prior arrangements have been made due to documented professional or extenuating personal circumstances (e.g., family emergency, participation in university-sanctioned activities, religious observation, etc.). Please contact me as soon as possible to discuss alternative arrangements.

***All students at the University of Nebraska Kearney should be aware of the following university-wide course policies and resources.***

### **Attendance Policy**

Your instructor may have indicated on their syllabus an attendance policy specific to their class. If so, that is the policy with which you must comply. If no other policy is stated, the University-wide attendance policy will apply.

[Undergraduate Student Attendance Policy](#)

[Graduate Student Attendance Policy](#)

### **Academic Honesty Policy**

Academic honesty is essential to the existence and integrity of an institution of higher education. The responsibility for maintaining that integrity is shared by all members of the academic community. To further serve this end, the University of Nebraska at Kearney has a policy relating to academic integrity.

[Undergraduate Academic Integrity Policy](#)

[Graduate Academic Integrity Policy](#)

### **Finals Week Policy**

The final exam will be administered in the time period scheduled during finals week in accordance with University policy ([Final Exam Schedule](#)). More information about UNK's Finals Week Policy, including when it is appropriate to ask for special accommodations to move a course's final exam, can be found here: [Finals Week Policy](#).

### **Mental Wellness**

The UNK Counseling Center provides mental health services to support the academic success of students. The Counseling Center provides a full range of short-term professional mental health services. Getting help is a smart and courageous thing to do. Contact the UNK Counseling Center at 308-865-8248 or visit their website for more

information: [https://www.unk.edu/offices/counseling\\_healthcare/counseling\\_care/index.php](https://www.unk.edu/offices/counseling_healthcare/counseling_care/index.php)

### **Military and Veteran Services**

Military and Veteran Services assist veterans, service members, and their dependents with education benefits and academic and supporting resources. They serve as a liaison between students and the Veterans Administration and branches of the military. Contact the UNK Military and Veteran Services office at 308-865-8677 or visit their website for more

information: [https://www.unk.edu/offices/financial\\_aid/veterans\\_services/index.php](https://www.unk.edu/offices/financial_aid/veterans_services/index.php)

### **Reporting Student Sexual Harassment, Sexual Violence or Sexual Assault**

Reporting allegations of rape, domestic violence, dating violence, sexual assault, sexual harassment, and stalking enables the University to promptly provide support to the impacted student(s), and to take appropriate action to prevent a recurrence of such sexual misconduct and protect the campus community. Confidentiality will be respected to the greatest degree possible. Any student who believes they may be the victim of sexual misconduct is encouraged to report to one or more of the following resources:

- **Local Domestic Violence, Sexual Assault Advocacy Agency** 308-237-2599
- **Campus Police (or Security)** 308-865-8911
- **Title IX Coordinator** 308-865-8655

Retaliation against the student making the report, whether by students or University employees, will not be tolerated.

## Students with Disabilities

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students with documented disabilities. To receive accommodation services for a disability, students must be registered with the UNK Disabilities Services for Students (DSS) office, 175 Memorial Student Affairs Building, 308-865-8214 or by email [unkdso@unk.edu](mailto:unkdso@unk.edu)

## Students Who are Pregnant

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students who are pregnant. To receive accommodation services due to pregnancy, students must contact the Student Health office at 308.865.8218. The following links provide information for students and faculty regarding pregnancy rights. <https://thepregnantscholar.org/title-ix-basics/>  
<https://nwlc.org/resource/faq-pregnant-and-parenting-college-graduate-students-rights/>

## UNK Statement of Diversity & Inclusion

UNK stands in solidarity and unity with our students of color, our Latinx and international students, our LGBTQIA+ students and students from other marginalized groups in opposition to racism and prejudice in any form, wherever it may exist. It is the job of institutions of higher education, indeed their duty, to provide a haven for the safe and meaningful exchange of ideas and to support peaceful disagreement and discussion. In our classes, we strive to maintain a positive learning environment based upon open communication and mutual respect. UNK does not discriminate on the basis of race, color, national origin, age, religion, sex, gender, sexual orientation, disability or political affiliation. Respect for the diversity of our backgrounds and varied life experiences is essential to learning from our similarities as well as our differences. The following link provides resources and other information regarding D&I: <https://www.unk.edu/about/equity-access-diversity.php>

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**Distribution of course materials:** The materials on the course website are only for the use of students enrolled in this course for purposes associated with this course and may not be retained or further disseminated. The materials on the course website may be protected by copyright, and any further use of this material maybe in violation of Federal copyright law.

**Disclaimer:** Any typographical errors in this Course Outline are subject to change and will be announced on the course Canvas page.

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## Tentative Spring 2024 Course Schedule

All work due by 11:59PM Central Time unless otherwise indicated. Required content not listed here may be provided in Canvas.

Week	Topics	Required Readings	Assessment
1	Introduction to microbiology	Ch. 1, 2	Q1
2	Bacterial and archaeal cell structure;	Ch. 3, 4	Q2
3	Eukaryotic cell structure; viruses and other acellular infectious agents	Ch. 5, 6	Q3
4	Bacterial and archaeal growth; <u>Discussion: fermentation and the making of beer</u>	Ch. 7, 8, 9	Q4; D1
5	Microbial metabolism	Ch. 10, 11, 12	Q5
6	Microbial molecular biology; <u>Discussion: microbes and cancer</u>	Ch. 13, 14, 15	Q6; D2
7	Microbial genetics	Ch. 16, 17, 18	Q7; mA1
8	Spring semester break		

9	Microbial diversity	Ch. 19-25	Q8
10	Microbial ecology	Ch. 26-30	Q9
11	Host resistance and adaptive immunity; <u>Discussion: antibiotic resistance</u>	Ch. 31, 32	Q10; D3
12	Infection and Pathogenicity	CH. 33, 34	Q11
13	Clinical and public health microbiology	Ch. 35, 36	Q12
14	Human diseases; <u>Discussion emerging and re-emerging infectious diseases</u>	Ch. 37, 38, 39	Q13; D4
15	Applied microbiology	Ch. 40, 41, 42	Q14
16	Dead week		mA2
17	Finals week		P1

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