BIOL 3300 GENERAL MICROBIOLOGY

Course Description

Biology, ecology, and diversity of microorganisms. Emphasis placed on bacteria, viruses, fungi, and protists, and their role in the environment. One lectures, one labs.

Prerequisite/Restriction: BIOL 1610 and BIOL 1615 (with a grade of C- or better); CHEM 1120 or CHEM 1220 or CHEM 2300 or CHEM 2310 (may be taken concurrently). To receive University Studies Breadth Life Sciences (BLS) credit, students must complete both BIOL 1610 and BIOL 3300. The BIOL 1610 and BIOL 3300 option for BLS credit is available only to students majoring in Biological Engineering or Environmental Engineering.

Semester(s) Traditionally Offered: Fall, Spring

Fees

USU includes a $100.00 lab fee for this course. These funds are used to provide media and equipment for work with bacteria, repair and maintenance of microscopes, and additional supplies for the course.

Course Objectives

By the end of this course, you will be able to:

1. Explain the functional and structural aspects of microorganisms that have contributed to their continuing importance for life on planet Earth.
2. Demonstrate mastery of the metabolic processes, ecological roles, and evolutionary history associated with the extreme diversity of microorganisms present on the planet Earth.
3. Design and safely complete basic experiments associated with bacteria, archaea, fungi, and other microorganisms in the lab.

Instructor

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Course Resources

**Text:** Brock Biology of Microorganisms 15th ed., by Madigan et al., plus Mastering Microbiology

**Lab Manual:** Benson’s Microbiological Applications (Selected material, 13th or 14th Ed.), by Brown

Course Requirements

Each student will:

1. Complete assigned reading by their assigned due dates.
2. Come to class prepared to engage with other students and discuss the topic of the class.
3. Be proactive and personally responsible for exam and assignment deadlines.
4. Prepare for lab exercises by reading and understanding labs before the start of class.
5. Be aware of the safety requirements for the course and follow all appropriate safety rule during the course.

Evaluation Methods and Criteria

**Final Grade:** Your final grade in the course will be based on a combination of weekly (roughly) small lab reports, a single large lab report due at the end of the semester and a lab practical (quiz) that you will complete before the fall (Thanksgiving) break. You will receive a separate grade for the lab portion of the course.

**Summary**

**Lab Reports:** 12 reports @ 10 points each 120 points

**Unknown Bacteria Project Report:** 50 points

**Lab Quizzes:** 13 @ 5 points each (drop the lowest one) 60 points

**Lab Practical (Online):** 20 points

**Total:** 250 points

Lab Reports: No late lab reports. They are due before class on the Tuesday after we complete the lab. You can either place the lab reports in the folder provided in the lab or scan and submit them online in Canvas. These will be graded on both completion and accuracy.

Unknown Bacteria Report: This will be due at the end of the semester (prior to finals). Part of the curriculum (learning goals) for upper biology courses is to teach you to do science and learn how to communicate through writing. Your final lab report will require
you to collect and record data accurately through the second part of the semester and then organize those results in a paper that present your data and draws conclusions in an organized and thoughtful manner. I will provide a detailed rubric with the assignment to make you understand how you will be evaluated.

Lab Quizzes: These are open book and all of them will be available at the beginning of the course. Quizzes are due before Tuesday class on the week we start that lab. I will not accept late quizzes. I will drop the lowest of these. You will still be responsible for these if we move online.

Lab Practical (Quiz): This will be an online quiz that will require you to use some of what you've learned in lab to identify microbes and microbial structures. Traditionally this is done in lab but Covid-19 will prevent us from doing this safely so you lab practical will conducted online with pictures of slide rather than in lab.

Course Schedule & Canvas: You will need to use the course website on CANVAS to the course schedule, access all materials, current grade status, course information, link to my email, study guides, links to useful learning resources and more. Please use the calendar and syllabus function in Canvas to see the current schedule (dates) for exams and assignments as well as the topic list.

Safety: Safety in the lab is your responsibility. Because many microorganisms are pathogenic lab safety is critical in this course and the following rules are not flexible:

1) No food or drink in the lab (including water).

2) No gum, candy, mints or the equivalent.

3) Do not use your mobile devices during lab or touch them when you have gloves on.

4) Always use personal protection: lab coat, gloves, and facial protection in lab.

5) Do not wear personal protection outside the lab.

6) Do not apply makeup or Chapstick in the lab.

7) Wash hands and clean-up after lab.
**Studying:** Do your best to complete assignments on time. Spend time outside of class thinking about making connections between what you are reading, what we are talking about in class, what we are doing in lab, and your daily life. Since we will spend time on complex concepts in class, you are responsible for learning much of the vocabulary on your own. Flash cards are good for this. The only way to be successful in this course will be to keep up with the reading assignments. Please do the reading. Finally, some of the BEST study resources are your peers. I strongly encourage you to study together and try teaching each other as a way to strengthen your understanding of the material.

**Online Student Resources:** In addition to the textbook website, the USU Academic Resource Center can help you develop your study skill at the Online Learning Center ([https://www.usu.edu/asp/](https://www.usu.edu/asp/)). Additionally, the Student Policy Manual can be read online at [http://www.usu.edu/policies/](http://www.usu.edu/policies/).

**Grade Scheme**

The following grading standards will be used in this class:

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<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>100 % to 93.0%</td>
</tr>
<tr>
<td>A-</td>
<td>&lt; 93.0 % to 90.0%</td>
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<tr>
<td>B+</td>
<td>&lt; 90.0 % to 87.0%</td>
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<tr>
<td>B</td>
<td>&lt; 87.0 % to 83.0%</td>
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<tr>
<td>B-</td>
<td>&lt; 83.0 % to 80.0%</td>
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<tr>
<td>C+</td>
<td>&lt; 80.0 % to 77.0%</td>
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<td>C</td>
<td>&lt; 77.0 % to 73.0%</td>
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<td>Grade</td>
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<tr>
<td>C-</td>
<td>&lt; 73.0 % to 70.0%</td>
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<tr>
<td>D+</td>
<td>&lt; 70.0 % to 67.0%</td>
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<tr>
<td>D</td>
<td>&lt; 67.0 % to 60.0%</td>
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<td>F</td>
<td>&lt; 59.0 % to 0.0%</td>
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</tbody>
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**Course Schedule/Outline**

See Below & Home Page

**Attendance and Excused Absences Policy**

**Attendance:** Given the current Covid-19 situation I will not require attendance. Much of the course is designed to operator online and I will be providing extensive video to support the textbook.

**Nonattendance Policy**

**Students May Be Dropped For Nonattendance**

If a student does not attend a class during the first week of the term or by the second class meeting, whichever comes first, the instructor may submit a request to have the student dropped from the course. *(This does not remove responsibility from the student to drop courses which he or she does not plan to attend.)* This option is typically used for classes that are full and the instructor is trying to make a seat available for another student, but may be considered for other courses. Requests must be made during the first 20 percent of the course and will be considered on an individual student basis. Students who are dropped from courses will be notified by the Registrar’s Office through their preferred e-mail account (see 2018-2019 General Catalog [http://catalog.usu.edu/content.php?catoid=12&navoid=3955]).

**Assumption of Risk**

All classes, programs, and extracurricular activities within the University involve some risk, and certain ones involve travel. The University provides opportunities to participate in these programs on a voluntary basis. Therefore, students should not participate in them if they do not care to assume the risks. Students can ask the respective program leaders/sponsors about the possible risks a program may generate, and if students are not willing to assume the risks, they should not select that program. By voluntarily participating in classes, programs, and extracurricular activities, a student does so at his or her own risk. General information about University Risk Management policies, insurance coverage, vehicle use policies, and risk management forms can be found at: [http://www.usu.edu/riskmgmt/](http://www.usu.edu/riskmgmt/)
Library Services

All USU students attending classes in Logan, at our Regional Campuses, or online can access all databases, e-journals, and e-books regardless of location. Additionally, the library will mail printed books to students, at no charge to them. Students can also borrow books from any Utah academic library. Take advantage of all library services and learn more at libguides.usu.edu/rc. (http://libguides.usu.edu/rc)

Classroom Civility

Utah State University supports the principle of freedom of expression for both faculty and students. The University respects the rights of faculty to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede the learning process. Disruptive classroom behavior will not be tolerated. An individual engaging in such behavior may be subject to disciplinary action. Read Student Code Article V Section V-3 (https://studentconduct.usu.edu/studentcode/article5) for more information.

University Policies & Procedures

COVID-19 Classroom Protocols

In order to continue to provide a high standard of instruction at USU, and to limit the spread of COVID-19 during the pandemic, students are asked to follow certain classroom protocols during the fall 2020 semester. These protocols are in place not only for your safety but also the safety of the rest of the campus community. You will be asked to clean your desk area at the start of each class, sit in designated seats, wear face coverings, and follow dismission instructions. There may be individual medical circumstances that prevent some students from using face coverings. These circumstances will be rare, but if they do exist, we ask that everyone be respectful. It is imperative that we each do our part so that on-campus instruction can continue.

Academic Freedom and Professional Responsibilities

Academic freedom is the right to teach, study, discuss, investigate, discover, create, and publish freely. Academic freedom protects the rights of faculty members in teaching and of students in learning. Freedom in research is fundamental to the advancement of truth. Faculty members are entitled to full freedom in teaching, research, and creative activities, subject to the limitations imposed by professional responsibility. Faculty Code Policy #403 (http://www.usu.edu/hr/files/uploads/Policies/403.pdf) further defines academic freedom and professional responsibilities.

Academic Integrity – "The Honor System"

Each student has the right and duty to pursue his or her academic experience free of dishonesty. To enhance the learning environment at Utah State University and to develop student academic integrity, each student agrees to the following Honor Pledge:

"I pledge, on my honor, to conduct myself with the foremost level of academic integrity."

A student who lives by the Honor Pledge is a student who does more than not cheat, falsify, or plagiarize. A student who lives by the Honor Pledge:

- Espouses academic integrity as an underlying and essential principle of the Utah State University community;
- Understands that each act of academic dishonesty devalues every degree that is awarded by this institution; and
- Is a welcomed and valued member of Utah State University.

Academic Dishonesty
The instructor of this course will take appropriate actions in response to Academic Dishonesty, as defined the University's Student Code. Acts of academic dishonesty include but are not limited to:

- **Cheating**: using, attempting to use, or providing others with any unauthorized assistance in taking quizzes, tests, examinations, or in any other academic exercise or activity. Unauthorized assistance includes:
  - Working in a group when the instructor has designated that the quiz, test, examination, or any other academic exercise or activity be done “individually;”
  - Depending on the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments;
  - Substituting for another student, or permitting another student to substitute for oneself, in taking an examination or preparing academic work;
  - Acquiring tests or other academic material belonging to a faculty member, staff member, or another student without express permission;
  - Continuing to write after time has been called on a quiz, test, examination, or any other academic exercise or activity;
  - Submitting substantially the same work for credit in more than one class, except with prior approval of the instructor; or engaging in any form of research fraud.

- **Falsification**: altering or fabricating any information or citation in an academic exercise or activity.

- **Plagiarism**: representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes using materials prepared by another person or by an agency engaged in the sale of term papers or other academic materials.

For additional information go to: ARTICLE VI. University Regulations Regarding Academic Integrity (https://studentconduct.usu.edu/studentcode/article6)

**Sexual Harassment/Title IX**

Utah State University is committed to creating and maintaining an environment free from acts of sexual misconduct and discrimination and to fostering respect and dignity for all members of the USU community. Title IX and USU Policy 339 (http://www.usu.edu/policies/339) address sexual harassment in the workplace and academic setting.

The university responds promptly upon learning of any form of possible discrimination or sexual misconduct. Any individual may contact USU's Office of Equity (https://equity.usu.edu/) for available options and resources or clarification. The university has established a complaint procedure to handle all types of discrimination complaints, including sexual harassment (USU Policy 305 (http://www.usu.edu/policies/305/)), and has designated the Office of Equity Director/Title IX Coordinator as the official responsible for receiving and investigating complaints of sexual harassment.

**Withdrawal Policy and "I" Grade Policy**

Students are required to complete all courses for which they are registered by the end of the semester. In some cases, a student may be unable to complete all of the coursework because of extenuating circumstances, but not due to poor performance or to retain financial aid. The term ‘extenuating’ circumstances includes: (1) incapacitating illness which prevents a student from attending classes for a minimum period of two weeks, (2) a death in the immediate family, (3) financial responsibilities requiring a student to alter a work schedule to secure employment, (4) change in work schedule as required by an employer, or (5) other emergencies deemed appropriate by the instructor.

**Students with Disabilities**

USU welcomes students with disabilities. If you have, or suspect you may have, a physical, mental health, or learning disability that may require accommodations in this course, please contact the Disability Resource Center (DRC) (http://www.usu.edu/drc/) as early in the semester as possible (University Inn # 101, (435) 797-
2444, drc@usu.edu (mailto:drc@usu.edu). All disability related accommodations must be approved by the DRC. Once approved, the DRC will coordinate with faculty to provide accommodations.

Students who are at a higher risk for complications from COVID-19 or who contract COVID-19 may also be eligible for accommodations.

**Diversity Statement**

Regardless of intent, careless or ill-informed remarks can be offensive and hurtful to others and detract from the learning climate. If you feel uncomfortable in a classroom due to offensive language or actions by an instructor or student(s) regarding ethnicity, gender, or sexual orientation, contact:

- Division of Student Affairs: https://studentaffairs.usu.edu (https://studentaffairs.usu.edu/), (435) 797-1712, studentservices@usu.edu (mailto:studentservices@usu.edu), TSC 220
- Student Legal Services: https://ususa.usu.edu/student-association/student-advocacy/legal-services (https://ususa.usu.edu/student-association/student-advocacy/legal-services), (435) 797-2912, TSC 326,
- Access and Diversity: http://accesscenter.usu.edu (http://accesscenter.usu.edu/), (435) 797-1728, access@usu.edu (mailto:access@usu.edu); TSC 315
- Multicultural Programs: http://accesscenter.usu.edu/multiculture (http://accesscenter.usu.edu/multiculture), (435) 797-1728, TSC 315
- LGBTQA Programs: http://accesscenter.usu.edu/lgbtqa (http://accesscenter.usu.edu/lgbtqa/), (435) 797-1728, TSC 3145
- Provost’s Office Diversity Resources: https://www.usu.edu/provost/diversity (https://www.usu.edu/provost/diversity/), (435) 797-8176

You can learn about your student rights by visiting:
The Code of Policies and Procedures for Students at Utah State University: https://studentconduct.usu.edu/studentcode (https://studentconduct.usu.edu/studentcode/)

**Grievance Process**

Students who feel they have been unfairly treated may file a grievance through the channels and procedures described in the Student Code: Article VII (https://studentconduct.usu.edu/studentcode/article7).

**Full details for USU Academic Policies and Procedures can be found at:**

- Student Conduct (http://www.usu.edu/studentconduct)
- Student Code (https://studentconduct.usu.edu/studentcode/)
- Academic Integrity (https://studentconduct.usu.edu/studentcode/article6)
- USU Selected Academic Policies and Procedures (http://www.usu.edu/provost/faculty-life/syllabus.cfm)

**Emergency Procedures**

In the case of a drill or real emergency, classes will be notified to evacuate the building by the sound of the fire/emergency alarm system or by a building representative. In the event of a disaster that may interfere with either notification, evacuate as the situation dictates (i.e., in an earthquake when shaking ceases or immediately when a fire is discovered). Turn off computers and take any personal items with you. Elevators should not be used; instead, use the closest stairs.

**Mental Health**

Mental health is critically important for the success of USU students. As a student, you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events
may lead to diminished academic performance or reduce your ability to participate in daily activities. Utah State University provides free services for students to assist them with addressing these and other concerns. You can learn more about the broad range of confidential mental health services available on campus at Counseling and Psychological Services (CAPS) (https://counseling.usu.edu).

Students are also encouraged to download the “SafeUT App” (https://healthcare.utah.edu/uni/programs/safe-ut-smartphone-app) to their smartphones. The SafeUT application is a 24/7 statewide crisis text and tip service that provides real-time crisis intervention to students through texting and a confidential tip program that can help anyone with emotional crises, bullying, relationship problems, mental health, or suicide related issues.