

# **Microbiology BI 330 Spring 2018 Course Syllabus**

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Class meetings: Wednesdays and Fridays, 8:30-9:50 MKC240

Office hours: Mondays, Tuesdays 11:30-1:00, Klamath 32

**Assistant:** Kaye Shek [kshek@uoregon.edu](mailto:kshek@uoregon.edu) Office hours: TBD

## **Course description**

This course in Microbiology introduces students to the cell biology, physiology, evolution and ecology of microorganisms. Students will gain an appreciation for the diversity and elegance of microbial life strategies, the role of microorganisms in global processes, and microbial interactions with macroorganisms. Student will learn how the scientific process is applied in microbiology and become familiar with modern experimental methods for studying microorganisms in the laboratory and in their natural habitats. The course is organized into four parts:

### **Part 1: Microbial Cell biology**

In the first portion of the course, we will study the structure and function of microbial cells, including the cell wall, the cell membrane, and genetic material. You will learn how microbial populations grow, experimental approaches for measuring this growth, and practical approaches for controlling microbial growth. We will also discuss the biology and importance of non-bacterial microorganisms including microbial eukaryotes and viruses.

### **Part 2: Microbial Genetics and Evolution**

Next will we explore how genetic information is exchanged between microbial cells, how genes are made into proteins, and how this process is regulated. We will then take an in-depth look at the genetic approaches used to study cellular behaviors of microbial species, specifically including their ability to communicate, move, and sense their environment. We will consider the origins of life on earth and how microbial physiologies have diversified and changed our planet. Finally, we will discuss how microbial genes and physiologies have been harnessed for human benefit.

### **Part 3: Physiology and functional diversity**

The third part of the class focuses on the functional and metabolic diversity of microorganisms. We will study the metabolic strategies used by different classes of microorganisms that make their livings in remarkable ways from limited resources, for example, generating energy from sunlight and inorganic compounds. You will learn how these different strategies complement one another to structure microbial communities.

### **Part 4: Interactions and impacts of microorganisms**

The final portion of the class focuses on the ecology of microbes and considers how microbial metabolisms function in concert in different environments. We will familiarize ourselves with modern experimental approaches to studying microbial communities in nature and will survey the types of microbial communities that inhabit our planet. Then we will focus our attention on the microbial communities that live in association with plants and animals. We will investigate the mechanisms by which microbes and their hosts orchestrate their co-existence, ranging from pathogenic to mutualistic relationships.

## **Learning objectives**

This course is designed provide you with information and skills necessary to develop a sound understanding of the scope of the microbial world, how it is studied, and its role in shaping this planet and all it's inhabitants. You will become knowledgeable about the basic features of microbial cells, their lifestyles and metabolisms, and how they exist in their natural habitats. You will gain an understanding of the logic of seminal scientific experiments in the history of microbiology and scientific strategies used by microbiologists to study microorganisms.

## **Prerequisites**

The prerequisites for this course are BI214 or BI252. The course assumes knowledge of biologically important macromolecules and familiarity with basic cellular processes such as DNA replication, transcription, translation, and regulation of gene expression.

## **Course materials**

Textbook: ***Microbiology: An Evolving Science 4th ed.*** Slonczewski, Foster (W. W. Norton)  
Available at the UO Bookstore and will be on 2-hour reserve in the Science Library.

*Website.* Canvas ([canvas.uoregon.edu](http://canvas.uoregon.edu)) will be used to post all announcements, lecture notes, additional readings, media, practice problems.

*Lecture notes.* Lecture notes will be posted on Canvas the evening before class. These notes are merely an outline of what is to be discussed in class to aid in note taking; they are not a substitute for coming to class and will not completely cover all material to be discussed in class. If you miss class, it is your responsibility to obtain detailed notes from a classmate, as the instructors will not provide them.

*Readings and media:* Additional materials required for the class will be posted with the lecture notes on Canvas.

*iClickers.* We will use iClickers on Friday lectures. These exercises are intended to help with understanding lecture material and will not contribute significantly to course grade.

## **Acceptable technology use in the classroom**

If you choose to use a laptop or tablet computer for note taking, please sit toward the back of the classroom (unless the instructor requests otherwise) so that your screen content does not become a distraction to others. If we notice you are using an electronic device for non-class related activities, you will be asked to refrain from bringing it to further lectures. Cell phone use is prohibited during lectures. All electronics (e.g. cell phones, music players, laptops, tablets) must be out of reach during all quizzes and exams. Instructor permission is required for recording lectures.

## **Accessibility**

The University of Oregon aims to create inclusive learning environments. If aspects of the instruction or design of this course create disability-related barriers to your participation, 1) please notify the instructor, and 2) contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or [uoaec@uoregon.edu](mailto:uoaec@uoregon.edu). The AEC will advise the instructor on accommodation.

## **Academic integrity**

All students will be expected to adhere to the University's guidelines on academic integrity as outlined in the Student Conduct Code (<http://conduct.uoregon.edu>). Students are encouraged to discuss class material with one another, including the reading and problem sets. However, all submitted written work must be the original work of each student. Distribution of course materials, including exams, problem sets, quizzes, outside of those enrolled in the Spring 2018 Microbiology BI330 class is strictly prohibited.

## **Office hours:**

See times and locations above. The instructor and assistants will also be available to answer brief questions via email. Your email correspondences are an extension of your class participation, so please maintain a professional tone. Students are not permitted to drop in on Instructor or GEs in their lab or research spaces outside of office hours or scheduled appointments. Instructor and GEs will not respond to phone calls or text messages.

## **Student Assessments:**

Weekly quizzes =  $10 \times 10\% = 100\%$  (9 in class + 1 assignment)

Final exam =  $3 \times 10\% = 30\%$  Can replace 3 lowest-scoring quizzes

Participation =  $1 \times 10\% = (\% \text{ quiz attendance}) \times (\text{reading quizzes} + \text{iClicker}) + \text{citizenship}$

**Course grade scored from the best 10 out of 14 Assessments.**

Examples: best 6 quizzes + final(3) + participation, or best 9 quizzes + no final + participation

*Weekly quizzes* (60-100%) will occur every Wednesday during the last 20 minutes (9:30-9:50) of lecture and must be turned in before the Instructors leave the room. Quizzes will cover material from previous week's lectures and specific topics will be announced during Friday's lecture and posted in Canvas. No notes of any kind will be permitted, unless otherwise indicated. Each quiz is graded on a curve and worth 10% of your course grade. The three lowest quizzes can be replaced by the final exam. Early or make-up quizzes will not be offered for any reason.

*Final Exam* (0-30%) **10:15 am, Monday, June 11.** The final exam will follow a format similar to the quizzes. It will test your ability to apply knowledge and synthesize concepts learned throughout the quarter. If you are unable to take the final for any reason, then your grade will be calculated from all completed quizzes and participation.

*Participation.* (0 or 10%) Score =  $(\% \text{ Assessments taken}) \times (\% \text{ Reading Quiz scores} + \text{iClicker and in-class exercises})$ . Citizenship (in-class contributions, professionalism, etc.) = +/- 1% point.

*Reading quizzes* are short, online quizzes covering basic background knowledge, completed in Canvas before Friday lectures. You may take them as many times as you wish up until the due date. They contribute almost half of your participation grade.

*Practice Problems* will not be graded but are composed of example quiz questions to prepare you for the quizzes.

**Course Grade:** End-of-quarter point totals will be adjusted on a curve. Letter grade assignments will approximate standard cutoffs (90% A-, 80% B-...), but will ultimately be determined by gaps in the grade distribution. Grade totals displayed in Canvas will not reflect the final adjustment, but are intended to be a close underestimate of current grade.