



## MCB3020 Basic Biology of Microorganism

Summer 2024

Online Asynchronous, 3-Credits

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Zoom office hours - Zoom time & link is available within Canvas

*I genuinely care about your success in this course. Please reach out to me via email, phone calls, text messages. Your well-being during the semester is paramount to everything else. Please take care of your health while going through these stressful times in your professional life. Let me know if I can be of any assistance to you. I wish you all the best with your academic and professional endeavors.*

### Student Learning Objectives

Study of the basic microbiological principles, microbiological fundamentals, and applications: including medical, environmental, industrial microbiology, the relevant terminology in the area of microbiology. Specific area of study includes:

- Student will understand and comprehend the structure, metabolism, genetics, and impact of various microbes such as bacteria, viruses, fungi, and parasite on their environment.
- Understanding the microbial world and its impact on our lives (Microbes and human welfare). Knowing that Microbes are essential for life, and their activities support life and maintain the livability on planet earth.
- Exploring the diversity of microbial metabolism and genetics, regulation of gene expression, and their role in diverse microbial activities such as Microbiome, Bioremediation, Pathogenicity, etc.
- Understanding recombinant DNA technology and role of microbes in biotechnology, cloning and genetic engineering.
- Understanding bioinformatics, metagenomics, and bioinformatics
- Explore and understand microbial cell structure and function, the differences between prokaryotes and eukaryotes. Outline structures possessed by microbes that contribute to microbial activities and interactions with others.
- Exploring Microbial ecology, applied and environmental microbiology, and understanding microbes as primary producers (converting gas to mass, converting carbon dioxide, oxygen and nitrogen gas into soluble forms for other living organism to assimilate)
- Understanding microbes as agents of infectious diseases including the type of virulence factors they possess, and their mode of transmission.

- Explore human immune system and its role in encountering infectious diseases. Immunology discussion also includes Immunodeficiency, Hypersensitivity, Autoimmunity, and Vaccine development.
- Explore the role of therapeutics and antimicrobial drugs such as antibiotics, antiviral, antifungal, and parasitic drugs and study the mechanism of their action.
- Explore the role of microbes in human welfare and maintaining the health of planet earth (the Big Picture). Area of discussion also includes food microbiology, industrial and environmental microbiology
- Microbes are everywhere and their activities directly impact all forms of life and health of the planet earth.

### Outline of topics discussed in this course

- Explore prokaryotic cell structure, Eukaryotes vs. Prokaryotes
- Study of Physiology, Metabolism and Microbial growth
- Genetics of microorganisms, Genetic Engineering
- Host-Parasite Interactions
- Mechanism of Pathogenesis, Role of Virulence Factors
- Selected Infectious diseases
- Immune system, Host Defense Mechanism /Vaccines
- Antimicrobial AGENTS, Chemotherapeutics
- Microbial ecology and Symbiosis
- Applied and environmental microbiology
- Food, water, soil, and industrial Microbiology

This course closely follows the ASM Recommended Curriculum Guidelines for Undergraduate Microbiology, which include:

- Cell Structure and Function
- Role of Mutation and Horizontal Gene Transfer in Microbial Diversity
- Exploring the diversity of microbial metabolism
- Discussing Flow of Genetic Information
- Microbiome and Impact of Microbial Activities on Human Welfare

### Course Description & General Education Purpose

Explore prokaryotic cell structure and function. Compare prokaryotes vs. eukaryotes. Study microbial growth, physiology, genetics, metabolism, and their role in chemical transformations, infectious disease, public health, and agriculture. Fundamental concepts are discussed, followed by beneficial and harmful actions of microorganisms as they affect our lives.

**McGraw Hill Connect Website:** McGraw Hill Connect for “Prescott’s Microbiology by Willey, Sherwood and Woolverton, 12<sup>th</sup> Edition” is required for this course. Course website in Canvas provides a link to McGraw Hill connect. This site provides complete access to textbook chapters, homework, online quizzes, figures, tables, animations, etc. The e-textbook serves as a reference that provides tutorial information, helps students prepare for the lectures, and provides supplemental materials for the lectures. It also provides practice exams. Students may take these exams multiple times. Most of the tables, figures, and animations used in lectures and lecture notes come from this website and the e-book.

## Student & Instructor Expectations

I am committed to (1) providing a welcoming atmosphere; (2) teaching you something new and unexpected within the course topics; and (3) introducing you to relevant topics & ideas. I am available during Zoom office hours which are posted within Canvas.

For this course to run smoothly, I expect students to:

- **Have** a computer, and stable internet connection (see the section below on “Online Submissions”).
- **Check Canvas** for announcements at least twice a week.
- Participate in class with **honesty**.
- **Be responsible for keeping up with due dates.** Use Canvas to identify all due dates. All deadlines are set for 11:59 pm ET. Late work is not accepted. Extra time has been built into all deadlines and due dates.
- **Submit work early**, if necessary. If you work or have extracurricular commitments that impact your ability to meet a course deadline, you need to submit quizzes, and exams before the due date.
- **Student-Instructor Communication Tool.** If you think a question has been graded unfairly or if you missed a quiz or assignment deadline, use Canvas messaging.

## Online Submissions

Students are responsible for verifying assignments are successfully submitted into Canvas. The instructor cannot be responsible for internet connections or failures. Locating a hard-wired connection (UF or public library) greatly reduces the instance of technical issues. Contact the instructor early if you foresee difficulty with maintaining a hard-wired connection (e.g., military service or living abroad). UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. <https://helpdesk.ufl.edu/> | 352-392-4357

## Course Prerequisites

Statement: Students are encouraged to be self-directed and take responsibility for their learning.

## Materials and Supplies & Fees

- The e-textbook for this course is fully online. McGraw Hill Connect for “Prescott’s Microbiology by Willey, Sherwood and Woolverton, 12<sup>th</sup> Edition”. This electronic textbook is required.
- Instructions on how to purchase and activate the E-Book are within the Canvas course. Do not purchase a paper edition.
- This e-textbook provides complete access to textbook chapters, homework, online quizzes, figures, tables, animations, etc. The e-textbook serves as a reference that provides tutorial information, helps students prepare for the lectures, and provides supplemental materials for the lectures. It also provides practice exams. Students may take these exams multiple times. Most of the tables, figures, and animations used in lectures and lecture notes come from the e-book.

## Course Topic Schedule

Dates/Modules	Topics	Assessments/Activities	Submission Date
Module 1 05/12-05/22	Course Orientation Introduction to Microbiology Exploring Microbial World	Orientation Quiz and Perusall 1 Honorlock Practice Test Module 1 Lectures	05/12-05/22
Module 2 05/12-05/22	Cell Structure and Function, Microscopy Prokaryotes vs Eukaryotes	Quiz 1 Homework 1 Module 2 Lectures	05/12-05/22
Module 3 05/12-05/22	Macromolecules and Cellular Chemistry, Microbial Growth and Nutrition	Quiz 2 Homework 2 Module 3 Lectures	05/12-05/22
<b>Module 4</b> <b>05/21-05/22</b>	<b>Exam ONE</b> <b>Module 1-3 Lectures/Notes</b>	<b>Exam ONE</b> <b>Module 1-3 Lectures/Notes</b>	<b>05/21-05/22</b>
Module 5 05/21-06/01	Microbial Metabolisms, Respiration and Fermentation	Perusall 2 Module 5 Lectures	05/21-06/01
Module 6 05/21-06/01	Microbial Genetics, Regulation of gene expression Horizontal gene transfer	Quiz 3 Homework 3 Module 6 Lectures	05/21-06/01
Module 7 05/21-06/01	Recombinant DNA, Cloning, Biotechnology-Bioinformatics, Genomics, Metagenomics	Quiz 4 Homework 4 Module 7 Lectures	05/21-06/01
<b>Module 8</b> <b>05/31-06/01</b>	<b>Exam TWO</b> <b>Module 5-7 Lectures/Notes</b>	<b>Exam TWO</b> <b>Module 5-7 Lectures/Notes</b>	<b>05/31-06/01</b>
Module 9 05/31-06/11	Survey of Microorganisms, Cellular and Acellular Structures, Virology	Perusall 3 Module 9 Lectures	05/31-06/11
Module 10 05/31-06/11	Chemotherapeutics- Antibiotics, antiviral, and other antimicrobial Agents	Quiz 5 Homework 5 Module 10 Lectures	05/31-06/11
Module 11 05/31-06/11	Microbial Ecology; Applied and Environ. Microbiology, Primary Producers	Quiz 6 Homework 6 Module 11 Lectures	05/31-06/11
<b>Module 12</b> <b>06/10-06/11</b>	<b>Exam THREE</b> <b>Module 9-11 Lectures/Notes</b>	<b>Exam THREE</b> <b>Module 9-11 Lectures/Notes</b>	<b>06/10-06/11</b>
Module 13 06/10-06/21	Immunity, Hypersensitivity, Immunodeficiency, and Autoimmune Diseases	Quiz 7 and Homework 7 Perusall 4 Module 13 Lectures	06/10-06/21
Module 14 06/10-06/21	Clinical and Diagnostic Microbiology-Identification of Infectious Diseases	Quiz 8 Homework 8 Module 14 Lectures	06/10-06/21
Module 15 06/10-06/21	Epidemiology, Mechanism of Pathogenicity, and Survey of Infectious Disease	Module 15 Lectures	06/10-06/21
<b>Module 16</b> <b>06/20-06/21</b>	<b>Exam FOUR</b> <b>Module 13-15 Lectures/Notes</b>	<b>Exam FOUR</b> <b>Module 13-15 Lectures/Notes</b>	<b>06/20-06/21</b>

## Grading Policy

Four scheduled exams are given through Canvas via Honorlock. Exams are conducted via Honorlock. Homework and quizzes will be required through McGraw Hill Connect.

## Final Grade Percentage for Assignments

Assignment Type	Points of Final Grade
Exams (4)	360 (60%)
McGraw Hill Connect HW (8)	80 (14%)
McGraw Hill Connect Quizzes (8)	80 (14%)
Microbes in the News Perusall Discussion Activities (4)	80 (14%)
Total	600 (102%)

## Grading Scale

Grading scale (Total accumulated percentage):

A	90% and Up
A-	87.5% – 89.9%
B+	85% – 87.4%
B	80% – 84.9%
B-	78% – 79.9%
C+	76% – 77.9%
C	67.5% – 75.9%
C-	65% – 67.4%
D	57% – 64.9%
E	55% or Below

A minimum grade of C is required for general education credit. A grade of C- is not a qualifying grade for major, minor, Gen Ed, or College Basic distribution credit. For further information on UF's Grading Policy. See the current [the current UF grading policies for more information](#).

This course meets the General Education requirement. Primary General Education Designation: Physical and Biological Sciences (B): <https://undergrad.aa.ufl.edu/general-education/gen-ed-courses/structure-of-gen-ed-courses/slos-and-performance-indicators/student-learning-outcomes/>

## Due Dates & Late Policy

Please be proactive and work ahead to avoid late submissions. Requirements for make-up exams, and other work in this course are consistent with university policies. [UF Attendance Policies](#)

## Academic Honesty

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by

abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Conduct Code specifies several behaviors that are in violation of this code and the possible sanctions. [Click here to read the Conduct Code](#). If you have any questions or concerns, please consult with the instructor or TAs in this class.

### Student Privacy Disclaimer:

For online course with recorded materials a statement informing students of privacy related issues such as: Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

### In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or guest lecturer during a class session.

Publication without the permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student

### Course Evaluation Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email, they

receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

## Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

## Services for Students with Disabilities

A statement related to accommodations for students with disabilities such as: Students with disabilities who experience learning barriers and would like to request academic accommodation should contact the disability Resource Center. [Click here to get started with the Disability Resource Center](#). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

## Campus Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

### Health and Wellness

- *U Matter, We Care*: If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or <https://umatter.ufl.edu/> to refer or report a concern and a team member will reach out to the student in distress.
- *Counseling and Wellness Center*: Visit <https://counseling.ufl.edu/> or call 352-392-1575 for information on crisis services as well as non-crisis services.
- *Student Health Care Center*: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit <https://shcc.ufl.edu/>
- *University Police Department*: Visit <https://police.ufl.edu/> or call 352-392-1111 (or 9-1-1 for emergencies).
- *UF Health Shands Emergency Room / Trauma Center*: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; visit <https://ufhealth.org/locations/uf-health-shands-emergency-room-trauma-center>
- *GatorWell Health Promotion Services*: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit <https://gatorwell.ufsa.ufl.edu/> or call 352-273-4450.

### Academic Resources

- *E-learning technical support*: Contact the UF Computing Help Desk at 352-392-4357 <https://helpdesk.ufl.edu/> or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

- [Career Connections Center](#): Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- [Library Support](#): Various ways to receive assistance with respect to using the libraries or finding resources.
- [Teaching Center](#): 1317 Turlington Hall, 352-392-2010. General study skills and tutoring.
- [Writing Studio](#): 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- *Student Concern*: [Report Student Concerns or Conduct](#)

### Additional Information

Instructors may choose to clarify in their syllabus their teaching philosophy, expectations for classroom behavior, utilization of e-learning, and other information that will help students succeed in the course.

### Privacy and Accessibility Policies

For information about the privacy policies of the tools used in this course, see the links below:

- Honorlock
  - [Honorlock Privacy Policy](#)
  - [Honorlock Accessibility](#)
- Instructure (Canvas)
  - [Instructure Privacy Policy](#)
  - [Instructure Accessibility](#)
- Microsoft
  - [Microsoft Privacy Policy](#)
  - [Microsoft Accessibility](#)
- Sonic Foundry (Mediasite Streaming Video Player)
  - [Sonic Foundry Privacy Policy](#)
  - [Sonic Foundry Accessibility \(PDF\)](#)
- Zoom
  - [Zoom Privacy Policy](#)
  - [Zoom Accessibility](#)
- McGraw Hill Connect
  - [McGraw Hill Privacy Policy](#)
  - [McGraw Hill Accessibility](#)