

# MCB3020-Basic Biology of Microorganisms-Fall 2023

## I. General Information

### MCB3020-Basic Biology of Microorganisms (Online)

Summer 2023

Meeting: 100% Online, Presented through eLearning (Canvas)

Department of Microbiology and Cell Sciences

Meets 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/>)

### Instructor

Dr. Karim Asghari, 1046 Microbiology Bldg. 980

Virtual Office Hours by Appointment Only

Email: Asghari@ufl.edu

Tel:

352-392-5226 Office

352-214-2469 Cell

X (Twitter): @MicrobesNews Microbes in The News

### Course Description

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 (B).

Outline of topics discussed in this course (B):

- Explore prokaryotic cell structure, Eukaryotes vs. Prokaryotes
- Study of Physiology, Metabolism and Microbial growth
- Genetics of microorganisms, Regulation of Gene Expression 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

## **Required & Recommended Course Materials**

**REQUIRED TEXTBOOK:** Textbook (E-BOOK) for this course is Prescott's Microbiology by Willey, Sherwood and Woolverton, 12<sup>th</sup> Edition in the form of E-book from Connect by McGraw Hill Education (**Required**). See the ISBN on UF registrar's office website. This course is included in UF ALL ACCESS Textbook program. See the link below for more details; <https://businessservices.ufl.edu/services/uf-bookstore/uf-all-access/>. Unless you opt out, as registered student in this course, you are already enrolled in All Access program. Go to UF registrar's website to redeem your access code for the eBook. Use the link provided in Canvas to access McGraw Hill Connect website. The E-book contains study aide and the required readings assigned for each exam. The e-textbook also serves as a reference that provides tutorial information, helps students prepare for the lectures, and provides supplemental materials for the lectures. Connect also provides practice exams. Students may take these exams multiple times. These exams draw questions from a pool of questions drawn for lectures and required reading materials. Most of the tables and figures used in the lectures come from this website and the e-book. Online Quizzes are also conducted via Connect as well.

**CANVAS COURSE WEBSITE:** The class is on E-learning (Canvas). The class syllabus, lecture presentations, study guides, and other materials will be posted on E-Learning throughout the semester. Questions about lecture material should be addressed during office hours or via email. Course details, clarifications, and Updates about the class policies will be posted online as announcements and/or emails on a regular basis. Students should check their emails and announcements on Canvas daily.

**McGraw Hill Connect Website:** Connect by McGraw Hill Prescott's Microbiology by Willey, Sherwood and Woolverton, 12<sup>th</sup> Edition is required for this course. See UF Registrar's Office website for correct ISBN number. Access this site requires purchasing of an access code through UF All Access. Purchasing print version of the textbook does not provide access code for Connect. Course website in Canvas provides a link to Connect. This site provides complete access to textbook chapters, online quizzes, figures, tables, etc. The site also contains the required readings assigned for each exam. 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. These exams draw questions from the lectures and required reading materials. Most of the tables and figures used in the lecture notes come from this website and the e-book. Online quizzes are conducted via Connect as well.

## II. Graded and Extra Credit Assignments:

**EXAMS:** Four scheduled exams are given through Canvas via Honorlock. Exams are conducted via Honorlock. Each exam contains fifty (50), all multiple-choice questions. You will have 90 minutes to complete each exam. Use of SCRATCH PAPERS OR ANY OTHER RESOURCES DURING THE EXAM SESSION IS STRICTLY PROHIBITED.

Exam materials come from lectures presentations, lecture notes, and assigned textbook readings. Study guide posted for each exam provides an excellent outline for topics covered for each exam. In some cases, information presented in class may be in contradiction with information from other sources, especially internet-posted materials. In these cases, exam questions will be based only on the information available in the textbook, lecture notes, or materials presented during the lecture presentations, and exams will be graded accordingly. Practice exams/answers available through Connect website to familiarize students with materials covered for each exam. Students should use these practice exams as real assessments of learning rather than study guides.

Requirements for class participation and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

**Online Extra Credit Quizzes:** There are EIGHT online quizzes available through McGraw Hill Connect Website. Each quiz carries 5 points and includes 10 questions. You take these quizzes online Through McGraw Hill Connect Website. Therefore, you do not need Canvas or Honorlock to submit these quizzes. See the McGraw Hill Connect course website for more details. Points from these quizzes are added to your total scores in the course. Taking Extra Credit Quizzes are considered timely class participations. They are designed to keep students engaged with the course. Therefore, Quizzes are closed after the due date and no late submission is possible. See Canvas under "QUIZZES" for date/time for each quiz. Each quiz remains open for several days. Quizzes will no longer be available in Connect after the due date. **Extra Credit Quizzes cannot be made up under any circumstances.**

Extra Credit Quizzes Submission Dates:

Extra Credit Quizzes	Ch.	Opening Date	Submission Date
Quiz ONE	3	08/28/2023	09/03/2023
Quiz TWO	7	09/04/2023	09/10/2023
Quiz THREE	11	09/25/2023	10/01/2023
Quiz FOUR	14	10/02/2023	10/08/2023
Quiz FIVE	6	10/23/2023	10/29/2023
Quiz SIX	17	10/30/2023	11/05/2023
Quiz SEVEN	32	11/13/2023	11/19/2023
Quiz EIGHT	34	11/27/2023	12/03/2023
Quiz Makeup	36	12/04/2023	12/10/2023

**GRADING/TESTS:** The final class grade is based on accumulated points. There are four (4) regularly scheduled non-cumulative exams, 100 points each (50 M/C questions). Exams are on Canvas via Honorlock. The course is based on 400 points. Points from Online Extra Credit Quizzes are considered bonus points and will be added on top of your total scores. A written (short answer) makeup exam is allowed for a missed exam due to an excused absence. Makeup exam contains short answer questions, fill-in-the-blank questions, but it does not contain any multiple choice or T/F questions.

Grading scale (Total accumulated points including exams and quizzes):

A	360 – 400 points
A-	356 – 359.9 points
B+	348 – 355.9 points
B	320 – 347.9 points
B-	316 – 319.9 points
C+	308 – 315.9 points
C	280 – 307.9 points
C-	275 – 279.9 points
D	240 – 274.9 points
E	000 – 239.9 points

**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: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>**

**Attendance:** Attendance is not required. There are no live, in-class sessions. Pre-Recorded Lectures are posted on MediaSite and can be accessed through a link on e-learning course site under Modules.

### III. Weekly Presentations Schedule

Sess. Date	TOPICS
08-21	Introduction to Microbiology and Microscopy
08-28	Macromolecules and Cellular Chemistry, Prokaryotes vs Eukaryotes
09-04	Cell Biology, Cell Structure and Function- Microscopy
09-11	Microbial Growth, Nutrition
<b>EXAM ONE</b>	<b>September 15-17, 2023 (Chapters 1-5, 7)</b>
09-18	Bacterial Metabolisms, Metabolic Pathways, Respiration and Fermentation
09-25	Bacterial Genetics, Regulation of Gene Expression
10-02	Horizontal Gene transfer (HGT) Bioinformatics, Genomics, Metagenomics
10-09	Recombinant DNA Technology, Genetic Engineering, Cloning
<b>EXAM TWO</b>	<b>October 13-15, 2023 (Chapters 10-14)</b>
10-16	Survey of Microorganisms, Cellular and Acellular Structures, Virology
10-23	Microbial Ecology; Applied and Environ. Microbiology, Primary Produces

10-30 Chemotherapeutics-Antibiotics, antiviral, and other antimicrobial Agents  
**Exam THREE November 07-09, 2023 (Chapters 6, 9, 16-18, 20)**

11-06 Immunity, Innate (Natural) vs Acquired (Specific) Immunity, AMI and CMI  
11-13 Hypersensitivity, Autoimmunity, Immunodeficiency, Immuno-Oncology  
11-20 Epidemiology, Mechanism of Pathogenicity, and Survey of Infectious Diseases  
11-27 Selected Infectious Diseases- Clinical and Diagnostic Microbiology, Serology  
**Exam FOUR December 09-11, 2023 (Chapters 32-40)**

**NOTE: See Canvas and Connect for required reading assignments**

#### **IV. Student Learning Outcomes (SLOs)**

Subject Area: Biological Sciences and Microbiology (B)

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, and their role in diverse microbial activities such as Microbiome, Bioremediation, Pathogenicity, etc.
- 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.
- 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.

#### **V. Required Policies**

Makeup Exam Policy-Requirements for class participation and make-up exams, assignments, and other work in this course are consistent with university policies that

can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

### **-Students Requiring Accommodation**

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. 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.

### **-UF Evaluations 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/>.

### **-University Honesty Policy**

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 Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or in this class.

### **-Counseling and Wellness Center**

Contact information for the Counseling and Wellness Center:

<http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Other UNIVERSITY SUPPORT SERVICES: Resources are available on campus for students having personal problems or lacking clear career and academic goals that interfere with their academic performance. These resources include:

- University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling.
- Student Mental Health, Student Health Care Center, 392-1171, personal counseling.
- Sexual Assault Recovery Services, 392-1161.
- Student Health Care Center, 392-1161.
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

### **Useful Links:**

- Center for Disease Control and Prevention: CDC: <http://www.CDC.gov>
- US Food and Drug Administration: FDA: <http://www.FDA.gov>
- US Environmental Protection Agency: EPA <http://www.EPA.gov>
- Microbiology and Cell Science: MCS: <http://microcell.ufl.edu>
- College of Agriculture and Life Sciences: CALS: <http://www.ifas.ufl.edu>
- University of Florida Libraries: UF Libraries: <http://www.uflib.ufl.edu>
- University of Florida: UF: <http://www.ufl.edu>

### **VI. End Notes:**

**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.**

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