



# BISC 333 General Microbiology

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## Course Overview

Bisc 333 General Microbiology is a course designed to introduce students to the basic physiology and diversity of microorganisms. By the end of this course, students will be able to describe key cellular aspects that differentiate microorganisms from other larger forms of life, and articulate the diversity of microbial life and the factors governing that diversity.

## Prerequisites:

Bisc 160: Biological Sciences I (Minimum grade: C)  
Bisc 161: Biological Sciences I Laboratory (Minimum grade: C)  
Bisc 162: Biological Sciences II (Minimum grade: C)  
Bisc 163: Biological Sciences II Laboratory (Minimum grade: C)  
Chem 105: General Chemistry I (Minimum grade: C)  
Chem 106: General Chemistry II (Minimum grade: C)

**Department policy for majors:** Successful completion of this course for the Biology major requires a C or better final grade.

## Instructor

### Patrick Curtis

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## Course Description

Morphology, taxonomy, ecology, physiology of bacteria and related microorganisms; basic techniques.

## Course Learning Objectives

After completing this course, the participant will be able to:

1. List at least 5 types of prokaryotic metabolism and compare them to eukaryotic metabolism.
2. Compare and contrast prokaryotic and eukaryotic core physiological processes.
3. Describe basic characteristics of at least 40 diverse prokaryotes.

## Methods of Instruction

Instructional methods used in this course include lectures, small written assignments, a laboratory portion (see Laboratory syllabus), and multiple-choice exams. Exams will be proctored using Proctorio.

## Course Expectations

Students should proceed sequentially through the modules according to the dates on the syllabus (see below).

### *Time management*

It is expected that the lecture portion of this class should take approximately 3 hours per week.

### *Ground Rules for Interaction/ Engagement*

Students are expected to engage with each other in a professional and courteous fashion.

### *Discussion board*

A discussion board is provided on the class Blackboard site as a mechanism of informal discussion. Students may post questions about material they do not understand, which may be answered by the instructor or other students.

### *Assignment Submissions*

At the end of each lecture, each student will submit one multiple choice question they design from the material from that lecture. These questions will be submitted via Blackboard quiz and will be due by 5 PM Central time the Friday of that lecture's week (see schedule below).

### *Exams*

Three multiple-choice exams will be taken during the semester. These will be administered via Blackboard and will utilize the Proctorio proctoring service. An ungraded dummy quiz will be posted for students to troubleshoot any technological issues. Students will have 1 hour to complete each exam, and will have a 1 hour window on the exam day to initiate the exam.

## Course Requirements

### *Recommended Materials*

Brock Biology of Microorganisms, 14th Edition (recommended).

### *Technology*

#### *INTERNET ACCESS*

You must have access to the Internet, preferably high speed Internet, for the duration of this course.

- *SOFTWARE*

You must have access to a computer with the following software installed:

- Microsoft Office - You must have consistent access to a professional word processor and a presentation program. Alternatives to MS Office are [WPS Office Free](#), [SoftMaker FreeOffice](#), [OpenOffice](#), and [LibreOffice](#).

○ *BROWSERS, PLUG-INS, PLAYERS AND VIEWERS*

In order to take full advantage of all the features in this course, be sure you have the right technology at your fingertips. This includes:

- Google Chrome browser – required for Proctorio
- [Acrobat Reader](#)

Run [Blackboard Browser Checker](#) to verify browser and installed technologies on your computer.

○ *HARDWARE*

- Computer Speakers or headsets

### *Tech support*

The [IT Helpdesk](#), centrally located in Weir Hall, is open Monday through Friday, 8 a.m. to 5 p.m. The helpdesk offers assistance to Ole Miss students and employees with technology-related issues involving software, hardware and networking. It provides support for email, Wi-Fi, Microsoft Office and other campus-wide applications. Come by Weir Hall or call us at 662-915-5222. Email [helpdesk@olemiss.edu](mailto:helpdesk@olemiss.edu) or visit their website for more information.

## Course Policies

### *Communication Policy*

The professor can be contacted through email, Blackboard discussion board, or during the weekly Zoom office hours.

### *Grading*

Exams – three exams will be taken during the semester. Each exam is worth 80 points.

Lecture questions – each lecture question is worth 2 points. There are 32 lectures this semester, for a total of 64 points.

Laboratory – the laboratory portion of the course is worth 100 points. Each week you will perform a lab exercise from Labster Online Virtual labs. In each exercise are embedded quiz questions. While each lab exercise has its own total point value (typically 100-300 points each), the laboratory portion of the course is worth a total of 100 points. Therefore, your lab score for the semester will be normalized to 100 points.

Categories	Points
Exams (3 x 80 pts)	240
Lecture question submissions	64
Laboratory	100
<b>Total</b>	<b>100%</b>

### *Grading Scale*

A = 90 – 100%

B = 80 – 89%

C = 70 – 79%

D = 60 – 69%

F = Below 59%

### *Attendance Policy*

This course is designed for students to digest material on a weekly basis, watching the lectures for each week and submitting their questions for those lectures. While working ahead is permitted, it is not necessarily recommended. During the first two weeks of class, each student must take the introductory quiz 1) to verify their technology is compatible with the Proctorio service and 2) provide attendance data for attendance verification.

### *Late Work Policy*

Given that material for this course is available well in advance, late work is not accepted. The only exception to this is the exams which have a very specific time window. Should unforeseen circumstances arise, please contact the instructor.

## **University of Mississippi Policies**

### *Testing Policy*

The tests for this course will be given on Blackboard using Proctorio (proctoring service provided by the University of Mississippi). Please visit to the [Proctorio Student Guide webpage](#) to learn more about using this testing software. Also, the University of Mississippi's policy on [Proctored Assessments in Online Education](#) explains the purpose and use of proctored assessments.

During the first two weeks of the course, you will be required to take an ungraded "Introductory Quiz" to 1) verify your attendance in the course, and 2) troubleshoot taking an exam using Proctorio.

### *Disability Access and Inclusion*

The University of Mississippi is committed to the creation of inclusive learning environments for all students. If there are aspects of the instruction or design of this course that result in barriers to your full inclusion and participation or to accurate assessment of your achievement, please contact the course instructor as soon as possible. Barriers may include, but are not necessarily limited to, time limits, difficulty with the acquisition of lecture content, inaccessible web content or the use of non-captioned or non-transcribed video and audio files. Students must also contact Student Disability Services at 662-915-7128 or [sds.olemiss.edu](mailto:sds.olemiss.edu) so that office can 1) explore if barrier removal is necessary; 2) provide you, if approved, with Instructor Notification forms; 3) facilitate the removal of curricular barriers; and 4) ensure you have equal access to the same opportunities for success that are available to all students.

### ***Copyright Notice***

Materials used in connection with this course may be subject to copyright protection under Title 17 of the United States Code. Under certain Fair Use circumstances specified by law, copies may be made for private study, scholarship, or research. Electronic copies should not be shared with unauthorized users. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability as well as disciplinary action under University policies.

### ***IT Appropriate Use Policy***

This policy sets forth the privileges of and restrictions on students, faculty, staff, and other users with respect to the computing and telecommunications systems offered by the University of Mississippi (UM). This policy is designed to protect the University community from illegal or damaging actions by individuals, either knowingly or unknowingly. Inappropriate use exposes the University to risks, including virus attacks, compromise of network systems and services, and legal issues. This policy directly addresses copyright issues related to illegal downloads and peer-to-peer file sharing. For Appropriate Use Policy questions, send an email to [aup@olemiss.edu](mailto:aup@olemiss.edu).

### ***Academic integrity***

The University of Mississippi is dedicated to supporting and sustaining a safe and scholarly community of learning dedicated to nurturing excellence inside and outside of the classroom. Each student has a duty to become familiar with University values and standards reflected in University policies, and each student has a duty to honor University values and standards reflected in University policies. These policies are outlined in the [M Book](#). For a complete listing of policies, please visit the University Policy Directory.

### ***Verification of Student Attendance Policy***

The University must abide by federal guidelines to verify the participation of online students. For all course types, including thesis, internships, labs, online courses, etc., the instructor must verify your participation based on some type of participation. This may include submission of an online assignment or other course related contact with the instructor. (However, simply logging into Blackboard will not count as an academically related activity.) [Attendance Policy for Online Education](#)

### ***Student Identity Policy***

Federal regulations, our accrediting agency (SACS) and university policies require that safeguards are used to ensure that the student who receives the academic course credit is actually the person doing the work. You will need to present your student ID before taking proctored exams and your instructor may verify your identity through live or virtual meetings, or by using an identity verification program.

### ***Student Privacy Policy***

The University of Mississippi protects the privacy of all students, including online and distance learning students, through adherence to the Family Educational Rights and Privacy Act of 1974 (FERPA) through compliance with other institutional policies and procedures governing the management and security of protected information of faculty, staff, and students, and by outlining the expectations of privacy for the university community as regards to electronic information. [Student Privacy Policy](#)

## Course Outline

Date	Topic	Textbook pages
Week 1	Lecture 1 - Introduction to Microbiology	13-20
Aug 24-28	Lecture 2 - Essential Chemistry for Microbiology	N/A
	Lecture 3 - Microbial Evolution and Systematics	348-54
	Lecture questions 1-3 due Friday, Aug 28	
	Virtual Lab – Lab Safety	
Week 2	Lecture 4 - Microbial Metabolism Part 1 (Energy)	79-86
Aug 31-Sep 4	Lecture 5 - Microbial Metabolism Part 2 (Fermentation/Respiration)	86-95
	Lecture 6 - Microbial Classification and Community Analysis	355-9, 369-75, 579-87
	Lecture questions 4-6 due Friday, Sep 4	
	Virtual Lab – Bacterial Isolation	
Week 3	Lecture 7 - Metabolic Diversity Part 1	385-92
Sep 7-11	Lecture 8 - Metabolic Diversity Part 2/Biogeochemical Cycles	393-400, 408-15
	Lecture 9 - Microbial Cell Biology Part 1 (Cell wall/membrane)	32-47
	Lecture questions 7-9 due Friday, Sep 11	
	Virtual Lab – Bacterial Cell Structures	
Week 4	Lecture 10 - Microbial Cell Biology Part 2 (Cell Structures)	47-52
Sep 14-18	Lecture 11 - Proteobacteria (Alpha)	480-4
	Lecture 12 - Microbial Growth	144, 149-57, 171-8
	Lecture questions 10-12 due Friday, Sep 18	
	Virtual Lab – Bacterial Quantification by Culture	
Week 5	<b>Exam 1 – Friday, Sep 25, available 12-1 PM Central</b>	
Sep 21-25	Virtual Lab – Bacterial Growth Curves	
Week 6	Lecture 13 - Basic Molecular Biology Part 1 (DNA Replication)	108-20
Sep 28-Oct 2	Lecture 14 - Basic Molecular Biology Part 2 (Transcription)	120-124
	Lecture 15 - Proteobacteria (Beta, Gamma)	484-5, 486-9
	Lecture questions 13-15 due Friday, Oct 2	
	Virtual Lab – Control of Microbial Growth	
Week 7	Lecture 16 - Basic Molecular Biology Part 3 (Translation)	127-35
Oct 5-9	Lecture 17 - Regulation of Gene Expression (Part 1)	216-21, 236-39
	Lecture 18 - Proteobacteria (Gamma)	486-9
	Lecture questions 16-18 due Friday, Oct 9	
	Virtual Lab – Protein Synthesis	
Week 8	Lecture 19 - Regulation of Gene Expression (Part 2)	222-3
Oct 12-16	Lecture 20 - Overview of Bacterial Genetics	292-5, 299-307
	Lecture 21 - Proteobacteria (Delta, Epsilon)	489-91
	Lecture questions 19-21 due Friday, Oct 16	
	Virtual Lab – Genetic Transfer in Bacteria	
Week 9	<b>Exam 2 – Friday, Oct 23, available 12-1 PM Central</b>	
Oct 19-23	Virtual Lab – The Gram Stain	
Week 10	Lecture 22 - Signaling	225-6, 228-30
Oct 26-30	Lecture 23 - Firmicutes Part 1	494-7
	Lecture 24 - Firmicutes Part 2	491-4, 497-8
	Lecture questions 22-24 due Friday, Oct 30	
	Virtual Lab – Identification of Unknown Bacteria	

Week 11	Lecture 25 - Protein Secretion	135-8
Nov 2-6	Lecture 26 - Motility	56-63, 226-228
	Lecture 27 - Actinobacteria	499-504
	Lecture questions 24-27 due Friday, Nov 6	
	Virtual Lab – Pasteurization and Sterilization	
Week 12	Lecture 28 - Cyanobacteria	435-40, 443-5
Nov 9-13	Lecture 29 - Other Bacteria	466-8, 504-14
	Lecture 30 - Archaea	518-41
	Lecture questions 28-30 due Friday, Nov 13	
	Virtual Lab - Biosafety	
Week 13	Lecture 31 - Virology Part 1	246-57
Nov 16-17	Lecture 32 - Virology Part 2	257-61, 266-8
	Lecture questions 31-32 due Tuesday, Nov 17	
Tues, Nov 24	<b>Final exam – Friday, Dec 11, available 12-1 PM Central</b>	