

COURSE SYLLABUS  
MONTGOMERY COLLEGE  
BI 210--GENERAL MICROBIOLOGY

INSTRUCTOR INFORMATION

Name:

OFFICE:

OFFICE PHONE:

FAX:

OFFICE HOURS:

E-MAIL:

REQUIRED BOOKS:

*For Lecture:* Microbiology: An Introduction by Gerard J. Tortora, Berdell R. Funke, and Christine L. Case. 11- 13th Edition. ISBN# 10: 0-321-55007-2

*For Laboratory:* Microbiology: Laboratory Theory & Application. Brief Third Edition customized for Montgomery College. TPSS Michael. J. Leboff & Burton E. Pierce.

*Prerequisites:* 4 semester hours of Principles of Biology (Biology 150) and an assessment level of EN101/101A

Course Description (from the Montgomery College catalog)

This course provides an overview of microorganisms emphasizing bacteria, and including the structure, metabolic activities, genetics, and mechanisms of control of microorganisms as well as the relationships of microorganisms to humans, then environment, disease, and immunity.

Laboratory sessions include basic techniques of culturing and identifying microorganisms as well as observations of their activities.

GENERAL COURSE OBJECTIVES:

A successful student should be able to:

- Identify major contributors to the field of microbiology and explain how their discoveries impacted the whole field of microbiology.
- Describe different types of microscopes and how they are utilized to examine microbes.
- Describe different types of staining procedures and how they are utilized to examine microbes.
- Discuss the cellular structures of prokaryotic and eukaryotic cells.
- Explain the overall function of metabolic pathways.
- Describe how pure cultures can be isolated by using the streak plate method.
- Explain how microbes are classified on the basis of oxygen requirements, temperature preferences and/or media preferences.
- Explain the regulation of gene expression in bacteria by induction, repression, and catabolic repression.
- Classify mutations by type, and describe how mutations are prevented and repaired.

- Discuss how genetic mutation and recombination provide material for natural selection to act upon.
- Describe the lytic cycle of bacteriophages.
- Describe the lysogenic cycle of bacteriophage lambda.
- List Koch's postulates.
- Differentiate a communicable from a non-communicable disease.
- Contrast human, animal, and nonliving reservoirs, and give one example of each.
- Define nosocomial infections, and explain their importance.
- Explain how capsules and cell wall components contribute to pathogenicity.
- Contrast the nature and effects of exotoxins and endotoxins.
- Describe the role of normal microbiota in innate immunity. Describe the role of the skin and mucous membranes in innate immunity.
- List the components of the complement system.
- Describe Adaptive Immunity and the various types

### ATTENDANCE

*Lecture:* Full attendance in class is essential for mastering course material. In general, you will earn better exam scores with consistent attendance. It is imperative that you arrive on time and stay through the-entire class. If you do miss a class, it is your responsibility to obtain lecture notes and handouts from classmates. If you are late to lecture, please be courteous to the rest of the class by quietly and discretely settling into a seat. Consistent attendance is mandatory and monitored by a sign-in sheet. It is your responsibility to obtain materials handed out during your absence. I value courtesy and manners in the classroom. Please bring your best self to class each day, prepared to speak and listen. Please note that there are no unexcused absences in professional life. Otherwise, please inform me in writing/e-mail or a note, of the reason for your absence. As in professional life, notice should be given before the absence - doctor's appointment, Nobel Prize ceremony, wedding, etc. If the absence cannot be scheduled, please inform me immediately.

Be prepared to provide documentation (hospital or infirmary papers, family emergency contact with phone numbers, traffic problem by date and intersection, etc.). You are expected to be punctual, classes will start on time.

#### *Laboratory:*

The lab exercises are designed with the idea that you will read them in advance of the lab period. If you miss one lab, you are missing the equivalent of one week of work. The materials used in each lab will not be available later, so it is impossible to make up lab work.

LATE OPENINGS & CLOSINGS: On occasion, Montgomery College will announce a late school opening or early closing because of weather conditions or other emergencies.

- If the College opens or closes at a time when more than 50% of a class period will be missed, that class will be cancelled for the day. For example, if the College were closing at 5:00 p.m., a class that begins at 4:45 p.m. would not meet.
- If less than 50% of a class will be missed, that class will meet for the remaining portion of its regularly scheduled time. For example, if the College opens at 11:00 a.m., a class that begins at 10:55 a.m. will meet, starting at 11:00 a.m.
- For the most up-to-date information regarding campus openings, closings, or emergencies, you are encouraged to sign up for email and text alerts via Montgomery College ALERT at

<https://alert.montgomerycountymd.gov/register.php>. When you register as a *New User*, choose the group *Montgomery College Alert*.

**WITHDRAWAL FROM CLASS:** If you are considering withdrawing from class, meet with me first to discuss your academic progress and potential. Withdraw dates are listed on the course schedule and in your *MyMC* account. If you decide to withdraw from the course, you are required to complete a *Registration/Schedule Change*. If you stop participating in class, yet fail to complete all necessary paperwork to remove your name from the class roster; you will receive a grade of "F" for the semester. Excessive absence (3 or more) may also result in an F for the semester.

### **COMMUNICATION**

- The use of Blackboard is *essential* for this class. Course materials such as lecture notes, objectives, homework, etc.. will be made available on Blackboard. I will communicate with you via Blackboard and Montgomery College e-mail.
- Use your MCemail account for e-mail. Include a subject in the subject line. Include your name within the message. Please Do NOT contact me through a non-MC email account. If I do not respond to your email within 48 hours, it is likely you sent it from an inappropriate email address, you did not include a subject, or you did not include a name in your email. You can also use the course e-mail in Blackboard, but I am likely to see your message sooner if it is addressed to my Montgomery College e-mail.
- Be sure to regularly check your Montgomery College e-mail, not only for messages from me, but also from the college.

### **CLASSROOM & LAB. POLICIES**

*Behavior:* Each and every student is expected to behave in ways that promote a learning and teaching atmosphere. Students have the right to learn; however, they do not have the right to interfere with the freedom of the faculty to teach or the rights of other students to learn. Students will be treated respectfully in return for respectful behavior. All in-class discussions should be carried out in a way that keeps the classroom environment respectful of the rights of others. For example, students should not interrupt someone else who is talking regardless of whether that person is the instructor or another student. Students are also expected to conduct themselves in ways that create a safe learning and teaching environment that is free from such things as violence, intimidation, and harassment, including sexual harassment.

If you disrupt the class during lecture or Lab., the Instructor reserves the right to ask you out of the class and the security will have to take you out if you refuse. Your rights and responsibilities as a student at Montgomery College are described in the *Student Code of Conduct*

**Electronic Devices:** Personal electronic devices should be silenced during lecture and Lab. It is considered inappropriate to text during lecture & Lab, check messages during, surf the web during or otherwise be engaged with your electronic devices. It is not appropriate to excuse yourself from class to check messages or place calls during class time, except in cases of emergency. Department policy prohibits videotaping instructor lectures and discussions. Audio recording is permitted. **ABSOLUTELY NO CELL PHONES AND/OR LAPTOPS ARE ALLOWED ON THE LAB BENCHES DURING LABORATORY.** Failure to adhere to the rules **will attract loss of points.**

**\*CELL PHONES:** Cell phones as well as "smart devices" such as smart watches are to be turned off and placed in your book bags during exams and quizzes. A cell phone or other smart device that

is visible on your person, in your hand, in a pocket, etc. •.during an exam or quiz is considered a violation of the academic honesty code. You will earn O credit for the exam. ALL violations will be reported to the Dean of Students. If you need to use the bathroom during an exam, you must leave your cell phone IN THE CLASSROOM, in your bookbag.

### LABORATORY BEHAVIOR:

Learning is best accomplished by trying, then asking, because until you have attempted an exercise, what you do not understand is not always clear to you. Most of the lab exercises are detailed and will require the entire lab period to complete; therefore, it is imperative that you be prepared when you begin so that your time is spent more fruitfully in the lab. Before you come to the lab, you should definitely read the list of objectives that explain what you should get out of each lab exercise.

The objectives will also be useful as a review for tests. Successful completion of laboratory experiments should include the filling out of the data section as well as answering the questions at the end of the unit. Students should seize this opportunity to work collaboratively with others to reinforce the material learned.

Each student is responsible for cleaning up the materials he or she has used during the lab and for returning equipment and materials to their original locations. This will allow all students taking the lab, to begin with materials and equipment that are clean and in good order just as you did.

### Lah. Safety Procedures & what I expect of you:

- Eating, chewing gum, drinking, and applying cosmetics are not permitted in the lab.
- Decontaminate your lab bench with a disinfectant at the beginning and at the end of every laboratory activity involving liquids or preserved materials.
- Disposable gloves are recommended for laboratory activities. Hands should be washed immediately after gloves have been removed, before exiting the lab.
- Disposable materials such as gloves, swabs, and toothpicks that come into contact with body fluids should be placed in a biohazard container located on your table.
- Students who are pregnant, taking immunosuppressive drugs, or have any other medical condition that might necessitate special precautions in the laboratory should inform the instructor immediately.
- Make sure your hands are dry when you handle electrical connectors. If electrical equipment crackles, snaps, or begins to smoke, do not attempt to disconnect it. Inform your instructor immediately.
- Do not touch broken glassware with your hands. Use a broom and dustpan. Place broken glassware in the container marked for that purpose.
- Let your instructor know if you are color-blind, as some procedures require discrimination of colors.
- Children are not permitted in the laboratory. Adult guests are allowed only with the permission of the instructor.
- Push in stools and chairs at end of lab to avoid tripping hazard.
- Laboratory coats must be worn at all times in the laboratory and open-toed shoes are not allowed.
- Goggles, lab coats, closed toed shoes, "**restrained**" **Jong hair (a must)**, and on-time attendance are required! Goggles must be worn whenever you are transferring bacteria or using chemicals. Written warnings will be given in the event of safety violations

- along with a loss of 5-10 points commiserate with the level of the violation
- Multiple violations can/will lead to a student being removed from the lab.
  - A contract must be signed by each student after they have received, read and agree to abide by the laboratory rules. This must be done before any laboratory exercise is carried out.

### *ASSESSMENT*

*Coverage:* Learning objectives identify the information that your exams will test. Most of our Microbiology students plan careers in medical/allied health fields. In the actual practice of medicine unusual situations frequently arise that need to be quickly dealt with by applying past knowledge to solve problems not previously encountered. To help you prepare for these situations, our exams will include questions that require you to apply your knowledge, reasoning, and critical thinking to new situations involving microorganisms and disease.

It is YOUR responsibility to take each exam at the scheduled time. When you miss an exam due to a serious and unavoidable circumstance, you may, at my discretion be permitted to take a make-up exam. If you have not made prior arrangements, you must contact me immediately upon your return following the missed exam to discuss the possibility of a make-up exam, which is **entirely** essay (*See exam make-ups*).

*Lab: There is no way to make up missed lab sessions.* You must be on time for lab since that is when we discuss safety issues specific to that day's lab. If you are more than 15 minutes late it will count as an unexcused absence. You are responsible for reading the lab manual, obtaining lab data from your partner(s) and completing the analysis on your own. If you have more than 2 absences from lab you may not be able to do well in the course. Please come and see me immediately if you know you will miss a lab.

Points will be lost for each infraction in the lab, i.e. food, chewing gum, improper technique, dirty microscope. Tardiness is not tolerated and will result in the loss of points. Tardiness greater than 15 minutes will be considered an absence.

### LECTURE EXAMS

Four lecture non-comprehensive exams valued at 100 points each will be given. It is your responsibility to maintain the integrity of your answers during an exam. A sub-comprehensive final exam worth 100 points will be given at the end of the semester. Please consult the school calendar for final exam dates.

Exam 1 [chapters 1, 3, 4, 5]

Exam 2 [chapters 6, 7, 8, 9]

Exam 3 [chapters 11, 12, -13)

Exam Final [chapters 14-17 & selected topics and other assignments]

*Format:* Lecture exams can include multiple choice, matching, true/false, Definitions, fill-in the blank, and short essay questions. Medical/allied health personnel may risk the health and life of their patient if a medication, treatment, or diagnosis is altered due to spelling errors. In order to prepare students for medical/allied health careers, exam points may be deducted if practical exam structures and organisms are not spelt correctly.

*Scheduling and Timing:* Exam dates and chapters covered are given on the Syllabus. Each exam is to

be turned in by the announced completion time or you will receive zero points, an "F" grade, on that exam.

*Using t/le bat/1room:* You should use the bathroom prior to beginning your exam. You may not leave during an exam.

*Exam Make-ups:* You are expected to take each exam at the scheduled times. In the case of a documented emergency, you may make-up ONE lecture exam. You must contact me within 24 hours of the original exam date. The make-up exam will be ENTIRELY ESSAY. Make-up exams may be given during finals week to help you keep on schedule with the course curriculum and to allow your instructor adequate time to develop a make-up exam.

#### **LABORATORY EXAMS:**

Lab exams and/or quizzes cannot be made up, because many lab-testing materials are only available to us during a scheduled time period. Therefore, you may receive zero points for missed lab exams and/or for quizzes. Two lab practical exams worth 100 points each will be given.

#### **LABORATORY UNKNOWNNS:**

Lab unknowns will be used to evaluate your technique and application of knowledge acquired in the lab. You will have performed a number of gram stains and practicing aseptic techniques to give you the opportunity to become proficient in these very important microbiological techniques.

\*Morphological Unknowns are worth 50 points

\*Biochemical Unknowns are worth 150 points

#### **TERM PAPER:**

Each student will write a paper on a microbiology topic of their choice after clarification from the instructor, for a total of 100 points. Details of this paper will be discussed in class and a grading rubric will be handed out.

**ACADEMIC HONESTY:** Medical/allied health professionals deal with the health and lives of patients; therefore, honesty and reliability are paramount. All graded assignments, quizzes, and exams are to be the results of your own efforts. Academic dishonesty or misconduct is described in the *Student Code of Conduct*. Violations of the *Code* will not be treated lightly. Any cheating, copying, or other form of academic dishonesty will result in a failing grade (0 credit) for the assignment and could result in a failing grade in the course. All parties involved in the cheating will receive a 0 for the assignment. All academic dishonesty will be reported to the Dean of Students.

#### **STUDENT SERVICES:**

Link to Important Student Information: <http://cms.montgomerycollege.edu/mcsyllabus/>

In addition to course requirements and objectives that are in this syllabus, Montgomery College has information on its web site to assist you in having a successful experience both inside and outside of the classroom. It is important that you read and understand this information. The link above provides information and other resources to areas that pertain to the following: student behavior (student code of conduct), student e-mail, the tobacco free policy, withdraw and refund dates, disability support services, Veteran services, how to access information on delayed openings

and closings, how to register for the Montgomery College Alert System, and finally, how closings and delays can impact your classes. If you have any questions, please bring them to your professor. As rules and regulations change they will be updated and you will be able to access them through the link. If any student would like a written copy of these policies and procedures, the professor would be happy to provide them. By registering for this class and staying in this class, you are indicating that you acknowledge and accept these policies.

*Computer Access on TPSS:* <http://cms.montgomerycollege.edu/learningcenters/computersTPSS/>

*General Support Services:* A summary of campus services offered to students to support your success can be found at <http://cms.montgomerycollege.edu/learningcenters/servicesTPSS/>.

*Instructional Support Services:* The Science Learning Center, located in Science North Room 101 (240-567-1594), has tutors, reinforcement materials to support this course including all assigned course software, videos, and some anatomical models. Information on Learning Centers at all campuses of the College can be found at <http://cms.montgomerycollege.edu/learningcenters/>.

*Student Disability:* A student needing special accommodations due to a disability should let the instructor know as soon as possible. A letter from Disability Support Services (Germantown-SAI 75, Rockville-CB122, or Takoma Park/Silver Spring-ST120) authorizing your accommodations is required. Any students who may need assistance in the event of an emergency evacuation should identify themselves to the Disability Support Services Office.

*Veteran's Services:* If you are a veteran or on active or reserve status and you are interested in information regarding opportunities, programs, and/or services, please visit the Combat2College Website at <http://www.montgomerycollege.edu/combat2college> and/or contact Joanna Starling at 240-567-7103 or [Joanna.starling@montgomerycollege.edu](mailto:Joanna.starling@montgomerycollege.edu)

### **WHAT I EXPECT OF YOU:**

You are responsible for what you learn.

### **WHAT YOU CAN EXPECT FROM ME:**

I bring the best of my professional and academic experience to you and our shared work. I will prepare materials and presentations, and guide discussion during classes. I will respect your contribution and do look forward to learning from you.

Some of the structure of this course simulates the work world. Timeliness, accuracy, insight, knowledge, presentation - these are the tools of an intelligent and dedicated worker. Advancement, opportunity, and salary are all performance - based; so too are Grades.

### **LIMITS OF EVALUATIONS:**

You are much more than any of the notches your teachers - including this one - must by necessity make on the stick marked BI 210.

I like the model of track and field: run the best race you can, giving muscle and imagination to the event. There will be marks for certain efforts (the assignments) and a score on your big event (final grade). Do what you will with the coaching and esprit de corps. I stand ready to help you improve your marks, but also name here the long perspective: school is only a fraction of your life.

## BI 210 LECTURE OUTLINE

<b>DATE</b>	<b>CHAPTER</b>	<b>TITLE</b>
<b>M/WTffH</b>		
08/27 08/28	1	Introduction to the Microbial World
08/29 08/30	3	Microscopic Observations
09/03 09/04	4	Microscopic/Anatomy (for 09/02 only)
09/05 09/06	4&5	Anatomy of Prokaryotes and Eukaryotes
09/10 09/11	5	Microbial Metabolism
09/12 09/13	5	Microbial Metabolism
<b>09/17 09/18</b>		<b>EXAM1</b>
09/19 09/20	6	Microbial Growth
09/24 09/25	6	Microbial Growth
09/26 09/27	7	Microbial Control
10/01 10/02	7&8	Microbial Control/Microbial Genetics
10/03 10/04	8	Microbial Genetics
10/08 10/09	9	<b>Recombinant DNA</b>
<b>10/10 10/11</b>		<b>EXAM2</b>
10/15 10/16		Bacteria of Medical Importance
10/17 10/18		Bacteria of Medical Importance
10/22 10/23	11	Fungi & Parasites
10/24 10/25	11&12	Fungi & Parasites
10/28 10/29		Parasites & Tropical Diseases
10/30 10/31	13	Viruses
11/01 11/05	13	Viruses/HIV Emerging Diseases
<b>11/06 11/07</b>		<b>EXAM 111</b>
11/08 11/12	14	Epidemiology
11/13 11/14	14&15	Epidemiology/Pathogenicity
11/15 11/19	15	Pathogenicity
11/20 11/21	15	Pathogenicity
<b>11/22 11/25</b>		<b>THANKSGIVING BREAK</b>
11/26 11/27	16 & 17	Nonspecific Defense ( <b>Term paper due</b> )
11/28; 11/29	16 & 17	Nonspecific & Specific Defense
12/03 & 5; 12/4 & 6 (16 & 17)		Nonspecific & Specific Defense
<b>12/10 through 12/16</b>		<b>FINAL EXAM WEEK/NO CLASSES</b> <b>FINAL EXAM DATE: TB</b>

## BI 210 LABORATORY OUTLINE

WEEK		SESSION	EXPERIMENT	PAGE
M/W	T/TH			
08//27	08/28	A	Introduction/Aseptic Technique	26&29
08/ 29	08/30	B	Introduction: light microscopy	125
09/03	09/04	A	Wet mount preps	193 & 143
09/05	09/06	B	Smear and Simple Basic & .Simple (Acidic) Negative Staining	153 -165
09/10	09/11	A	Differential Staining: Gram & Acid fast	169-177
09/12	09/13	B	Special staining (Endospore & capsule)	183 - 187
09/17	09/18	A	Ubiquity	52
09/19	09/20	B	Gram stain & Isol. Of Pure Cultures	39&59
09/24	00/25	A	Morphological Unknown	201
09/26	09/27	B	Morphological Unknown Cont••• Morph.Unknown & Spec. media	207-236
10/01	10/02	A	Reading & Interpretation	
10/03	10/04	B	Aerotolerance: Oxygen and growth of bacteria	<b>81-88</b>
10/08	10/09	A	Effects of temperature on Bact. growth	89
10/10	10/11	<b>B</b>	Germicides: Disinfectants & Antibiotics: Susceptibility tests: Bacitracin, Optochin & Novobiocin	119,335 & 397
10/15	10/16		Reading Results	
10/17	10/18	A	Carbohydrate Catabolism (OF & Starch)	240 & 293
10/22	10/23	B	Ferment. Of Carbs.	245,273,329 & 323
10/24	10/25	A	Reading Results & LAB. EXAM 1	
10/28	10/29	<b>B</b>	Prot.Catab.Part 1 & 2:	299-309; 323,279,283
10/30	10/31	A	READING RESULTS	

11/01	11/05	B	Respiration: catalase, oxidase, Nitrate 257 - 273
11/06	11/07	A	Rapid Id. (imvic, enterotube) API 20E, 501-509;
11/08	11/12	B	READING RESULTS
11/13	11/14	A	Final Lab. Exam
11/15	11/19	B	Biochemical Unknowns
11/20	11/21	A	Biochemical Unknowns cont..•
11/22	11/25	B	THANKSGIVING BREAK
11/26	11/27	A	Biochemical Unknown
12/01	12/02	B	Biochemical Unknown
12/03	12/04		Final Practical Exam/Submission of Biochemical Unknown

The Morphological Unknown will be worth 50 points. The Biochemical Unknown is worth 150 points. Please make sure that you follow directions. You will have performed a number of gram stains to give you the opportunity to become proficient in this very important microbiological technique.

Successful completion of lab experiments should include the complete filling out of the data section as well as answering the questions at the end of the unit. Students should take this opportunity to work collaboratively with others to reinforce the material learned.

Please remember there are no makeup labs available during the semester

### DATES TO REMEMBER

8/27	Fall Classes begin
09/03	Memorial Day - No classes
11/22 - 11/25	Thanksgiving break
12/10-12/16	Final week of classes-Exams
12/17 -12/21	Non-instructional duty days

**GRADE RECORD SHEET  
BI 210-MICROBIOLOGY**

<b>LECTURE EXAMS</b>	<b>POSSIBLE POINTS</b>	<b>YOUR POINTS</b>
Exam#1	100 points	
Exam#2	100 points	
Exam#3	100 points	
Final Exam	100 points	
<b>Term Paper</b>	<b>100 points</b>	
<b>Subtotal</b>	<b>500 points</b>	

<b>MISCELLANEOUS</b>	<b>POSSIBLE POINTS</b>	<b>YOUR POINTS</b>
Morphological unknown	50 points	
Biochemical unknown	150 points	
Laboratory practicals	200 points	
<b>subtotal</b>	<b>400 points</b>	

Total# of possible points	900
Your total number of points	

**DETERMINATION OF COURSE GRADE:**

Term Paper = 100 points  
 Lecture [3 exams] = 300 points  
 Final = 100 points  
 Morphological Unknown = 50 points

Biochemical Unknown = 150 points  
Laboratory Practicals = 200 points  
900 points total

**STANDARDS:**

Grade will be assigned as follows:

A = 90% - 100% of total points

B = 80-89%

C = 70-79%

D = 60-69%

F = <60%