

**Microbiology for the Health Sciences**  
**BIOL 206**  
**Spring 2010**

**Instructor:** Dr. Frank T. Kuserk  
305 Collier Hall of Science  
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Office Hours: T, Th 2:30 PM-4:00 PM or by appointment

**Lecture Classroom:** 102 Pricilla Payne Hurd Academic Complex  
MWF 2 (8:55 AM-9:45 AM)

**Laboratory:** 300 Collier Hall of Science  
L-A: 1:15 PM-2:45 PM  
L-B: 2:45 PM-4:15 PM

**Course Description:** Microbiology involves the study of microorganisms, literally those organisms such as bacteria, viruses, fungi, algae and protozoa that are too small to be seen clearly by the naked eye. This, however, would be a monumental task to perform within the time limits of one semester. Therefore, we will primarily restrict ourselves to the study of bacteria and viruses during this course. Even then, we will only be able to scratch the surface. Broad in its scope, this course will introduce you to the taxonomy, evolution, morphology, physiology, ecology and behavior of microorganisms. We will pay particular attention to the nature of infectious organisms in causing disease and how the human body fights these foreign invaders. I hope that you will find our journey exciting!

**Course Objectives:** Upon completion of this course students will be able to demonstrate:

- 1) Knowledge of basic concepts in microbiology, including understanding the dynamic nature of host-microbe interactions in causing infectious disease and the importance of host defenses in the disease process
- 2) Ability to make a scientific argument & support it with appropriate examples or scientific justification
- 3) Knowledge of and ability to apply the scientific process
- 4) Ability to find, evaluate, & use published scientific information
- 5) Ability to objectively analyze and interpret data and to use other qualitative and quantitative microbiological techniques
- 6) Competence in scientific writing and oral communication
- 7) Ability to work together in teams
- 8) Ability to integrate concepts within and among disciplines of science
- 9) Understanding of the relevance of microbiology to society

**Required Texts:** Talaro, Kathleen Park. 2009. *Foundations in Microbiology* (7<sup>th</sup> edition). McGraw-Hill, Boston (ISBN: 978-0-07-337522-9).

Pierce, Burton E. and Michael J. Leboffe. 2005. *Exercises for the Microbiology Laboratory* (3<sup>rd</sup> edition). Morton Publishing Co., Englewood, CO (ISBN: 0-89582-657-7).

**Grading:** The grading system is as follows:

A	=	93.0-100	C	=	73.0-76.9
A-	=	90.0-92.9	C-	=	70.0-72.9
B+	=	87.0-89.9	D+	=	67.0-69.9
B	=	83.0-86.9	D	=	63.0-66.9
B-	=	80.0-82.9	D-	=	60.0-62.9
C+	=	77.0-79.9	F	=	59.9 and below

Lecture Exam 1	100 points
Lecture Exam 2	100 points
Lecture Exam 3	100 points
Lecture Exam 4 (Final Exam)	100 points
Project & Report	100 points
Laboratory Question Sheets (Midterm)	50 points
Laboratory Question Sheets (Midterm)	50 points
Laboratory Midterm Exam	50 points
Laboratory Final Exam	50 points
Laboratory Attendance	<u>50 points</u>
	750 points

It is within the instructor's purview to apply qualitative judgment in determining grades for an assignment or for the course.

**Class Attendance:** It has been my experience that students who do poorly in this course usually have numerous absences. I strongly suggest that you attend and participate in all lecture sessions unless you have a valid reason not to. I will not specifically maintain lecture attendance records. However, if I detect that you have excessive absences or are habitually tardy I will speak with you in private. **An absence on an examination day will require either prior permission or a suitable excuse from the health center or Dean of Students Office before a make-up is given.**

Laboratory sessions, because they involve hands-on experiences that cannot be mastered effectively without performing them, are especially critical to gaining an understanding of basic concepts and techniques and are not excusable. Therefore, I will keep a record of your laboratory attendance. There are 26 lab sessions this semester. Each lab session is worth 2 points so you can miss one session and still earn the maximum 50 points. You can earn a bonus of 2 points by attending the remaining session.

**Course Guidelines:**

All assignments are expected to be handed in according to the due date on the syllabus. Late work will be penalized.

All students are expected to follow the principles of academic honesty as set out in the policies of Moravian College. See the Student Handbook for details. Any and all written work must be done in your own words (with the exception of direct quotations which are clearly indicated as such), and written work must include proper citations indicating the sources for any ideas, concepts, facts, or other information derived from others, whether or not you have restated it in your own words. Any cases of suspected cheating or plagiarism will be referred to the Academic Affairs Office. Academic dishonesty may result in a failing grade in the course.

In case of any crisis or emergency, or an extended absence from class, you must inform me directly, through Learning Services or the Academic Dean's Office.

Learning disability accommodations: students who wish to request accommodations in this class for support of learning disabilities should contact Learning Services (x1510). Accommodations cannot be provided until authorization is received from the appropriate disability support provider on campus.

These guidelines are intended for the benefit of the students as far as clarification of my expectations for the course; however, in exceptional circumstances I reserve the right to exercise discretion in the application of these guidelines to individual cases or to refer a particular case to the Academic Dean if necessary.

### **Classroom Expectations:**

Respect for others' answers and views.

Disruptive behavior during class will result in your dismissal from the class the first time, after that, disciplinary action will be taken.

Cell phones need to be turned to OFF and put away in a purse or bookbag during class. Use of cell phones in any way during class will result in dismissal from class and be counted as an absence.

Non-alcoholic drinks and non-odiferous snacks are allowed in class, other odiferous food is not.

If you arrive late, be respectful by not disrupting a class already in progress.

**Microbiology for the Health Sciences**  
**Lecture Schedule**  
**Spring 2010**

Day & Date			Topic	Talaro Chapter
M	Jan.	18	The Main Themes of Microbiology	1
W		20	The Main Themes of Microbiology	1
F		22	NO CLASS	
M		25	Prokaryotic Cell Structure & Function	2 <sup>1</sup> , 4
W		27	Prokaryotic Cell Structure & Function	2 <sup>1</sup> , 4
F		29	Eucaryotic Cells & Microorganisms	5 (pp. 121-132)
M	Feb.	01	Eucaryotic Cells & Microorganisms	5 (pp. 121-132)
W		03	Introduction to Viruses	6
F		05	Introduction to Viruses	6
M		08	Introduction to Viruses	6
<b>W</b>		<b>10</b>	<b>Exam 1</b>	<b>1, 2<sup>1</sup>, 4, 5, 6</b>
F		12	Microbial Nutrition, Ecology & Growth	7
M		15	Microbial Nutrition, Ecology & Growth	7
W		17	Microbial Control: Physical Methods	11
F		19	Microbial Control: Physical Methods	11
M		22	Microbial Control: Chemical Methods	11
W		24	Microbial Control: Chemical Methods	11
F		26	Chemotherapy	12
M	Mar.	01	Chemotherapy	12
W		03	Chemotherapy	12
<b>F</b>		<b>05</b>	<b>Exam 2</b>	<b>7, 11, 12</b>
M		08	NO CLASS: Spring Break	
W		10	NO CLASS: Spring Break	
F		12	NO CLASS: Spring Break	
M		15	Infection & Disease	13
W		17	Infection & Disease	13
F		19	Epidemiology	13
M		22	Host Defenses	14
W		24	Host Defenses	14
F		26	Specific Immunity & Immunization	15
M		29	Specific Immunity & Immunization	15
<b>W</b>		<b>31</b>	<b>Exam 3</b>	<b>13, 14, 15</b>
<b>F</b>	Apr.	<b>02</b>	NO CLASS: Easter Break	
M		05	NO CLASS: Easter Break	
W		07	Cocci of Medical Importance	18
F		09	Cocci of Medical Importance	18

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<sup>1</sup> I assume that you have already studied much of what is in Chapter 2 in previous courses. However, since it covers the basic chemistry of life it is important that you review this chapter. Questions from material in this chapter will appear on the first exam.

M	12	Gram-Positive Bacilli of Med. Importance	19
W	14	Gram-Negative Bacilli of Med. Importance	20
F	16	Gram-Negative Bacilli of Med. Importance	20
M	19	Miscellaneous Bacterial Diseases	21
W	21	Miscellaneous Bacterial Diseases	21
F	23	DNA Viral Diseases	24
M	26	DNA Viral Diseases	24
W	28	RNA Viral Diseases	25
F	30	RNA Viral Diseases	25

**Final Exam: Wednesday, May 5 @ 1:30PM**

**18, 19, 20, 21, 24, 25**

**Spring 2010**

Date	Laboratory Exercise	
W	Jan. 210	Do: Exercise 1-1 (Nutrient Agar & Nutrient Broth Preparation) Set up: Exercise 2-1 (Ubiquity of Microorganisms)
F	Jan. 22	NO LAB
W	Jan. 27	Introduction to Safety and Laboratory Guidelines Read: Exercises 1-1, 2-1 Set up: Exercise 1-2 (Common Aseptic Transfers and Inoculation Methods)
F	Jan. 29	Read: Exercises 1-2 Exercise 3-1 (Introduction to the Light Microscope) Do: Exercise 3-2 (Calibration of the Ocular Micrometer) Assignment: Read Talaro, Chapter 3  Do: Exercise 2-2 (Colony Morphology) Exercise 3-3 (Examination of Eukaryotic Microbes)
W	Feb. 03	Do: Exercise 3-6 (Gram Stain) Exercise 3-7 (Acid-Fast Stains)
F	Feb. 05	Do: Exercise 3-8 (Capsule Stain) Exercise 3-9 (Endospore Stain) Examination of Bacterial Flagella
W	Feb. 10	Set up: Exercise 2-5 (Evaluation of Media) Exercise 2-9 (Anaerobic Jar) Exercise 2-10 (Effect of Temperature on Growth) Exercise 2-12 (The Effect of Osmotic Pressure on Growth)
F	Feb. 12	Read: Exercises 2-5, 2-9, 2-10, 2-12
W	Feb. 17	Set up: Exercise 4-1 (Mannitol Salt Agar) Exercise 4-2 (Phenylethyl Alcohol Agar) Exercise 4-3 (Desoxycholate Agar) Exercise 4-4 (Endo Agar) Exercise 4-5 (Eosin Methylene Blue Agar) Exercise 4-6 (MacConkey Agar) Exercise 4-7 (Hektoen Enteric Agar) Exercise 4-8 (Xylose Lysine Desoxycholate Agar)
F	Feb. 19	Read: Exercises 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8
W	Feb. 24	Review for Laboratory Mid-term Exam

<b>F</b>	<b>Feb. 26</b>	<b>Laboratory Mid-Term Exam</b>
W	Mar. 03	Set up: Exercise 5-2 (Phenol Red Broth) Exercise 5-4 (Methyl Red and Voges-Proskauer Tests) Exercise 5-5 (Catalase Test) Exercise 5-6 (Oxidase Test) Exercise 5-7 (Nitrate Reduction Test) Exercise 5-8 (Citrate Test) Exercise 5-10 (Decarboxylation Test) Exercise 5-11 (Phenylalanine Deaminase Test)
F	Mar. 05	Read: Exercises 5-2, 5-4, 5-5, 5-6, 5-7, 5-8, 5-10, 5-11
W	Mar. 10	NO LAB: Spring Break
F	Mar. 12	NO LAB: Spring Break
W	Mar. 17	Set up: Exercise 5-13 (Starch Hydrolysis) Exercise 5-14 (Urease Tests) Exercise 5-15 (Casease Test) Exercise 5-16 (Gelatinase Test) Exercise 5-19 (SIM Medium) Exercise 5-20 (Triple Sugar Iron Agar)
F	Mar. 19	Read: Exercises 5-13, 5-14, 5-15, 5-16, 5-19, 5-20
W	Mar. 24	Set up: Exercise 5-25 (Blood Agar) Exercise 5-26 (Coagulase Tests) Exercise 5-27 (Motility Test) Exercise 5-28 (Bacterial Unknowns Project: Enterotube II)
F	Mar. 26	Read: Exercises 5-25, 5-26, 5-27, 5-28
W	Mar. 31	Instructions for Epidemiology Project: CDC's MMWR
F	Apr. 02	NO LAB: Easter Break
W	Apr. 07	Set up: Exercise 6-1 (Standard Plate Count) Do: Exercise 6-3 (Direct Count)
F	Apr. 09	Read: Exercises 6-1, 6-3
W	Apr. 14	Set up: Exercise 2-14 (Measuring Disinfectant Effectiveness) Exercise 2-15 (Antimicrobial Susceptibility Test)
F	Apr. 16	Read: Exercises 2-14, 2-15
W	Apr. 21	Set up: Exercise 7-1 (Membrane Filter Technique) Exercise 7-9 (Snyder Test)

F	Apr. 23	Read: Exercises 7-1, 7-9 Epidemiology Project Due
W	Apr. 28	Review for Laboratory Final Exam Laboratory Cleanup & Checkout
<b>F</b>	<b>Apr. 30</b>	<b>Laboratory Final Exam</b>