

Introductory Microbiology
50-240 (3 credits)
FALL SEMESTER 2008

Instructor: Dr. Karl Henry
 Office: HSC 172 (Hartline Science Center)
 Phone: (570) 389-4819
 E-mail: khenry@bloomu.edu
 Office hours: HSC 172 or HSC 155
Mon: 10 AM – 12 PM; Wed: 3 – 4 PM; Fri: 11AM – 1 PM
 Office hours are subject to change based on student's needs.

CATALOG DESCRIPTION

Presents morphology, metabolism, cultivation, and control of bacteria, viruses and other microorganisms with emphasis on public health aspects. Topics will include bioterrorism, epidemiology, food safety, immunology, and infectious diseases. Three hours lecture and 2 hours laboratory per week. Counts as a Group C. Not applicable to biology major or minor.

COURSE GOALS & OBJECTIVES

By the end of this course, you should be able to:

- Demonstrate a working knowledge of some of the tools used by microbiologists.
- Demonstrate an understanding of the fundamental characteristics of microbes (cell structure, types, classification) and how these differences affect both human health and disease.
- Demonstrate a practical and theoretical knowledge of microbial growth, metabolism, reproduction, nutrition, cultivation, collection, identification, and control (both physical and chemical).
- Demonstrate an understanding of the host-parasite relationships and principles of immunity/immunization.
- Develop the ability to associate specific pathogens based on microbial characteristics as well as disease symptoms.

COURSE ORGANIZATION

Introductory Microbiology (50.240) is a 3 credit course designed for Nursing and/or Allied Health majors. It consists of three lectures and one lab per week. The maximum number of students allowed for the lecture is 80. Laboratory sections have a maximum capacity of 16 students.

	Room	Section	Days	Start Time	End Time
Lecture:	086 Hartline	All	M W F	2:00 PM	2:50 PM
			Compressed	3:00 PM	3:40 PM
Lab:	155 Hartline	50.240.01:	T	8:00 AM	9:50 AM
		50.240.02:	T	10:30 AM	12:20 PM
		50.240.03:	T	2:00 PM	3:50 PM
		50.240.04:	Th	8:00 AM	9:50 AM
		50.240.05:	Th	10:30 AM	12:20 PM

MATERIALS

Lecture: **Required text:** Kathleen Tolaro *Foundations in Microbiology, 6th Edition*, McGraw-Hill, ISBN-13 number 978-0-07-299489-6.

Laboratory: **Required text:** Karl Henry *Laboratory Manual for Introductory Microbiology 50.240, Fall 2008*. Shrink-wrapped, three-hole punched document.

Required supplies: three ring binder (100 page capacity), lab coat, Sharpie™ pen and colored pencils.

These items are available at the bookstore.

Suggested additional laboratory text: Kleyn and Bicknell *Microbiology Experiments: A Health Science Perspective*. McGraw-Hill, ISBN-13 number 978-0-07-299949-5.

While this item provides more background information than the required laboratory text, it is not at all necessary to succeed in this course.

ATTENDANCE POLICY

Lecture: While attendance of the lecture is not required, there may be discussions or assignments that are not covered in either the text or lecture notes for which you will still be responsible. In addition, quizzes will be given at the start of certain lectures. As such, it is a good idea to be present at all lectures but I leave this up to you.

Laboratory: As it would be impossible to make up a laboratory exercise due to space and set up issues, attendance in *your scheduled* laboratory section is *required*. You are given five points towards your overall grade for each lab. In addition, you will be given three points for each completed lab exercise. For an excused absence (serious illness, academic conflict, death in the family) where your instructor has been notified ahead of time, you will be given the chance to complete an alternative assignment as a means of getting credit. You may only take advantage of this option one time for the course. You will be required to provide documentation (such as a note from your health care provider or a letter from your coach) for your absence. It is up to the discretion of the instructor to determine if an absence is excused or not. Unexcused absences will not be given the option of a make-up assignment.

Exams: You are expected to take all exams at the scheduled time and location. In extreme cases (death in the family, severe illness, etc...), a make-up exam is possible with proper prior notice and/or documentation. The make-up exam will be different from the regular exam and will be given at the instructor's convenience.

For sections where the laboratory session normally begins at 8 AM (50-240.01 and 50-240.04), the laboratory exams will start at 8:30 AM. Because of the setup required, a **laboratory exam cannot be made up**.

If a lecture/laboratory exam happens to fall on a compressed schedule day or cancellation as decided upon by the University, the exam will take place at the next regularly scheduled meeting time.

OTHER POLICIES

- Students are subject to the policies of Bloomsburg University as outlined in the Student Handbook/Pilot. These policies supersede any policies outlined within this syllabus.
- Students are encouraged to ask questions and participate in the lecture/lab.
- The syllabus, reading, lab and/or homework assignments are subject to change.
- Students are responsible for all material (lecture/lab notes, handouts, homework and readings).
- Assignments other than lab assignments that are due at the conclusion of your scheduled laboratory session must be in my office on the due date by 4 PM. Ten percent (10%) of the available points will be deducted from your assignment grade for each day that an assignment is late.

ACADEMIC INTEGRITY

As defined by the University (Policy 3512), students will not engage in cheating, plagiarism or falsification. In this course, this would include any form of cheating on an exam, copying another student's homework assignment or lab report (from the current or previous semesters). If you have been found to have cheated on an assignment and/or exam, you will not receive credit for that assignment and will be subject to the further disciplinary actions of the University.

Students are expected to perform their own work except in cases where collaboration is required. In group exercises, while the observations/results/data collection may be collaborative, the analysis/write-up is not! In cases where assignments indicate that a single source is responsible for the work, no credit will be given to all students that have identical or nearly identical work.

LABORATORY MANUAL

Based on my first experience teaching Introductory Microbiology last year, there were several areas that I felt could be improved upon. The laboratory manual that was used in the fall of 2007 was one of these items. While the laboratory manual that was used was, in my opinion, quite good, it contained more material than was needed for the course. In addition, several experiments could not be performed (in whole or in part) due to material or equipment that we do not have. So instead of having students spend another \$80 on a book with limited usage, I decided to make one that would be specific for this course.

Over the course of the summer, I created several laboratory exercises that I feel 1) best utilize the facilities and equipment we have available given the size of the class, 2) can be completed in the time we are given for a lab period, 3) will provide a "hands-on" experience that will reinforce and/or supplement material covered in the lectures, and 4) provide a unique learning experience that will demonstrate important clinical concepts and principles to the student. Another nice feature is the significant savings to the student.

As this is a first draft (or attempt), please understand that there may be a need to revise or modify some exercises as needed. In addition, there may be errors (typographical, mental) in the text that may only get caught when read by 80 different pairs of eyes. If you happen to find an error or if something does not seem to make sense, let me know and I will clarify and/or correct the item in question. Any additional constructive comments are also welcome.

The first half of the manual (up to the mid-term exam) is currently available in the bookstore. The second part will be available shortly. I will announce in class when the second half is available.

LECTURE NOTES

Lecture notes will be available on Blackboard the week before the scheduled lectures. The lecture notes will be in the form of selected Powerpoint slide from the lectures. In some cases, there will be material missing on the lecture note slides that you will be required to fill in during lecture.

EVALUATION AND GRADING

Grades will be posted outside of my office *as soon as possible* following an exam. Students shall be listed by official Bloomsburg University ID number. Grades for quizzes and assignments will *likely* be available by the next lab session. Exams, quizzes and assignments will not be handed back but students are free to look at this material in my office and discuss any issues when I am available.

At the start of the first lecture that follows an exam, a *post-mortem* of the exam will be performed as long as all exams have been completed. All questions will be quickly reviewed and the correct answers revealed with a special emphasis on any questions where more than one-third (1/3 or ~33%) of the class incorrectly answered the question. There are times when mistakes are made during the preparation of an exam/assignment or during the grading process. If a mistake is found (by myself or a student), I will take measures to fix the problem (such as throwing out a bad question or allowing more than one correct answer, etc...).

Lecture:	Exams	450 points
	There will be three lecture exams worth 100 points each. A semi-comprehensive final exam will be worth 150 points.	
	Quizzes, assignments	40 points
	Throughout the course, small projects/quizzes will be assigned. Assignments may be individual and/or group projects.	
Laboratory:	Exams	80 points
	Two exams worth 40 points each	
	Attendance	60 points
	Lab assignments	40 points
	There will be approximately 13 exercises during the course of the semester. Timely completion of each assignment is worth 3 points.	
	<ul style="list-style-type: none">You will obviously lose points (depends on the number of assignments for that day) for unexcused absences.	
	Quizzes	30 points
	There will be 6 quizzes (5 points each) given during the semester at the start of the laboratory session that will cover the material and/or procedures for the lab being performed on that day. The days and sections of the quizzes will be random.	

	TOTAL:	700 points

At the end of the semester, letter grades will be computed based on the overall number of points a student has obtained during the course. You can keep track of your overall grade in the class by dividing the number of points you have obtained at that time by the total number of available points. The following scale will be used to determine your final grade:

A (93 – 100%) = 651 – 700 points	C+ (77 – 79.9%) = 539 – 559 points
A- (90 – 92.9%) = 630 – 650 points	C (73.5 – 76.9%) = 514 – 538 points
B+ (87 – 89.9%) = 609 – 629 points	C- (70 – 73.4%) = 490 – 513 points
B (83.5 – 86.9%) = 585 – 608 points	D+ (66 – 69.9%) = 462 – 489 points
B- (80 – 83.4%) = 560 – 584 points	D (60 – 65.9%) = 420 – 461 points
	E (>60%) > 420 points

INTRODUCTORY MICROBIOLOGY TENTATIVE LECTURE SCHEDULE

This is a tentative schedule and may change as needed during the course of the semester. Students will be informed of any changes. You will not be responsible for material that is not covered.

<u>DATE</u>	<u>TOPIC</u>	<u>TEXT</u>
Aug. 25	Introduction to Microbiology	Chap. 1
Aug. 27	Biochemistry of the Cell	Chap. 2
Aug. 29	The Microscope and other tools of the trade	Chap. 3
Sept. 1	Labor Day – NO CLASS	
Sept. 3	Basic Cell Structures: Prokaryotes	Chap. 4
Sept. 5	Basic Cell Structure: Eukaryotes	Chap. 5
Sept. 8	Viruses	Chap. 6
Sept. 10	Viruses	Chap. 6
Sept. 12	Metabolism of Microorganisms	Chap. 8
Sept. 15	Microbial Growth	Chap. 7
Sept. 17	Microbial Genetics	Chap. 9
Sept. 19	EXAM #1	
Sept. 22	Microbial Classification/Taxonomy	Chap. 1, 4-6
Sept. 24	Control of Microbes, Part I (Physical and Chemical)	Chap. 11
Sept. 26	Control of Microbes, Part II (Anti-infectives)	Chap. 12
Sept. 29	Control of Microbes, Part III (Drug resistance)	Chap. 12
Oct. 1	Epidemiology/Routes of Infection	Chap. 13
Oct. 3	Microbe – Host Interactions, Part I (Nonspecific immunity)	Chap. 14
Oct. 6	Microbe – Host Interactions, Part II (Specific immunity)	Chap. 15
Oct. 8	Microbe – Host Interactions, Part III (Immunization)	Chap. 15
Oct. 10	Reading Day – NO CLASS	
Oct. 13	Microbe – Host Interactions, Part IV (Immune disorders)	Chap. 16
Oct. 15	Diagnostic tools	Chap. 17
Oct. 17	EXAM # 2	
Oct. 20	Gram-Positive Cocci	Chap. 18
Oct. 22	Gram-Positive Cocci	Chap. 18
Oct. 24	Gram-Negative Cocci	Chap. 18
Oct. 27	Gram-Positive Bacilli	Chap. 19
Oct. 29	Gram-Positive Bacilli	Chap. 19
Oct. 31	Gram-Positive Bacilli, Gram-Negative Bacilli	Chap. 19, 20
Nov. 3	Gram-Negative Bacilli	Chap. 20
Nov. 5	Gram-Negative Bacilli	Chap. 20
Nov. 7	Miscellaneous Bacteria	Chap. 21
Nov. 10	EXAM # 3	
Nov. 12	Medically Important Fungi	Chap. 22
Nov. 14	Medically Important Fungi, Medically Important Parasites	Chap. 22, 23
Nov. 17	Medically Important Parasites	Chap. 23
Nov. 19	DNA viruses	Chap. 24
Nov. 21	DNA viruses	Chap. 24
Nov. 24	RNA viruses	Chap. 25
Nov. 26	No Class – Thanksgiving recess	
Nov. 28	No Class – Thanksgiving recess	
Dec. 1	RNA viruses	Chap. 25
Dec. 3	Introduction to Clinical Cases	*****
Dec. 5	LAST CLASS	
Dec. 9 (Tuesday)	FINAL EXAM	3:30 PM to 5:30 PM

INTRODUCTORY MICROBIOLOGY LABORATORY TENTATIVE SCHEDULE

<u>WEEK OF:</u>	<u>TOPIC</u>	<u>TEXT</u>
Aug. 26, 28	Lab Introduction, Lab Safety Ubiquity of Microorganisms	Ex. 1
Sept. 2, 4	Complete Ubiquity of Microorganisms Pure Cultures and Aseptic Technique Introduction to Microscopy	*Ex. 1 Ex. 2 *Ex. 3
Sept. 9, 11	Complete Pure Cultures and Aseptic Technique Simple and Differential Staining	*Ex. 2 Ex. 4
Sept. 16, 18	Complete Simple and Differential Staining Selective and Differential Media	*Ex. 4 Ex. 5
Sept. 23, 25	Complete Selective and Differential Media Aerobic and Anaerobic Growth	*Ex. 5 Ex. 6
Sept. 30, Oct. 2	Complete Aerobic and Anaerobic Growth Control of Microbial Growth	*Ex. 6 Ex. 7
Oct. 7, 8	Continue Control of Microbial Growth	Ex. 7
Oct. 14, 16	Lab Mid-Term Exam (at regularly scheduled lab time for your section*)	
Oct. 21, 23	Complete Control of Microbial Growth Identification of <i>Staphylococcus</i> species Identification of <i>Streptococcus</i> species	*Ex. 7 Ex. 8 Ex. 9
Oct. 28, 30	Complete Identification of <i>Staphylococcus</i> species Complete Identification of <i>Streptococcus</i> species Identification of Gram-Negative Enterics	*Ex. 8 *Ex. 9 Ex. 10
Nov. 4, 6	Complete Identification of Gram-Negative Enterics Quantification of Microbes	*Ex. 10 Ex. 11
Nov. 11, 13	Complete Quantification of Microbes Medically-Important Fungi	*Ex. 11 *Ex. 12
Nov. 18, 20	Medically Important Parasites	*Ex. 13
Nov. 25, 27	Thanksgiving Recess, No labs this week The lab will be open Tuesday, Nov. 25 (9 AM to 4 PM) to examine parasite slides	
Dec. 2,4	Lab Final Exam (at regularly scheduled lab time for your section*) * 8 AM lab sections will meet at 8:30 AM on lab exam days	