BIOL220001, Microbiology for Health Professionals; 3 credits
Boston College Summer Session 2017
Summer 2 session, June 26th – July 14th 2017
Mon, Tue, Wed, Thu; 1 PM – 4 PM

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Office: Higgins 545A
Office Hours: by appointment

Instructor note: Please do not include a room on your syllabus, as room assignments may change.
Always check Course Information & Schedule (Agora Portal sign in required) to see the most accurate
information on room assignments.

Boston College Mission Statement
Strengthened by more than a century and a half of dedication to academic excellence, Boston College commits
itself to the highest standards of teaching and research in undergraduate, graduate and professional programs
and to the pursuit of a just society through its own accomplishments, the work of its faculty and staff, and the
achievements of its graduates. It seeks both to advance its place among the nation's finest universities and to
bring to the company of its distinguished peers and to contemporary society the richness of the Catholic
intellectual ideal of a mutually illuminating relationship between religious faith and free intellectual inquiry.

Boston College draws inspiration for its academic societal mission from its distinctive religious tradition. As a
Catholic and Jesuit university, it is rooted in a world view that encounters God in all creation and through all
human activity, especially in the search for truth in every discipline, in the desire to learn, and in the call to live
justly together. In this spirit, the University regards the contribution of different religious traditions and value
systems as essential to the fullness of its intellectual life and to the continuous development of its distinctive
intellectual heritage.

Course Description
This course is a study of the basic components and physiological activities of bacteria, viruses and protozoans.
Emphasis will be placed on virulence factors and the mechanism by which a variety of microorganisms and viruses
establish an infection, and how the immune system responds to infection. The use of anti-microbial drugs and
vaccines will also be discussed.
Textbooks & Readings (Required)
Microbiology, An Introduction, 12th edition
Authors: Tortora, Funke, Case
Publisher: Pearson

All forms of the textbook (bound, loose-leaf, e-book) are acceptable for this course. The course will not use any online materials (Mastering Microbiology) that can be purchased with the textbook (however, you may find them helpful for increasing your understanding of the course material). Note that college bookstores generally only buy back the US edition of a textbook.

It is expected that the students have read and understood chapter 2 and the first half of chapter 10 (The Study of Phylogenetic Relationships + Classification of Organisms, plus appropriate study outline and study questions) by the first day of the course.

Textbooks & Readings (Recommended)
Additional materials may be distributed or assigned as needed.

Canvas
Canvas is the Learning Management System (LMS) at Boston College, designed to help faculty and students share ideas, collaborate on assignments, discuss course readings and materials, submit assignments, and much more - all online. As a Boston College student, you should familiarize yourself with this important tool. For more information and training resources for using Canvas, click here. Powerpoint lectures will be posted on Canvas right before class; any other materials used in class will be posted after class as needed.

Course Objectives
In this course, students will gain factual knowledge pertaining to microbiology, microbial diversity and pathogenesis, and immunology, and they will learn the fundamental principles of infectious diseases. Students will apply the course material through discussions, in-class assignments and exam questions related to the following:

1. Structure of prokaryotic and eukaryotic cells, viruses, and fungi
2. Physiology and genetics of microbes
3. Mechanisms used to control infections (antimicrobials, antibiotics, vaccines)
4. Differences between bacterial, viral and fungal infections
5. Immune system and immune responses to infection
6. The student will demonstrate competency across cultural settings and will learn the impact of culture, gender, and age in microbial pathogenesis as demonstrated by group exercises and exams.
7. The student will demonstrate ethical knowledge pertaining to epidemiology as demonstrated by discussions.

Grading
Participation/homework/quizzes/in-class assignments: 100 points (lowest score is dropped)
Exam 1: 100 points
Exam 2: 100 points
Exam 3: 100 points

400 points total

Grading criteria are preliminary and subject to change at the instructor’s discretion.
The undergraduate grading system for Summer Session is as follows:
A (4.00), A- (3.67)
B+ (3.33), B (3.00), B- (2.67)
C+ (2.33), C (2.00), C- (1.67)
D+ (1.33), D (1.00), D- (.67)
F (.00)

The graduate grading system for Summer Session is as follows:
A (4.00), A- (3.67)
B+ (3.33), B (3.00)
B- (2.67), passing but does not count toward degree
C (2.00), passing but not for degree credit
F (.00)

All students can access final grades through Agora after the grading deadline each semester. Transcripts are available through the Office of Student Services.

**Deadlines and Late Work**
Assignments are due at the beginning of the class period on the specified dates. Late assignments will result in point deductions equaling 20% of the total possible score for each day late. If it is necessary to turn in a late assignment, it is the student’s responsibility to contact the instructor immediately.

**Course Assignments**
It is expected that 24 hours (2 hours per 1 hour of in-class time) per week of your time will be spent on out-of-class assignments and reading. Please note that some weeks may require more time and some weeks less time but the average is approximately 24 hours per week over the course.

Students are expected to read any assigned material prior to attending the lecture. Over the course of the class, 100 points be earned through participation, the completion of homework, in-class assignments, or quizzes. Quizzes may not be announced prior to the time given and may include questions that pertain to information from either the lectures or reading assignments.

**Course Schedule**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading/Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/26/16</td>
<td>Course overview; intro to microbiology</td>
<td>Chapter 2, 10</td>
</tr>
<tr>
<td>06/27/16</td>
<td>Bacteria I (types, structures)</td>
<td>Chapter 4, 8</td>
</tr>
<tr>
<td>06/28/16</td>
<td>Bacteria II (metabolism, genetics)</td>
<td>Chapter 7, 15, 20</td>
</tr>
<tr>
<td>06/29/16</td>
<td>Bacteria III (pathogenicity, antimicrobials, antibiotics &amp; resistance)</td>
<td></td>
</tr>
<tr>
<td>07/03/16</td>
<td><strong>EXAM 1</strong>; Viruses I (types, structures, genetics)</td>
<td>Chapter 13, 15</td>
</tr>
<tr>
<td>07/04/16</td>
<td>NO CLASS – INDEPENDENCE DAY</td>
<td></td>
</tr>
<tr>
<td>07/05/16</td>
<td>Viruses II (pathogenesis)</td>
<td>Chapter 12</td>
</tr>
<tr>
<td>07/06/16</td>
<td>Fungi, eukaryotic parasites &amp; vectors</td>
<td>Chapter 16, 17</td>
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<tr>
<td>07/10/16</td>
<td><strong>EXAM 2</strong>; Immunology I (Innate &amp; adaptive immune system)</td>
<td>Chapter 18</td>
</tr>
<tr>
<td>07/11/16</td>
<td>Immunology II (Host-pathogen interactions &amp; vaccines)</td>
<td>Chapter 19, 20</td>
</tr>
<tr>
<td>07/12/16</td>
<td>Pathogenesis of selected microbes</td>
<td></td>
</tr>
<tr>
<td>07/13/16</td>
<td><strong>EXAM 3</strong></td>
<td></td>
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Written Work
Summer Session students are expected to prepare professional, polished written work. Written materials must be typed and submitted in the format required by your instructor. Strive for a thorough yet concise style. Cite literature appropriately, using APA, MLA or CLA style per your instructor’s requirements. Develop your thoughts fully, clearly, logically and specifically. Proofread all materials to ensure the use of proper grammar, punctuation and spelling. For writing support, please contact the Connors Family Learning Center.

Attendance
Attending class is an important component of learning. Students are expected to attend all class sessions. When circumstances prevent a student from attending class, the student is responsible for contacting the instructor before the class meets. Types of absences that are not typically excused include weddings, showers, vacations, birthday parties, graduations, etc. Students who miss class are still expected to complete all assignments and meet all deadlines. Many instructors grade for participation; if you miss class, you cannot make up participation points associated with that class. Additional assignments, penalties and correctives may be assigned at the discretion of the instructor. If circumstances necessitate excessive absence from class, the student should consider withdrawing from the class.

Quiz Make-up Policy: There are no make-up quizzes. The missed quiz will constitute the dropped score.
Exam Make-up Policy: There are no make-up exams. If illness (requires physician or health center note) or personal circumstance (requires Dean’s verification) results in a missed exam, the score of the dropped quiz will constitute the grade for the missed exam.

Consistent with BC’s commitment to creating a learning environment that is respectful of persons of differing backgrounds, we believe that every reasonable effort should be made to allow members of the university community to observe their religious holidays without jeopardizing their academic status. Students are responsible for reviewing course syllabi as soon as possible, and for communicating with the instructor promptly regarding any possible conflicts with observed religious holidays. Students are responsible for completing all class requirements for days missed due to conflicts with religious holidays.

Accommodation and Accessibility
Boston College is committed to providing accommodations to students, faculty, staff and visitors with disabilities. Specific documentation from the appropriate office is required for students seeking accommodation in Summer Session courses. Advanced notice and formal registration with the appropriate office is required to facilitate this process. There are two separate offices at BC that coordinate services for students with disabilities:

- The Connors Family Learning Center (CFLC) coordinates services for students with LD and ADHD.
- The Disabilities Services Office (DSO) coordinates services for all other disabilities.

Find out more about BC’s commitment to accessibility at www.bc.edu/sites/accessibility.

Scholarship and Academic Integrity
Students in Summer Session courses must produce original work and cite references appropriately. Failure to cite references is plagiarism. Academic dishonesty includes, but is not necessarily limited to, plagiarism, fabrication, facilitating academic dishonesty, cheating on exams or assignments, or submitting the same material or substantially similar material to meet the requirements of more than one course without seeking permission of all instructors concerned. Scholastic misconduct may also involve, but is not necessarily limited to, acts that violate the rights of other students, such as depriving another student of course materials or interfering with another student’s work. Please see the Boston College policy on academic integrity for more information.
Appendix A

Design
How will students make progress on objectives you have chosen for your course? What activities will promote development of those skills, concepts, experiences? How will you and your students check their progress on objectives? What assessments will provide that feedback?
Objectives --> Activities --> Assessments --> should be linked

Guidelines
The syllabus is a key communication tool between you and your students. “Your syllabus is the first learning material students encounter in your course. Because of this it is important to include the tone of your class in addition to its form. In addition to its contractual nature, the syllabus represents your initial attempt to form a relationship with your students, to begin the process of community the class will take. Take advantage of that opportunity.” From: the Center for Teaching Excellence at the University of North Carolina, Wilmington (see http://www.uncwil.edu/cte/resources/Best Practices in Syllabus Construction.doc).

There are many models available to help you design this important document.

The Center for Teaching Excellence at Iowa State has materials from a "Learning-Centered Syllabi" workshop. This site helps you put student learning at the center of this important document, including a detailed list of what to include: http://www.celt.iastate.edu/teaching/syllabi.html#intro

A tutorial from the Center for Teaching and Learning at the University of Minnesota will help you construct a syllabus. Many examples are provided: http://www1.umn.edu/ohr/teachlearn/tutorials/syllabus/

The "Teaching Tools and Resources" area of a web site at the University of Nebraska at Lincoln (originally prepared by their Teaching & Learning Center) has many suggestions about lots of aspects of the teaching and learning process -- arranged by topic, easy to browse for ideas. Included are ideas for planning a course, developing a syllabus, motivating students, as well as "101 Things You Can Do the First Three Weeks of Class."

Active learning tools
A great way to get more students engaged in the course material during class is to use Think-Pair-Share when you pose a question to the group. The advantages of this approach, and how to do it, are described in the following article by Susan Ledlow which also includes sample prompts to the class to help implement the approach. http://www.hydroville.org/system/files/team_thinkpairshare.pdf

The following article by Susan Ledlow, found on the web site of the UOEEE Center for Teaching & Learning at Arizona State University, describes an often used cooperative learning approach, the Jigsaw Method, giving very specific instructions for implementation. One of the strengths of the jigsaw is that students collaboratively develop understanding of a piece of complex material and then are placed in the position to explain (teach!) that understanding to others. A synthesis assignment is also often part of the whole process. http://www.hydroville.org/system/files/team_jigsaw.pdf

For a description of the Newsprint Dialogue method, go to the following site at Indiana University-Purdue University of Indianapolis: http://www.iupui.edu/~idd/active_learning/puNewsprint.htm
For a description of the Structured Academic Controversy, go to the following site at the University of Minnesota. Roger and David Johnson are internationally known experts on cooperative learning: 
http://www.co-operation.org/?page_id=65

More general information on strategies for Active Learning can be found at the following websites:

From a text Tools for Teaching by Barbara Gross Davis, 1993, Jossey-Bass (available in the Center for Faculty Development Library)—many chapters are available on line as well including this one on lecturing: http://teaching.berkeley.edu/bgd/delivering.html

Indiana University at Bloomington Teaching Handbook: 
http://teaching.iub.edu/wrapper_big.php?section_id=lect

Center for Teaching Effectiveness at the University of Delaware: http://cte.udel.edu/instructional-topics/engaging-students.html

Center for Teaching Excellence at the University of California Santa Cruz 
http://teaching.ucsc.edu/tips/tips-active.html

Center for Teaching and Learning Services at the University of Minnesota: A tutorial on ways to use active learning strategies with PowerPoint presentations; includes 12 active learning strategies. 
http://www1.umn.edu/ohr/teachlearn/tutorials/powerpoint/index.html

**Classroom Assessment Techniques (CAT)**
The key text about classroom assessment is Angelo, T.A. and K.P. Cross. 1993 Classroom Assessment Techniques: A Handbook for College Teachers. 2nd ed. San Francisco: Jossey-Bass Publishers. This text has detailed descriptions of 50 different CATs including instructions on how to implement them and examples of use in various courses. The text categorizes CATs by the type of goal the CAT helps you assess. Additionally this text contains a self-scorable Teaching Goals Inventory. Available from the Center for Faculty Development Library.

• A partial list of Classroom Assessment Techniques from Iowa State: 
http://www.celt.iastate.edu/teaching/cat.html
• From the Schreyer Institute for Teaching Excellence at Penn State University—an article introducing Classroom Assessment and discussing several techniques “An Introduction to Classroom Assessment Techniques” by Diane M. Enerson, Kathryn M. Plank, and R. Neill Johnson 
http://www.schreyerinstitute.psu.edu/pdf/Classroom_Assessment_Techniques_Intro.pdf
• The FLAG (Field-tested Learning Assessment Guide) site, created by the National Institute for Science Education housed at the University of Wisconsin-Madison, provides extensive descriptions of several CATs, including the Minute Paper and Concept Mapping. http://www.flaguide.org/cat/cat.php For the Minute Paper description specifically, go to: 
http://www.flaguide.org/cat/ minutepapers/ minutepapers1.php
• From the Teaching Effectiveness Program at the University of Oregon: This site gives short descriptions of such CATs as the One-Sentence Summary; Word Journal; Directed Paraphrasing; Application Cards. 
http://tep.uoregon.edu/pdf/assessment/Ways_to_Assess_Student_Learning_During_Class.pdf
IDEA student centered Teaching Methods

1. Displayed personal interest in students and their learning
2. Found ways to help students answer their own questions
3. Scheduled course work (class activities, tests, projects) in ways which encouraged students to stay up-to-date in their work
4. Demonstrated the importance and significance of the subject matter
5. Formed “teams” or “discussion groups” to facilitate learning
6. Made it clear how each topic fit into the course
7. Explained the reasons for criticisms of students’ academic performance
8. Stimulated students to intellectual effort beyond that required by most courses
9. Encouraged students to use multiple resources (e.g., data banks, library holdings, outside experts) to improve understanding
10. Explained course material clearly and concisely
11. Related course material to real life situations
12. Gave tests, projects, etc. that covered the most important points of the course
13. Introduced stimulating ideas about the subject
14. Involved students in “hands on” projects such as research, case studies, or “real life” activities
15. Inspired students to set and achieve goals which really challenged them
16. Asked students to share ideas and experiences with others whose backgrounds and viewpoints differ from their own
17. Provided timely and frequent feedback on tests, reports, projects, etc. to help students learn
18. Asked students to help each other understand ideas or concepts
19. Gave projects, tests, or assignments that required original or creative thinking
20. Encouraged student-faculty interaction outside of class (office visits, phone calls, email, etc.)

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Choose two to three Operationalized Learning Objectives (this list from IDEA)

1. Gaining factual knowledge (terminology, classifications, methods, trends)
2. Learning fundamental principles, generalizations, and theories
3. Learning to apply course material (to improve thinking, problem solving, and decisions)
4. Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course
5. Acquiring skills in working with others as a member of a team
6. Developing creative capacities (writing, inventing, designing, performing in art, music, drama, etc.)
7. Gaining a broader understanding and appreciation of intellectual/cultural activity (music, science, literature, etc.)
8. Developing skill in expressing myself orally or in writing
9. Learning how to find and use resources for answering questions or solving problems
10. Developing a clearer understanding of, and commitment to, personal values
11. Learning to analyze and critically evaluate ideas, arguments, and points of view
12. Acquiring an interest in learning more by asking my own questions and seeking answers

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