Introductory Microbiology

Syllabus

MB 230
Fall 2018

Lecture: LINC 210
Lab: Nash 304

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Course Outcomes:

Microbes are an amazingly diverse and important group of organisms! This a four-credit course with no prerequisites will allow you to explore these fascinating, useful, and sometimes harmful organisms. MB 230 meets requirements for OSU Perspectives Biological Sciences Baccalaureate Core (Bacc Core) course credit. This course emphasizes the interrelationships between the microbial world and topics including human health, antibiotics and vaccines, industry, agriculture, genetic engineering, food production and global nutrient cycles. Students will be challenged to critically assess relevant topics at the intersection of microbiology and their daily lives. Scientific theories, including Cell Theory, Germ Theory of Infectious Disease, and Gene Theory of Inheritance are discussed.

OSU Perspectives Biological Sciences Learning Outcomes:
1. Recognize and apply concepts and theories of basic physical or biological sciences.
2. Apply scientific methodology and demonstrate the ability to draw conclusions based on observation, analysis and synthesis.
3. Demonstrate connections with other subject areas.

Lecture Outcomes:
1. Be able to define, identify and use the technical terms, keywords and concepts characteristic of basic microbiology.
2. Be able to distinguish between different groups of microorganisms and their unique characteristics.
3. Recognize specific pathogenic microorganisms and their relationship to human disease.
4. Evaluate and select appropriate ways by which to control or eliminate microorganisms in specific environments.
5. Explain both direct and indirect microbial impacts on human life, including economic, environmental and health impacts.
6. Apply basic microbiological knowledge to everyday interactions with microorganisms.

Laboratory Outcomes:
1. Demonstrate competence in the use of a light microscope to visualize microorganisms.
2. Demonstrate competence in performing basic microbiological techniques, including:
   a. Preparation of bacterial smears
   b. Gram staining
   c. Use of aseptic technique
   d. Streak plate inoculation
   e. Bacteriophage plaque assay
3. Evaluate the application of Koch’s postulates in demonstrating a microorganism/disease correlation.
4. Record, interpret and evaluate observations made in the laboratory.
My pledge to you:

I am here to help you learn about the microbiology and to assist you in developing the skills that you need to succeed as an informed person who will be armed with a collegiate-level general scientific background in microbiology upon completion of this course. My goal is to develop your technical understanding, as well as your critical thinking and laboratory skills. In the end, you are ultimately responsible for your own learning. I will do my best to facilitate your learning, answer your questions, show you how to improve your own learning, and help you develop the kinds of critical thinking skills that you will need in future jobs, regardless of your chosen major. I am here to foster an inclusive learning environment for everyone enrolled in the course, and I will do everything within my power to achieve that objective! If you succeed, then I succeed – we’re in this together!

However, I can only do this if we have two-way communication. One feature of a large class such as this is that I cannot evaluate everyone’s detailed level of understanding easily. The most helpful thing you can do is to ask me if you have questions or require clarification. I will strive to create an atmosphere in which we can have constructive dialogue through interactions in the classroom, discussions during office hours, discourse on the Canvas discussion board assignments, and through your homework assignments. I will do my best to be clear in my communications of my expectations. Each of you can help by asking questions when you have them. Do not hesitate to ask a second time if my first answer is either not clear or needs additional explanation. This requires you to recognize when my explanations are insufficient and ask for clarification. I will happily try again until I express a concept in a way that is understandable for you.

Communication:

Outside of class, the two best ways to communicate with me are through Canvas and email. General questions about the syllabus, assignments, due dates, terminology or lecture content, or any other aspects of the class that are likely to interest other students should be directed to the General Discussion Board on Canvas. Do you have a question about a lecture concept or something in the reading? Are the assignment instructions confusing? Would you like additional explanation about a particular task? If the answer is "yes", please post your course-related questions in the General Discussion Board so the entire class may benefit from our conversation. Additionally, if you feel you can answer another student's question on the general discussion board, please do! I will check the Canvas General Discussion Board daily on weekdays, but perhaps only occasionally on weekend days.

Please contact me directly (email, Canvas Inbox message, or you can leave a comment on an assignment directly in Canvas) for specific questions about feedback on your assignments specifically or matters of a personal nature that do not concern the entire class. In general, I prefer email to Canvas because I can more easily provide links and attachments via email. Correspondence with any of your instructors (lecture or lab) is considered an extension of participation, so please remember that a professional tone and proper grammar and punctuation are required. I will make every effort to respond to emails within one business day, but during high-volume periods expect delays up to two or three business days. Please start the subject of all class-related emails with: “MB230: [Insert your subject here]”. This allows me to easily identify class-related emails so that I can attend to them quickly. Email correspondence with any of your instructors must be conducted through your ONID address or through the Canvas inbox (left-hand menu in Canvas). Correspondence with the instructor is considered an extension of participation, so a professional tone is required.

Use of Canvas:

Canvas is the forum we will use for handing in homework and having discussions. I will also post the lecture slides and other material to Canvas after class. In addition, I will send important announcements about class via Canvas. Steps you should take at the beginning of the class include:
• Access Canvas at: https://oregonstate.instructure.com. Login using your ONID username.
• There are separate Canvas portals for the lecture and your lab section. Make sure you have access to both.
• Set up your Canvas notifications (instructions: https://community.canvaslms.com/docs/DOC-10624) so that you get class announcements as they are posted or at the end of the day. I recommend that you choose either the “notify me right away” or the “send daily summary” option for announcements. This ensures that you will get notifications about items related to class in a timely manner. If you have the “send weekly summary” selected, you may not get an announcement that I send until a week after I have sent it.
• Subscribe to the General Discussion Board (instructions: https://community.canvaslms.com/docs/DOC-10471-4212126078) so that you will get notifications when other students post questions that might interest you. Again, I recommend setting your discussion post notification setting to either “notify me right away” or “send daily summary”. Note that you need to set your notification setting for discussion posts just like you did for the announcements in the step above.

Expectations for Student Conduct:

You are responsible for understanding Oregon State’s Expectations for Student Conduct. You can view the full code of conduct at: http://studentlife.oregonstate.edu/code and you can view the Student Conduct and Community Standards site here: http://studentlife.oregonstate.edu/studentconduct. As a student at OSU, all of your classes require you to conduct yourself as described in these documents. I have listed a few items below about academic integrity. This is part (only one part) of the Student Conduct Code. All of you are adults. I expect everyone to be honest and forthright and to understand their responsibilities as an OSU student. I do not want to have to take this topic up with any of you, but I will not hesitate to do so if you are acting outside of the code of conduct.

Academic Integrity:

The following is a condensed version of the Student Conduct Code on Academic Dishonesty. Academic or Scholarly Dishonesty is defined as an act of deception in which a student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the student's own efforts or the efforts of another. It includes:

(A) CHEATING - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information.

(B) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.

(C) ASSISTING - helping another commit an act of academic dishonesty.

(D) TAMPERING - altering or interfering with evaluation instruments or documents.

(E) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one’s own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.
Course Materials and Resources

Required materials are described in detail below and include:
- the course packet,
- a Top Hat subscription and account (see below)
- access to Canvas, and
- the textbook: Alcamo’s “Microbes and Society” (4th edition)

Course Packet: The course packet can be purchased at the OSU Book Store or printed from Canvas. You must purchase the packet. This packet contains two important things:

- This syllabus
- The lab manual for the laboratory portion of the class. You MUST bring the lab manual to the lab each session, including the first lab session.

Top Hat subscription: Top Hat is an application that will allow you to respond to in-class activities and reading quizzes. This is NOT the same as the “clicker” that has been used at OSU in the past. You must purchase a Top Hat subscription at the OSU Book Store, and then create a Top Hat account. Instructions are provided by OSU here: https://learn.oregonstate.edu/classroom-response/student-tools If you have purchased a clicker in the past, you may be able to return it for a partial refund. Instructions are at the site above. See below under “Course Policies” for additional information.

Canvas (my.oregonstate.edu): Use of Canvas is required as described above.

Textbook: The required text is Alcamo’s Microbes and Society 4th Edition. Jeffrey C. Pommerville; ISBN 978-1-284-02347-3. Alcamo’s text is a somewhat casual text about how microbiology impacts our lives on a daily basis. This book will provide you with the necessary foundation in microbiology. You will be asked to do the reading prior to coming to class. This way, I can then use class time to clarify your questions.

Optional book: Prescott’s Microbiology 8th Edition, Willey/Serwood/Woolverton; ISBN 978-0-07-337526-7. Prescott’s is used by serious students of microbiology who desire a much deeper understanding of the material beyond the scope of MB 230. Generally, I feel this level of text is only required for those who will be undertaking microbiology as a major discipline, and it is not generally needed for this class.

Reading Quizzes: For the three midterms, the grading scale is as follows:

- A .......... 93 – 100%
- B .......... 87 – 90%
- B- ........ 83 – 87%
- D .......... 70 – 73%
- D- ........ 67 – 70%
- C .......... 73 – <77%
- C- ........ 70 – <77%
- D- ........ 67 – <77%
- D- .......... 63 – <67%
- F .......... 67 – <70%
- F- ........ 63 – <63%
- D- .......... 60 – <63%
- F .......... <70%
- F- ........ <67%
- F- .......... <63%
- F- .......... <60%

Midterms:
The three midterms are worth 44 pts each and will be multiple choice format. The dates for the midterms are listed in the lecture schedule. If you miss an exam for any reason, you will need to take a make-up version of the exam in essay question format within one week of the regularly scheduled exam date. If the make-up exam is not taken within the given timeframe, you will receive a zero for the midterm. Any questions regarding
grading of exams must be submitted in writing to the instructor for consideration within one week of the exam being returned to you (see below under “Grades”).

Final Exam:

The final exam is worth 74 points and will be a comprehensive final. Approximately 44 points of the final will cover material from the fourth unit and the remaining 30 points will review material from the first, second, and third units. The final exam is scheduled for Thursday, Dec. 6th at 6:00 pm. In the past, OSU has sometimes changed this date during the term, in which case the change will be posted on Canvas and announced in class. No accommodations for alternate final exam times or make up exams will be offered.

Reading Quizzes:

Points for in-lecture reading quizzes are earned using Top Hat, a smartphone application that enables personal responses. This is also used for other in-lecture activities. You are responsible for bringing a functioning device to earn participation points. No written responses are allowed. You may accumulate up to 40 points for reading quizzes. Reading quizzes will generally be given at the start of class, and they will cover the text material you were expected to read prior to coming to class that day. You must be present in class to take the reading quizzes. No make-up options for reading quizzes are available. There are 26 non-exam class sessions. You can earn 2 points per day for the reading quizzes, for a total of 40 points (2 points over 20 class sessions). If you take the reading quizzes on 25 days, I will take your highest 20 grades. If you take the reading quizzes on 20 days, I will use those 20 scores. If you take the reading quizzes on 18 days, you will score two zeros for sessions 19 and 20. This provides some built in flexibility regarding both lecture attendance and understanding of the material.

Homework:

There will be three homework assignments during the course, each worth 10 pts. 30 pts maximum are available for homework. Scores for late work will be reduced by 20% per day of the total homework score for that assignment. Homework instructions and grading rubrics will be available on Canvas.

Discussion Boards:

There will be four discussion board assignments during the term. Discussion board assignments will take place via Canvas to give you a chance to practice expressing your thoughts in writing. Detailed explanations of the scoring for the discussion boards will be provided in class and will be available on Canvas prior to the first discussion assignment. Scores for late work will be reduced by 20% per day of the total discussion board score. Note that if late posts do not receive responses from classmates, it will not be possible to receive any points for that portion of these assignments. Discussion board instructions and grading rubrics will be available on Canvas.

Laboratory:

The laboratory portion is worth 100 pts of the total course points. See the lab manual for a detailed breakdown of the lab points. You cannot earn a passing grade in MB 230 if you do not pass the lab portion of the course. In addition, this course has a no-show-drop policy. This means that you will be dropped from this class if you do not attend the first lab session. All lab related questions should be directed to the lab instructor.

Extra Credit:

Extra credit points (2 pts) are available if you complete BOTH a pre-assessment survey AND a post-assessment survey. The pre-assessment survey will be available on Canvas during the first two days of the
course. The post-assessment survey will be available after the last lecture session and until midnight on the day of our scheduled final. Extra credit points (0.5 pts) are also available when you state that you have read and understood the syllabus, which you can do via Canvas before the second class session.

Students with Disabilities:

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at (541) 737-4098.

Diversity Statement:

The College of Science strives to create an affirming climate for all students including underrepresented and marginalized individuals and groups. Diversity encompasses differences in age, color, ethnicity, national origin, gender, physical or mental ability, religion, socioeconomic background, veteran status, sexual orientation, and marginalized groups. We believe diversity is the synergy, connection, acceptance, and mutual learning fostered by the interaction of different human characteristics.

Religious Holiday Statement:

Oregon State University strives to respect all religious practices. If you have religious holidays that are in conflict with any of the requirements of this class, please see me immediately so that we can make alternative arrangements.
<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Lecture Number</th>
<th>Topic</th>
<th>Alcamo’s Textbook Chapters</th>
<th>Assignments: due before class (12pm) on the day listed</th>
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<tbody>
<tr>
<td>0</td>
<td>F</td>
<td>Sep 21</td>
<td>1</td>
<td>Course introduction/Basics</td>
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<td>1</td>
<td>M</td>
<td>Sep 24</td>
<td>2</td>
<td>History of Microbiology</td>
<td>1-2</td>
<td>Pre-course survey; Discussion #1 initial post</td>
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<td></td>
<td>W</td>
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<td>3</td>
<td>History/Macromolecules</td>
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<td>Sep 28</td>
<td>4</td>
<td>Information Flow</td>
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<td>-</td>
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<tr>
<td>2</td>
<td>M</td>
<td>Oct 1</td>
<td>5</td>
<td>Genes and Growth</td>
<td>5.2-5.3; 9-9.1</td>
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<td></td>
<td>W</td>
<td>Oct 3</td>
<td>6</td>
<td>Environment/Metabolism</td>
<td>9.2-9.5</td>
<td>-</td>
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<td>F</td>
<td>Oct 5</td>
<td>7</td>
<td>Metabolism II</td>
<td>9</td>
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<td>3</td>
<td>M</td>
<td>Oct 8</td>
<td>Midterm 1 (Lectures 1-7)</td>
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<td>W</td>
<td>Oct 10</td>
<td>8</td>
<td>Taxonomy/Cell Structure</td>
<td>2-2.2; 5-5.2</td>
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<td>F</td>
<td>Oct 12</td>
<td>9</td>
<td>Cell Structure</td>
<td>5-5.2</td>
<td>-</td>
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<td>4</td>
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<td>Oct 15</td>
<td>10</td>
<td>Prokaryotes</td>
<td>5.3-5.4; 7-7.2</td>
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<td>W</td>
<td>Oct 17</td>
<td>11</td>
<td>Protists and Algae</td>
<td>7.3-7.4</td>
<td>-</td>
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<td></td>
<td>F</td>
<td>Oct 19</td>
<td>12</td>
<td>Fungi</td>
<td>8</td>
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<td>5</td>
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<td>13</td>
<td>Acellular entities</td>
<td>6</td>
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<td></td>
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<td>14</td>
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<td>19</td>
<td>Pathogens (Viruses)</td>
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<td>16-16.1</td>
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<td>Nov 19</td>
<td>22</td>
<td>Drinking &amp; Waste Water</td>
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<td>Thanksgiving – no class</td>
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<td>25</td>
<td>Food/Food Safety</td>
<td>12-13</td>
<td>Discussion #4 all posts</td>
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<td>Nov 30</td>
<td>26</td>
<td>Cumulative review for final exam</td>
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<td>R</td>
<td>Dec 6</td>
<td>Final Exam – 6:00 PM</td>
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Course Policies

- **Electronics**: Use of electronics in the classroom is prohibited, other than those used for course related activities. I may sometimes ask you to use an electronic device to look up something related to class, which is an approved use. If you are observed using cell phones, pagers, laptops, tablets, or any other device non-course related activities (texting, social media, email, etc.) during class, you may be asked to leave the class and you will forfeit any reading quiz points you have earned that day.

- **Top Hat application**: The Top Hat application is used for in-class reading quizzes as well as other in-class activities. It is your responsibility to ensure that your device and application are in working order (this includes full batteries). Accommodations for “broken” or forgotten devices will not be made. If anyone is found operating more than one device or application during class, everyone involved will receive a zero for all points based on Top Hat responses for the entire term.

- **Grades**: You are responsible for ensuring grades have been added and entered properly into the Canvas gradebook. Please check my manual entry of your grades. It is in your interest to make sure that your grade is accurately represented in Canvas. You have one week from the time an assignment is handed back to you to contest a score. If a score is contested, I reserve the right to re-grade the assignment in its entirety. Any grade adjustments made after the 1-week period are at my discretion. In order to contest a score on an answer, you should submit a request via email. I may ask you to provide additional information as to your rationale or ask you to explain something before coming to a decision regarding your request. Alternative assignments to make up points lost elsewhere in the class will not be offered.

- **Academic Integrity**: In any situation of academic dishonesty, I will document the incident, permit you to provide an explanation, advise you of possible penalties, and take action. I may impose any academic penalty up to and including an “F” grade in the course after consulting with the department chair and informing you of the action taken. See the above material under the Student Code of Conduct for additional information about academic integrity.

- If you ask for points at the end of the term, you will lose ALL extra credit points and any points that were added back to exams.

Classroom Environment

- The University, and this laboratory, should be a safe and comfortable working environment for all students. The expectation is that no one should feel awkward, embarrassed, unwelcome, or uncomfortable engaging in classroom activities or discussions. Please be conscious of your own language and behavior – it should be respectful to the other students and your instructors. If you are having any problems or need help, please bring it to my attention. It is my job to facilitate your education.