

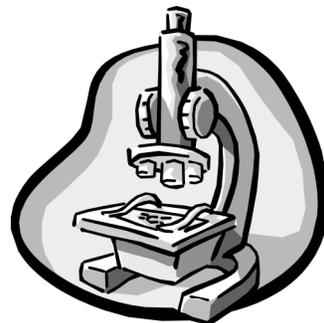
Introductory Microbiology

Syllabus

MB 230

Winter 2020

Lecture: Pharmacy Bldg 305
Lab: Nash 304



Instructor: Kenton Hokanson, Ph.D.
Kenton.hokanson@oregonstate.edu

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Course Syllabus

Instructor: Kenton Hokanson, Ph.D.
Office: Nash Hall, room 334
Office Hours: I am more than happy to schedule a meeting – please email me!
Email: Kenton.Hokanson@oregonstate.edu

Lecture:	MB 230-001 (CRN#30318)	MWF	4:00pm-4:50pm	PHAR 305
Lab Sections:	MB 230-010 (CRN#30319)	W	10:00am-11:50am	Nash 304
	MB 230-012 (CRN#30938)	F	12:00pm-1:50pm	Nash 304

Welcome to Introductory Microbiology!

In this class, we will explore the many ways that tiny organisms (microbes) impact our health, our society, and our planet. My goal is for every student to feel engaged and welcome, to learn about the exciting and important world of microbiology, and to be able to apply key scientific concepts to understanding everyday and societal issues for the rest of your life. Class activities, homework, and lab work is all designed to help you master and apply fundamental microbiological ideas.

I am here to help you learn. I am always happy to answer your questions, discuss your learning strategies, and to use your feedback to improve this course. When in doubt, please reach out to me in person or through email or Canvas. This course has no prerequisites and is taken by students from dozens of different majors, so it is my responsibility to make the course goals achievable regardless of your previous classwork and experience. So, if something is unclear or incompletely explained, please let me know and I will gladly try again.

Communication:

There are two ways to communicate with me outside of class. For general questions about things like the course syllabus, assignments, due dates, or course content, please post your question on the General Discussion Board on Canvas. This will allow the entire class to benefit from our conversation.

For specific issues such as questions about feedback on your assignment or personal matters, please contact me directly. The best way to do this is via email (please send your message from your OSU email – I cannot respond to emails from personal email addresses). You can also contact me through a Canvas Inbox message or by leaving a comment on an assignment in Canvas.

If you are having any issues, inside or outside the classroom, that are making it more difficult to succeed in this course, please don't hesitate to contact me. I am always happy to talk.

Course Outcomes:

Microbes are an amazingly diverse and important group of organisms. This four-credit course with no prerequisites will allow you to explore these fascinating creatures. 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 the environment. Students will be challenged to critically assess relevant topics at the intersection of microbiology and their daily lives. We will discuss scientific theories, including Cell Theory, Germ Theory of Infectious Disease, and Gene Theory of Inheritance.

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 the similarities and interrelationships between human and microbial life.
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.

Use of Canvas:

Canvas is the online system we will use to manage the course and have discussions. I will post the lecture slides and other materials to Canvas, and will use it to send important announcements. 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 lab section. **Make sure you can access both.**
- Set up your Canvas notifications (instructions: <https://community.canvaslms.com/docs/DOC-10624>) so that you get class announcements promptly. I recommend that you choose either the “notify me right away” or the “send daily summary” option for announcements. If you have the “send weekly summary” option selected, you may not get an important announcement 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 interest you. You can set your notification settings for discussions as you did for announcements, above.

Expectations for Conduct:

In science, we never get to know the “truth” – all we can do is try to think clearly and design the best experiments we can based on the evidence that exists. This means that it is fundamentally important to be honest and transparent about how you arrive at your conclusions. Furthermore, it is essential to be respectful of your classmates and their efforts, regardless of whether you agree with them. Disagreements in science are common and important (remember, none of us know all the “right” answers!), but they must be argued on the

basis of evidence and reasoning, not opinion or dogma. We will all put a lot of work into this course – please do not jeopardize your success through any act of academic dishonesty or inappropriate conduct.

As in all your classes, you are responsible for understanding and complying with 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>. I have listed a few items below about academic integrity. This is only one part of the Student Conduct Code; it is very important that you understand the full Code.

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.

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. Please note that copying, or even closely paraphrasing from online sources such as websites providing flashcards or study aids *is plagiarism*. You may of course use these sites to study, but if you take material from them and include it in your class work, this is academic dishonesty.

Course Materials and Resources

Required materials are described in detail below and include:

- the course packet
- access to Canvas
- the textbook: Alcamo’s “Microbes and Society” (4th edition)
- a Top Hat subscription, account, and application

Course Packet: The course packet must be purchased at the OSU Book Store. This packet contains the lab manual for the laboratory portion of the class, and course syllabi. You must bring the lab manual to the lab each session, including the first lab session.

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. Previous students have reported that doing the assigned readings *before* class is very helpful in understanding important concepts and making the course feel

Top Hat subscription: Top Hat is an application that will allow you to respond to in-class activities and quizzes using Apple or Android smartphones and tablets, laptops, or through text message. 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 create a Top Hat account. Instructions are provided by OSU here: <https://learn.oregonstate.edu/classroom-response/student-tools>. You will also need to join our course on Top Hat. An invitation to join the Top Hat course will be emailed to you, but if don't receive this email you can register by simply visiting our Canvas course site and clicking the Top Hat menu link. Note: our Course Join Code is **343678**. If you need technical support for Top Hat, please contact their Support Team directly by email (support@tophat.com), the in-app support button, or by calling 1-888-663-5491. 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.

Top Hat application: The Top Hat application is used for in-class participation points 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). 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.

Electronics:

It is scientifically documented that multitasking impairs learning, and past students have reported that their course grade was harmed because the student was distracted by their electronic devices. For these reasons, use of electronics in the classroom is prohibited, other than those used for course related activities such as Top Hat participation and notetaking. I will 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 for non-course related activities (texting, social media, email, etc.) during class, you may be asked to leave the class and you will forfeit any participation points you have earned that day.

Grading:

Grades in this course are calculated based on the combined scores from the lecture and laboratory components of the class. The point breakdown and conversions from numeric to letter grades are listed below. I understand that the divisions between letter grades are meaningful, so my policy is to round final grades to the nearest whole number before converting them to letter grades. This means, for example, that a final grade of 86.5% would earn a B+. Beyond this rounding, and extra credit options that I may offer to the whole class, I will absolutely not provide any further opportunities to improve final grades, regardless of how close the grade is to the cutoff. The late policy for each type of assignment or exam in this course is explained below.

You are responsible for ensuring grades have been entered properly into the Canvas gradebook. Please check my entry of your grades – I want you to receive the score you earned! I may ask you to provide additional information as to your rationale or ask you to explain something before coming to a decision about your grade.

Midterms	132 pts	A	92.5 – 100%	C	72.5 – <76.5%
Final Exam	74 pts	A-	89.5 – <92.5%	C-	69.5 – <72.5%
Participation Points	40 pts	B+ ...	86.5 – <89.5%	D+	66.5 – <69.5%
Homework.....	30 pts	B	82.5 – <86.5%	D	62.5 – <66.5%
Discussion Boards	24 pts	B-	79.5 – <82.5%	D-	59.5 – <62.5%
<u>Laboratory.....</u>	<u>100 pts</u>	C+ ...	76.5 – <79.5%	F.....	<59.5%
Total.....	400 pts				

Midterms:

The three midterms are multiple-choice and worth 44 pts each, and portions of each will be comprehensive (that is, they will draw on material from earlier in the course) . 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. I will not release answer keys to the midterm exams, because this has been scientifically demonstrated to have a negative impact on learning. However, you may contact me anytime after an exam to get a list of the questions you missed, which may help guide your studying for future coursework and exams.

I recognize that the material in this class is new and challenging for many, and that exams are not the best way to drive and quantify learning. For anyone who receives a score of less than **75%** on an midterm exam, if you are willing to put in the work to master the material from the exam and demonstrate it to me, I will reflect that effort in your exam grade. This is not a simple exercise – you are required to analyze every answer to every missed question and explain in a typed, editable document why the answer is right or wrong. You are also required to meet with me once to discuss how the course could work better for you. If you do all this, I will raise your exam grade by 50% of the gap between your exam result and **75%**. Note that while this system cannot improve an exam to beyond a C-, it can still add a significant number of points. Detailed instructions for these optional corrections will be posted in a Canvas Announcement. Be very careful to follow these instructions exactly, and to submit corrections before their due date, or no points will be awarded – these corrections require a lot of work from you and from me, and so I hold them to a very high standard.

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 currently scheduled for **Thursday, Mar. 19th at 12:00 pm**. In the past, OSU has sometimes changed this date during the term, in which case I will post the change on Canvas and announce it in class. No accommodations for alternate final exam times or make up exams will be offered.

Participation points:

Points for in-lecture participation in activities and reading quizzes are earned using Top Hat. 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 participation points. Points may be given for participating in class activities, correctly answering questions based on the day's class material or the text material you were expected to read prior to coming to class that day, etc. You must be present in class to take the participation points. No make-up options for participation points are available. There are **26** non-exam class sessions. You can earn 2 points per day for the participation points, for a total of 40 points (2 points over 20 class sessions). If you earn participation points on more than 20 days, I will take your highest 20 grades (dropping your remaining lower grades). If you earn participation points 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. Be aware that a technical issue could prevent us from collecting participation points on a given day, which would reduce the number of class sessions from which I can count your best 20 scores.

Attendance:

Attendance in the "lecture" section of the class is not required, though there are daily participation points that can be earned in each class session, discussed above. However, I strongly encourage you to attend as many classes as possible! It's the best, most efficient way to make sure you've heard all the key information for our course, and gives you a chance to ask questions of me and your peers.

Attendance in the lab course, on the other hand, is required. This policy is discussed more in the lab syllabus and we will discuss it in-person on the first day of class, but the key thing to know is that you can only miss your regular lab session ONE time during the entire term, and still pass the class. It is not possible to make up absences (each lab session requires more than half a dozen people to organize their efforts), and each lab connects with many other labs, so we cannot allow students to miss their regular lab more than once, even in the case of emergencies, illness, etc. I understand this is unfortunately very strict, but I have no flexibility to make exceptions to this policy – please check your calendars for all academic, athletic, and family events, etc, that may conflict with the lab, and be sure that you will be able to attend all of the lab sessions.

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 1/3 of their total value per day. Homework instructions and grading rubrics will be available on Canvas.

Discussion Boards:

There will be three 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. If your initial post to a discussion board is late, its score will be reduced by 1/3 of its total value per day. Note that if late posts do not receive comments from classmates, it will not be possible to earn the points that were offered for responding to comments. Late comments on your classmates' posts or responses to comments you receive will earn no credit, as they do not contribute to the ongoing conversation or give your classmates a chance to participate. Discussion board instructions and grading rubrics will be available on Canvas. **One important note: it is not recommended to make posts on Canvas using a cell phone.** Due to a bug, these posts can appear in the wrong section of the Canvas site, where they will not allow your classmates to see and respond to them, and so they will not earn credit.

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. Additional extra credit points (2 pts) are available for providing me with mid-course feedback through a Canvas survey I will post during the term, in order to help me improve the course for you..

Students with Disabilities:

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

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.

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.

Reach Out for Success: University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about resources that assist with wellness and academic success at oregonstate.edu/ReachOut. If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255)

Tentative Lecture and Assignment Schedule

(Subject to change; announcements will be made in lecture and on Canvas)

Week	Day	Date	Class	Topic	Alcamo's Textbook Chapters	Assignments: due before 11:59pm on the day listed
1	Mon	Jan 6	1	Course Introduction/Basics	1	
	Wed	Jan 8	2	History of Microbiology	1-2	Pre-course survey (due before class)
	Fri	Jan 10	3	History/Macromolecules	3	
2	Mon	Jan 13	4	Information Flow	4	
	Wed	Jan 15	5	Genes and Growth	5.2-5.3; 9-9.1	
	Fri	Jan 17	6	Environment/Metabolism	9.2-9.5	
3	Mon	Jan 20		MLK Day - No Class		
	Wed	Jan 22	7	Metabolism II	9	Homework #1
	Fri	Jan 24		Midterm 1 (Classes 1-7)		
4	Mon	Jan 27	8	Taxonomy/Cell Structure	2-2.2; 5-5.2	
	Wed	Jan 29	9	Cell Structure	5-5.2	
	Fri	Jan 31	10	Prokaryotes and ET	5.3-5.4; 7-7.2	Discussion #1 initial post
5	Mon	Feb 3	11	Protists and Algae	7.3-7.4	Discussion #1 comments
	Wed	Feb 5	12	Fungi	8	Discussion #1 responses
	Fri	Feb 7	13	Acellular Entities	6	
6	Mon	Feb 10	14	Human microbiota	17-17.3	Homework #2
	Wed	Feb 12		Midterm 2 (Classes 8-14)		
	Fri	Feb 14	15	Innate Immunity	17.4-17.5	
7	Mon	Feb 17	16	Adaptive Immunity	17.4-17.5	Mid-course feedback (extra credit)
	Wed	Feb 19	17	Chemotherapy	11.2-11.4	
	Fri	Feb 21	18	Epidemiology	17.2-17.3	Discussion #2 initial post
8	Mon	Feb 24	19	Pathogens (Viruses)	18	Discussion #2 comments
	Wed	Feb 26	20	Pathogens (Bacteria, Eukaryotes)	19-19.2	Homework #3, Discussion #2 responses
	Fri	Feb 28		Midterm 3 (Classes 15-20)		
9	Mon	Mar 2	21	Global Nutrient Cycles	16-16.1	
	Wed	Mar 4	22	Drinking & Waste Water	16.2-end	
	Fri	Mar 6	23	Microbial Genetics	10	
10	Mon	Mar 9	24	Industrial/Agricultural Microbiology	14	Discussion #3 initial post
	Wed	Mar 11	25	Food/Food Safety	12-13	Discussion #3 comments
	Fri	Mar 13	26	Cumulative review for final exam	None	Discussion #3 responses
	Thu	Mar 19		Final Exam - 12:00 PM		Post-course survey