

Course	MICRO 20 (0495); 4 Units
Semester	Spring, 2013
Meeting time & Place	M/W 9 AM – 12:10 PM (CFS 92004)
Instructor	Dr. Michael Nicholson
Contact information	e-mail = dr@michael-nicholson.com web page = <a href="http://www.pierce.michael-nicholson.com/pierce.html">http://www.pierce.michael-nicholson.com/pierce.html</a> Office phone = (805) 498-8451 - do not use any other contact phone Mail box in mail room in Building 2100)
Office hours	By appointment only and/or immediately before or after class

**Description:** Microbiology 20, General Microbiology, is a lecture and laboratory course that is primarily focused on the study of bacteria—their history, morphology, metabolism, genetics, growth, methods for control and most importantly, their role in infectious diseases, host-pathogen interactions, and as potential agents of bioterrorism. Other major topics covered include virology and immunology.

**Objectives and Learning Outcomes:** Introduce skills in microscopy, and aseptic techniques in the handling, isolation, cultivation, staining, identification, genetic manipulation, and control of bacterial populations. Students must be able to perform all of the steps needed to accurately identify a species of bacterium, including following scientific directions, using proper techniques, keeping records of relevant information, and using critical thinking skills. Students must know and be able to apply microbiological and immunological terms and concepts to microbiological problems. Students must be able to demonstrate that they understand and can differentiate between taxonomy, biological significance, genetics, and metabolism of organisms. Student Learning Outcomes will be evaluated during the course with multiple-choice and short answer exams, written assignments, and demonstrations of abilities by the student.

**Texts:** The required lecture text is Tortora, Funke, and Case's Microbiology: An introduction, 11<sup>th</sup> ed. The text is available at the Bookstore. Please note additional requirements, if posted at the Bookstore (such as masteringmicrobiology.com access codes). The required lab manual for this class is: Benson's Microbiological Applications. This is a custom manual from McGraw-Hill available at the Bookstore.

**Expectations & grades:** Lecture material will be assessed with four in-class lecture exams, each worth 100 points. No exams are dropped, so be sure to review the schedule. Exams will be the first order of business on a date with an exam scheduled. Tardiness may result in ineligibility to take an exam. Exams should only require 60 minutes to complete. After exams are completed, expect continued lecture or lab. Lab material will be assessed with a total of 14 quizzes and assignments, each is expected to be worth 10 points. The lowest two quiz/assignment grades will be dropped. Expect quizzes at the beginning of class on Mondays. Ten minutes is all that is required (assignments will be due first thing, or will be considered late). DO NOT MISS QUIZZES because there are no make-up quizzes (or labs, for that matter). A bacterial unknown report is also required for the lab assessment, and is the culmination of the semester's work with techniques to identify bacteria. The report is worth 80 points and must be turned in in a composition notebook with proper formatting and information related to the identification efforts and laboratory work. Details regarding formatting and delivery of the

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report are available in a separate document at: [http://www.pierce.michael-nicholson.com/Lab\\_Notebook.htm](http://www.pierce.michael-nicholson.com/Lab_Notebook.htm). Failure to follow lab safety rules or lab conduct protocols may result in point deductions.

Lecture Exams .....	(4x100 pts each).....	400	points
Lab Quizzes .....	(12 x 10 pts each).....	120	points
Lab Unknown report ..	(1 x 80 pts each).....	80	points
Total .....		600	points

**Exam & Quiz Requirements:** For each exam, be prepared with a Scantron (883-E) and a #2 pencil (4 are needed for the semester). For each quiz, be prepared with a Scantron (815-E) and a #2 pencil (15 are needed for the semester). Alternate forms and/or sheets may be provided by the instructor for any assessment; advance notice will be given, if possible, when Scantrons will not be needed. Exams and quizzes are offered only ONE TIME, at the beginning of the class period, and make-ups are not available. Do not waste time asking for a make-up! Arriving late may result in loss of eligibility to take the exam or quiz.

**Attendance:** Failure to attend may impact the final grade. Students who miss role for four consecutive classes (two weeks, or 12 hours of class time) will be dropped from the course, if possible, or may receive a failing grade (depending on when the consecutive absences occur), unless the nature of the absence is discussed with the instructor. Keep in mind that being dropped after the census date will result in a “W” for the course, and thus counts as one attempt to take the course (you can try to take a course three times only). Quizzes are only offered one time, so missing an exam/quiz will result in an automatic failing grade for the specific exam/quiz, since such are not available for make-up. The lab is unique in that your physical presence is required to get the most out of the lab. You must be here for all the labs that deal with the unknown. You will be given a bacterial “unknown” that you will attempt to identify over the course of a few weeks and the media is available for a limited time. If you miss these critical labs, you will not be able to perform your unknown write-up. You must attempt to identify your bacterium (which I will help you do) to get credit for the write-up... In order to identify the bacterium, you must attend the labs for this purpose.

**General Lab Conduct:** There is no eating or drinking in the lab - not even water. A lab coat or a lab shirt (long-sleeve, button-up, un-tucked, past belt) is required. Lab glasses are required while working with microbiological specimens and stains. Desk surfaces must remain uncluttered of book bags and unnecessary gear – students only need a lab book/binder and pencil/pen in addition to the lab gear required on the desk surface. All other books, bags, and paraphernalia need to be relocated to a suitable place along the periphery of the room, under the desk, or in a cabinet. Lab coats are to remain in the laboratory, so if you must exit the lab, you must remove your lab coat. Dangerous conduct is not tolerated. Students found to be acting in a dangerous manner, even only if “playing around” will be summarily dismissed for the balance of the class, and not eligible to make-up missed portions of the lab. Microscopes must be cleaned properly before being put away. Desk surfaces must be cleaned properly before and after use. Failure to follow safety rules and to follow lab conduct protocols will initially result in a warning, followed by point deductions that will escalate.

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**Academic Honesty:** Cheating is not tolerated and any student found cheating in any way will receive a grade of zero on the material at hand, be it quiz or lab. Forging required signatures or initials for labs and/or copying answers from a colleague's lab are both considered methods of cheating and will result in a grade of zero for the lab material. Unless otherwise expressly allowed, all labs are to be completed individually, with data collected on an individual basis. Exceptions do apply, specifically wherein students are assigned labs to work on in pairs. Academic Dishonesty Reports will be filed as appropriate for a student who performs any acts of cheating.

**Schedule:** See the schedules (attached) for information regarding subjects and labs. Exams are noted on the general lecture schedule.

**Cell Phones:** Cell phones cannot be used during lecture and lab and must be muted or otherwise silenced during lecture. Recognizing that emergencies can occur and that some students may have a specific responsibility, if an incoming call **MUST** be answered, please exit the classroom to do so. During exams and quizzes, cell phones must be turned off, so students with responsibilities to others must prepare for a temporary break in possible communications at these times.

**Emergencies/Contingencies:** Sometimes life gets in the way of our individual pursuits. In cases of life-threatening or life-changing emergencies that prevent attendance for an exam or quiz, special dispensation can be arranged *only* if the circumstances are appropriately communicated to the instructor. For emergencies that allow reasonable preparation, notification must be made in advance of the date of the exam/quiz (e.g., funeral, surgery). For emergencies that are sudden, communication as soon as possible is required (e.g., traffic accident en route to school or sudden illness). Planning a trip outside the country for the holidays is not an emergency; other non-emergencies include: missing the bus, vehicles that don't start, not being able to schedule a babysitter, and just being late to class. For contingency purposes, the usual approach that is followed is to double the weight/score of the next exam/quiz to allow for a sort of a "make-up". One emergency/contingency per student per quiz is allowed without issue, with appropriate communications to/from the instructor. Emergencies/contingencies that affect an exam (as well additional quizzes beyond the first) will require documentation that can be used to verify the circumstances. Persistent or chronic emergencies may constitute a pattern that might require alternate resolution, including, but not limited to, dropping the course or arranging an incomplete.

**Special Services:** Students with disabilities, whether physical, learning, or psychological, who believe that they may need accommodations in this class, are encouraged to contact Special Services as soon as possible to ensure that accommodations are implemented in a timely fashion. Authorization, based on verification of disability, is required before any accommodation can be made. The phone number for Special Services is (818) 719-6430 and they are located in the Student Services Building (Building 4800), Room 48-175 (through main entrance, down the hall on the right).

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## Lecture and Laboratory Schedules:

General lecture schedule; Subjects and dates may change. Revisions to this schedule and syllabus will be posted as required.

<u>Week</u>	<u>Date</u>	<u>Subject</u>	<u>Text Chapter</u>
1	Mon, Feb 04	Introduction	1
1	Wed, Feb 06	Chemistry; Microscopy	2; 3
2	Mon, Feb 11	Microscopy; Cell Structure	3; 4
2	Wed, Feb 13	Cell Structure/Function	4
3	Mon, Feb 18	No Class	
3	Wed, Feb 20	Metabolism	5
4	Mon, Feb 25	Metabolism; Growth	5; 6
4	Wed, Feb 27	Growth	6
5	Mon, Mar 04	<u>Exam 1</u> ; Controlling Growth	7
5	Wed, Mar 06	Innate Immunity	16
6	Mon, Mar 11	Innate & Adaptive Immunity	16; 17
6	Wed, Mar 13	Adaptive Immunity	17
7	Mon, Mar 18	Microbial Genetics	8
7	Wed, Mar 20	Microbial Genetics; Biotechnology	8; 9
8	Mon, Mar 25	Biotechnology	9
8	Wed, Mar 27	<u>Exam 2</u> ; Classification	10
	Mon, Apr 01	Spring Break	
	Wed, Apr 03	Spring Break	
9	Mon, Apr 08	Classification	10
9	Wed, Apr 10	Prokaryotes	11
10	Mon, Apr 15	Prokaryotes	11
10	Wed, Apr 17	Eukaryotes	12
11	Mon, Apr 22	Eukaryotes	12
11	Wed, Apr 24	Eukaryotes	12
12	Mon, Apr 29	<u>Exam 3</u> ; Viruses; Epidemiology	13;14
12	Wed, May 01	Viruses; Epidemiology	13;14
13	Mon, May 06	Viruses; Epidemiology	13;14
13	Wed, May 08	Immunology	18; 19
14	Mon, May 13	Immunology	18; 19
14	Wed, May 15	Immunology	18; 19
15	Mon, May 20	CDC & Microbial Diseases	21-23
15	Wed, May 22	CDC & Microbial Diseases	24-26
16	Mon, May 27	Final exams begin	
16	Wed, May 29	<u>Final Exam</u> (see link below)	9:00-11:00 AM

[http://www.piercecollege.edu/schedules/spring\\_2013/Final\\_Exam\\_Schedule-Spring\\_2013.pdf](http://www.piercecollege.edu/schedules/spring_2013/Final_Exam_Schedule-Spring_2013.pdf)  
[http://www.piercecollege.edu/schedules/spring\\_2013/Calendar-Spring\\_2013.pdf](http://www.piercecollege.edu/schedules/spring_2013/Calendar-Spring_2013.pdf)

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**Benson's Microbiological Applications, Brown, 12<sup>th</sup> edition, 2012 (page # at the bottom of each page)**

<b>week</b>	<b>Chapter/Ex.</b>	<b>page</b>	<b>lab</b>
Week 1: 2/4	Ex. 1	p. 3	Brightfield microscopy, use of 100X objective
Week 2: 2/11	Ex. 6	p. 47	Ubiquity of Bacteria (session 1, no TSB or blood agar)* (work in pairs)
	Ex. 5	p.33	Protists and cyanobacteria (slides, live organisms)*
Week 3: 2/19	Ex. 8	p. 61	Aseptic technique ( discussion and demo)
	Ex. 10	p. 85	Smear preparation
	Ex. 11	p. 89	Simple stain
Week 4: 2/25	Ex. 9	p. 71	Pure Culture (session 1)
	Ex. 14	p. 99	Gram stain
Week 5: 3/4	Ex. 9		Pure Culture (session 2)
	Ex. 29	p. 195	Effects of lysozyme (work in groups of 4)*
	Ex. 16	p. 107	Acid fast stain (work in pairs)
Week 6: 3/11	Ex. 9		Pure culture (finish)
	Ex. 34	p. 231	unknown labs (2 stock slant cultures, Gram stain)
	Ex. 36	p. 241	unknown labs (KOH test, oxidase, catalase) Addition: KOH test using original of the unknown culture.
Week 7: 3/18	Ex. 34		(finish observations of growth @ temps; motility)
	Ex. 36	p. 241	unknown labs (fermentation, nitrate, citrate)
	Ex. 19	p. 131	Standard plate count (session 1)
Week 8: 3/25	Ex. 36		(finish observations of growth)
	Ex. 19		Standard plate count (finish)
SPRING BREAK/CESAR CHAVEZ HOLIDAYS; FRI 3/29-SUN 4/7			
Week 9: 4/8	Anaerobe jar demonstration		
	Ex. 37	p. 253	indole, urea tests (Gram motile only)*
	Ex. 39	p. 267	Use of Bergey's manual and flow charts demo Kirby-Bauer plates will be set up for the students to analyze next week
	Ex. 37, 38	p. 253, 259	unknown labs (Gram - organisms only)*
Week 10: 4/15	Ex. 37		(finish)
	Ex. 31	p. 205	Kirby-Bauer method – demo (analyze)
	Ex. 32	p. 215	Evaluation of antiseptics and disinfectants Research project (on unknown bacteria) or similar activity
Week 11: 4/22	transformation handout (session 1)		
	Do the control tube (pGLO-) as a demo only; students make 3 plates per group		
	Ex. 32		(finish)

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Week 12: 4/29	transformation lab	(finish)
	Virtual PCR lab	(handout & computer)
	Ex. 7                      p. 51	Fungi slides and live yeast
Week 13; 5/6	Ex. 7	(finish)
	Helminths	slides and demos
	Staph and strep lab	(handout)*
Week 14: 5/13	Staph and strep lab	(finish); staph and strep demo plates
	Blood studies and blood typing	(handout, textbook)
Week 15: 5/20	influenza epidemic simulation and/or DVD and/or infectious disease case studies	
	Virtual ELISA lab on the computer (handout)*	

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