Course Syllabus: Fundamental Clinical Microbiology

BIOL 2144

General Information:

Course Meetings: MWF (9:00 – 9:50 am) Bolin Hall 221
Instructor: James Masuoka, Ph.D.
Office: Bolin Hall 224F
Telephone: 397-4181
E-mail: james.masuoka@msutexas.edu
Office Hours: TR: 9:30 – 11:00 am
WF: 1:00 – 2:00 pm
(Other times by appointment)

Course Description (from the catalog):

Introduction to the study of medically important bacteria, protozoa, viruses, helminths, and fungi. May not be applied to biology major.

Required Materials:

Microbiology: with Diseases by Body System by RW Bauman. 5th Edition. Pearson Benjamin Cummings, 2018. ISBN: 978-0-134-47720-6. **Note:** An e-text version of the textbook is included in the Mastering Microbiology links in the course D2L page through the Courseware Access and Affordability Program (see below).

Mastering Microbiology: Required digital materials for this course are part of the Courseware Access and Affordability Program at MSU Texas. Students are charged for required course materials on their student account with the Business Office. Opt-out instructions are sent to students' official my.msutexas.edu email address after the first day of class. I have sent a similar message through D2L in case the Postmaster message was not sent. Please contact the MSU Bookstore if you have any questions about the opt-out process.

Microbiology Laboratory Theory & Application: Essentials by L Norman-McKay, MJ Leboffe & BE Pierce. 2nd Edition. Morton Publishing Company, 2022. ISBN: 978-1-64043-400-4.

Note: This semester, we will be using a print/digital hybrid lab manual. The print version is available in the bookstore. See the lab section syllabus for more information on the digital content and how to access it.

Course Objectives (Lecture):

- Compare and contrast the cellular structures of prokaryotic and eukaryotic cells
- Describe how specific cellular structures carry out processes such as motility, nutrient transport, energy production and reproduction
- Describe how microbial cell structures and processes can be the targets of antimicrobial agents, and explain how these relate to therapeutic decisions
- Explain the importance of aseptic technique in patient care

- Explain the impact of human activity on microbial evolution, and describe the mechanisms by which genetic information is modified and transferred between microorganisms
- Contrast the lifecycles of bacteria, eukaryotic microbes, and viruses
- Describe the environmental factors that affect microbial growth, and relate these factors to the environment of the human host and growth in laboratory culture
- Explain the various relationships that exist between microbes and the human host, and how both microbial and host factors influence development of disease
- Explain the factors important in microscopy and how each is optimized or controlled
- Relate microbial biology to means of identification, classification, and host defense mechanisms
- Describe how microbial genetic information flows and is shared
- Contrast the prokaryotic and eukaryotic pathways of carbohydrate catabolism

Classroom Expectations and Policies:

- Students are expected to be prepared for lecture and lab by 1) reading the text, lab manual or handouts prior to coming to class; 2) having paper and pen at hand.
- Students are expected to arrive a few minutes early to mentally prepare. If late arrival is unavoidable, the student should enter the class in a manner that creates as little disruption as possible.
- Points will be deducted from assignments turned in late.
- Student Conduct: Please refer to the MSU Student Handbook: (https:// msutexas.edu/student-life/_assets/files/handbook.pdf) for university policies related to student responsibilities, rights, and activities. For example: valid grounds for an instructor drop (excessive absence, indifferent attitude, disruptive conduct, failure to meet class assignments; p. 79), code of student conduct (p. 10-71), and definitions of academic dishonesty that may be subject to disciplinary action (cheating, plagiarism, and collusion; p. 72). In this class, academic dishonesty on an assignment or exam will minimally result in a score of 0 for that assignment or exam. Depending on the magnitude or frequency of these types of infractions, more severe sanctions – including being dropped from the course – will be imposed.
- Analytical and critical thinking skills in both written and oral communication are part of the learning outcomes of this course. Therefore, all writing assignments and classroom discussion responses should be prepared by the student. Developing strong competencies in this area will prepare you for a competitive workplace. Because of this, AI-generated submissions are not permitted and will be treated as plagiarism (Adapted from Texas Tech University statement).
- Students with disabilities: It is the responsibility of the student to first contact Disability Support Services and then the instructor to decide what accommodations might be provided for a disability. It will be the responsibility of the student to plan to acquire notes. Any requests for accommodation must be made 2 weeks prior to the first exam.
- The instructor considers this classroom to be a place where you will be treated with respect as a human being. Students will show respect for each other and the instructor. Failure to do so will result in the disrespectful student being asked to leave the classroom or laboratory. Furthermore, guns or other weapons create a coercive environment that is neither safe nor conducive to learning. Therefore, weapons of any kind will not be allowed in my classroom. This includes guns, concealed or otherwise, regardless of licensure. Any student bringing a weapon to class or to lab will be immediately dropped from the course. It is the professor's expectation that ALL students consider the classroom a safe environment.

- **CELL PHONES (and other electronic devices): (READ THIS TWICE, PLEASE)** This class, as well as your other classes, requires your engagement, and typical cell phone use serves to detract from that engagement. While in class, your phone should be on "silent" (NOTE: vibrate is NOT silent).
- **Other electronic devices (laptops, tablets and similar devices):** These may be used only if you are using them as "electronic paper". That is, if you are writing on them with a stylus or some type. The ability to take good notes is a skill that university students must be able to master. Further, classroom studies have shown that taking notes by hand increases engagement in the material. Simply transcribing the lecture word-for-word (as you are tempted to do while typing) is not helpful.
- The instructor reserves the right to amend these rules as needed throughout the term.

E-mail Policy:

I will respond to e-mail during regular school hours (8:30 am – 5:00 pm M-F). I will make every effort to respond to e-mail sent during the week within 24 hours. Those sent over the weekend will be attended to on Monday. Always include a subject line in your e-mail messages. It would be particularly helpful to include in the subject line the course number & section (*i.e.,* BIOL 2144). Questions about simple matters of class schedule or those that can otherwise be answered from information in this syllabus will be given low priority.

Attendance Policy:

Students are expected to attend all meetings of lecture and lab. Although in general students are graded on intellectual effort and performance rather than attendance, absences lead to lower overall grades and demonstrate a failure to give priority to your studies. Instructor's records will stand as evidence of absences. A student with excessive absences may be dropped from a course by the instructor. The instructor must give the student a verbal or written warning prior to being dropped from the class (Student Handbook, p. 79).

If you feel ill (esp. with signs and symptoms of COVID-19): Stay home and isolate yourself. Inform your instructor of your circumstances.

It is the responsibility of the student to obtain notes or other information covered in class during an absence.

Exam Policies:

No make-up exams will be given in this course. If you must miss class during a midterm exam period, then the cumulative part of the final exam will replace the missed midterm score. You must notify the instructor of problems **prior to** the start of the exam and provide the proper documentation as soon as possible. Only **one** midterm exam will be substituted for in this manner. Exams will not be moved for congested midterm or finals schedules.

Grading:

All exams and assignments count toward your final grade in the course and so it is important to do the best that you can on everything you turn in. If you find yourself having difficulties, please come to me for help early in the semester so that you give yourself time to improve.

Attendance is not a direct part of your course score. However, continual tardiness – and the resulting class disruption due to coming in late – will be considered and may influence your final points awarded. As stated above, cell phone use distracts from attention in class. Therefore, students who persist in using their mobile devices during class, except for designated classroom activities, will be marked as absent.

This course is not graded on a traditional curve. The course is worth 900 points. Grade categories and equivalent percentages are as shown: A (90-100%); B (80-89%); C (70-79%); D (60-69%); F (59% and below). Passing requires 60% of the points (unadjusted) for the course, or 560. Fractional percentages will be rounded at the end of the semester.

Lectures constitute approximately 60% of the BIOL 2144 grade. There will be three midterm exams, each worth 90 points. The final exam will be worth 180 points. Each exam, including the final, will focus on what was covered since the previous exam. However, each exam will also be cumulative in that each section of the course builds on what came before. The final will also be more typically cumulative in that it will cover the entire semester, focusing on material that needs to be reviewed (*i.e.,* most of the class got it wrong the first time around).

There is a part of the lecture score (100 points) related to the assigned reading. These assignments will be available through Mastering Microbiology accessed through the course D2L page. Assignments are available beginning the first day of class. Assignments will be due the day we begin discussion of that topic. Assignments may be completed after the due date for half credit.

In addition to the textbook reading assignments, there will be five homework assignments. The purpose of these assignments is to: reinforce course concepts, introduce students to the operations of a clinical microbiology laboratory, and to highlight the diversity of science and the scientists within the medical microbiology field. Assignment information will be posted on the course D2L page.

Lab constitutes approximately 33% of the BIOL 2144 grade. Specifics for lab exercises, assignments and grading will be provided during the first laboratory session.

Participation in both lecture and lab is critical to success in this (or any other) class. Although focused on the laboratory part, participation in lectures is also assessed. This includes attendance and participation in lecture discussion and completion of a pre-/post-semester concept inventory survey (10 pts). For the latter, I will be sending a link to the survey during the first week of class and about two weeks before the final exam.

Note:

1) No regrades will be provided for exams (short answer or questions other than multiple choice entered onto a Scantron form) done in pencil.
2) Misspelled words (esp. organism names) and incorrect taxonomic nomenclature will result in ¼ point deductions for each instance.

Assignment Summary:

Midterm exams:	270 points (3 x 90 points)
Final Exam:	180 points
Mastering Microbiology:	100 points
Homework Assignments:	50 points (5 x 10 points)
Laboratory:	300 points
Total:	900 points

Important Dates (Fall 2025):

Classes begin:	**August 25**
Labor Day: no classes	September 1
Midterm Exam 1:	**September 22**
Midterm Exam 2:	**October 20**
Midterm Exam 3:	**November 10**
Undergraduate Research Forum:	November 20
Last day to drop with a W:	November 24 (by 4:00 pm)
Thanksgiving Break:	November 26-28
Classes end:	December 5
Final Exam:	**December 8 (Monday) (8:00 am – 10:00 am)**

Tentative Lecture Schedule

Date	Week	Topic	Chapter (eText Sections)	Mastering Due Dates
Aug 25 – 29	1	Class Introduction, Relevance of Microbiology; Microscopy	**4 (4.1 – 4.3)**	
Sept 1	2	**Labor Day: No classes**		**Pre-semester Concept Inv.**
Sept 3 – 5	2	Microscopy, Cell Structure & Function (Eukaryote)	**4 (4.1 – 4.3)** **3 (3.1, 3.2, 3.10 – 3.12)**	**1, 2 (9/3)** **3 (9/5)** **H1 (9/5)**
Sept 8 – 12	3	Cell Structure & Function (Eukaryote, Bacteria)	**3 (3.1, 3.2, 3.10 – 3.12)**	**4 (9/10)**
Sept 15 – 19	4	Culturing, Growth	**6 (6.2, 6.1, 6.3)**	**5 (9/15)** **6 (9/17)**
Sept 22 – 26	5	**Exam 1 (Monday)** Metabolism	**5 (5.1 – 5.3)**	**7 (9/24)** **H2 (9/26)**
Sept 29 – Oct 3	6	Metabolism, Gene Expression	**5 (5.1 – 5.3)** **7 (7.1 – 7.3, 7.4 (Intro), 7.4.2)**	**8 (10/1)**
Oct 6 – 10	7	Gene Expression (Mutations) Classification: General, Bacteria, Eukaryotes	**7 (7.1 – 7.3, 7.4 (Intro), 7.4.2)** **4 (4.4)** **11 (11.1, 11.2)** **12 (12.1 – 12.3, 12.6)**	**9 (10/8)** **10 (10/10)**
Oct 13 – 17	8	Classification: Eukaryotes; Viruses	**12 (12.1 – 12.3, 12.6)** **13 (13.1 – 13.3, 13.5)**	**11 (10/13)** **12 (10/17)** **H3 (10/17)**
Oct 20 - 24	9	**Exam 2 (Monday)** Viruses, Innate Immunity	**13 (13.1 – 13.3, 13.5)** **15 (15.1 – 15.3)**	**13 (10/22)**
Oct 27 - 29	10	Innate Immunity Adaptive Immunity	**15 (15.1 – 15.3)** **16 (16.1 – 16.5)**	**14 (10/27)**
Oct 31	10	**TX-ASM (Sub lecture: Fri)**		
Nov 3 – 7	11	Adaptive Immunity Pathogenesis	**16 (16.1 – 16.5)** **14 (14.1 - 14.8)**	**15 (11/3)** **H4 (11/7)**
Nov 10 – 14	12	**Exam 3 (Monday)** Skin & Wounds* Respiratory*	**19 (19.1 - 19.6*)** **22 (22.1 - 22.6*)**	**16 (11/12)** **17 (11/14)**
Nov 17 – 21	13	Respiratory* Gastrointestinal* Genitourinary*	**22 (22.1 - 22.6*)** **23 (23.1 - 23.6*)** **24 (24.1 - 24.7*)**	**18 (11/19)** **19 (11/21)**
Nov 24	14	Genitourinary*	**24 (24.1 - 24.7*)**	**H5 (11/25)**
Nov 26 – 28	14	**Thanksgiving Break – No classes**		
Dec 1 – 5	15	Nervous; Systemic	**20 (20.1 – 20.5, 20.7*)** **21 (21.1 – 21.4*)**	**20 (12/1)** **21 (12/3)**
Dec 18	**Final Exam (Monday) 8:00 am – 10:00 am**			

*Select diseases and infectious agents: see disease list