BIOL 4021: Immunology Laboratory

General Information

Course Meetings: M (2:00 – 4:50 pm) Bolin Hall 233
Instructor: James Masuoka, PhD
Office: Bolin Hall 224F
Telephone: 940-397-4181
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):

This course introduces microscopy, molecular and serological techniques used in basic and clinical immunology.

Required Materials:

- Laboratory exercises (provided)
- Lab coat (disposable is acceptable)
- Safety glasses (provided)
- Gloves (provided)

Course Objectives:

- Practice general laboratory safety
- Correctly perform experimental calculations and quantitiative manipulations used in the clinical and research laboratories
- Demonstrate technical skills with various materials and methods used in clinical and basic research laboratories
- Correctly use and maintain a compound microscope
- Identify cells of the immune system based on microscopic anatomy
- Describe how the experimental techniques arise from an understanding of basic immune system function

Classroom expectations and policies:

- You are expected to be prepared for lab by: 1) reading the text, lab manual and handouts prior to coming to class; 2) having paper and pen at hand
- You are expected to arrive a few minutes early in order to mentally prepare.
- Laboratory safety rules **must** be always followed (see section below). Failure to comply with these regulations will result in dismissal from the lab session and deductions from the laboratory participation grade (see below).
- Food and beverages are prohibited in the lab. [See also safety section below]
- 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 determine what accommodations might be made for a disability. It will be the responsibility of the student to make arrangements to acquire notes. Any requests for accommodations 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)** NO cell phones are permitted to be out in this class. This class, as well as your other classes, requires your engagement, and cell phones serve to detract from that engagement. Additionally, your phone should be not only put away, but on “silent” (NOTE: vibrate is NOT silent). If your phone is out and/or in sight, you will be asked to put it away.
- The instructor reserves the right to amend these rules as needed throughout the term.
- <u>It is NOT possible to make up missed labs.</u>

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 4021). Questions regarding 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.

Three unexcused lab absences will result in failure (receiving 0 points) of the laboratory portion of the course.

Exam Make-Up Policy:

There is only one exam in this course – the practical/written exam at the end of the semester. Because of the nature of the exam – laboratory practical – that requires set up of equipment and assays, a make-up exam cannot be provided except for extraordinary circumstances. Should these circumstances arise, the content and format of the make-up exam will be at the discretion of the instructor.

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.

This course is not graded on a traditional curve, but it is scaled to where the students are/end up. This allows for any adjustments that the instructor deems necessary. The course is worth approximately 350 points. Grade categories and equivalent percentages are as indicated: 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 210. Fractional percentages will be rounded at the end of the semester.

Note:

1) No regrades will be provided for exams done in pencil.
2) Misspelled words (esp. organism names) and incorrect taxonomic nomenclature will result in ¼ point deductions for each instance.

Assessment Summary:

Weekly quizzes/questions (10 of 11):	100 points
Final Exam (written + practical):	100 points
Assignments	100 points
Participation/lab safety:	70 points
Research Forum:	30 points
Total:	400 points

Quizzes: Quizzes will be given in the first 10 minutes of the laboratory period. If you are late, you will have whatever time remains to complete the quiz. If you are more than 10 minutes late, you will not be able to take the quiz that week. Quizzes will cover the exercises from the previous week and material from the upcoming exercises. Thus, it is important both to

understand your previous results and to have read the exercises for the week so that you are prepared.

Lab Practical/Written Exam: There will be one exam given the last week of class. This exam will be a combined format: one-half will be a laboratory practical-type format, emphasizing application and problem-solving. The other half will be a written exam testing concepts, but also involving problem-solving.

The **laboratory participation/safety** grade is based on adherence to laboratory safety and attendance policies (see below and in Laboratory Manual). Everyone starts the semester with 70 points. During the first week of lab, students will be given gentle reminders regarding lab safety and attendance as needed. After that, points will be deducted for each violation. The severity of the deduction is at the discretion of the instructor. The exception to this regards appropriate dress. As stated above, students wearing open-toed shoes or short pants/skirts will not be permitted to enter the laboratory.

Each semester, the University sponsors the **Undergraduate Research and Creative Activity Forum**. In this Forum, students present their research findings or creative works. For this assignment, students will **critically evaluate** three (3) poster presentations or three (3) oral presentations (or combination thereof). This will provide experience in both how to present results and how to critically evaluate data presented. Satisfactory completion of this assignment will be awarded 30 points towards your laboratory/course grade.

Laboratory Practices

Development of professional attributes goes beyond technical competency. It also includes compliance with safety regulations, considerate behavior towards patients, co-workers, supplies & equipment, as well as ethical conduct. In addition, a subjective assessment of preparation, initiative and resourcefulness may be applied. During EACH laboratory period the following behaviors should be observed.

Personal safety:

1. No food or drinks are to be taken into or consumed in the laboratory.
2. Do not apply cosmetics or handle contact lenses in the laboratory.
3. Wash your hands thoroughly with soap and water before leaving the laboratory – even if only for a short time.
4. Open-toed shoes, sandals or similar footwear are not appropriate and should not be worn in the laboratory. Shorts and short skirts are also inappropriate in terms of laboratory safety. These regulations are for your personal safety. Students wearing inappropriate dress will not be permitted to enter the laboratory.
5. Long hair must be tied back as it is not only a potential source of contamination, but also a fire hazard.
6. Wear a lab coat, gloves and protective eyewear when indicated.
7. Identify the location of safety devices in the laboratory.

Laboratory Supplies & Equipment:

1. Use lab supplies efficiently. You are allotted supplies as necessary to perform each lab exercise.
2. You should use glassware, pipets, etc. safely to minimize breakage. Broken glassware should be handled according to safety procedures. The instructor must be notified.
3. Dirty reusable glassware and lab equipment should be washed, rinsed with tap and then DI water and placed in the designated area when the lab exercise is complete.
4. Use lab equipment appropriately and safely. Prior to usage you should familiarize yourself with operation procedures.

Laboratory work area:

1. Keep bench-top work area clean and uncluttered. Maintain lab supplies in neat and orderly arrangement in work area.
2. Backpacks and other materials should not be within the immediate working lab area. These should be placed in a non-working area. Use ONLY pens and pencils provided in the lab. We don't want you to take contamination home with you.
3. Clean bench-top with disinfectant before leaving the lab.
4. While working in the lab and before leaving, place chair under the bench.
5. Minimize clutter of notebooks, papers, etc. around work area.
6. Clean and properly store microscopes at end of session, if used.
7. Dispose of contaminated materials appropriately.

(adapted from D. Berson, Advanced Clinical Microbiology Laboratory, UNLV)

Important Dates (Fall 2025):

Classes begin	August 25
Labor Day (no classes)	September 1
Last day to drop with a "W"	November 24 (4:00 pm)
Thanksgiving Break (no classes)	November 26-28
Final Exam	**December 1**
Classes end	December 5

Tentative Laboratory Schedule

Date	Week	Exercise	Topic	Quiz
Aug 25	1		Introduction: Safety, requirements, assignments; pre-test	
Sept 1	2		**No Labs: Labor Day**	
Sept 8	3	**1**	White Blood Cell Counts: Total & Differential	**1**
Sept 15	4	**3**	Innate: Lysozyme	**2**
Sept 22	5	**3**	[Read results]; Dilutions; Innate: Serum	**3**
Sept 29	6	**7**	[Read results]; RIA; Ouchterlony	**4**
Oct 6	7	**2**	[Read results]; Protein Assay (std curve)	**5**
Oct 13	8	**2, 4**	Protein Assay (Serum)	**6**
Oct 20	9	**4, 5, 6**	SDS-PAGE/Blot	**7**
Oct 27	10	**6**	Probe Blot	**8**
Nov 3	11	**9**	Agglutination: Titer, Typing	**9**
Nov 10	12	**10**	Agglutination: Diagnostics	**10**
Nov 17	13	**8**	ELISA: Diagnostic	**11**
Nov 24	14		Review: open lab, review results	
Dec 1	15		**Final Exam (Comprehensive: Written & Practical)**	