



Fundamental Clinical Microbiology - Laboratory

College of Science, Mathematics and Engineering

Spring 2026 | Section 21A | TR 1:00pm – 2:20 pm | Bolin 231

Contact Information

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Course Description

This laboratory section complements the lecture portion of the course as an introduction to medically important bacteria, fungi, helminths, protozoa, and viruses. Students will learn and apply practical laboratory techniques to the study and identification of microorganisms, particularly bacteria, which affect the health and lives of humans. **NOTE:** Microbiology relies on studying living organisms. As a result, time is required for organisms to grow after inoculation into growth medium. We have made every attempt to restrict student activity to the scheduled periods. However, students may still need to come into the lab outside of the scheduled laboratory period to collect data and interpret results.

Textbook & Instructional Materials

Microbiology Laboratory Theory & Application: Essentials, 2nd Edition by L Norman-McKay, MJ Leboffe and BE Pierce. 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. The digital content is accessed through the TopHat link in the course D2L page.

Personal Protective Equipment (PPE): Students need to provide their own labcoat to use during the semester. Lab coats must remain in the lab throughout the semester. Gloves and safety glasses will be provided by the department.

Recommended, but not required: Composition book (Laboratory notebook): This does not have to be anything fancy, but it should have a tape/cloth binding (as opposed to being spiral-bound). Non-perforated pages are best. I like the pages with grids, but lines are perfectly acceptable. A 50 page

composition book should be plenty. This will be used to record your observations and data throughout the semester.

Academic Misconduct Policy & Procedures

Academic Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given). Additional guidelines on procedures in these matters may be found in the Office of Student Conduct.

[Office of Student Conduct](#)

Moffett Library

Moffett Library provides resources and services to support student's studies and assignments, including books, peer-reviewed journals, databases, and multimedia materials accessible both on campus and remotely. The library offers media equipment checkout, reservable study rooms, and research assistance from librarians to help students effectively find, evaluate, and use information. Get started on this [Moffett Library webpage](#) to explore these resources and learn how to best utilize the library.

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. Passing requires 60% of the points (unadjusted) for the course, or 560. Fractional percentages will be rounded at the end of the semester.

Table 1: Points allocated to each assignment

| Assessments | Points |
|----------------------------|--------|
| Quizzes | 100 |
| Assignments | 60 |
| Patient Case Report | 40 |
| Research Forum Evaluations | 30 |
| Participation/safety | 70 |
| Total Points | 300 |

Quizzes

Quizzes will be given in the first 10 minutes of one laboratory period per week (see General Course Rules). Quizzes will cover the exercises from the previous lab and material from the upcoming exercises (including materials from the online pre-labs). Thus, it is important both to understand your previous results and to have read the exercises for the week so that you are prepared.

Laboratory Assignments

There will be **3 assignments** that will evaluate **key laboratory skills**. Each assignment will be worth 20 points. One will focus on the use of proper aseptic technique. One will focus on correct use and care of the compound microscope. One will focus on successful completion of a Gram stain. One will focus on the streak plate technique of isolating colonies.

Patient Sample Unknown

The **patient sample unknown** will be a simulated sample based on an actual case study. Each student will be responsible for identifying one isolate from their group's sample. Identification of the isolates will be conducted using traditional culture and morphological assays, along with biochemical/metabolic tests. The results and conclusions of this analysis leading to the identification of the unknown organism will be written up as a brief **case study report**. This report will also put your unknown organism in the context of the case and present your analysis of the patient's case – background, diagnosis, treatment, etc. A separate project sheet describing expectations in more detail will be handed out around mid-semester. Throughout the semester, you should record your observations in a **laboratory notebook**. Your records from the notebook will greatly enhance your ability to write a good lab report as well as provide material you can use to prepare for lab quizzes.

Research Forum Evaluations

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 by others in preparation for the Case Study reports at the end of the semester. Satisfactory completion of this assignment will be awarded 30 points towards your laboratory/course grade.

Laboratory Safety Compliance and Participation

The **laboratory participation/safety** grade is based on adherence to laboratory safety and attendance policies. **Everyone starts the semester with 70 points.** During the first week or two 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.

Late Work

Points will be deducted from assignments turned in late.

Important Dates

- Last day for term schedule changes: **January 23, 2026**
- Deadline to file for graduation: **February 16, 2026**
- Last Day to drop with a grade of "W:" **April 29, 2026**
- Refer to: [Drops, Withdrawals & Void](#)
- Refer to the course D2L page for exam and assignment due dates

Desire-to-Learn (D2L)

Extensive use of the MSU D2L program is a part of this course. Each student is expected to be familiar with this program as it provides a primary source of communication regarding assignments, examination materials, and general course information. You can log into [D2L](#) through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program or contact your instructor.

Attendance

Students are expected to attend all meetings of the classes in which they are enrolled. Although in general students are graded on intellectual effort and performance rather than attendance, absences may lower the student's grade where class attendance and class participation are deemed essential by the faculty member. In those classes where attendance is considered as part of the grade, the instructor should so inform students of the specifics in writing at the beginning of the semester in a syllabus or separate attendance policy statement. An instructor who has an attendance policy must keep records on a daily basis. The instructor must give the student a verbal or written warning prior to being dropped from the class. Instructor's records will stand as evidence of absences. A student with excessive absences may be dropped from a course by the instructor. Any individual faculty member or college has the authority to establish an attendance policy, providing the policy is in accordance with the General University Policies.

Accommodations for some lab aspects may be made for students who miss lab for acceptable reasons (see lecture syllabus). However, due to limitations in resources and personnel time, we cannot offer full make up labs.

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

If you feel ill: 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.

Instructor Expectations and Class Policies

- All general course policies, as provided in the lecture syllabus, also apply to the laboratory portion of the course.
- 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).
- Cell phones and pagers are to be turned off before lab begins.
- Students are expected to read the introductory material prior to each lab session.
- Cheating will not be tolerated. Anyone suspected of cheating will be subject to the consequences outlined in the University's academic honesty policy.
- 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).
- All lab sessions should be attended. We will not offer make-up labs.
- Punctuality is always expected. If you are more than 10 minutes late, you will miss the quiz for the day and be counted as absent.
- All quizzes, exams, or assignments missed due to unexcused absences will be recorded as zeros.
- Each group is responsible for proper clean up at the end of the laboratory period. This includes proper cleaning and storage of microscopes, proper disposal of contaminated materials, disinfection of benches and workspaces, etc.
- If you have a documented disability that will impact your work in this class, please contact the TA or instructor to discuss your needs.
- 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 the laboratory. 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.

- The instructor reserves the right to amend these rules as needed throughout the term.

Change of Schedule

A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a 100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

Refund and Repayment Policy

A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees and room/board charges that were paid to MSU for the semester. HOWEVER, if the student received financial aid (federal/state/institutional grants, loans and/or scholarships), all or a portion of the refund may be returned to the financial aid programs. As described below, two formulas (federal and state) exists in determining the amount of the refund. (Examples of each refund calculation will be made available upon request).

Services for Students with Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through Disability Support Services, located in the Student Wellness Center, (940) 397-4140. Current documentation of a disability will be required in order to provide appropriate services, and each request will be individually reviewed. For more details, please go to [Disability Support Services](#).

College Policies

Smoking/Tobacco Policy

College policy strictly prohibits the use of tobacco products in any building owned or operated by WATC. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy

To comply with the Drug Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State are informed that strictly enforced policies are in place which prohibits the unlawful possession, use or distribution of any illicit drugs, including alcohol, on university property or as part of any university-sponsored activity. Students and employees

are also subject to all applicable legal sanctions under local, state and federal law for any offenses involving illicit drugs on University property or at University-sponsored activities.

Active Shooter

The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by MSU Police Department regarding the options and strategies we can all use to stay safe during difficult situations. For more information, visit [MSUReady – Active Shooter](#). Students are encouraged to watch the video entitled “*Run. Hide. Fight.*” which may be electronically accessed via the University police department’s webpage: [“Run. Hide. Fight.”](#)

Grade Appeal Process

Update as needed. Students who wish to appeal a grade should consult the Midwestern State University [MSU Catalog](#)

***Notice:** Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor.

Tentative Laboratory Schedule:

| Week and Dates | Exercise | Topic |
|---------------------|----------------------------------|--|
| 1 1/20 and 1/22 | D2L Videos | Labs do not meet in-person |
| 2 1/27 and 1/29 | 9, 1 | Lab Check In, Lab Safety Ubiquity, Microscope Use |
| 3 2/3 and 2/5 | 3 (A,B,C), 2, 4 | Aseptic Technique, Examine Eukaryotes Streak Plate |
| 4 2/10 and 2/12 | 1, 4, 11, 13 | Examine Bacteria, Streak Plate Making Smears, Gram Stain |
| 5 2/17 and 2/19 | Handout | Koch's Postulates: Microscopy, Streak plate, Gram Stain |
| 6 2/24 and 2/26 | Handout, 22, 23, 24, 25 | Koch's Postulates: Streak plate, Selective and Differential Media |
| 7 3/3 and 3/5 | 47 | Work on lab skill assignments, Case Study Introduction, Unknown Dry Lab |
| 8 3/10 and 3/12 | No labs | Spring Break |
| 9 3/17 and 3/19 | 47 | Unknown Dry Lab, Case Study: Patient Specimen (Group and Individual work) |
| 10 3/24 and 3/26 | 29, 25, 18, 44 27, 28, 31, 38 | Patient Specimen Isolates: Biochemical Testing |
| 11 3/31 and 4/2 | Handouts | White Blood Cell Differential Counts No labs 4/2: Holiday Break |
| 12 4/7 and 4/9 | 44, 33, 34 30, 27, 35 | Patient Specimen Isolates: Biochemical Testing |
| 13 4/14 and 4/16 | Handouts | Latex Agglutination Assays, Patient unknown confirmatory tests |
| 14 4/21 and 4/23 | 43 | Kirby-Bauer Susceptibility Assay, Case study: group analysis |
| 15 4/28 and 4/30 | Handouts | Fungal culture, Immunoassays (ELISA) |
| 16 5/5 and 5/7 | | Reports Due (5/5), Lab Check Out |

Laboratory Safety

As you will see in one of our exercises, microbes are found everywhere within the environment – in the air, on surfaces, on your body. In the Microbiology Laboratory, we deal with microbes at higher concentrations than found in the environment. We will also be dealing with organisms that are potentially pathogenic to humans – thus we treat EVERY organism as if it were pathogenic.

- No food or drinks are to be taken into or consumed in the laboratory. Further, ANY activity that involves hand-to-face contact (applying cosmetics, handling contact lenses, etc.) should be avoided.
- Disinfect the work area before starting lab, after completing lab, and after any spills that occur. Do not assume that the lab members in the previous section cleaned up after themselves.
- Wash your hands thoroughly with soap and water before leaving the laboratory – even if you need to leave only for a brief time.
- 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.
- Long hair must be tied back as it is not only a potential source of contamination, but also a fire hazard.
- Proper personal protective equipment (PPE) must be used in the lab whenever work is being done. For this laboratory, PPE includes a lab coat, safety glasses and laboratory gloves.
- Be aware of the location of safety equipment such as fire extinguishers, eyewashes, showers, First Aid kits, etc.
- Follow all waste disposal guidelines. (See below)
- Refer to the Introduction section of your lab manual for additional discussion of laboratory safety issues.
- When in doubt, ASK!
- SDS (Safety Data Sheets) are in Bolin 223 in the white bookcase

Waste Disposal and Cleanup:

Proper cleanup of the laboratory is essential to reduce contamination and to ensure that subsequent lab sections have a clean and organized work area. The following guidelines must be observed during each lab session. Each student must take an active role in proper cleanup and waste disposal. Do not leave it for someone else.

Lab benches: There are squirt bottles of disinfectant (Cidecon) located on the lab benches. You must clean the lab bench before AND after each lab. If you run out of disinfectant, refill the bottle from the large carboy next to the microscope

cabinet. The best technique for disinfection is to stream disinfectant over the surface, then use a paper towel to even the fluid over the surface so that a light film remains. Do not wipe to dryness but allow the disinfectant to air dry. The extended contact of the fluid to the surface increases effectiveness.

Paper towels and **soap** are located next to the sink.

Spills: Immediately cover any spilled culture material with paper towels to contain the spill and prevent it from spreading. Saturate the paper towels with disinfectant (Cidecon) and allow it to stand 15 minutes. Report the spill to the instructor. After the reaction time is done, remove the towels and dispose of them in the regular trash (all living cells should have been killed during the time exposed to disinfectant).

Waste material: Bacterial cultures must be killed prior to disposal. Each group must dispose of their cultures once they have obtained and recorded their results. Dispose of each type of waste according to the following guidelines:

- **Liquid cultures:** add bleach to the tube. Squirt bottles containing bleach (1:2 dilution of household bleach in water, 2.5% final) are kept next to the sink. Add 1/5 the culture volume (usually about 1 cm) and place the tube into the holding racks next to the sink. The tube cap should go into the appropriately marked basket. **NEVER** pour your cultures down the drain or into the trash.
- **Solid cultures (plates):** All cultures on plastic Petri plates are disposed of in the Contaminated Material Container (CMC), large box with the red plastic bag) next to the sink.
- **Solid cultures (slants):** For cultures on agar slants – remove the cap and place the cap in the appropriate basket. The tube is disposed of in the CMC. DO NOT bleach your slants.
- **Semi-solid cultures:** Some growth media are termed semi-solid because they do not contain enough agar to completely solidify. These media are treated like agar slants.
- **Additional note on CMCs:** Only materials that are visibly contaminated are to be put into CMCs. Paper towels used for washing hands go into the trash, as do transfer pipette wrappers, sterile swab wrappers and the like. If the organisms are dead/killed – as with paper towels used to wipe up Cidecon from the benches – the material still goes into the trash.