



**PATH 3100 – Introduction to Medical Microbiology,
Section 001
Fall Semester 2022
Mondays and Wednesdays, 10:45 AM -11:35 AM
HSEB room 1750**

Course Directors:

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This syllabus is meant to serve as an outline and guide for our course. Please note that we may modify it with reasonable notice to you. We may also modify the Course Schedule to accommodate the needs of our class and guest presenters. Any changes will be announced in class and posted on Canvas under Announcements.

Have questions?

With any general questions, please email Dr. Enioutina and cc Prof. Hohmann. If you have a question related to the lecture material, please contact the course directors or lecturer indicated in the course schedule.

Textbook (optional)

Medical Microbiology, 9th Edition: Murray, Rosenthal, Pfaller

*E-book available **FREE** for U of U students through "Clinical Key"; see Canvas for details*

Website

All relevant course materials are provided on the Canvas page, accessed through CIS login, My Classes. Use Google Chrome or Safari as your browser. Internet Explorer does not work well.

Course Description

3-semester units

Introduction to Medical Microbiology is a didactic course in medical microbiology and infectious diseases for pharmacy, pre-nursing, and other allied health students. Topics include common disease-producing bacteria, virulence factors, normal flora vs. pathogens, disease states, and antibiotics. An introduction to viruses, fungi, and parasites is also presented.

Course instructors conduct a study to determine whether the in-person class offering will increase students' understanding and retention of key microbiology concepts of common pathogenic organisms and infectious diseases.

*The study will compare two sections of the Medical Microbiology course offered at the University of Utah during the Fall 2022 semester: PATH3100-001 (in-person class) and PATH3100-090 (online class) (**see Consent Cover Letter below for more details**).*

Course Outcomes

By the end of this course, the student will be able to successfully fulfill the objectives listed in each lecture outline.

Teaching and Learning Methods

This course will be taught using live lectures, online Canvas assignments, and case studies to apply classroom concepts to the real-world environment. Content is organized into four modules.

Teaching microbiology is a task that we take great joy and pride in. We know that the knowledge we are imparting to students will directly impact the health and well-being of many people. Microbiology is a diverse and complex field riddled with strange vocabulary, unknowns, and correlations—it is our duty to take that large and varied body of knowledge, condense it, make it meaningful and ultimately useful to you. In order for you to understand this complex field of information, we will encourage you to think independently and critically examine situations in order to make correlations between cause (organism) and effect (disease). We care that you understand this information and how it affects you as a person and a future professional.

Students who have questions regarding Canvas-presented assignments may contact course directors, lecturers, or TAs. Consequently, the course teaching philosophy is based on self-directed learning for highly motivated students.

Course Policies

Attendance & Punctuality: We do not track lecture attendance but highly recommend attending all lectures. Lectures provide key materials to students wanting to do well in the class. For exams – a student must contact the course director prior to an exam if there is an illness, a family emergency, or if the student is involved with a university commitment such as a sports team or band in order for it to be considered an

excused absence. A student will not be able to "make up" an exam for an unexcused absence. A letter from a physician or a coach may be requested by the instructor.

Electronic Devices in Class: It is expected that cell phone use/texting will not be done during class time. **Use of cell phones, smartwatches, or any other electronic device, for any reason, during an exam will be considered cheating, and the student will receive a zero for the exam.**

Student Responsibilities: Students are expected to follow the Code of Student Rights and Responsibilities ("Student Code") as delineated in the University of Utah Policies and Procedures Manual (<http://regulations.utah.edu/academics/6-400.php>).

Faculty Responsibilities: These guidelines are delineated in the University of Utah Policies and Procedures Manual. [<http://regulations.utah.edu/academics/6-316.php>]

- Convene class unless a valid reason and notice are given
- Perform and return evaluations in a timely manner
- Inform students at the beginning of class about general content, course activities, methods of evaluation, grade scale, schedule of lectures, assignments, laboratory, examinations, etc.
- Ensure an environment conducive to learning
- Enforce the student code

Plagiarism: Plagiarized material submitted for assignments may result in failure in the course and potential dismissal from the University of Utah. Read the University of Utah Code of Student Rights and Responsibilities outlining policies regarding plagiarism. **Academic misconduct will not be tolerated.** A zero will be given to any student cheating on any assignment or an exam.

Course Evaluations: We take these seriously. We appreciate your specific, CONSTRUCTIVE comments in the evaluation and have made changes based on comments from previous evaluations.

Grading Policy: Exams are 60% of the grade, and the exam percentage is based on the total number of points accumulated for the four exams divided by the total number of points possible. For those who want to improve their grades, we will be offering a bonus (optional quiz) that will cover 10-15 questions from exams 1 and 2. Additionally, will be an optional virology quiz which will cover materials presented in pre-recorded viral lectures. *A final grade of students who do not wish to take bonus (optional) quizzes for any reasons will not be affected.* Assignments submitted after the posted due date and time will have an automatic 5%-point reduction for each day the assignment is late. For grade review requests, please visit the Grade Review Policy review below prior to contacting the course directors.

Examinations: Examination material is derived from the course lectures, outlines, and assignments. Gram stain reactions and morphology are cumulative (refer to Gram Stain List on Canvas) and **will be present on every exam.** Otherwise, the exams are not cumulative. Unless otherwise noted, exams are administered online at the Canvas website. Unless otherwise noted, exams are administered during scheduled class time. Questions are multiple-choice, matching, and true/false.

There will be no make-up examinations without instructor consent PRIOR to the scheduled examination. Instructors must be notified PRIOR to the exam, or make-up will not be allowed. Only an emergency situation will be considered as an acceptable reason for a student to take the examination at another time. Make-up exams may be different in content or format. Exam scores are not curved. All exam scores will be posted on Canvas. *If a student wishes to review their individual results, please contact the TAs.*

Item	% of grade
Weekly Case Studies	13%
Micro Diary	10%
Online Exercises	7%
Capstone Case Studies	10%
4 Exams	60%

GRADING SCALE	
Letter Grade	Range
A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D+	67-69%
D	63-66%
D-	60-62%
E	0-59%

Using LockDown Browser and Webcam for Online Exams:

Examinations will be administered online within Canvas and may be taken at any time during the day of the scheduled exam. This course requires the use of LockDown Browser for online exams. Watch this [short video](#) to get a basic understanding of LockDown Browser and the webcam feature. Then download and install LockDown Browser from [this link](#). For those who have not used Respondus for online exams, please practice using the [Practice Respondus Quiz](#) in Canvas.

To take an online test, start LockDown Browser and navigate to the exam. (You won't be able to access the exam with a standard web browser.) For additional details on using LockDown Browser, review this [Student Quick Start Guide \(PDF\)](#).

Finally, when taking an online exam, follow these guidelines:

- Select a location where you won't be interrupted
- Before starting the test, know how much time is available for it, and that you've allotted sufficient time to complete it
- Turn off all mobile devices, phones, etc. and don't have them within reach
- Clear your area of all external materials — books, papers, other computers, or devices
- Remain at your desk or workstation for the duration of the test
- LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted

Online Canvas assignment and case study environment:

Students and instructors will work together and follow University policies and procedures to create an environment conducive to teaching and learning in this course. As with all courses at the University, the online environment is considered to be equivalent to in-person (land) classrooms and offices. Email, discussions, and other online communications in the course are part of the classroom and, as such, are University property and subject to GRAMA regulations and the Student Code. Privacy regarding these communications within the academic community must not be assumed, while professionalism regarding these communications is required. Students are responsible for maintaining in working condition the hardware and software that they need to access the course and its materials.

Assignments

Weekly Case Studies – [due on Sunday by 11:59 PM, the week when the lecture was given.](#)

Under Assignments in Canvas, students are assigned a case study each week derived from that week's lecture content. Students will analyze the case studies and answer accompanying questions in a Canvas quiz. You are welcome to use your lecture outline and notes for the quiz. Case studies will be due at 11:59 PM on the Sunday after the lecture was given. Refer to Canvas for exact due dates. The case studies are worth 13% of your final grade.

Hospital Epidemiology and the laboratory – [due by August 28th, 2022](#)

Under Assignments in Canvas, watch the recorded lecture "Hospital Epidemiology and the Laboratory," take notes on the associated outline, and take the associated quiz. You are welcome to use your lecture outline and notes for the quiz. This score will count towards your overall Weekly Case Studies grade.

Microbiology Diary – [due November 6th, 2022](#)

WARNING: This assignment evaluates your ability to follow written instructions!

Microbes impact our lives in many ways, but most of the time, we are unaware of their activities. In this assignment, you will keep a daily diary enumerating the ways you personally have been affected by microbes.

This assignment is worth 10% of your final grade. Spelling and grammar will be considered in your score. Recall that proper genus and species names are italicized or underlined. You will lose a point if you fail to complete #4 below at the conclusion of your diary, even if you discuss genus and species names in your entries.

1. Briefly leaf through a microbiology textbook taking note of the diverse activities of microorganisms. This will help you focus on your "unseen encounters" with microbes.
2. Prepare a Word or other rich text file (.rtf) format using font size 12 in "Times" or "Times New Roman" style.
3. Write a paragraph each day for 7 consecutive days describing how microbes have interacted with you that day. State the connection between the specific event and the activity of the microbes involved.
 - Be sure to use correct grammar, spelling, and nomenclature.
 - Use a diary format, listing dates.
 - Note: the instructors are highly sympathetic if you or one of your family members has an infectious disease for the entire 7 days, but one entry per disease is sufficient. The instructors appreciate interesting and even entertaining entries that are professionally presented but discourage entries that are overtly distasteful. An example of an acceptable journal is posted on Canvas.
4. At the end of the week, write a separate one-paragraph summary reflecting on your experience.
 - In your summary paragraph, highlight your "favorite" organism encounter by including a possible proper name (genus and species). Also, state whether your organism is a bacterium, virus, parasite, or fungus. We are asking you to make an *intelligent, reasonable** guess. (*You will be marked down for outrageous proposals. e.g., the *Salmonella* that you may have gotten with your salad bar probably wasn't *S. typhi*!)
5. Submit the assignment online through the Canvas Assignments tab.

Online Laboratory Exercises – due dates below

Included in this course is an independent study of two online laboratory exercises. You will go through the tutorials listed below and take the quizzes at the end of the tutorial. Take a screenshot of

your score report for each tutorial and upload it to Canvas by the due date.

An example of an acceptable submission can be found on the Canvas assignment page. A minimum passing score is 80% to achieve full credit; you can take the tutorials and quizzes as many times as you need to achieve the minimum passing score. These assignments are worth 7% of your final grade.

Content from these online exercises will be included in exams (Infection Control – Exam #1, Gram Stains – Exam #4). These exercises require several hours to complete, so it is strongly recommended NOT to leave the material until just before the due date.

Everyone must complete:

1. **Infection Control module** – [September 3rd, 2022](#)
2. **Gram Stain module** – [due November 28th, 2022](#)

Website: http://www.medtraining.org/	Lab code: 227951
1. Go to the website, click LOGIN	
2. Sign up for a new account using the lab code above and choose your own password.	

Capstone Case Studies – [due December 4, 2022](#)

Each student will be given 20 case studies to read and answer the accompanying questions. Resources for answering the questions are, but not limited to, the lecture notes, course textbook, other current microbiology textbooks, online resources that are reputable sites such as .gov or Mayo Clinic, or CDC, for example. The textbook is highly recommended for reference as many of the cases come directly from it.

- The case studies can be done in pairs or small groups, but each student will submit their own assignment online through the course website, Assignments tab.
- Some of you may find it easier to review the cases and select your answers offline before taking the quiz. Canvas will save your progress each time you select an answer but won't grade the quiz until you click Submit Answers.
- Note that Canvas randomizes the questions and answers for each individual's quiz. Review your online responses to ensure they are really what you want to select.

Course Schedule				
Date	Topic	Chapter(s) <i>optional</i>	Lecturer	Classroom
Aug 22	Introduction - Bacterial Characteristics	1, 12, 13	Dr. Enioutina	HSEB1750
Aug 24	Host/Parasite Interactions	2,3,7,14,15	Dr. Enioutina	HSEB1750
Aug 28	Due date for assignments: 1. Case study 1 2. Hospital Epidemiology and the Laboratory lecture Quiz			online
Aug 29	Sterilization and disinfection		Prof. Leetham/Enioutina	HSEB1750
Aug 31	Staphylococcus and Disease Transmission	18, 15 (Tab 15.1)	Dr. Enioutina	HSEB1750
Sep 3	Due date for assignments: 1. Online Exercise: Infection Control 2. Case study 2			online
Sep 4-5	Labor day			No class
Sep 7	Streptococcus/Enterococcus	19	Dr. Enioutina	HSEB1750
Sep 11	Due date for assignment: Case study 3			online
Sep 12	Gram Positive Bacilli	20, 21, 30	Dr. Enioutina	HSEB1750
Sep 14	<i>Neisseria/Moraxella</i>	23	Dr. Enioutina	HSEB1750
Sep 18	Due date for assignments: 1. Case study 4 2. Case study 5			online
Sep 19	Exam 1 (August 22- Sep 14 materials PLUS Infection Control Tutorial and Hospital Epidemiology)			online
Sep 21	Enteric Bacilli	25	Prof. Leetham/Enioutina	HSEB1750
Sep 25	Due date for assignment: Case study 7			online
Sep 26	Fastidious Gram-Negative Rods	24, 29	Prof. Hohmann	HSEB1750
Sep 28	<i>Vibrio, Aeromonas, Campylobacter, Helicobacter</i>	26, 28	Prof. Hohmann	HSEB1750
Oct 2	Due date for assignments: 1. Case study 6 2. Case Study 8			online
Oct 3	<i>Pseudomonas</i> and Related Organisms	27	Prof. Hohmann	HSEB1750
Oct 5	Mycobacterium and Acid-Fast Bacteria lecture	22	Dr. Enioutina	HSEB1750
Oct 8	Due date for assignments: 1. Case study 9 2. Case study 10			online
Oct 9- 16	Fall Break			No classes
Oct 17	Anaerobiasis and Common Anaerobes	30, 31	Prof. Hohmann	HSEB1750
Oct 19	Exam 2 (Sep 21- Oct 17 materials)			online
Oct 23	Due date for assignment: Case study 11			online

Oct 24	Spirochetes, Chlamydia, and Mycoplasma	32, 33, 35	Prof. Hohmann	HSEB1750
Oct 26	Antimicrobials, Part 1	17, 61	Dr. Enioutina	HSEB1750
Oct 30	Due date for assignments: 1. Case study 12 2. Case study 13			online
Oct 31	Antimicrobials, Part 2	17, 61	Dr. Enioutina	HSEB1750
Oct 30-Nov 6	Microbiology Diary is Due			online
Nov 2	Virology and Prions	36-56	Prof. Buckendorf	HSEB1750
Nov 7	HIV and Retroviruses	54	Prof. Buckendorf	HSEB1750
Nov 13	Due date for assignments: 1. Case study 14 2. Case Study 15			online
Nov 9	Parasitology	67-77	Prof. Hohmann	HSEB1750
Nov 14	Malaria (parasitology)	74	Dr. Enioutina	HSEB1750
Nov 16	Exam 3 (Oct 24- Nov 14 materials)			online
Nov 20	Due date for assignments: 1. Case study 16 2. Case Study 17			
Nov 21	Mycology	57-66	Prof. Hohmann	HSEB1750
Nov 23	Sexually Transmitted Infections	Lecture	Dr. Enioutina	HSEB1750
Nov 24-27	Thanksgiving Holiday			No class
Nov 27-28	Online Exercise: Gram Stain is Due			online
Nov 28	Respiratory Tract Infections	Lecture Outline	Dr. Enioutina	HSEB1750
Nov 30	Skin and Soft Tissue Infections	Lecture Outline	Prof. Leetham/ Enioutina	HSEB1750
Dec 4	Capstone Case Studies Due			online
Dec 5	Bacteremia and CNS Infections	Lecture Outline	Dr. Enioutina	HSEB1750
Dec 7	Urinary Tract Infections	Lecture Outline	Prof. Leetham/Enioutina	HSEB1750
Dec 12	Exam 4 (Nov 21- Dec 7 PLUS Gram Stain Tutorial)			Online

University Policies

1. **The Americans with Disabilities Act.** The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581-5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.
2. **University Safety Statement.** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call

campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu

3. **Addressing Sexual Misconduct.** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status, or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581- 8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).
4. **Undocumented Student Support Statement.** Immigration is a complex phenomenon with broad impact—those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801.213.3697 or visit dream.utah.edu.
5. **Drop/Withdrawal.** – Check the current semester Academic Calendar for these important dates. <https://registrar.utah.edu/academic-calendars/index.php>
 - a. The last day to drop (delete) classes. Students can drop classes with no tuition penalty, and the classes will not appear on their transcripts.
 - b. The last day to withdraw from classes. Students can withdraw, but will be held responsible for tuition, and a "W" will appear on their transcript.
6. **Accommodation Policy** (see Section Q): <http://regulations.utah.edu/academics/6-100.php>
7. **Student Names & Personal Pronouns Statement.** Class rosters are provided to the instructor with the student's legal name as well as "Preferred first name" (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and update CIS) so I can help create a learning environment in which you, your name, and your pronoun will be respected. If you need assistance getting your preferred name on your UID card, please visit the LGBT Resource Center Room 409 in the Olpin Union Building or email bpeacock@sa.utah.edu to schedule a time to drop by. The LGBT Resource Center hours are M-F 8 AM-5 PM and 8 AM-6 PM on Tuesdays.
8. **Wellness Statement.** Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed

and thrive at the University of Utah. For helpful resources, contact the Center for Student Wellness at www.wellness.utah.edu or 801-581-7776.

9. ***Learners of English as an Additional/Second Language.*** If you are an English language learner, please be aware of several resources on campus that will support you with your language and writing development. These resources include: the Writing Center (<http://writingcenter.utah.edu>); the Writing Program (<http://writing-program.utah.edu>); the English Language Institute (<http://continue.utah.edu/eli>). Please let me know if there is any additional support you would like to discuss for this class.

10. Student Mental Health Resources

- a. Rates of burnout, anxiety, depression, isolation, and loneliness have noticeably increased during the pandemic. If you need help, reach out for [campus mental health resources](#), including counseling, trainings and other support.
- b. Consider participating in a [Mental Health First Aid](#) or other [wellness-themed](#) training provided by our Center for Student Wellness and sharing these opportunities with your peers, teaching assistants and department colleagues.

Consent Cover Letter

This study aims to determine whether the in-person class offering will increase students' understanding and retention of key microbiology concepts of common pathogenic organisms and infectious diseases.

The PATH3100 course has two sections: PATH3100-001 (in-person class) and PAT3100-090 (online class). The study will compare two sections of the medical microbiology course offered at the University of Utah during the Fall 2022 semester. Section PATH3100-090 will be taught a standard online course that includes prerecorded lectures, bi-weekly assignments, and four-course exams. Section PATH3100-001 will have bi-weekly in-person classes, and online Canvas bi-weekly assignments, and four-course exams.

At the end of the course, the average *section score* for assignments and four exams will be compared between two-course sections. *Your class performance will not be evaluated in this study.* Three months later, you will be recontacted and asked to take *an anonymous survey* consisting of 20 questions from course exams and 5 Gram stain matching questions. The exam question would be chosen for the survey if most students responded correctly to the question during the semester. The knowledge retention survey will compare the percent of students who responded correctly to the question during the semester and the percent of students who responded correctly to the question 3 months later.

Your participation in this study is completely voluntary and will not affect your grade in the course. You will not be identified in any publications. The information collected in this research will not be used for future research studies.

You can opt out of the study. *Your decision will not affect your course scores.* If you will decide to *opt-out of the study*, please contact the PI, Dr. Enioutina (Elena.Enioutina@hsc.utah.edu), or one of the co-Investigators, Prof. Sheri Hohmann (sheri.hohmann@path.utah.edu), Prof. Mallory Leetham (mallory.leetham@path.utah.edu), Prof. Diana Wilkins (Diana.Wilkins@utah.edu) or Jonathan Buckendorf (jonny.buckendorf@path.utah.edu). If you will decide not to participate in the study, your exam and assignments' scores will not be collected and used in the calculated average scores for section exams and assignments.

If the PI or Co-Investigators have not heard from you to opt-out of this study by September 1, 2022, your data will be included to the section exam and assignments' scores.

Benefits. There are no obvious benefits to participant in this study. However, by participating in this study may could offer better understanding of the microbiology key concepts and help students in their future healthcare professions.

Risks. The risk associated with this study is minimal and associated with a breach of FERPA confidentiality. However, we do not expect that your education records, such as report cards, transcripts, disciplinary records, contact, will become available to the general public since all this information is a part of the Canvas course site and will not be used in the study. This study will analyze only the average scores of the whole class, not an individual student. Knowledge retention survey will be conducted on volunteer and anonymous bases and analyze the percent of correct answers. The PI, Dr. Enioutina, and study co-Investigators will put all efforts protecting any sensitive information. Collected during this study, data will be stored in the password-protected computers.

If you have any questions complaints, or if you feel you have been harmed by this research, please contact Principal Investigator Dr. Elena Enioutina at 801-587-1916 or via e-mail Elena.Enioutina@hsc.utah.edu.

Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints, or concerns which you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

You may also contact the Research Participant Advocate (RPA) by phone at (801) 581-3803 or by e-mail at participant.advocate@hsc.utah.edu.

Thank you for considering this study, Dr. Elena Enioutina and all Co-Investigators