

**QBS 131/BIOL 073: Foundations of Epidemiology II
Winter 2025 Syllabus**

Professor: Megan Romano, MPH, PhD, Megan.E.Romano@dartmouth.edu

Office location: Dartmouth Hitchcock Medical Center (DHMC), Williamson, Rm 758

Graduate Teaching Assistant(s): redacted

COURSE MEETINGS: Attendance is expected at all synchronous lectures and class participation constitutes 10% of the course grade. Lectures will take place on Tuesdays and Thursdays, 2:25 PM to 4:15 PM in Room 201 of the LSC unless otherwise noted on the posted schedule on Canvas.

OFFICE HOURS: See Canvas website for course for up to date information about office hours.

COURSE OBJECTIVES: The primary goal of this second course of the two-part sequence on Foundations of Epidemiology is to develop in-depth understanding of epidemiologic theory and methods. The two courses provide a strong foundation that can be used to conduct sound epidemiological research. We specifically seek to:

1. Demonstrate why epidemiology is an interesting and useful scientific discipline.
2. Develop proficiency in the following concepts and skills used by practicing epidemiologists:
 - Understand criteria for confounding of exposure-disease associations, how it arises, evidence of confounding, how it may impact the interpretation of study results, and advanced methods to describe and control for confounding.
 - Understand key characteristics of epidemiological study designs (e.g. case-control, cohort) and which designs are most appropriate to answer certain research questions.
 - Design a randomized trial, cohort study, or case-control study to evaluate associations between an exposure and health outcome of interest.
 - Describe the methods and terminology used in outbreak investigation and evaluation of screening tests.
3. Develop the ability to effectively describe and interpret primary papers in epidemiology both orally and in writing using the language of epidemiology. This will include the ability to:
 - Critically review the primary epidemiologic literature.
 - Interpret epidemiologic studies and synthesize findings in of context of other epidemiologic studies, biological or other mechanisms, and public health implications.
 - Understand the types of evidence that support a causal exposure-disease relationship and interpret the causality of associations presented in epidemiological studies.

COURSE MATERIALS: The course will use the textbook, Epidemiologic Methods, 2nd edition, by N.S. Weiss and T.D. Koepsell. 2011. Oxford University Press, Oxford. Additional readings and faculty-generated course materials will be posted on Canvas.

COURSE PHILOSOPHY: The professor and students are partners who share a mutual goal of advancing the students' mastery of basic epidemiological theory and methods. The professor's role is to create a course structure and environment that will best enable students to gain mastery of the material. The student's role is to actively use that course structure and environment to learn course material as well as to repeatedly apply and practice using that material. Evaluations of the student's proficiency with the course material are important to understand and address any deficits; in addition to formal evaluations by the professor, students should continually evaluate their mastery of the material to best guide their learning process.

RESPONSIBILITIES & EXPECTATIONS:Students in this course are expected to:

1. Be prepared for course lectures by reading the assigned readings before each lecture.
2. Attend all lectures and actively participate by asking and answering questions.
3. Appropriately use electronic devices during class meetings in ways that foster learning and do not distract from the learning of the student or his/her classmates.
4. Demonstrate understanding of course material on problem sets and study design exercises.
5. Keep track of course activities and announcements via our Canvas site.
6. Seek help from the Professor or T.A. when needed.

Professor Romano can be expected to:

1. Be organized and well prepared throughout the course.
2. Explain course material clearly and efficiently.
3. Answer student questions thoroughly.
4. Be available for consultations regarding course material and assessments outside of class.
5. Use evaluation methods that provide a representative test of student knowledge and understanding of the course material.
6. Grade student work fairly and return it promptly.

The Teaching Assistant can be expected to:

1. Master the material presented at lecture.
2. Grade homework assignments fairly and return them promptly.
3. Provide assistance with course material upon request.
4. Serve as a liaison between students and the professor.

COURSE REQUIREMENTS & GRADING:**Course Requirements and Grading**

Final grades will be based on course participation, quizzes, study design assignments and project, midterm exam, journal critiques, and final exam.

Method of Assessment	Contribution to Final Grade
Course Participation	10%
Quizzes	15%
Study Design Assignments	10%
Study Design Project	15%
Midterm Journal Article Critique	25%
Final Journal Article Critique	25%

The percentile to letter grade conversion is as follows:

Undergraduate Student Grade¹ (BIOL 73 Students)

94 - 100%	A	Excellent mastery of the course material
90 - <94%	A-	
87 - <90%	B+	Good mastery of the course material
83 - <87%	B	
80 - <83%	B-	
77 - <80%	C+	Acceptable mastery of the course material
73 - <77%	C	
70 - <73%	C-	
67 - <70%	D+	Deficient mastery of the course material
63 - < 67%	D	
60 - <63%	D-	
0 - <60%	E	Serious deficiency in mastery of the course material

¹In accordance with Dartmouth College's policies. The appendage of a "+" or "-" to the grade indicates mastery slightly above or below the norm for that grade, respectively.

Graduate Student Grade² (QBS 131 Students)

94 - 100%	HP	Work quality that is distinctly superior to that normally expected of a graduate student
77-<94%	P	Work of good quality normally expected of a graduate student
70-<77%	LP	Work which is acceptable for graduate credit, but in which the student exhibited one or more serious deficiencies
<70%	NC	Unsatisfactory work, not acceptable for graduate credit

² In accordance with Dartmouth's Guarini School of Graduate and Advanced Studies' policies: HP=High Pass, P=Pass, LP=Low Pass, NC=No Credit

Course participation:

Active participation by students in this course is essential and will be evaluated primarily through contributions to the class discussion throughout the term.

- First and foremost, active participation requires that students are prepared for lecture. Expected preparation includes reading required materials prior to lecture, completing all assignments, and coming to class ready to critically discuss the course material.
- Both answering questions and asking thoughtful questions are important to active participation. The quality of what is said and how comments and questions enrich class discussions is more important than the quantity of the participation by a student.
- Class attendance is expected, with the understanding that health, family, or personal matters may occasionally interfere. Discuss how to make up missed class time with the professor.
 - Students are expected to notify the professor in advance (or as soon as they are able in the case of illness or emergency) by email about missing class.
 - COVID-19 precautions or other illness may occasionally prevent students from being able to attend class in person. Please coordinate with the instructor when absence due to illness is anticipated.
 - Planned absences (e.g., conference attendance) should be discussed with the

- o professor at office hours or by email during the first two weeks of the class.
 - o Participation grades will be penalized for students with unexcused absences or a pattern of arriving late to lecture. Occasional lateness or interruptions will be overlooked. Absences related to COVID-19 precautions will be excused as long as students make a good faith effort to keep up with the course material.
- Students are strongly encouraged to *put away cellphones, limit distractions, and avoid surfing the web during lecture.*
 - o Research suggests that use of laptops in class is inversely associated with classroom performance due to non-academic internet usage (Ravizza et al. Psychol Sci, 28 (2), 171-180;Feb 2017).
 - o As many students prefer to take notes on their laptop the use of computers during class is not prohibited, but you are strongly urged to avoid multi-tasking during class. Staying focused on what your instructor and classmates are saying and fighting the temptation to communicate with the outside world during class will improve everyone’s experience in the course.
- Active participation also means that you will seek assistance from the teaching assistant and professor if you do not understand an assignment or feel as though you are falling behind. Students are expected to take responsibility for their own learning, so if you’re lost or confused, ask for help. Attending office hours and completing extra credit assignments are also encouraged as ways to facilitate active course participation.

Quizzes:

There will be six quizzes to provide frequent assessment of a student’s independent mastery of the course material. Collaboration of any kind is not permitted on quizzes. Material covered on quizzes will lean heavily toward content recently covered in class, but students are advised to carefully read the instructions for each quiz and review the material described in the instructions prior to beginning. Reading for a future course meeting will also be covered in quizzes, but this will be clearly indicated in the quiz instructions. Quizzes will vary in length; the time limit and quiz length will be described in the instructions for each quiz so that students may plan accordingly. Students may consult notes and course readings during quizzes but are cautioned against heavily relying on such materials due to the timed nature of the quiz. Quiz 6 includes computational problems, these will be provided on the page with the quiz instructions so that students can work through the calculations and prepare a written answer prior to starting the timed portion of the quiz. Quizzes are due at 2 pm unless otherwise noted. Late quizzes will be assigned a grade of 0 and will not be accepted unless you have requested and been approved for an extension from the course instructor. Such extensions will typically be granted if they are requested at least two hours prior to the quiz deadline. At the end of the quarter your lowest quiz grade will be dropped prior to calculation of your final course grade.

Quizzes	Text Chapters	Primary Topic(s)	Date Due
1	Ch 5	Basic Study Design	1/9
2	Ch 12	Confounding	1/14
3	Ch 13 & 14	Randomized Clinical Trials and Cohort Studies	1/21
4	Ch 6, 14 & 15	Data Sources, Cohort Studies and Case Control Studies	1/28
5	Ch 16 & 17	Cross-sectional, ecologic, and multi-level studies; meta-analysis	2/11
6	Ch 20	Induction and latent periods, Outbreak Investigation	2/20

Study Design Exercises and Project:

The purpose of the study design exercises is to help you organize your final study design project and to receive timely feedback on your progress throughout the quarter. *Study Design Assignments 1-3* count toward 10% of your total class grade. The primary goal of these study design assignments is to allow for feedback from the professor and TA on the project throughout the quarter as you learn to apply course concepts. Incorporation of instructor and peer feedback into your final project will be factored into your study design project grade. Problem sets will be completed and submitted via Canvas. Discussing these exercises with classmates is encouraged as a way to promote learning. Late exercises will be penalized 10% for each 24-hour period (or part thereof). The *study design project* will be graded out of 120 points total and account for 15% of your final grade in the course. Students will present their project during the last two class sessions, but all students will submit the slides for their presentation on Canvas by February 27, 2025 at 2:00pm.

Midterm and Final Journal Article Critiques:

Journal article critiques will help you to synthesize the course material. Each critique will be based on a specific article from the primary literature. We will discuss how to critique a journal article during the first course session. Active participation by all class members is required during the two in class journal article critiques. Students are encouraged to prepare their own notes to support participation in the in-class critiques and are encouraged to discuss papers for in-class critiques with their peers. Questions related to these articles will be incorporated into the quizzes. Rather than a midterm and final exam, you will submit a written journal article critique. Students are strongly encouraged to use the in-class journal article critiques to effectively learn this important skill. Midterm and final journal article critiques will follow the same outline as in class-critiques plus supplemental questions specific to the article being reviewed. The written midterm and final journal article critiques are each worth 25% of the course grade. Late Midterm or Final Critiques will be penalized 25% for each 24-hour period (or part thereof).

HONOR PRINCIPLE:

Honesty is the foundation of the academic pursuit of knowledge. In recognition of this, the faculty will not overlook any violations of the Academic Honor Principle. Please review the Academic Honor Principal at: <https://student-affairs.dartmouth.edu/policy/academic-honor-principle>Links to an external site.. The Faculty of Dartmouth College and the Geisel School of Medicine at Dartmouth are obligated to report potential violations of the Academic Honor Principle

STUDENT ACCOMMODATIONS:

Students with disabilities, including invisible disabilities such as chronic illnesses and learning disabilities, are encouraged to arrange for accommodations that might be helpful. Students requiring disability-related academic adjustments and services must consult the Student Accessibility Services (SAS) office in Carson Hall 125 or by phone: 646-9900 or email: Student.Accessibility.Services@Dartmouth.edu. Once SAS has authorized services, students must show the originally signed SAS Services and Consent Form and/or a letter on SAS letterhead to the course director. If you have questions about whether you qualify to receive academic adjustments and services, you may contact the SAS office. All inquiries and discussions will remain confidential. Students are always encouraged to speak with me about what I can do to make this course more inclusive and accommodating to those with disabilities.

TITLE IX DISCLOSURES:

At Dartmouth, we value integrity, responsibility, and respect for the rights and interests of others, all central to our Principles of Community. We are dedicated to establishing and maintaining a safe an inclusive campus where all have equal access to the educational and employment opportunities

Dartmouth offers. We strive to promote an environment of sexual respect, safety, and well-being. In its policies and standards, Dartmouth demonstrates unequivocally that sexual assault, gender-based harassment, domestic violence, dating violence, and stalking are not tolerated in our community. The Sexual Respect Website (sexual-respect.dartmouth.edu[Links to an external site.](#)) at Dartmouth provides a wealth of information on your right with regard to sexual respect and resources that are available to all in our community. *Please note that as a faculty member, Professor Romano is obligated to share disclosures regarding conduct under Title IX with Dartmouth's Title IX Coordinator.* If you wish to access confidential resources, those that may not share your information without your expressed consent unless there is imminent danger to self or others or as otherwise required by law (e.g., mandatory reporting for sexual violence against minors), a list of such resources is available here: <https://sexual-respect.dartmouth.edu/reporting-support/all-resources/confidential-resources>[Links to an external site.](#). Should you have any questions, please feel free to contact Dartmouth's Title IX Office at TitleIX@dartmouth.edu.

RELIGIOUS OBSERVANCES:

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with the professor before the end of the second week of the term to discuss appropriate accommodations.

COVID-19 Precautions:

Students are encouraged to wear masks or stay home if they have symptoms of respiratory illness. Lecture recordings will be made available when possible for online for review, and Zoom options may occasionally be made available at the professors discretion. Refer to the [current College policy](#)[Links to an external site.](#) as protocols could change during the term.

Attendance:

You are expected to attend class in person unless you have made alternative arrangements due to illness, medical reasons, or the need to isolate due to illness. For the health and safety of our class community, please: do not attend class when you are sick, nor when you have been instructed by Student Health Services to stay home. You will typically be able to view recordings of lecture on Canvas if you are unable to attend. Summaries of learning objectives from in-class activities will also be made available on Canvas.

Generative Artificial Intelligence (GenAI):

Students may not use Gen AI tools for coursework, unless expressly permitted within the instructions for a specific assignment. When permitted, use of GenAI tools requires acknowledgement or citation for academic integrity. A full summary of Dartmouth's policies on GenAI is available here: [Guidelines on using Generative Artificial Intelligence \(GenAI\) for Coursework | Policies](#)[Links to an external site.](#)

Wellness

Resources are available to assist you with caring for your physical and emotional health, including the [Dartmouth College Health Service](#)[Links to an external site.](#), the [Counseling Center](#)[Links to an external site.](#) and the [Student Wellness Center](#)[Links to an external site.](#) Please make your health and wellness your top priority and take care of yourself throughout the term. Particularly in light of the current COVID-19 pandemic, health and wellness are of the utmost importance. If your performance in the class is being impacted by your experiences outside of class, please don't hesitate to talk with the professor.

Consent to Record:

1. *Consent to recording of course meetings and office hours that are open to multiple students. By enrolling in this course,*
 - a. *I affirm my understanding that the instructor may record meetings of this course and any associated meetings open to multiple students and the instructor, including but not limited to scheduled and ad hoc office hours and other consultations, within any digital platform, including those used to offer remote instruction for this course.*
 - b. *I further affirm that the instructor owns the copyright to their instructional materials, of which these recordings constitute a part, and my distribution of any of these recordings in whole or in part to any person or entity other than other members of the class without prior written consent of the instructor may be subject to discipline by Dartmouth up to and including separation from Dartmouth.*
2. *Requirement of consent to one-on-one recordings: By enrolling in this course, I hereby affirm that I will not make a recording in any medium of any one-on-one meeting with the instructor or another member of the class or group of members of the class without obtaining the prior written consent of all those participating, and I understand that if I violate this prohibition, I will be subject to discipline by Dartmouth up to and including separation from Dartmouth, as well as any other civil or criminal penalties under applicable law. I understand that an exception to this consent applies to accommodations approved by SAS for a student's disability, and that one or more students in a class may record class lectures, discussions, lab sessions, and review sessions and take pictures of essential information, and/or be provided class notes for personal study use only.*

If you have questions, please contact the Office of the Dean of the Faculty of Arts and Sciences.

COURSE SCHEDULE: (check Canvas website for course for schedule updates)

*Quizzes are due at 2pm unless otherwise indicated.

Date	Session Title	Assignments*
7-Jan	Journal Article Critiques Exposure and Outcome Assessment Romano	<ul style="list-style-type: none"> • Course SurveyLinks to an external site.
9-Jan	Advanced Confounding and Causal Diagrams Romano	<ul style="list-style-type: none"> • Quiz 1
14-Jan	DAGs Workshop and Randomized Control Trials Romano	<ul style="list-style-type: none"> • Quiz 2
16-Jan	Randomized Clinical Trial Example; In class critique of Kramer et al. 2001 Romano	<ul style="list-style-type: none"> • SD 1
21-Jan	Cohort Study Example; In class critique of Pollack et al. 2010 Romano	<ul style="list-style-type: none"> • Quiz 3
23-Jan	Case-Control Study Example; In class critique of Daling et al. 1985 Pomares-Millan/ Romano	<ul style="list-style-type: none"> • SD 2
28-Jan	Data sources, selection bias, and generalizability; Study design project group discussion Romano	<ul style="list-style-type: none"> • Quiz 4
30-Jan	Cross-sectional, Ecologic, and Multi-Level Study Designs; In class critique of Watson et al. Romano	<ul style="list-style-type: none"> • Midterm Critique Released
4-Feb	Weight of evidence and systematic reviews Romano	<ul style="list-style-type: none"> • Mid-course evaluation (optional)
6-Feb	Evaluating the effect of policies on health; In class critique of Wakefield et al. Romano	<ul style="list-style-type: none"> • Midterm Critique Due
11-Feb	Structural Racism and Health Disparities Romano	<ul style="list-style-type: none"> • Quiz 5
13-Feb	Induction and Latent Periods; Power and Sample Size Hoen/ Romano	
18-Feb	Outbreak Investigation Romano	<ul style="list-style-type: none"> • SD 3
20-Feb	Specialized Study Designs Romano	<ul style="list-style-type: none"> • Quiz 6
25-Feb	Improving the Sensitivity and Specificity of Epidemiologic Studies; Small group discussion of study design project Romano	
27-Feb	Screening Romano	<ul style="list-style-type: none"> • Study Design Project Slides Due
4-Mar	Study design presentations	<ul style="list-style-type: none"> • Final Critique Released
6-Mar	Study design presentations and Course Synthesis	TA Evaluation (optional, but greatly appreciated!)
10-Mar	Final Critique Due by 11:59pm	