MTR 603 Disease Measurement - Lab Section  
Fall 2022

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| Meeting Days/Times | Course Dates | Course Location |
| Tues & Thurs  10:30AM – 12:00 PM | Sept 8 – Dec 13, 2022 | Online via Zoom |
| **Course Directors** | Tracey Polsky, M.D., Ph.D. | [polskyt@chop.edu](mailto:polskyt@chop.edu)  Charlene Bierl, M.D., Ph.D. | [Charlene.Bierl@Pennmedicine.upenn.edu](mailto:Charlene.Bierl@Pennmedicine.upenn.edu) | |
| **Course Coordinator** | Jessica German, MSEd: [jbgerman@upenn.edu](mailto:jbgerman@upenn.edu) | |

# Zoom Information TBA

# Description

The Laboratory section of the Disease Measurement Course (MTR 603) offers an introduction to a wide array of analytical methodologies that are commonly used in research studies and their applications to both basic science and translational research. Over the course of the semester, students will be introduced to all aspects of laboratory medicine, including regulatory requirements and basics of test development, specific analytical methodologies, translational applications, and Penn resources. Most of the course lecturers are members of the Department of Pathology and Laboratory Medicine, each with a specific clinical and/or research interest.

The format of each class will be split between lecture and discussion time. The guest lecturer will spend approximately 30 min presenting course material. The remaining time will be dedicated to student and faculty led open discussion related to the subject matter and guided by the discussion questions students are expected to post in advance (additional details below).

The intention of the lecture material and associated reading is to be translational rather than technical. Guest lecturers will focus their presentation/material on the basics of the method they are presenting, the translational applications, and the risks vs benefits of the method.

The objectives of the course are to ensure the students acquire the knowledge to:

* Gain a basic understanding of the many kinds of laboratory tests used in clinical medicine and research
* Choose the most appropriate analytical method for a research study or clinical question
* Understand the limitations of lab tests and how to best interpret the data
* Understand the statistics that drive clinical utility (i.e. Sensitivity, specificity, normal ranges, etc.)

# Evaluation Methods

Attendance/Participation: 25%  
Discussion Board/Discussion Facilitation: 50%  
Final Methods Presentation: 25%

# Attendance and Participation

# Students are expected to complete required asynchronous material, attend, and actively participate in class. If for any reason a student will not be in class, they should contact the Course Coordinator prior to class to alert them of the absence. Attendance will be taken at the beginning of each class, please make sure to be on time to be counted as present. If you anticipate being late to class, please contact the course coordinator. Part of class attendance consists of using your camera each class. If you experience technical issues, please let the course director(s) know.

# Two absences are allowed during the course. Additional absences result in points deducted from the Attendance & Participation grade*. If a class date conflicts with a holiday or religious observance, please contact the course coordinator. If an assignment is due during this time, please work with the course director and course coordinator to determine an alternative due date.*

# Discussion Board and In-Class Discussion Facilitator

## Discussion Board

Each synchronous session will involve discussions in which you are expected to participate. Your engagement and participation are important to build a collaborative learning community. We will use the Canvas Discussion Boards as an opportunity to post questions/comments/observations for discussion during the synchronous sessions. These questions will be based on the asynchronous material (slides, paper, video, etc.) provided to you in advance of the session.

A minimum of one post per class is required. The Tuesday/Thursday lectures during any given week are thematically related. All guest lecturers will be asked to share their asynchronous material at least one week in advance of their session so students can review the material and submit (at least two) discussion questions to Canvas by the Sunday night prior to the coming week. You can find the material in Canvas under ‘Modules’, go to the date of the class, and click on ‘Submit DATE Lecturer Question’ link to the discussion board. A point will be deducted from your grade for each missed post.

Your discussion question/observation should be related to the material but may be technical or translational in nature. We encourage you to draw upon your own clinical and research experiences when connecting to the material.

**Due dates for online discussion posts:** Every Sunday, by 11:59pm

**Disclaimer:** Discussion Facilitators do not need to post a question if they’re the lead facilitator for that session.

## In Class Discussion Facilitator

Students are expected to lead 2 discussions throughout the term, one in the first half of the term and one in the second half of the term. Students should sign-up in pairs to lead the synchronous discussions during the Q&A of each session (this may be imperfect due to the final number of students vs lectures).

As a discussion facilitator, you will be expected to read all discussion posts and identify any themes or unifying concepts. These questions will help kick-start the discussion after the guest lecturer presents their material. As the facilitator, you are free to pull additional literature or speak to the guest lecturer in advance about your thoughts. Students are encouraged to invite their peers to pose their questions from the discussion board to the class. All students are expected to engage during the synchronous discussion by asking additional questions and/or by sharing their experiences.

# Final Methods Presentations (“Elevator Pitches”): Dec 6,8 & 13

Students will give a brief, 10-minute maximum, focused presentation that discusses **one** measurement methodology related to their MSTR research proposal. The intention is for this to be a reflection of what students learned in the course and how the principles or methodologies presented during the semester can be applied to their own projects.

Students should be prepared to present on any of the dates. *If you know you will be absent on one of the dates, please make arrangements with the course directors and coordinator well in advance to present on a specific date.*

# Academic Policies

## Academic Integrity

As a student at the University of Pennsylvania, you are required to uphold the [Code of Academic Integrity](https://catalog.upenn.edu/pennbook/code-of-academic-integrity/). Specifically, this means that materials that you submit either online or in person should be independent works created by you that uphold all tenets of academic integrity (i.e. do not cheat, fabricate, or plagiarize, amongst others). We encourage you to reach out to the course director or coordinator if you are not clear on what potential violations are.

## Course Management: Canvas

All course materials (ppts, announcements, lecture recordings) will be posted on [Canvas](https://canvas.upenn.edu). **Log in with Pennkey/Password.**

## Course Evaluations

Course and lecturer evaluations are completed via [BLUE](https://upenn.bluera.com/UPENNEVAL) throughout the semester. Students can access evaluation forms with their Pennkey and password and will receive an email when evaluations are available to be completed.

## Student Disabilities Services

The University of Pennsylvania provides reasonable accommodations to students with disabilities who have self-identified and been approved by the office of Student Disabilities Services (SDS). Please discuss your accommodations and your needs with instructors. If you have not yet contacted SDS, and would like to request accommodations or have questions, you can make an appointment by calling SDS 215.573.9235. The office is located in the Weingarten Learning Resources Center at Hamilton Village, 220 S 40th St., Suite 260. Please use the [MyWeingartenCenter portal](https://urldefense.com/v3/__https:/upenn-accommodate.symplicity.com/__;!!IBzWLUs!WJlqmEZJ2bLUqcwD4QBVczq89Zm784ZasCfu1qyjPOXyFTV18VHAOPVgke63Jiy5xIk5sphYPUzFS_RJYEI$) to schedule appointments with staff. All services are confidential.

**Course Schedule**

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| DATE | TOPIC | INSTRUCTOR |
| Thurs, 9/8 | Intro to Disease Measurement *(Lab/Imaging Combined Session)* | David Mankoff, Yong Fang, Tracey Polsky, Charlene Bierl |
| Tues, 9/13 | Test Validation IMAGING (Lab/Imaging Combined Session) | Sharyn I Katz |
| Thurs, 9/15 | Test Validation LAB (Lab/Imaging Combined Session) | Charlene Bierl |
| Tues, 9/20 | Lab Overview & Expectations | Development & Deployment of New Ranges | Tracey Polsky, Charlene Bierl |
| Thurs, 9/22 | Measurement of Proteins: Proteomics | Stephen Master |
| Tues, 9/27 | Measurement of Proteins: Immunoassays | Tracey Polsky |
| Thurs, 9/29 | Biomarkers: The Good, The Bad, and The Ugly | Khushbu Patel |
| Tues, 10/4 | Whole Genome Testing in Clinical Diagnostics | Matt Dulik |
| Thurs, 10/6 | High-Dimensional Tissue Analysis | Mike Feldman |
| Tues, 10/11 | No Class – ITMAT Symposium | |
| Thurs, 10/13 | Utility of Immunohistochemistry: Developing Biomarkers in Anatomical Pathology | Kester Haye |
| Tues, 10/18 | Mid-Semester Check-In | Tracey Polsky, Charlene Bierl |
| Thurs, 10/20 | Clinical Application of Flow Cytometry | Gerald Wertheim |
| Tues, 10/25 | Lab/Imaging Tour (Lab/Imaging Combined Session) | David Mankoff, Yong Fang, Tracey Polsky, Charlene Bierl |
| Thurs, 10/27 | From Bedside to Bench: When is a Laboratory Assay Ready for Clinical Use? | Jacquelyn Roth |
| Tues, 11/1 | Concepts in High-Dimensional Analysis for Diagnostic Testing | Amrom Obstfeld |
| Thurs, 11/3 | Population Health Screening | Dan Herman |
| Tues, 11/8 | Antibody Engineering & Phage Display | Don Siegel |
| Thurs, 11/10 | Cell Engineering in a GMP Laboratory | Andrew Fesnak |
| Tues, 11/15 | Autoimmunity/Immune Health | Eline (Nina) Luning Prak |
| Thurs, 11/17 | Introduction to Microbiome Research | Rick Bushman |
| Tues, 11/22 | Animal Models of Disease | Brad Johnson |
| Thurs, 11/24 | No Class – Thanksgiving | |
| Tues, 11/29 | Point of Care Testing | Ping Wang |
| Thurs, 12/1 | Biorepositories | Dan Rader |
| Dec 6, 8, 13 | Student Presentations | |