



**Master's Degree in Clinical & Translational Investigation Program
Spring 2024 Course Offerings (Career Enhancement)**

Core Course	Instructor(s)	Core / Elective	Credits	Dates	Days (Times)	Classroom
Participatory Design for Digital Making ¹ CTIV 5052 Deadline to apply: 01/10/2025	Parikh	Elective	3	Start: 1/21/2025 End: 5/16/2025 No Class: 2/18, 4/1 & 4/3	Tuesdays & Thursdays 1:25p–2:40p	MakerLAB at Cornell Tech Campus
Introduction to GPT & LLMs in Clinical & Translational Research ² CTIV 5057 Intro to Statistics Pre-req. Deadline to apply: 01/15/2025 Prerequisite Submission Deadline: 01/15/2025	Peng	Elective	1	Start: 1/27/2025 End: 4/7/2025 No Class: 2/17	Mondays 3:30p–4:45p	Campus: 1300 York Ave. Classroom pending
Foundations of Epidemiology CTIV 5013 Deadline to apply: 01/15/2025	Cassano Du	Core	3	Start: 1/31/2025 End: 5/16/2025 No Class 2/21 & 4/18	Fridays 3:45 – 5:00pm Wednesdays 2/26, 3/12, 4/9 3:45pm - 5:00pm	Fully Remote
Intermediate R Programming for Clinical & Translational Investigation ³ CTIV 5056 Intro to Biostatistics or Intro to R programming Pre-req. Deadline to apply: 01/15/2025 Prerequisite Submission Deadline: 01/15/2025	An	Elective	1	Start: 2/6/2025 End: 3/13/2025	Thursdays 3:45p – 5:50p	WCM Campus: 1300 York Ave. Classroom pending
Data Management in Clinical Research CTIV 5008 Deadline to apply: 01/15/2025	Wood Lee	Core	2	Start: 2/10/2025 End: 5/5/2025 No Class 02/17	Mondays 4p – 6p	WCM Campus: 1300 York Ave. Classroom pending
Sociocultural Barriers in STEM CTIV 5055 Deadline to apply: 01/17/2025	Mukherjee Guzman	Elective	1	Start: 2/13/2025 End: 4/10/2025	Thursdays 3:30p–5p	WCM Campus: 1300 York Ave. Classroom pending

¹ Course meets in-person at CornellTech campus

² Must have already taken pre-req Intro to Statistics or equivalent

³ Must have already taken pre-req Intro to Biostatistics, Intro to R programming or equivalent

Course Descriptions:

Participatory Design for Digital Making: This is a collaborative workshop where participants (seniors and graduate students from Cornell Tech and Weill Cornell CTSC) work on a prototype for a real-world problem that is worth investigating around digital fabrication. This workshop is an introduction to concepts and methods in design and making with digital fabrication tools while working in intergenerational and intercultural teams. The ability to digitally fabricate parts and whole pieces directly from our computers or design files used to be an exotic and expensive option, but 3d printing has fast become the preferred medium to allow easily adaptable ideas to develop from concept to creation quickly, at a relatively low cost. Not limited to just 3d Printing this course will focus in the area of materials and making, simulation, computational design and abilities to co-create in a team of diverse disciplinary backgrounds.

Introduction to GPT & LLMs in Clinical and Translational Research

Prerequisite: Introduction to Statistics or similar course is required prior to enrollment

The emergence of Generative AI, exemplified by Generative pre-trained transformers (GPT) and other large language models (LLMs) has the potential to revolutionize research and clinical practice. This course provides students with an understanding of Generative AI, using GPT and other LLMs as examples, and its applications in clinical and translational research. Students will acquire knowledge of natural language processing, generative AI, large language models, and the range of prompting methods available for processing clinical text. Hands-on experience and a toolkit will provide useful skills for managing text data to solve a variety of problems in the health domain.

Foundations of Epidemiology:

This course is designed to train students to analyze and conduct epidemiologic research. Through lectures, classroom discussion, and project-based work, students will: 1. learn the principles of epidemiology, 2. evaluate evidence from epidemiologic studies and, 3. design epidemiologic studies to investigate hypotheses of interest. Students will apply epidemiologic approaches to questions in health-related specialties including clinical medicine, health services and health care management, and nutritional sciences. The course will provide students with the foundation for further work in epidemiology either as practicing epidemiologists or as sophisticated users of epidemiologic information.

Intermediate R-programming for Clinical & Translational Investigation

Prerequisites: Introduction to Biostatistics Introduction to R programming

This is an elective course for students seeking to gain intermediate-level skills in the R programming language and environment, with focus on using tidyverse functionality. The course will cover how to perform statistical analyses such as hypothesis testing, regression and model building, and survival analysis. Students must have taken an introductory R course as well as an introductory biostatistics course as we will be covering biostatistical methods only in the context of their application in R. Applications of skills learned in this course are geared towards clinical research, but these skills are transferrable to many projects outside the scope.

Data Management in Clinical Research: This course is designed to give participants an understanding of selecting, accessing, and retrieving information from web-based quality information resources for clinical research. They will also learn importance of properly designed data collection instruments to the quality of study results. Participants will be able to differentiate between spreadsheets, desktop databases and server-based databases, as well as learn the pros and cons of each. Students will also learn the definition and fundamental features of a relational database and the structure of Web-based data management systems. Participants will learn importance of securing your data, and the different mechanisms used to achieve this. At the end of this course trainees will gain knowledge of the current government standards related to data sharing, and practices that promote data interchange. They will be taught HIPAA considerations in clinical research data management as well as the importance to clinical research of the medical record, clinical data warehousing, and the use of national standards for data representation.

Sociocultural Barriers to STEM: In this seminar course we will discuss the historical context of bias and exclusion in science, read from and discuss the primary literature to understand the science of bias and why it is present and how it has continued to persist across the Science, Technology, Engineering, and Mathematics (STEM) fields, and identify actionable items to address and overcome these issues. By the end of this course, students will have learned:

- To identify types of systemic inequities in STEM
- To understand and analyze how sociological theory and principles intersect with the higher educational system and scientific workforce.

- Terminology, trends, resources, and tools for understanding sociocultural barriers.
- To identify and propose actions that can be implemented as individuals, as well as steps institutions can take, to decrease bias and promote equity and inclusion.