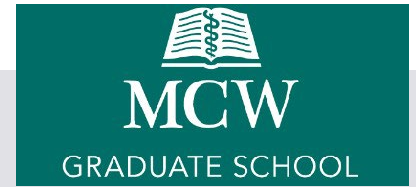


2025-26

## CLINICAL AND TRANSLATIONAL SCIENCE

Degree Offered: Doctor of Medicine/Master of Science Dual Degree



### Program Description

This program is operated by the Clinical and Translational Science Institute (CTSI) of Southeast Wisconsin. The mission of the CTSI is to develop an integrated, shared home for clinical and translational research and to establish a borderless, collaborative, and investigator/ community/patient- friendly, research environment. The CTS MD/MS dual degree program fits with the CTSI's strategic goals of providing quality education and training to cultivate the next generation of clinical and translational researchers.

The MD/MS in Clinical and Translational Science Program is designed for students who wish to pursue a medical career with a research focus. During the first two years of the dual degree program, students complete the basic science coursework for the MD degree. In addition, dual degree students take some coursework to meet the requirements for the MS degree. MS degree coursework emphasizes clinical study design, biostatistics, and research methods, and provides students with an opportunity to conduct a mentored research project. Some coursework meets the requirements for both degrees. Students engage in their research projects during the summer between the first and second years of study and subsequent research electives during the third and fourth years of medical school.

Upon entering the dual degree program, students have a designated faculty advisor who will provide guidance in the program and assist them in identifying an area of research that is of interest to them. During the first year of the program, students will have the opportunity to explore a wide range of research options and to identify a research mentor with whom they will work.

### Admission Requirements

In addition to the general [Graduate School admission requirements](#), this program has additional specific requirements.

To enroll in the MD/MS program, applicants must first be admitted to the Doctor of Medicine program.

### Fields of Study

MS degree coursework emphasizes clinical study design, biostatistics, and research methods, and provides students with an opportunity to conduct a mentored research project.

### Credits Required to Graduate

36 credits

## Program Credit Requirements

The MD/MS in Clinical and Translational Science consists of 36 credit hours. 27 credits are from required courses, 9 credits are from thesis hours. The program is designed to be completed in four (4) academic years.

## Required Courses

### **BIOE 10226 Regulatory Issues in Human Subject Research Protections. 3 credits.**

There is no question that the fruits of research have fueled medical progress. Yet, the history of research involving human subjects is not unblemished. Federal regulations, based on ethical principles set forth in the Belmont Report, now govern much of the research undertaken in the United States. In this course, we will explore the history and substance of research regulations in the United States, the application of the regulations to specific research issues, and situations where the regulations do not provide clear guidance.

### **PUBH 18209 Community Health Assessment and Improvement. 3**

*credits. Recommended: 18203 Public Health Administration*

This course provides students with a comprehensive understanding of the community health assessment and improvement planning process, focusing on achieving health equity. Students will learn to systematically assess community health needs and assets using both quantitative and qualitative data. The course emphasizes identifying priority health concerns and developing data-driven plans to address unmet needs. Students will also explore the role of social, economic, behavioral, and environmental factors that influence health outcomes, and understand the importance of multisector collaboration, community engagement, and evidence-based interventions. By the end of the course, students will be equipped to apply the Mobilizing for Action Through Planning and Partnerships (MAPP) framework, driving positive health outcomes and enhancing public health in their communities.

### **CTSI 20101 Introduction to Clinical and Translational Science. 3 credits.**

The goal of this course is to help students understand the foundations of translational science, develop an understanding of the benefits and difficulties associated with translational research, and to understand and evaluate the role of interdisciplinary and team science in translational research. Coursework will include weekly reading of peer-reviewed manuscripts, assignments, and a final project. Weekly classes will include discussion of reading and assignments are designed to allow practice of critically reading and planning translational science projects. The course will meet once per week for a total of 18 weeks.

### **CTSI 20151 Introduction to Epidemiology. 3 credits.**

This course provides an introduction to the concepts, principles, and research methods specific to epidemiology. Students will learn about population health, how to select appropriate study designs for collecting evidence for medical practice, how to summarize evidence for medical practice and how to translate evidence into medical practice. By the end of the course, students should be able to apply the skills learned to assess the health of a population, describe determinants of health, and select an appropriate study design to evaluate population health. The course will meet once per week for a total of 18 weeks.

**CTSI 20160 Foundations in Health Services Research. 3 credits.**

The course will provide the student with a broad understanding of health services research design and methodology, as well as provide the student with the opportunity to engage in a mentored, individualized, in-depth study experience. By the end of the course the student will be able to understand key theories that serve as the foundation of health services research and understand the process of developing a research idea and translating it into an R-series level NIH proposal. Coursework will include weekly reading of peer-reviewed manuscripts, one introductory textbook on health services research, and one introductory textbook on designing clinical research. Weekly classes will include discussion of reading and assignments are designed to allow practice of critically reading and planning health services research projects.

**CTSI 20220 Clinical Statistics I. 3 credits.**

This is an introductory course in evidence discovery that demonstrates the concepts and application of statistical techniques/tools, given the role of statistics as an information science. The course is intended to inform and provide quantitative skills for graduate students interested in undertaking research in clinical medicine, epidemiology, public health, translational and biomedical sciences. This course emphasizes the basic dogma of statistics namely the central tendency theorem as well as sampling as the core of statistics. With the characterization of statistics as descriptive and inferential, the descriptive arm of statistics is stressed in this course namely summary statistics. Basic probability concepts are covered to stress the importance of sampling prior to reliable inference from the sample data. Sample estimation of the population and the precision (confidence interval) are described as well as the hypothesis testing notion in inferential statistics. The parametric and non-parametric methods are introduced with the intent to describe the methods as applicable to continuous (ratio, interval, cardinal) and discrete (categorical binary, dichotomous) data.

**CTSI 20260 Introduction to Dissemination and Implementation Science. 3 credits.**

The course is an introduction to dissemination and implementation and science research methods both theoretical and applied. By the end of the course the student will be able to understand the science of dissemination and implementation and applied methods for dissemination and implementation. Coursework will include weekly reading of peer-reviewed manuscripts and one introductory textbook on dissemination and implementation science. Weekly classes will include discussion of reading and course projects are designed to allow practice of critically reading and planning implementation research.

**CTSI 20290 Research Elective. 3 credits.**

Students will select a mentor of their choice and will develop a novel research study using either their mentor's data or publicly available data to answer their question. Mentors will be expected to guide students and to serve as a content expert to effectively provide feedback and ensure adequate scientific rigor is achieved for their projects. Course deliverables by the last day of this course are comprised of a two-page literature review, a one-page abstract of their research project progress thus far, along with a scientific poster as it currently stands. Both the abstract and poster will also be submitted at the medical school SAMS poster day during the Fall term. Students will meet with their research mentor on a predetermined regular basis over the course of 9 weeks during the summer.

**20299 Master's Thesis. 3 credits.**

A total of 6 master's thesis credits is required for program completion. All students will complete a master's thesis describing a translational or clinical research project in which he or she participated in both the design and execution. The Committee will be comprised of a thesis mentor and two additional faculty members (one of whom is a biostatistician). The Committee will approve the project in advance, will provide guidance and supervision of the project, and will critique and, if appropriate, approve the thesis.

**CTSI 20302 Research Seminar. 3 credits,**

The goal of this course is to provide Master's students protected time to develop their thesis questions and to provide students with an opportunity to receive feedback on their thesis project at regular intervals in a structured format. By the end of the course students will be able to develop a research question, conduct a comprehensive literature review, select appropriate methods to answer the research question, and present their findings in written and oral formats. This course will also teach students how to provide constructive criticism and to effectively evaluate the work of their peers. Coursework will include developing a systematic review, providing constructive critiques of the work of other students in the seminar, developing a PowerPoint presentation, and developing a scientific poster presentation. All MS students will be required to take the course. First year Master's students will develop their research question, complete a thorough literature review of the topic of interest in the form of a systematic review, and begin to identify methods that will be used to answer their research question. While second year students will conduct the necessary steps to answer their research question, write their results and conclusions, and prepare an oral presentation of their thesis work to be presented before their colleagues at the end of the semester and during MCW student research day. All students will be expected to provide feedback to their classmates and will receive feedback from their peers and the course director. Each class period four students will present some aspect of their project and will receive feedback from peers and the course director.

**PRME 42100 Introduction to Precision Medicine. 3 credits.**

Introduction to Precision Medicine offers 10 applied learning sessions led by directors of PM Education courses. Students initiate a professional development plan and write and present reports explaining PM concepts, demonstrating research in practice, and judging the validity of PM information.

**PRME 42170 Medical Genetics, Undiagnosed, and Rare Diseases. 3 credits.**

*Prerequisite: 42100 Introduction to Precision Medicine*

Medical Genetics, Undiagnosed and Rare Diseases allows students examine the application of genomics to core clinical systems and applying that knowledge to personalized management of patients. Experts in their respective fields will guest lecture in several sessions.

### Required Courses as Needed

#### **CTSI 20002 Master's Thesis Continuation.** *0 credits.*

This is a form of registration available to students who have completed all of the required coursework, including thesis credits but have not yet completed the writing of the Thesis. Continuation status is limited to three consecutive terms following the completion of Thesis credits.

Contact information: [gradschool@mcw.edu](mailto:gradschool@mcw.edu) | (414)955-8218