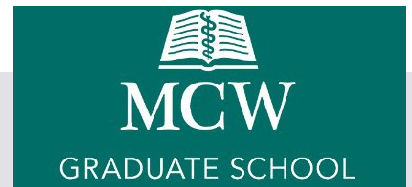


2024-25

CLINICAL & TRANSLATIONAL SCIENCE

Degree Offered: Certificate



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 Certificate 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.

Admission Requirements

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

Potential students must apply by July 1st for Fall term enrollment.

Fields of Study

Certificate students will select from the four tracks and complete four classes, or 12 credits. The emphasis tracks include Translational Science, Population Science, Health Systems Science, and Community Based Science.

Translational Science

This track is focused on the foundational principles of the translational process. This “bench-to-bedside” process involves moving discoveries from their basic foundation to clinical settings. Discoveries of focus include diagnostics, therapeutics, medical procedures, and other interventions. Suggested electives for this program include Translational Genomics and Survey of Biomedical Engineering.

Population Science

There are a variety of factors that can influence health outcomes at a population level, and this track will focus on the relationship between these factors, health, and research. This program will focus on factors such as socioeconomic status, health disparities, social determinants of health, healthcare systems, environment, and policies. Suggested electives include Health Economics, Introduction to Statistics using Stata, Regression using Stata, and Health and Medical Geography.

Health System Science

The focus of this track is on principles and processes within the healthcare system. The topics of focus will include delivery of healthcare, how healthcare professionals work together, and improvements that can be made within the system to improve healthcare delivery. Suggested electives for this program include Health Economics, Health and Medical Geography, Dissemination and Implementation Science, and Qualitative and Mixed Methods.

Community Based Science

This track is focused on engaging the community in research being conducted near the end of the translational spectrum. Emphasis is placed on collaboration with community members and organizations to promote engagement in developing community-wide approaches to improve health for all. Suggested electives include Health Disparities, Health and Medical Geography, Dissemination and Implementation Science, and Qualitative and Mixed Methods.

Credits Required to Graduate

12 credits

Required Courses

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.

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.

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.

Elective Courses

18165 Principles of Public Health Data and Epidemiology. 3 credits.

This course examines public health data and epidemiological concepts, including foundations of epidemiology, practical applications of public health data and epidemiology, core measures in public health, descriptive epidemiology, sources of data, study designs and data analysis, communicating data, informatics, disease transmission and prevention, morbidity and mortality, screening tests, infectious disease causation, environmental health, and social, behavioral, and psychosocial epidemiology. The course emphasizes practical application of concepts and skills learned related to accessing, analyzing, and communicating public health data. The course provides the student with an understanding of the distribution and determinants of health and disease in population groups. The course provides the foundation for many other courses in the MPH program.

18209 Community Health Assessment and Improvement. 3 credits.

Recommended: 18203 Public Health Administration

This course covers the central concepts of community health assessment and improvement. Students will review public health concepts from a public health systems and practice perspective. The course will focus on public health essential services 1 and 2. Students will obtain an understanding of the public health system, community health assessment and the health improvement process using selected frameworks. The course will focus in-depth on learning about the Mobilizing for Action through Planning and Partnerships (MAPP) frameworks and application of selected components to course projects. In addition, this course will provide the foundation for future community health planning and evaluation courses by building on the content of the public health administration course using a public health practice perspective.

20120 Introduction to Health Disparities Research. 3 credits.

Emphasis Track suggested for: Community Based Science

The course is an introduction to health disparities. By the end of the course, the student will be able to understand the relationship between inequities in social determinants of health and health outcomes in various populations. Coursework will include weekly readings from one textbook on multicultural medicine and health disparities as well as peer-reviewed articles to demonstrate the concepts in real-world experiences. Weekly classes will include discussion of the readings. Course projects will be assigned and are designed to allow practice of critically reading and appraising the literature related to applied health disparities research and also to understand the theoretical bases for health equity research.

Alternate: PUBH 18209 Community Health Assessment and Improvement. 3 credits.

This course covers the central concepts of community health assessment and improvement. Students will review public health concepts from a public health systems and practice perspective. The course will focus on public health essential services 1 and 2. Students will obtain an understanding of the public health system, community health assessment and the health improvement process using selected frameworks. The course will focus in-depth on learning about the Mobilizing for Action through Planning and Partnerships (MAPP) frameworks and application of selected components to course projects. In addition, this course will provide the foundation for future community health planning and evaluation courses by building on the content of the public health administration course using a public health practice perspective.

20241 Translational Genomics. 3 credits.

Emphasis Track suggested for: Translational Science

The primary goal of this course is to teach students how to develop a research program to ask relevant genetic questions in the clinical setting utilizing the molecular genetics toolbox. To this end, students will be provided with background in molecular genetics strategies and study designs as well as an understanding of common genetics questions emanating from the clinic so that they will be better able to make connections between bench and bedside. In addition, they will be challenged to think creatively and through a translational focus during course-long case studies and group projects.

20260 Introduction to Dissemination and Implementation Science. 3 credits.

Emphasis Track suggested for: Population Science Track

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.

20262 Introduction to Health Economics. 3 credits.

Emphasis Track suggested for: Health Systems Science

The course is an introduction to health economics both theoretical and applied. By the end of the course the student will be able to understand the basics of health economics including the principles and research methodology used to apply economic concepts to the health field. Coursework will include weekly reading of peer-reviewed manuscripts and one introductory textbook on health care economics. Weekly classes will include discussion of reading and course projects are designed to allow practice of critically reading and conducting health economic research.

Alternate: PUBH18165 Principles of Public Health Data and Epidemiology. 3 credits.

This course will be in the intersection between bioethics, global public health, and international biomedical research and practice. It will look at global health issues and their ethical challenge from the perspective of culturally diversity communities and their local experience related to health and health care. This course engages in a debate of the main ethical issues of clinical practices in health care and research institutions and health care actions in global health. It aims to provide students resources and practical skills to handle ethical dilemmas and lead decision making processes in clinical contexts, related to research with human subjects, healthcare delivery, and public health policies. To achieve this goal, this course is divided into two parts: First, it examines the foundational structures of bioethics, letting them to be challenged by pluralistic worldviews. Second, it discusses ethical dilemmas and concrete clinical situations in which students are challenged to lead decision-making processes in order to deal with moral stress and to address ethical dilemmas, at the same time that high ethical standards are considered. In addition, participants will be exposed to firsthand data from ethnographic and participatory action research in global health and challenged to read authors that show especial consideration for the voices and experiences of vulnerable and historical marginalized populations

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.

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.

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