Institute of Medical Science Program Goals

The Institute of Medical Science graduate programs support translational research relevant to human health from bench to bedside across multiple disciplines in biomedical and clinical/health sciences. IMS provides diverse education and training opportunities to facilitate the growth of its students related to the key roles of an effective researcher.

Role:	During the program, students will have the opportunity to:	Graduates will:
Researcher	develop a broad and integrated knowledge of the contemporary principles and approaches to conducting biomedical research in their chosen field AND build and hone their research skills by engaging in practical, experiential learning opportunities that offer a chance to apply knowledge and skills in a meaningful way.	demonstrate excellence in the conduct of biomedical research by applying a broad and integrated knowledge of the contemporary principles and approaches to conducting biomedical research in their chosen field
Scholar	develop appreciation of and abilities for scholarly practice including contributing new knowledge to the chosen field, thinking critically about emerging concepts that may impact the field, a commitment to continuous learning, and teaching and mentoring others.	demonstrate a lifelong commitment to excellence through creation and critique of new knowledge, integration of new knowledge into practice where appropriate, involvement in knowledge translation and dissemination activities and commitment to lifelong learning.
Professional	develop a sense of professionalism to enable successful integration into the diverse and multidisciplinary research environment through formal curriculum and extracurricular opportunities	function as professionals and responsible and collaborative members of the interdisciplinary team with ethical practice, high personal standards of behaviour and accountability to the community
Citizen	explore and consider ethical and cultural perspectives (such as race, gender, class, sexuality, language, disability. etc.) in the conduct of research in medical science.	foster and promote equity, diversity, and inclusion in research by considering, synthesizing, and advocating for multiple perspectives, theoretical standpoints, and contributions by individuals from diverse backgrounds.

IMS PROGRAM GOALS

Identify which role(s) the course will address. Check all that apply.

X Researcher   X Scholar   X Professional   X Citizen

MSC1125H: AI in Global Health Research

COURSE INFO

Course Date/Time: *May 7th to June 11th, 2025. Classes will be held every Wednesday from 6-7:30PM for 6 sessions.*
Course Location: *In person (RM location TBD) with option for virtual attendance (hybrid format)*
Course Credit: *0.25 FCE CR/NCR*
Prerequisites: None
Exclusions: None
Course Drop Deadline: *for 0.25 FCE courses, students can drop the course without academic penalty before 50% of the course has been delivered.*

CONTACT INFO

Course Director(s): *Prof Pascal Tyrrell, pascal.tyrrell@utoronto.ca*
Course Lecturer(s): JEAN CARLO SEGURA APARICIO <JEAN.SEGURAAPARICIO@ucr.ac.cr>
Teaching Assistant(s): *TBD*

GENERAL INFO

Target Audience:

All graduate students or medical trainees with an interest in global health research.
This course is part of the UofT Global Classrooms program which has a goal to internationalize teaching and learning experiences by combining global and cross-cultural collaborations with technology. Students from the Universidad de Costa Rica (Costa Rica) and from Universidad de las Américas Puebla (Mexico) are also part of course. This will create a true international 'melting pot' of students and faculty.

Course Description:

This course offers an in-depth exploration of the global health research (GHR) landscape, with a particular focus on the essential role of implementation research (IR) in advancing health systems and programs. Recognized as critical to overcoming barriers to effective healthcare delivery, IR addresses implementation bottlenecks, identifies optimal approaches for specific contexts, and fosters the uptake of research findings—ultimately improving healthcare access and quality. While definitions of IR vary among institutions, there is a shared understanding of its systematic approach to overcoming barriers in implementing health interventions, strategies, and policies. IR is demand-driven, with research questions

developed collaboratively alongside relevant stakeholders in the health system to address real-world needs.

In this course, participants will explore transformative approaches focusing on the integration of artificial intelligence (AI) as a powerful tool for enhancing global health initiatives. Through an interdisciplinary lens, critical topics such as health equity, data-driven decision-making, global health metrics, and cross-cultural practices will be examined. Interactive sessions, debates, and expert-led discussions will provide participants with the skills to use AI and other innovative methods in impactful global health research and policy development.

Tailored for researchers in MSc or PhD programs, this module emphasizes ethical research design, equitable health policy, and advanced methodologies for addressing complex health challenges worldwide. Students will cultivate essential skills for inclusive, real-world research that addresses pressing health issues across diverse settings. Topics covered include Global Health Research Methodologies, Health Disparities, Application of Technology in Health Solutions, Ethics in Global Health Research, Implementation Research Projects, and Promotion of Cross-Cultural Collaboration. This 0.25 FCE course aims to equip students with a comprehensive understanding of current trends and practical strategies in GHR.

Course Objectives:
- Describe key concepts and current trends in global health research, with a focus on the role of AI and implementation research (IR) in overcoming barriers to effective healthcare delivery and advancing health outcomes.
- Critically evaluate global health metrics, research methodologies, IR approaches, and AI applications to identify optimal solutions for diverse health settings.
- Engage in interdisciplinary approaches to address complex health issues across various socioeconomic and cultural contexts, promoting the uptake and scalability of evidence-based health interventions.
- Explore ethical and equitable frameworks for AI, IR, and other emerging technologies in global health research, emphasizing the importance of demand-driven, stakeholder-informed research.
- Develop skills in articulating the relevance and impact of research on global health policy and practice, with a focus on sustainable, context-specific health solutions.

Requirements:
None

SYLLABUS

Total contact time is 17 hours (0.25 FCE)

Format:
- o   *Weekly asynchronous Lectures* ==8 hrs (47%)==
- o   *Weekly synchronous Group discussion 9 hrs (53%)*

Class	Date	Topic Description:	Instructor
1	May 7th, 2025	Course Introduction and key concepts in global health research	Prof Segura/ Prof Tyrrell
2	May 14th, 2025	Key characteristics of implementation research	Prof Tyrrell
3	May 21st, 2025	Disparities and Determinants of Health	Prof Segura
4	May 28th, 2025	Technology, Innovation & AI	Prof Tyrrell
5	June 4th, 2025	Developing, conducting, monitoring and evaluating IR projects	Prof Segura
6	June 11th, 2025	Ethics and Equity	Prof Segura / Prof Tyrrell

EVALUATION

Grading Option: *CR/NCR*

Assessment	Description	Grade Weighting
Participation and Engagement	Active contribution in class discussions and online forums, with a focus on applying insights from readings and assignments. Students are required to complete a weekly survey to register their participation.	10%

Initial Reflection Essay	An essay where students explore their understanding of GHR and reflect on its significance, connecting it to their learning objectives for the course.	15%
Mid-Term Project: AI and Health Equity Analysis	Analysis incorporating the use of AI and technology as impactful tools for advancing global health.	20%
Initial Written Research Proposal	A written proposal on how implementation research concepts and strategies could be integrated to address a specific global health challenge.	20%
Final Written Research Proposal	A comprehensive research proposal addressing a global health challenge, highlighting interdisciplinary approaches, ethical considerations, and detailing an implementation plan to ensure success. This can be presented in the form of a formal report.	25%
Peer Review and Feedback	Provide two constructive recommendations for a peer's final research proposal.	10%

Attendance policy: Students must attend all six sessions and complete all assignments to receive credit for the course. As this is a hybrid course, students have the option to attend up to 3 sessions virtually if they cannot attend in person due to illness or other extenuating circumstances (notice must be sent to the course director and TA).