APPLIED MOLECULAR AND HEALTH SCIENCES

The Master of Applied Molecular and Health Sciences (MAMHS) is a unique and world-class course-based master's program that seamlessly integrates cutting-edge molecular biology, stem cell research models, genetics, immunology, bioinformatics, and AI-driven drug discovery. This program ensures that students acquire both profound theoretical knowledge and unparalleled hands-on experiential learning, equipping them to become visionary and adaptable leaders in the biotechnology, therapeutic development, biomanufacturing, and precision medicine sectors. Emphasizing applying novel molecular and computational techniques to address real-world challenges, the MAMHS program also fosters exceptional leadership skills. It offers robust connections with industry partners, positioning graduates at the forefront of innovation and success.

Administrative Staff

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Admission Requirements

To be admitted into this program, students must have successfully completed an undergraduate/baccalaureate degree in an honours program or the equivalent from a recognized university in molecular biology, biotechnology, biochemistry, immunology, or related field. The minimum average for admissions is B- in the last two years of full-time equivalent study.###Students must also have taken the following prerequisite courses: 1) one course in molecular biology, cellular biology, genetics, immunology, or microbiology; 2) one lab technique or methods course in biology or chemistry; and, 3) one course in biochemistry or structural biology.

If the students' first language is not English, they will be required to submit an acceptable result from one of the approved standardized English language tests. Minimum acceptable test scores are as follows:

- For TOEFL, a minimum score of 93, with a minimum score of 22 in each of the four categories.
- For IELTS, a minimum score of 7.0, with a minimum of 6.5 in each component.
- For Duolingo, a minimum overall score of 130, with a minimum score of 120 in each of the four categories.

Language test exemptions will be granted students with degrees completed in English from a university in Canada, Australia, New Zealand, the United States, and/or the United Kingdom.

Please note that these test score requirements are higher than the general university requirements. We cannot accept applicants with test scores lower than the minima stated above.

Learning Outcomes

Upon successful completion of the Master of Applied Molecular and Health Sciences, graduates will have the capacity to:

1. Master advanced principles of molecular and cellular biology, as well as the use of advanced laboratory techniques to study these principles.

2. Assess and apply various bioinformatics methods and tools to guide and accelerate drug discovery and protein modeling.

3. Conduct immunological and therapeutic research, including experimental design, data collection, statistical analysis, interpretation and dissemination of results, and ethical considerations.

4. Recognize the regulatory bodies and guidelines that govern biopharmaceutical development and acknowledge the ethical principles that ensure safe, effective, and transparent research and business practices across the globe.

5. Explore AI-based drug discovery pipelines to drive innovation in healthcare and biotechnology, in a way that is ethical and responsive to societal needs.

6. Execute laboratory techniques in stem cell biology and bio-manufacturing, emphasizing a comprehensive understanding and responsible and safe application of these techniques.

7. Analyze, integrate, and disseminate information from peer-reviewed publications, technical reports, and regulatory affairs documents using advanced written and oral communication skills across various multimodal platforms, both individually and in groups.

Program Requirements

Students are required to complete eight core courses (5.00 credits) in three semesters, as follows:

Code	Title	Credits
MCB*6600	Advanced Molecular and Cellular Biology	0.50
MCB*6610	AI-Driven Protein and Drug Design	0.50
MCB*6620	Fundamentals of Immunology and Host-Pathogen Interactions	0.50
MCB*6630	Techniques in Stem Cell Biology	1.00
MCB*6640	Advanced Cell Culture and Therapeutic Applications	1.00
MCB*6650	Vaccinology and Therapeutic Design	0.50
MCB*6660	Translational Medicine, Biologics and Protein Therapeutics	0.50
MCB*6670	Leadership, Ethics, and Scientific Communication in Biomedicine	0.50