BIOSYSTEMS ENGINEERING, M.SC.

Biosystems Engineering
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Academic Staff: Please refer to the Biosystems Engineering website (https://umanitoba.ca/engineering/faculty-staff/biosystems-engineering/) for Faculty information.

Biosystems Engineering Program Information

The Department of Biosystems Engineering offers graduate programs leading to Master of Science, Master of Engineering, and Doctor of Philosophy degrees. The graduate programs in the department focus on applications of engineering in biological systems. Strong emphasis is placed on assisting graduate students to gain a broad range of skills and experience in conducting interdisciplinary research, in understanding the interrelationships among physical and biological factors, and in written and oral communication.

Admission Information

Admission to the Faculty of Graduate and Postdoctoral Studies

Application and Admission Procedures are found in the Academic Guide (https://catalog.umanitoba.ca/graduate-studies/academic-guide/application-admission-registration-policies/).

Admission requirements for Master's students are found in the Master's Degrees General Regulations (https://catalog.umanitoba.ca/graduate-studies/academic-guide/masters-degrees-general-regulations/#Admission_FGSMasters) section of the Guide.

Biosystems Engineering M.Sc. Admission Requirements

For admission into the M.Sc. program, applicants are normally required to hold a Bachelor's degree in Biosystems Engineering or equivalent from a recognized university. Applicants with degrees in related areas may be recommended for admission by the Department Head.

Application Information

Students should complete and submit their online application with supporting documentation by the date indicated on the Biosystems Engineering M.Sc. program of study (https://umanitoba.ca/explore/programs-of-study/biosystems-engineering-msc/) page.

Degree Requirements

The M.Sc. is a research degree consisting of coursework and a thesis based on original research conducted by the student. In addition to the minimum course requirements of the Faculty of Graduate Studies found in the Graduate Studies Regulations Section (https://catalog.umanitoba.ca/graduate-studies/general-academic-regulations/) of this Calendar, a minimum of 12 credit hours of coursework is required, including at least 6 credit hours of courses at the 7000 level (which must include BIOE 7290) from the Department of Biosystems Engineering. The remaining 6 credit hours must be at the 3000 level or above from any department.

Master of Science students are required to spend at least one academic session in full-time resident graduate study. On recommendation of the department head, the residence requirement may be waived in special cases.

Graduate Specialization in Engineering Education (GSEE)

The Department of Biosystems Engineering offers a Graduate Specialization in Engineering Education (GSEE) for the Masters of Science degree. The GSEE will require 12 credit hours of coursework and a thesis on an Engineering Education topic. The coursework requirements include:

1. BIOE 7290 Biosystems Engineering Seminar 1 (3 credit hours);
2. One of two engineering education courses (3 credit hours): ENG 7030 The Discipline of Engineering Education or ENG 7040 Foundations of Engineering Education Research;
3. One research methodologies course suitable for engineering education research design & analysis (3 credit hours) at the 5000 level or higher from the Faculty of Education or other faculties as approved by the student's supervisor. Examples of suitable courses include EDUA 5800, EDUA 7830, EDUA 7840, and EDUA 7850; and
4. One course at the 3000 level or higher (3 credit hours) as approved by the student's supervisor.

Expected time to graduate: 18-24 months

Progression Chart

All students must complete a minimum of 12 credit hours of coursework approved by the faculty advisor.

Course	Title	Hours
Year 1		
GRAD 7300	Research Integrity Tutorial	0
GRAD 7500	Academic Integrity Tutorial	0
BIOE 7290	Biosystems Engineering Seminar 1	3
BIOE 7XXX	Course designated BIOE 7000 or above	3
Select courses designated 3000 or above from any department		6
Thesis Proposal		0
	Hours	**12**
Year 2		
GRAD 7000	Master's Thesis	0
	Hours	**0**
	Total Hours	**12**

Students are expected to demonstrate independence and professionalism during their graduate studies. Students are expected to be present on campus for scheduled classes, regular meetings with the advisor, and research work (unless the research work is being done at a site off-campus). It is understood that progress on research may be limited when the student is taking classes, however, substantial progress is expected during periods when classes are not being taken. Research progress includes tasks such as reviewing scientific literature, collecting experimental data, analyzing experimental data, and paper/thesis writing.

The advisory committee will judge whether the academic performance has been satisfactory based on the plans outlined in previous "Progress Reports."

Thesis Proposal

A thesis proposal (approximately 20 pages) is to be prepared by the M.Sc. student in consultation with the advisor/co-advisor, usually within 12 months of registration. The thesis proposal should include a statement of the thesis topic, a review of the relevant literature, the hypotheses to be tested, the proposed research methodology, and anticipated significance of the research. The thesis proposal should be circulated to the advisory committee prior to being presented orally to the student's advisory committee in a closed session. Unanimous approval by the advisory committee is required. If unanimous approval is not received, the thesis proposal can be revised and resubmitted.

Master's Thesis

A thesis must be submitted based on original research conducted by the student. The oral examination for the MSc degree, including distribution of the written thesis, will be organized by the student's advisor/co-advisor. Students are expected to present an overview of the work in 20-30 minutes and subsequently answer questions posed by the members of the examining committee.

Registration Information

Students should familiarize themselves with the Faculty of Graduate and Postdoctoral Studies 'GRAD' courses applicable to their program (https://catalog.umanitoba.ca/graduate-studies/registration-information/). If you have questions about which GRAD course(s) to register in, please consult your home department/unit.

Courses are subject to cancellation if there is insufficient enrolment. Courses with insufficient enrolment may be cancelled the first week of classes. Not all courses will be offered each year — contact the department for courses that will not be offered. All returning and newly admitted students must see an academic advisor or the department head prior to attempting to register.

Regulations

Students must meet the requirements as outlined in both Supplementary Regulation and BFAR documents as approved by Senate.

Supplementary Regulations

Individual units may require specific requirements above and beyond those of the Faculty of Graduate and Postdoctoral Studies, and students should consult unit supplementary regulations (https://umanitoba.ca/graduate-studies/supplementary-regulations/) for these specific regulations.

Bona Fide Academic Requirements (BFAR)

Bona Fide Academic Requirements (BFAR) (https://catalog.umanitoba.ca/graduate-studies/academic-guide/academic-performance-general/#BFAR) represent the core academic requirements a graduate student must acquire in order to gain, and demonstrate acquisition of, essential knowledge and skills.

All students must successfully complete:

- GRAD 7300 prior to applying to any ethics boards which are appropriate to the student's research or within the student's first year, whichever comes first; and
- GRAD 7500 within the first term of registration;

unless these courses have been completed previously, as per Mandatory Academic Integrity Course (https://catalog.umanitoba.ca/graduate-studies/academic-guide/academic-performance-general/#GRAD7500) and Mandatory Research Integrity Online Course (https://catalog.umanitoba.ca/graduate-studies/academic-guide/academic-performance-general/#GRAD7300).

Students must also meet additional BFAR requirements (https://umanitoba.ca/graduate-studies/student-experience/core-academic-requirements/#additional-requirements-by-program) that may be specified for their program.

General Regulations

All students must:

- maintain a minimum degree grade point average of 3.0 with no grade below C+,
- meet the minimum and not exceed the maximum course requirements, and
- meet the minimum and not exceed the maximum time requirements (in terms of time in program and lapse or expiration of credit of courses).