BIOSYSTEMS ENGINEERING, M.SC.

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.