Department/Academic Unit: Graduate Program in Mechanical & Materials Engineering Degree Program: M.A.Sc.

Degree Level Expectations, Learning Outcomes, Indicators of Achievement and the Program Requirements that Support the Learning Outcomes

Expectations	Learning Outcomes	Indicators of Achievement	Relevant Courses and academic requirements	Transferable Skills
Depth and breadth of knowledge	A systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of their academic discipline, field of study or area of professional practice. The ability to integrate and apply knowledge and skills of inquiry to courses taken within and outside Mechanical & Materials Engineering (if applicable to their research area in Mechanical & Materials Engineering). The ability to integrate the knowledge and skills acquired in other disciplines into their course work and research in Mechanical & Materials Engineering.	Developing an in-depth knowledge of current research and best practices in Mechanical & Materials Engineering. Integrating and applying knowledge and skills of inquiry to courses taken outside Mechanical & Materials Engineering (if applicable to their research area in Mechanical & Materials Engineering). Integrating knowledge and skills acquired in other disciplines into their course work and research in Mechanical & Materials Engineering.	Successful completion of course work requirement (4 graduate level courses). Successful completion and defense of research-based thesis.	Ability to apply acquired scientific knowledge to real life engineering problems in a research-intensive position or a consulting company
Research and scholarship	A conceptual understanding and methodological competence that: Enables a working comprehensive of how established techniques of research and inquiry are used to create and interpret knowledge in the discipline; Enables a critical evaluation of current research and advanced research and scholarship in the discipline or area of professional competence and; Enables a treatment of complex issues and	Enrolling in, and fulfilling the requirements of, courses which focus on methods of inquiry in Mechanical & Materials Engineering or topics related to their research area in Mechanical & Materials Engineering. Using their chosen methodology to conduct their own research in Mechanical & Materials Engineering.	Successful completion of course work requirement (4 graduate level courses). Successful completion and defense of research-based thesis.	Ability to use skills in a research intensive job dealing with mechanical engineering. Ability to carry out experiments or computation in common mechanical engineering fields.

	judgements based on established principles and techniques and On the basis of that competence, has shown at least one of the following: The development and support of a sustained argument in written form, or Originality in the application of knowledge			
Application of Knowledge	Competence in the research process by applying an existing body of knowledge in the critical analysis of a new question or of a specific problem or issue in a new setting.	The investigation of inquiry pertaining to their interests in the area of Mechanical & Materials Engineering, and integration of this thread of inquiry throughout their course work and research.	Successful completion of course work requirement (4 graduate level courses). Successful completion and defense of research-based thesis.	Ability to analyze technically difficult problems with minimal supervision. Understanding of intellectual property and commercialization issues.
Professional capacity/autonomy	The qualities and transferable skills necessary for employment training: The exercise of initiative and of personal responsibility accountability; and Decision-making in complex situations; and The intellectual independence required for continuing professional development; The ethical behaviour consistent with academic integrity and the use of appropriate guidelines and procedures for responsible conduct of research; and The ability to appreciate the broader implications of applying knowledge to particular contexts	A conceptual understanding of the relationship between theory, practice, and reflection in Mechanical & Materials Engineering. The engagement in the analysis and dissemination of Mechanical & Materials related research. A demonstrated comprehension of academic integrity in all scholarly activities.	Creation of a roster of courses (4 graduate level courses) that fulfills their own personal goals for professional development with the assistance of their supervisor(s). Responsibility taken for the creation of their course work portfolio and the execution of their scholarly activities related to the conduct and dissemination of their research. Successful completion of graduate seminar requirement (MECH 897).	Ability and commitment to adhere to the professional engineer's code of conduct Ability to participate in multidisciplinary teams Ability to manage projects of different sizes
Communication Skills	The ability to communicate ideas, issues and conclusions clearly.	A demonstration of communication skills through written projects and oral presentations in courses, seminars and research dissemination	Successful completion of course work requirement (4 graduate level courses). Successful completion of graduate seminar	Ability to explain complex systems to management and technical staff. Ability to write properly and

		activities.	requirements (MECH 897). Successful completion and defense of research-based thesis.	give concise, clear presentations
Awareness of limits of knowledge	Cognizance of the complexity of knowledge and of the potential contributions of other interpretations, methods, and disciplines.	An ability to understand the limitations of research and the boundaries of present-day understanding in their specific area of research in Mechanical & Materials Engineering. The demonstration of the ability to evaluate the level of uncertainty in their research and the significance of error analysis.	Successful completion of course work requirement (4 graduate level courses). Successful completion and defense of research-based thesis.	Ability to recognize the limitations of engineering empirical correlations, computational models and state-of-the-art equipment used in common mechanical engineering tasks