

# PROJECT MANAGEMENT IN THE BUILT ENVIRONMENT

## CURRICULUM

First Offered Fall 2022

<b>Master of Applied Science (MASc)</b>		
<b>DEGREE REQUIREMENTS</b>		<b>Credits</b>
Thesis		(Milestone)
PM8001	Integrated Project Planning	1
PM8002	Project Execution, Monitoring, Control	1
	PLUS	
	Research Methods course from among the following BL8210, SM8103, SM8104, CE8140 (Supervisor approval required)	1
Two Electives		2

<b>Master of Project Management (MPM)</b>		
<b>DEGREE REQUIREMENTS</b>		<b>Credits</b>
	Major Research Paper*	Milestone
PM8001	Integrated Project Planning	1
PM8002	Project Execution, Monitoring, Control	1
PM8003	Cost and Schedule	1
PM8004	Complex Project	1
Four Electives*		4

\*Students may take two additional electives in lieu of completing an MRP with the permission of the graduate program director.

### **Program Electives**

PM8201	Emergent Design and Construction Processes	1
PM8202	Strategic Leadership and Management	1
PM8203	Int'l Construction Project Management	1
PM8204	Negotiating Legal and Regulatory Issues	1
PM8205	Directed Studies	1
PM8206	Special Topics	1

### **Other Pre-Approved Electives**

CV8102 Advanced Construction Management  
 CV8105 Construction Administration and Management  
 CV8107 Infrastructure Asset Management  
 CV8501 Advanced Geospatial Info Systems  
 CV8503 Geospatial Modeling & Visualization  
 CV8504 Estimation and Data Series Analysis  
 CV8505 GIS for Civil Engineering  
 AR8102 Seminar in Critical Practice  
 AR8104 Seminar in Contemporary and Future Practice  
 AR8106 Current Topics in Architectural Praxis  
 AR8201 Advanced Construction Case Studies  
 AR8204 Architecture in Public Policy  
 AR8209 Advanced Design Methods  
 AR8210 Digital Tools  
 AR8215 How Buildings Work  
 AR8220 Sustainable Ratings Systems  
 AR8225 Globalization and Construction  
 BL8101 Building Science Theory  
 BL8102 Ecological and Resource Efficient Design  
 BL8201 Sustainability, Heritage and Existing Buildings

BL8202 Building Automation  
BL8203 Health, Human Comfort and Indoor Environment  
BL8207 Building Performance Assessment  
ME8124 Multiple Participant/Objective Dec. Making  
ME8127 Optimization Models  
ME8201 Design of Algorithms and Programming for Massive Data  
ME8202 Machine Learning  
ME8203 Management of Big Data and Big Data Tools  
ME8204 Data Mining and Prescriptive Analytics  
ME8128 Prob. Models in Operations Research  
MS8328 Supply Management  
MB8506 Real Estate Management  
MB8711 Negotiation and Conflict Resolution  
MB8718 Design, Commerce and Culture  
MT8212 Innovation and Organizational Theory  
MT8213 Technology and Organizational Strategy  
MT8220 Advanced Project Management  
MT8327 Data Management and Visualization

## Course Listing

### Thesis

This is a Milestone

### PM8001 Integrated Project Planning

This is the first of two Case-Based and Project-Based Learning courses that address the continuous process of managing a project from conception to operations, framed in the context of a rapidly-changing built environment shaped by evolving environmental, social, and economic realities. This course focuses on the three pedestals of project management: cost, time, and scope, which are addressed through comprehensive integrated project plan, developed consistent with industry best practices and critically considering emerging approaches. 1 Credit

### PM8002 Project Execution, Monitoring, Control

This course continues the Project- and Case-Based Learning used in PM8001, focusing on the critical activities and decisions made by Project Managers during the Execution, Monitoring & Control, and Closing phases of a project. Post-occupancy operations, facility management and deconstruction/re-use will be considered with a special focus on minimizing the environmental impact of construction and maximizing social and economic benefits. As with PM 8001, emerging technologies will be critically considered. Prerequisite: PM8001. 1 Credit.

### PM8003 Cost and Schedule

This course will provide an advanced understanding of building economics, including business case analysis and feasibility, development pro-forma, techniques for cost evaluation, cost control and value engineering strategies, life-cycle cost evaluation, IRR and ROI calculation, financing tools and total cost of borrowing. Both hard and soft costs will be considered throughout the project lifecycle (design, construction, operations, de-commissioning). Construction scheduling techniques are also covered to address the full spectrum of project deliverables. 1 Credit.

### PM8004 Complex Project

This course serves as a culmination of the research, discourse, and application of project management knowledge. This four-month project draws upon the diverse backgrounds of four PMBE students in undertaking a comprehensive strategic assessment of an organization within the AECO industry within the framework of all its operational areas and proposes feasible and actionable strategic solutions. The summative project culminates in a presentation identifying strategic direction with implementable and actionable recommendations. Prerequisite: PM8002. 1 Credit.

### PM8201 Emergent Design and Construction Processes

This course will focus on the application of virtual technologies to the design and construction processes, including digital tools for coordination, phasing and scheduling, and cost estimation, digital design and fabrication, visualization tools, IoT devices for construction site and facility data collection, adaptive building technologies, and the use of digital twins. Given rapid technology advancement, this course will incorporate case-based research into emerging technologies and their current or potential impacts on the project delivery process. 1 Credit.

### PM8202 Strategic Leadership and Management

This course provides the foundations of functional, business, and corporate strategy for management critical in the operations and growth of organizations in the AECO industry. This course promotes the development of leaders in the dynamic AECO industry through in-depth analyses of strategic decision-making models applied and reinforced with case-based exercises. This course focuses upon developing knowledge essential in leadership over a range of project stakeholders and skill development in recruiting, presentation, negotiation, and networking. 1 Credit.

### PM8203 Int'l Construction Project Management

This Course will inspire students to recognise the growing relevance of globalisation and how they relate to construction at large and to the Canadian construction industry. It will broaden their decision-making horizons beyond Canada. They will be made aware of issues and risks they may have to deal with in a highly competitive international market. 1 Credit.

**PM8204 Negotiating Legal and Regulatory Issues**

This course will introduce the legal aspects on construction including standard forms of contract; tort and liability; bonds and insurance; lien acts; dispute resolution; procurement law; professional liability; zoning and land use regulations; acquisitions and transactions; leases; and intellectual property. Students will also learn how to identify contractual traps and negotiate favorable terms. Navigating the Governance structures and the regulatory environment will also be discussed, focused on the project approvals process and potential site limitations. 1 Credit.

**PM8205 Directed Studies**

With the approval of the program director and supervisor, students enrolled in the graduate program in Project Management in the Built Environment may take a Directed Study course to gain knowledge in an area relevant to their research for which no graduate-level course is offered. A faculty member must supervise the study, and appropriate assignments (exam, report, etc.) will be agreed upon before registration. 1 Credit

**PM8206 Special Topics**

This course consists of lectures, seminars, and readings covering the latest advances and research in a field related to Project Management in the Built Environment. The course description will be announced prior to scheduling of the course. 1 Credit

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