



COURSE OUTLINE: CON302 - CONSTRUCTION ESTIMATING AND ACCOUNTING

Prepared: Marc Pilon, P.Eng

Approved: Corey Meunier, Chair, Technology and Skilled Trades

Course Code: Title	CON302: CONSTRUCTION ESTIMATING AND ACCOUNTING
Program Number: Name	4077: CNST. PROJECT MGMT.
Department:	CIVIL/CONSTRUCTION
Academic Year:	2023-2024
Course Description:	<p>This course introduces students to measuring techniques for items in construction projects. Utilizing Excel spreadsheets, students will interpret construction working drawings and specifications to measure items such as excavation, concrete, steel, mechanical and electrical components, etc. Emphasis is placed on accuracy of measurement, standard descriptions, logical sequence of take-off, and estimating principles. The parts of a detail estimate will be identified. Furthermore emphasis on company overheads will be examined in conjunction with logistical challenges such as crew production, equipment and travel costs.</p> <p>In addition, students will learn about the standard accounting practices including invoicing, progress tracking, accounts receivable and accounts payable as well as holdback releases.</p>
Total Credits:	4
Hours/Week:	4
Total Hours:	56
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course:	4077 - CNST. PROJECT MGMT.
Please refer to program web page for a complete listing of program outcomes where applicable.	VLO 1 Develop and use strategies to promote continuous professional learning in the construction industry.
	VLO 3 Assess construction project operations for compliance with contractual obligations, applicable laws, standards, bylaws, codes and ethical practices in construction methodology.
	VLO 5 Establish and manage relationships among diverse project stakeholders to achieve construction project goals.
	VLO 6 Manage the production, storage, retrieval and communication of project-related digital documents according to best practices, to meet construction project deadlines and goals.
	VLO 7 Perform a feasibility study to inform decisions in the planning phase of a construction project.
	VLO 8 Schedule, manage and evaluate the progression of construction projects by applying the principles, practices and tools of construction project management to complete projects on time and within budget.
	VLO 9 Prepare estimates and manage procurement processes to control costs in accordance with best practices in construction project management.



	<p>VLO 10 Develop and oversee quality assurance and control processes involved in the completion of construction projects to meet project specifications and industry quality standards.</p> <p>VLO 11 Analyze and manage project risks to mitigate their impact throughout the construction project lifecycle.</p> <p>VLO 12 formulate human resource management strategies to optimize personnel requirements for construction project completion.</p> <p>VLO 13 Build and lead multidisciplinary teams throughout the construction project lifecycle to accomplish construction project goals.</p> <p>VLO 14 Measure, record, maintain, and summarize the financial elements of a construction project including the cost control and the associated cash flow that contribute to a project being completed within budget.</p>
Essential Employability Skills (EES) addressed in this course:	<p>EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.</p> <p>EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.</p> <p>EES 3 Execute mathematical operations accurately.</p> <p>EES 4 Apply a systematic approach to solve problems.</p> <p>EES 5 Use a variety of thinking skills to anticipate and solve problems.</p> <p>EES 6 Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.</p> <p>EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</p> <p>EES 10 Manage the use of time and other resources to complete projects.</p> <p>EES 11 Take responsibility for ones own actions, decisions, and consequences.</p>
Course Evaluation:	<p>Passing Grade: 50%, D</p> <p>A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.</p>
Other Course Evaluation & Assessment Requirements:	<p>Grade Definition Grade Point Equivalent</p> <p>A+ 90 - 100% 4.00</p> <p>A 80 - 89%</p> <p>B 70 - 79% 3.00</p> <p>C 60 - 69% 2.00</p> <p>D 50 - 59% 1.00</p> <p>F (Fail) 49% and below 0.00</p> <p>CR (Credit) Credit for diploma requirements has been awarded.</p> <p>S Satisfactory achievement in field /clinical placement or non-graded subject area.</p> <p>U Unsatisfactory achievement in field/clinical placement or non-graded subject area.</p> <p>X A temporary grade limited to situations with extenuating circumstances giving a student</p>



additional time to complete the requirements for a course.
 NR Grade not reported to Registrar's office.
 W Student has withdrawn from the course without academic penalty.

Attendance

Students are only allowed to miss three classes without a documented explanation. One mark will be deducted from your overall grade for each undocumented explanation. The maximum deduction in overall grade is not to exceed 15%. Valid documented explanation include:

- Medical reason
- Family emergency
- Child care issue
- Transportation problems
- And any other reasonable explanation

The documented explanation has to be sent to the course professor by e-mail no later than three days from a missed class. A Doctor note, etc., is to be attached as a PDF file to your e-mail.

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
Upon successful completion, the student will be able to: 1. Develop and use strategies to promote continuous professional learning in the construction industry.	1.1 Keep abreast of changes in the construction industry in general and in the construction project management* field in particular 1.2 Seek out and act upon constructive feedback to enhance work performance identify the roles and benefits of professional organizations and certification e.g., Canadian Construction Association (CCA) Gold Seal Certification 1.3 Develop a plan to keep pace with and adapt to changing workforce demands and trends, as well as technological advances in the construction project management* field 1.4 Identify strategies for building a professional network and for participating in professional associations and activities.
Course Outcome 2	Learning Objectives for Course Outcome 2
Upon successful completion, the student will be able to: 2. Assess construction project* operations for compliance with contractual obligations, applicable laws, standards, bylaws, codes and ethical practices in construction methodology.	2.1 Determine relevant legislation and bylaws that apply to specific construction projects*. 2.2 Identify and apply legal principles affecting the review and administration of contracts. 2.3 Assess and interpret a range of contracts, contract offers and acceptances.
Course Outcome 3	Learning Objectives for Course Outcome 3
Upon successful completion, the student will be able to: 3. Establish and manage	3.1 Identify project stakeholders* and validate stakeholders' expectations, perceptions and motivation 3.2 Formulate and implement stakeholder management



	relationships among diverse project stakeholders* to achieve construction project* goals.	strategies to maximize positive influences and mitigate negative impacts 3.3 Collaborate with clients, engineers, architects and others to determine the implementation of construction projects* 3.4 Collaborate with local building and planning authorities 3.5 Obtain contracts with architects, vendors, contractors and other workers 3.6 Lead stakeholder meetings and report, in written, graphics and oral formats 3.7 Use appropriate interpersonal skills and terminology suited to the situation and project stakeholders* 3.8 Use communication technologies to facilitate clear and concise communication among project stakeholders* e.g., email, file transfer etc. 3.9 Use conflict/dispute resolution strategies to resolve conflicts arising during the implementation of construction projects*
	Course Outcome 4	Learning Objectives for Course Outcome 4
	Upon successful completion, the student will be able to: 4. Manage the production, storage, retrieval and communication of project-related digital documents according to best practices, to meet construction project* deadlines and goals.	4.1 Select and use appropriate technologies and applications to enhance work performance and support functions, processes and documentation within the construction project management* field 4.2 Apply principles of records management to hard copy and digital project records 4.3 Retrieve and review a range of construction drawings such as architectural, structural, plumbing, electrical and HVAC drawings 4.4 Develop project records including equipment and material inventories, time sheets, projected-related and actual-costs records and quality assurance and control* records 4.5 Manage the distribution, storage and retrieval of hard copy and digital project documents 4.6 Ensure accurate, clear and timely project-evaluation records 4.7 Establish criteria, organize, coordinate and prepare documents according to industry standards e.g., Canadian Construction Documents Committee (CCDC) 4.8 Prepare and present formal technical reports, budget forecasts and project estimates 4.9 Use and share project data in accordance with relevant privacy legislation, guidelines and data sharing agreements
	Course Outcome 5	Learning Objectives for Course Outcome 5
	Upon successful completion, the student will be able to:	5.1 Consult with project stakeholders* and regulatory authorities to determine scope of construction project*

	<p>5. Perform a feasibility study to inform decisions in the planning phase of a construction project*.</p>	<p>5.2 Perform appraisals of project goals, deliverables, approaches and finances to determine project feasibility 5.3 Assess requirements for business planning and management based on project stakeholders* needs 5.4 Evaluate historical, geographical and environmental site information for use in planning construction projects* 5.5 Align project goals with preliminary drawings and specifications 5.6 Determine the use of construction methods, processes and materials based on project requirements 5.7 Assess the need for construction equipment considering equipment capabilities and/or production rates 5.8 Complete feasibility analysis and cost estimate, for green and alternate strategies, materials and processes</p>
	<p>Course Outcome 6</p>	<p>Learning Objectives for Course Outcome 6</p>
	<p>Upon successful completion, the student will be able to: 6. Schedule, manage and evaluate the progression of construction projects* by applying the principles, practices and tools of construction project management* to complete projects on time and within budget.</p>	<p>6.1 Establish the phases of the project and their component activities 6.2 Produce and manage accurate and timely project-related reports using computers and appropriate software 6.3 Evaluate project schedules against baselines to ensure timely execution for both schedule and cost 6.4 Evaluate financial resources, human resources and time-lines of construction projects* 6.5 Resolve problems that arise related to inclement weather, emergencies or unforeseen circumstances and adapt the schedule as necessary 6.6 Resolve project cost, time and quality deviations</p>
	<p>Course Outcome 7</p>	<p>Learning Objectives for Course Outcome 7</p>
	<p>Upon successful completion, the student will be able to: 7. Prepare estimates and manage procurement processes to control costs in accordance with best practices in construction project management*.</p>	<p>7.1 Apply principles of value engineering* and project life cycle* costing to obtain optimal solution to construction methods 7.2 Prepare cost control plan using contract requirements, project data and analysis of costs 7.3 Conduct research to determine proposed labour costs, materials and timing 7.4 Review offers and quotes by subcontractors or vendors 7.5 Select and use software for costing analysis, forecasting and budgeting 7.6 Prepare and submit accurate preliminary and detailed budget estimates 7.7 Calculate accurate updated cost estimates and actual costs 7.8 Analyze labour-production-time studies to produce accurate unit prices of construction</p>



	<p>activities</p> <p>7.9 Apply principles of construction accounting to prepare cost plans, elemental estimates, budget forecasts and project estimates</p> <p>7.10 Measure and categorize quantities by using accepted methods of measurement such as, the Canadian Institute of Quantity Surveyors (CIQS) standard methods of measurement</p> <p>7.11 Coordinate the delivery of supplies according to project priorities</p> <p>7.12 Manage construction procurement and supply chain to successfully minimize project costs and optimize other project requirements</p> <p>7.13 Develop and implement strategies for optimal resource planning and utilization</p>
Course Outcome 8	Learning Objectives for Course Outcome 8
<p>Upon successful completion, the student will be able to:</p> <p>8. Develop and oversee quality assurance and control* processes involved in the completion of construction projects* to meet project specifications and industry quality standards.</p>	<p>8.1 Review and analyze project records including equipment and material inventories, time sheets, projected-related and actual-costs records and quality assurance and control* records</p> <p>8.2 Ensure that project cost and timelines remain within desired limits</p> <p>8.3 Resolve project quality and cost deviations</p> <p>8.4 Meet relevant quality specifications and standards such as Canadian Standards Association (CSA), ASTM International Standards for Building Design and Construction</p>
Course Outcome 9	Learning Objectives for Course Outcome 9
<p>Upon successful completion, the student will be able to:</p> <p>9. Analyze and manage project risks to mitigate their impact throughout the construction project lifecycle*.</p>	<p>9.1 Use data gathering techniques, e.g., brainstorming, SWOT analysis or interviewing, to identify project risks throughout the construction project life cycle*</p> <p>9.2 Complete a risk analysis to determine risks associated with specific construction projects* e.g., socioeconomic factors, environmental requirements, organizational relationships or technological problems associated with the design, site or construction processes</p> <p>9.3 Integrate risk management strategies into construction project management* plan</p> <p>9.4 Plan and implement strategies to eliminate or mitigate identified projects risks</p> <p>9.5 Use tools to track potential project risks, triggers, occurrences and re-occurrences</p> <p>9.6 Evaluate risk responses and modify strategies to produce intended responses throughout the construction project life cycle*</p>
Course Outcome 10	Learning Objectives for Course Outcome 10
<p>10. Build and lead multidisciplinary teams</p>	<p>10.1 Adapt leadership strategies to a range of team members and dynamics</p>

	throughout the construction project lifecycle* to accomplish construction project* goals.	10.2 Use collaborative leadership skills to communicate and to influence diverse project team members 10.3 Apply team building and coordination skills within multidisciplinary teams 10.4 Integrate negotiation and problem solving skills into leadership style 10.5 Use conflict resolution skills to resolve workplace discord 10.6 Establish and communicate performance expectations to team members 10.7 Develop and implement strategies to effectively manage changes in project scope, time and budget
	Course Outcome 11	Learning Objectives for Course Outcome 11
	11. Provide a general background to the process of measuring, recording, maintaining, and summarizing the financial elements of a construction project including cost control.	11.1 Prepare RFQ Documents for subcontractors and suppliers 11.2 Formulate and prepare progress draw quantities 11.3 Prepare invoicing for project elements 11.4 Tracking of accounts payable and receivable 11.5 Review productivity rates and material costing data with respect to overall project schedule to estimate profits/losses. 11.6 Overview of overhead costs applied to the project including labour and equipment. 11.7 Financial analysis of leasing and financing and the importance of project cash flow.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	80%
Participation	20%

Date:

July 13, 2023

Addendum:

Please refer to the course outline addendum on the Learning Management System for further information.

