COURSE OUTLINE: CWA101 - CIVIL CO-OP CAPSTONE

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Course Code: Title	CWA101: CIVIL ENGINEERING CO-OP CAPSTONE COURSE
Program Number: Name	4080: CIVIL ENG TECHNICIAN
Department:	CIVIL/CONSTRUCTION
Academic Year:	2024-2025
Course Description:	Students will participate in a comprehensive design project outlining the key steps they will face while working as a Civil Engineering Technician. Students will work through the project lifecycle from preliminary planning and code review, through to detailed design, cost estimates and specifications.
Total Credits:	3
Hours/Week:	3
Total Hours:	42
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: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4080 - CIVIL ENG TECHNICIAN** VLO 1 develop and use strategies to enhance professional growth and ongoing learning in the civil engineering field. VLO 2 comply with workplace health and safety practices and procedures in accordance with current legislation and regulations. VLO 3 complete duties and assist in monitoring that work is performed in compliance with contractual obligations, applicable laws, standards, bylaws, codes and ethical practices in the civil engineering field. VLO 4 carry out sustainable practices in accordance with contract documents, industry standards and environmental legislative requirements. VLO 5 collaborate with the project team and communicate effectively with project stakeholders to support civil engineering projects. VLO 6 collect, process and interpret technical data to produce written and graphical project-related documents. VLO 7 use industry-specific electronic and digital technologies to support civil engineering projects. VLO 8 participate in the design and modeling phase of civil engineering projects by applying engineering concepts, basic technical mathematics and principles of science to the review and production of project plans. VLO 9 assist in the scheduling, cost estimation and monitoring of the progression of civil engineering projects by applying principles of construction project management. VLO 10 perform quality control testing and the monitoring of equipment, materials and methods involved in the implementation and completion of civil engineering projects.

	VLO 11	apply teamwork, leadership and interpersonal skills when working individually or within multidisciplinary teams to complete civil engineering projects.
Essential Employability Skills (EES) addressed in this course:	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.
	EES 2	Respond to written, spoken, or visual messages in a manner that ensures effective communication.
	EES 3	Execute mathematical operations accurately.
	EES 4	Apply a systematic approach to solve problems.
	EES 5	Use a variety of thinking skills to anticipate and solve problems.
	EES 6	Locate, select, organize, and document information using appropriate technology and information systems.
	EES 7	Analyze, evaluate, and apply relevant information from a variety of sources.
	EES 8	Show respect for the diverse opinions, values, belief systems, and contributions of others.
	EES 9	Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
	EES 10	Manage the use of time and other resources to complete projects.
	EES 11	Take responsibility for ones own actions, decisions, and consequences.
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.	

Course Outcomes and Learning Objectives:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
1. Comply with workplace health and safety practices and procedures in accordance with current legislation and regulations.	The following will be applicable to all design projects: 1.1 Conduct self in safe manner and in accordance with the requirements of work situation 1.2 Participate in health and safety training 1.3 Review and implement a site or project-specific health and safety plan
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Complete duties and assist in monitoring that work is performed in compliance with contractual obligations, applicable laws, standards, bylaws, codes and ethical practices in the civil engineering field.	The following will vary depending on the nature of the design project: 2.1 Read and interpret relevant building codes i.e., National and/or Ontario Building Codes 2.2 Prepare estimates, and contract specifications 2.3 Select and use equipment, materials and practices that comply with relevant legislation, standards, codes and bylaws 2.4 read and interpret Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings 2.5 Develop detailed construction drawings
Course Outcome 3	**Learning Objectives for Course Outcome 3**

3. Collaborate with the project team and communicate effectively with project stakeholders to support civil engineering projects.	The following will be applicable to all design projects: 3.1 Identify the relationships among the various disciplines involved in civil engineering projects 3.2 Describe the rights, roles and responsibilities of the civil engineering technician as a member of the project team 3.3 Identify the rights, roles and responsibilities of project stakeholders associated with civil engineering projects 3.4 Use appropriate interpersonal skills and terminology suited to the situation and project stakeholders 3.5 Report in written, graphic and oral formats the results of project-related meetings as required 3.6 Use communication technologies to facilitate clear and concise communication among project stakeholders e.g., email, file transfer etc.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Collect, process and interpret technical data to produce written and graphical project-related documents.	The following will be applicable for all design projects: 4.1 Collect, interpret and check data by using systematic approaches in accordance with recognized standards and practices 4.2 Select and use appropriate technologies to produce documents for civil engineering projects 4.3 Present civil engineering data to project stakeholders 4.4 Participate as an active member of the team to measure, record and evaluate technical data 4.5 Use collected and stored information accurately and effectively to assist in decision making, reporting and quality assurance
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Use industry-specific electronic and digital technologies to support civil engineering projects.	The following will vary depending on the selected design project: 5.1 Select and use industry-specific electronic and digital technologies to design projects, produce plans and to solve project-related problems (e.g.,Computer-aided Design (CAD), hydrologic and hydraulic modeling software, 3D laser scanning technologies, etc. 5.2 Select and use standard survey instruments and Global Navigation Satellite Systems (GNSS) to verify and/or produce engineering and construction layouts 5.3 Apply survey techniques and use survey equipment (i.e., levels and total station)
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6. Participate in the design and modeling phase of civil engineering projects by applying engineering concepts, basic technical mathematics and principles	The following will be applicable for all design projects: 6.1 Use mathematical and scientific terminology correctly in written and oral communication 6.2 Review the technical criteria used in the design, layout and construction of civil engineering projects

of science to the review and production of project plans.	6.3 Select and apply standards, codes and procedures to participate in the design of civil infrastructure components (i.e., sewers, water mains, structural elements of wood, concrete and steel, geotechnical infrastructure, storm water, potable water, waste water infrastructure and transportation 6.4 Perform inspections, identifying structural, physical and/or environmental deficiencies and issues
Course Outcome 7	**Learning Objectives for Course Outcome 7**
7. Develop Construction Scheduling, cost estimation by applying principles of construction project management.	The following will be applicable for all projects: 7.1 Participate as a member of the project team to establish the scope of the project in consultation with the professor 7.2 Identify the phases of the project and their component activities 7.3 Follow project schedules 7.4 Observe, record, monitor and report work activity 7.5 Complete any surveys or cost estimates 7.6 Use organizational and time-management strategies effectively in own work 7.7 Assist in preparing and presenting formal technical reports, budget forecasts and project estimates
Course Outcome 8	**Learning Objectives for Course Outcome 8**
9. Apply teamwork, leadership and interpersonal skills when working individually or within multidisciplinary teams to complete civil engineering projects.	9.1 Take initiative and work independently with minimal supervision 9.2 Assume accountability for self in managing the use of time and resources to meet established project deadlines 9.3 Work as an effective team player to complete tasks while promoting a positive work environment 9.4 Take responsibility for one`s job related performance, as an individual and as a member of a multidisciplinary team 9.5 Use effective time-management and organizational techniques to prioritize tasks and to accomplish goals 9.6 Use conflict resolution skills in work situations including coordination, cooperation and compromise 9.7 Follow established reporting procedures within a team environment

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Detailed Design Drawings	40%
Final Design Report	30%
Final Presentation	10%
Preliminary Design Report	15%
Team Profile	5%

Date: September 4, 2024

Addendum: Please refer to the course outline addendum on the Learning Management System for further

information.