COURSE OUTLINE: CAD266 - AUTOCAD CIVIL 3D

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Course Code: Title	CAD266: AUTOCAD CIVIL 3D APPLICATIONS
Program Number: Name	4080: CIVIL ENG TECHNICIAN
Department:	CIVIL/CONSTRUCTION
Academic Year:	2024-2025
Course Description:	This course will further develop student`s skills in AutoCAD, specifically the understanding of applications and proficiency in Civil 3D. AutoCAD Civil 3D is the backbone of Civil Engineering Industry in a variety of sectors (Land development, Municipal Infrastructure, Transportation) and extends the knowledge of 2D AutoCAD, as well as surveying applications. This course will develop skills in Surfaces, Alignment, Corridors, Plan and Profiles, Cuts and Fills, as well as general geometric alignments of roadways and infrastructure. At the completion of this Course, students will be able to develop base drawings in 3D surveyed data, add and modify underground elements (i.e. sewers, watermain, maintenance structures), develop alignments of existing and proposed construction, and determine material quantities.
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 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 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 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 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 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.
Other Course Evaluation & Assessment Requirements:	Grade Definition Grade Point Equivalent A+ 90 - 100% 4.00 A 80 - 89% B 70 - 79% 3.00 C 60 - 69% 2.00 D 50 - 59% 1.00 F (Fail)49% and below 0.00 CR (Credit) Credit for diploma requirements has been awarded. S Satisfactory achievement in field /clinical placement or non-graded subject area. U Unsatisfactory achievement in field/clinical placement or non-graded subject area. X A temporary grade limited to situations with extenuating circumstances giving a student 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**

1) The graduate has reliably demonstrated the ability to develop and use strategies to enhance professional growth and ongoing learning in the civil engineering field.	• keep abreast of changes in the civil engineering field • use appropriate self-management techniques (e.g., time management, stress management) • identify the need for self-evaluation and explain the importance of lifelong learning • seek out and act upon constructive feedback to enhance work performance • seek assistance to resolve problems beyond own knowledge and skills • develop a plan to keep pace with and adapt to changing workforce demands and trends, as well as technological advances in the civil engineering services field
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2) The graduate has reliably demonstrated the ability to 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.	• read and interpret relevant building codes i.e., National and/or Ontario Building Codes • assist in the preparation of estimates, tenders and construction bids • select and use equipment, materials and practices that comply with relevant legislation, standards, codes and bylaws • identify codes of ethics of the applicable provincial association, societies or workplaces • read and interpret Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3) The graduate has reliably demonstrated the ability to collaborate with the project team and communicate effectively with project stakeholders* to support civil engineering projects*	• identify the disciplines involved in the planning, designing and implementation of civil engineering projects, i.e., architecture and surveying along with structural, mechanical, electrical and environmental engineering • identify the relationships among the various disciplines involved in civil engineering projects • describe the rights, roles and responsibilities of the civil engineering technician as a member of the project team • participate as a member of a multi-disciplinary team to design, implement, complete and evaluate civil engineering projects* • identify the rights, roles and responsibilities of project

	stakeholders associated with civil engineering projects • participate as a team member in project-related meetings • use communication technologies to facilitate clear and concise communication among project stakeholders* e.g., email, file transfer etc. • build and maintain effective client service skills
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4) The graduate has reliably demonstrated the ability to collect, process and interpret technical data to produce written and graphical project-related documents.	• collect, interpret and check data by using systematic approaches in accordance with recognized standards and practices • select and use appropriate technologies to produce documents for civil engineering projects • present civil engineering data to project stakeholders • use relevant information to construct models for civil engineering projects by using drawings and computer-assisted technologies • contribute to the development of strategies to collect technical data • participate as an active member of the team to measure, record and evaluate technical data • select and operate a variety of civil engineering-related equipment • measure, record and evaluate technical data to ensure data meet industry standards and are within expected parameters for precision and accuracy • read the criteria for the project and identify appropriate information sources • report data and assist in proposing recommendations to the appropriate team member • use systematic approaches and paper-based and computerized techniques to collect civil engineering data • collect and organize project-related information in a retrievable manner according to approved techniques • keep ongoing, accurate project records, minutes and accounts of civil engineering projects according to established formats, policies and procedures • use collected and stored information accurately and effectively to assist in decision making, reporting and quality control • ensure that project data is used and shared in accordance

	with relevant privacy legislation, guidelines and data sharing agreements
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5) The graduate has reliably demonstrated the ability to use industry-specific electronic and digital technologies to support civil engineering projects.	• keep abreast of changes in technology that affect civil engineering (e.g., imaging, heavy equipment machine control systems, mobile integration, cloud accessibility and Drone technologies) • identify the impact and application of technology throughout the lifecycle of civil engineering projects*, i.e., field data collection, design and engineering, estimating and construction • 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. • use and interpret satellite and other digital imagery • visualize, manipulate and analyze spatial data using a variety of data sources and technologies
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6) The graduate has reliably demonstrated the ability to 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.	• apply known and routine calculations to solve defined problems • apply standardized mathematical and scientific formulas and techniques accurately • use mathematical and scientific terminology correctly in written and oral communication • implement checks to ensure calculations and/or design concepts are accurate • review the technical criteria used in the design, layout and construction of civil engineering projects • 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 • seek assistance to resolve situations in the analysis, design, or construction of civil engineering projects* that are beyond the scope of the

	technician`s training, knowledge or legal authority
Course Outcome 7	**Learning Objectives for Course Outcome 7**
7) The graduate has reliably demonstrated the ability to assist in the scheduling, cost estimation and monitoring of the progression of civil engineering projects by applying principles of construction project management	• participate as a member of the project team to establish the scope of the project in consultation with the project stakeholders • perform quantity surveys and assist in cost estimates • use organizational and time-management strategies effectively in own work • assist in preparing and presenting formal technical reports, budget forecasts and project estimates • provide technical information for the development a project schedule
Course Outcome 8	**Learning Objectives for Course Outcome 8**
8) The graduate has reliably demonstrated the ability to apply teamwork, leadership and interpersonal skills when working individually or within multidisciplinary teams to complete civil engineering projects.	• take initiative and work independently with minimal supervision • assume accountability for self in managing the use of time and resources to meet established project deadlines • work as an effective team player to complete tasks while promoting a positive work environment • provide leadership when working with sub-trades and general workers • take responsibility for one`s job related performance, as an individual and as a member of a multidisciplinary team • use effective time-management and organizational techniques to prioritize tasks and to accomplish goals • provide technical assistance to less experienced members of the team • provide motivation and positive feedback to others to accomplish tasks and goals • use conflict resolution skills in work situations including coordination, cooperation and compromise • follow established reporting procedures within a team environment

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments (3)	30%
Design Project	40%
Theory Tests (3)	30%

Date: August 18, 2024

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