



COURSE OUTLINE: SUR101 - SURVEYING

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Approved: Martha Irwin - Dean

Course Code: Title	SUR101: SURVEYING
Program Number: Name	4080: CIVIL ENG TECHNICIAN
Department:	CIVIL/CONSTRUCTION
Academic Year:	2025-2026
Course Description:	<p>Surveying plays a key role with our built environment. As a civil technician you may have responsibilities at the initial planning, layout or construction phases of a project.</p> <p>This course introduces you to basic surveying principles. The topics will deal with theory, application and care of the level, distance measurement equipment and total stations. The theory is enhanced with practical field exercises.</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.
Substitutes:	OEL810, SUR100, SUR109
This course is a pre-requisite for:	SUR201
Vocational Learning Outcomes (VLO's) addressed in this course:	4080 - CIVIL ENG TECHNICIAN
Please refer to program web page for a complete listing of program outcomes where applicable.	VLO 2 comply with workplace health and safety practices and procedures in accordance with current legislation and regulations.
	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 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:	<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 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 additional time to complete the requirements for a course.</p> <p>NR Grade not reported to Registrar's office.</p> <p>W Student has withdrawn from the course without academic penalty.</p> <p>Attendance Students are only allowed to miss three classes without 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:</p> <ul style="list-style-type: none"> - Medical reason - Family emergency - Child care issue - Transportation problems <p>The documented explanation has to be sent to me by e-mail no later than three days from the missed class. A doctor note, etc., is to be attached as a PDF file to your e-mail.</p>
Books and Required Resources:	<p>Survey Field Book (Hardcover with Spine)</p> <p>CSA Reflective Vest (Surveyor's Vest Recommended)</p> <p>CSA Steel Toe Boots</p>



Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
<p>Upon successful completion, the student will be able to:</p> <p>1. Define, list and demonstrate basic surveying concepts from a historical and procedural perspective.</p>	<p>1.1 Define geomatics and surveying. 1.2 List the various branches of surveying. 1.3 Define and identify systematic and random errors. 1.4 Define and identify mistakes or blunders. 1.5 Identify the basic components of a surveyor's level, chain and total station. 1.6 Describe the proper care and handling of survey equipment. 1.7 Identify and demonstrate suitable formats for note taking</p>
Course Outcome 2	Learning Objectives for Course Outcome 2
<p>Upon successful completion, the student will be able to:</p> <p>2. Comply with health and safety practices and procedures while performing field activities.</p>	<p>2.1 Conduct self in safe manner and in accordance with the requirements of work situation. 2.2 Identify unsafe situations in the field. 2.3 Apply best safety practices when working outdoors.</p>
Course Outcome 3	Learning Objectives for Course Outcome 3
<p>Upon successful completion, the student will be able to:</p> <p>3. Use industry-specific automatic level, digital level, taping and total stations and technologies to support the survey field activities.</p>	<p>3.1 Select and use standard survey equipment such as automatic level, digital level, tapes and total station. 3.2 Apply survey techniques and use survey equipment such as automatic level, digital level, chains, tapes and total station. 3.3 Operate total station and record angular measurements 3.4 Perform traverse closure checks with tolerances 3.5 Access and import point cloud files (.las, .rcp, .e57, etc.) into compatible software (e.g., AutoCAD, ReCap, Cyclone, or CloudCompare)</p>
Course Outcome 4	Learning Objectives for Course Outcome 4
<p>Upon successful completion, the student will be able to:</p> <p>4. Participate as a member of a survey team by applying surveying concepts and basic technical mathematics to review and produce leveling, taping and total station activities.</p>	<p>4.1 Collect, interpret and check survey data by using systematic approaches in accordance to recognized standards and practices. 4.2 Perform a differential, benchmark and profile leveling field activity. 4.3 Perform a taping activity on level and sloping ground in the field. 4.4 Measure and record the horizontal angles of a closed traverse. 4.5 Present a field book that is complete, neat and illustrated with appropriate sketches at the mid-term and end of semester timeframes. 4.6 Apply known and routine calculations to check the closure of a leveling route. 4.7 Implement checks to ensure that field work is accurate. 4.8 Determine elevation differences by trigonometric leveling and level circuit adjustments.</p>



	<p>4.9 Perform calculations of right angle triangles.</p> <p>4.10 Convert horizontal angles to azimuths and bearings for a closed traverse.</p> <p>4.11 Perform computations of open traverse by determining the azimuth and bearing of each segment of the traverse.</p> <p>4.12 Seek assistance to resolve situations that are beyond the student's scope of training or knowledge.</p>
Course Outcome 5	Learning Objectives for Course Outcome 5
<p>Upon successful completion, the student will be able to:</p> <p>5. Apply teamwork, leadership and interpersonal skills when working individually or within a team to complete field projects.</p>	<p>5.1 Take initiative while working with your team to complete the field projects.</p> <p>5.2 Assume accountability for self in managing the use of time and resources to meet established deadline.</p> <p>5.3 Work as an effective team player to complete the survey projects while promoting a positive work environment.</p> <p>5.4 Use effective time-management and organizational techniques to prioritize project tasks and to accomplish goals set by the team.</p> <p>5.5 Use conflict resolution skills in the field including cooperation and compromise.</p>

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments/Quizzes	30%
Field Assignments	30%
Final Test	20%
Mid Term Test	20%

Date: July 31, 2025

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