

SE 312 Introduction to Geomatics Engineering

Credit and Contact hours	3 / 2 (Lectures), 1 (Tutorials), 2 (Laboratory)											
Required, or Elective	Required for a BSCE degree											
Course Description	Electromagnetic distance measurement & electronic theodolites; total station; control fixing (traversing, triangulation: resection & intersection); map compilation using electronic surveying instruments & computer; precise levelling; introduction to hydrographic surveying; setting out; horizontal & vertical curves & rout location.											
Prerequisites or Co-requisites	SE 212											
Course Learning Outcomes	Students completing this course successfully will be able to <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">Course Learning Outcomes</th> <th style="text-align: center;"><i>Related Student Outcomes (SO)</i></th> </tr> </thead> <tbody> <tr> <td>CLO1: Determine corrected horizontal distance, height and water depth using EDM, Total Station, Precise Levelling and Echo-sounder, respectively.</td> <td style="text-align: center;">SO1</td> </tr> <tr> <td>CLO2. Compute ground point coordinates using adjusted traverse, triangulation and trilateration methods for control extension.</td> <td style="text-align: center;">SO1</td> </tr> <tr> <td>CLO3. Determine 3D coordinates of ground points using tacheometry and total station for topographic mapping.</td> <td style="text-align: center;">SO1</td> </tr> <tr> <td>CLO4. Determine required data for setting out curves.</td> <td style="text-align: center;">SO1</td> </tr> </tbody> </table>		Course Learning Outcomes	<i>Related Student Outcomes (SO)</i>	CLO1: Determine corrected horizontal distance, height and water depth using EDM, Total Station, Precise Levelling and Echo-sounder, respectively.	SO1	CLO2. Compute ground point coordinates using adjusted traverse, triangulation and trilateration methods for control extension.	SO1	CLO3. Determine 3D coordinates of ground points using tacheometry and total station for topographic mapping.	SO1	CLO4. Determine required data for setting out curves.	SO1
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Student Outcomes	SO1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics, and using modern engineering tools [ABET 1].											

Topics Covered	List of Topics	Related CLOs
	Angle measurements (theodolites: parts, design and operation))	CLO1
	EDM & Total Station; parts, errors and procedures of measurements	CLO1
	Traversing: adjustment of angles, computation of departures, latitudes and adjusted coordinates.	CLO2
	Triangulation & Trilateration: adjustment and computation of coordinates	CLO2
	Tacheometry: principles and 3D coordinates determination	CLO3
	Precise Leveling	CLO1
	Horizontal Curves: types and setting out data determination	CLO4
	Vertical Curves: geometric properties and setting out data determination	CLO4
	Introduction to Hydrographic Surveying	CLO1
Textbook(s) and Other Required Material	Textbook: Paul, R. Wolf & Charles D. Ghilani, "Elementary Surveying: An Introduction to Geomatics" 14 th Ed. 2014. Pearson.	
Grading System	Tutorials problems and attendance 10% 2 Field work reports 20% 2 Mid-Terms 30% Final Exam 40%	
Instructors	Prof. Ismat El Hasan (2A44); email: ismat@ksu.edu.sa	
Date of Review	Nov, 2020	