

SE 419 Advanced Geodesy

Credit and Contact hours	[3] ; 3 (Lectures), 1 (Tutorials), 0 (Laboratory)															
Required, or Elective	Elective for a BSCE degree															
Course Description	Basic definitions and concepts (Geoid and ellipsoid); Ellipsoid and ellipsoidal references; systems; Geometric calculations on the ellipsoid surface; Datums and datums transformations; Geodetic networks.															
Prerequisites or Co-requisites	SE 315															
Course Learning Outcomes	Students completing this course successfully will be able to <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; width: 80%;"> <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 Identify the model of the Earth surface</td> <td style="text-align: center;">SO6</td> </tr> <tr> <td>CLO2. Model the Geoid surface</td> <td style="text-align: center;">SO1</td> </tr> <tr> <td>CLO3 Apply ellipsoidal geometry on geodetic problems.</td> <td style="text-align: center;">SO1</td> </tr> <tr> <td>CLO4. Explain datum transformation</td> <td style="text-align: center;">SO1</td> </tr> </tbody> </table>		Course Learning Outcomes	<i>Related Student Outcomes (SO)</i>	CLO1 Identify the model of the Earth surface	SO6	CLO2. Model the Geoid surface	SO1	CLO3 Apply ellipsoidal geometry on geodetic problems.	SO1	CLO4. Explain datum transformation	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. SO 6 An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions															
Topics Covered	<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; width: 80%;"> <thead> <tr> <th style="text-align: center;">List of Topics</th> <th style="text-align: center;">Related CLOs</th> </tr> </thead> <tbody> <tr> <td>Basic definitions and concepts (Geoid and ellipsoid)</td> <td style="text-align: center;">CLO1</td> </tr> <tr> <td>Ellipsoid and ellipsoidal references</td> <td style="text-align: center;">CLO1</td> </tr> <tr> <td>Systems</td> <td style="text-align: center;">CLO2</td> </tr> <tr> <td>Geometric calculations on the ellipsoid surface</td> <td style="text-align: center;">CLO3</td> </tr> <tr> <td>Datums and datums transformations</td> <td style="text-align: center;">CLO4</td> </tr> <tr> <td>Geodetic networks</td> <td style="text-align: center;">CLO3</td> </tr> </tbody> </table>		List of Topics	Related CLOs	Basic definitions and concepts (Geoid and ellipsoid)	CLO1	Ellipsoid and ellipsoidal references	CLO1	Systems	CLO2	Geometric calculations on the ellipsoid surface	CLO3	Datums and datums transformations	CLO4	Geodetic networks	CLO3
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Textbook(s) and Other Required Material	Textbook: Zhiping Lu, Yunying Qu, Shubo Qiao, Geodesy: Introduction to Geodetic Datum and Geodetic Systems, Springer; 2014th edition (May 23, 2014)															

Grading System	Activity and attendance	10%
	2 Tutorials problems	20%
	2 Mid-Terms	30%
	Final Exam	40%
Instructors	Prof. Hasan M Bilani); email: hbilani@ksu.edu.sa	
Date of Review	Nov, 2020	