جـــامـــعــة
الملك سعود
King Saud University 1957

SE 431 Computer Applications in Surveying Engineering

Credit and Contact hours	3 / 2 (Lectures), 2 (Laboratory)
Required, or Elective	Elective for a BSCE degree
Course Description	Introduction; Programming computations and adjustments of triangulation nets and traverses; Adjustment of levelling nets; Programs for coordinates transformations. Applications on Map Projection problems; Using software for DEMs; Applications of AUTOCAD in surveying engineering
Prerequisites or Co-requisites	SE 331 and GE 209

Course Learning Outcomes

Students completing this course successfully will be able to

Course Learning Outcomes	*Related Student Outcomes (SO)*
CLO1 Evaluate the error propagation and adjusted results applying statistical tests using the built in function using MATLAB.	**SO1**
CLO2. Implement the main problems in photogrammetry (i.e., Space Resection and Space Intersection) and other problems using computer programming language such as MATLAB	**SO6**

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].

SO6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

Topics Covered

List of Topics	Related CLOs
2D Conformal and Affine Transformation	CLO1
3D Conformal Transformation	CLO1
Projective Transformation	CLO1
Propagation of random errors in the object space coordinates	CLO1
Feature Extractions using software	CLO1 and CLO2
Normalize Image Concept	CLO1 and CLO2

	Space Resection with collinearity equations	CLO1 and CLO2
	Derivation of Survey information using terrestrial stereo photos	CLO2

Textbook(s) and Other Required Material	Textbook: Paul, R. Wolf & Charles D. Ghilani, "Elementary Surveying: An Introduction to Geomatics" 14th Ed. 2014. Pearson.
Grading System	Homework and quizzes 15% Programming Exercises 15% 2 Mid-Terms 30% Final Exam 40%
Instructors	Dr. Mohammed D. Alheyf (2A18); e-mail: alheyf@ksu.edu.sa - (2nd Semester 20-21)
Date of Review	March 2021