Surveying Engineering Program
Department of Civil Engineering
College of Engineering
King Saud University

SE 331 Adjustment Computations

Credit and Contact hours	3 / 2 (Lectures), 2 (Laboratory)
Required, or Elective	Required for a BSCE degree
Course Description	Basic definitions; the frequency curve & the accidental error; the variance, covariance & weight of a measured quantity; principles of correlation; least squares method; adjustment by conditions; adjustment by variation of coordinates; computer applications.
Prerequisites or Co-requisites	Math 107
Course Learning Outcomes	Students completing this course successfully will be able to

Course Learning Outcomes	*Related Student Outcomes (SO)*
CLO1. Evaluate the error propagation in networks solving common problems in surveying.	**SO1**
CLO2. Adjust horizontal and vertical networks	**SO1**
CLO3. Evaluate adjusted results applying statistical tests	**SO6**
CLO4. Implement some problems (i.e., traverse, differential leveling) using computer programming language such as MATLAB	**SO1**

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].

SO 6. 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
Introduction: Direct and indirect measurements, Error sources, Precision versus accuracy	CLO1
Measurements and their analysis	CLO3
Propagation of random errors	CLO1
Error propagation in angle and distance observations	CLO1
Error propagation in Traverse surveys	CLO1

	<table><tr><td>Weights of observations</td><td>CLO3</td></tr><tr><td>Principles of Least Squares</td><td>CLO4</td></tr><tr><td>Adjustment of differential levelling networks</td><td>CLO2</td></tr><tr><td>Trilateration surveys</td><td>CLO2</td></tr></table>
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 10% 2 Mid-Terms 35% Final Exam 40%
Instructors	Dr. Mohammed D. Alheyf (2A18); e-mail: alheyf@ksu.edu.sa - (2nd Semester 20-21)
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