

<b>Date:</b>	Examination No.: 3	Version:2023-2024	Start:1/9/2023
<b>Module Name - Code</b>	Adjustment Theory - 7131		
<b>Module Language:</b>	English		
<b>Responsible:</b>	Asst. Prof. Dr. Mohammed Anwer Jassim		
<b>Lecture (s):</b>	Weekly		
<b>College:</b>	College of Engineering – Salahaddin University-Erbil		
<b>Duration:</b>	15 week – 1 semester		
<b>Course outcomes:</b>	1- The student knew the concept of the weights of observations. 2- The student learns the principle of the Least Squares criterion. 3- The student knew the main types of mathematical model and its structure. 4- The student learns the principle of the correlative method. 5- The student learns the principle of the observation equation method. 6- The student learns the principle of the condition equation method. 7- The student learns the accuracy analysis of the above methods and assessment of the obtained results.		
<b>Course Content:</b>	<ul style="list-style-type: none"> <li>- Introduction &amp; weights of observations.</li> <li>- Mathematical model definition. Its main parts and main types.</li> <li>- Linearization of non-linear mathematical model.</li> <li>- Principle of redundant observations.</li> <li>- Concept of Least squares criterion.</li> <li>- Adjustment by L.S. criterion.</li> <li>- Correlative method of adjustment.</li> <li>- Observation equations method of L.S. adjustment.</li> <li>- Examples of observation method.</li> <li>- Observation method - Non-linear model.</li> <li>- Examples of non-linear model.</li> <li>- Condition equations method of L.S.</li> <li>- Examples of Condition equations method.</li> </ul>		
<b>Literature:</b>	<ul style="list-style-type: none"> <li>- Higher Surveying by Dr Chandra.</li> <li>- Ghilani C. D. &amp; P. R. Wolf. 2006. Adjustment computations: spatial data analysis.</li> <li>- Surveying Theory and practice. By Raymond E. Davis. Francis S. Foote.</li> <li>- Elementary surveying an introduction to geomatics. By Charles D. Ghilani &amp; Paul R wolf.</li> <li>- Linear Algebra, Geodesy, and GPS. By Gilbert Strang and Kai Borre. 1997.</li> </ul>		
<b>Type of Teaching:</b>	4 hrs. in lectures		
<b>Pre-requisites:</b>	None		
<b>Preparation Modules:</b>	Theory of Errors.		
<b>Frequency:</b>	Spring Semester and Autumn Semester		

<b>Requirements for credit points:</b>	For the award of credit points, it is necessary to pass the module exam. It contains: Three examination during the academic semester, Assignments and Final examination. Student's attendance is required in all classes.
<b>Credit point:</b>	6
<b>Grade Distribution:</b>	The following grade system is used for the evaluation of the module exam: The module exam is based on the summation of two categories of evaluations: First: (40%) of the mark is based on the academic semester effort which includes - Two exams during the academic semester = 30%. - Quizzes and Assignments = (10%). Second: (60%) of the mark is based on final examination that is comprehensive for the whole of the study materials reviewed during the academic semester.
<b>Workload:</b>	The workload is 135 hrs. It is the result of 45 hrs. attendance and 90 hrs. self-studies (Assignments, preparation for exam and applications).