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

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| **Requirements for credit points:** | 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.<br>Student's attendance is required in all classes. |
| **Credit point:** | 6 |
| **Grade Distribution:** | The following grade system is used for the evaluation of the module exam:<br>The module exam is based on the summation of two categories of evaluations:<br>First: (40%) of the mark is based on the academic semester effort which includes<br>- Two exams during the academic semester = 30%.<br>- Quizzes and Assignments = (10%).<br>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. |
| **Workload:** | The workload is 135 hrs. It is the result of 45 hrs. attendance and 90 hrs. self-studies (Assignments, preparation for exam and applications). |