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| **Date:** | Examination No.: | Version:2023-2024 | Start:1/9/2023 |
| **Module Name - Code** | Combinatorics and Graph Theory- 5136 |
| **Module Language:** | English |
| **Responsible:** | Lecturer Salar Jamal Abdulhameed Atroshi |
| **Lecture (s):** | None |
| **College:** | College of Engineering – Salahaddin University-Erbil |
| **Duration:** | 15 week – 1 semester |
| **Course outcomes:** | At the end of this course, students will be able to:* Define graph theoretic concepts, state and prove their properties.
* Describe graph theoretic algorithms and prove their correctness.
* Formulate problems in terms of graphs and apply the theorems and algorithms taught in the course to solve them.
* Define the various types of generating functions.
* State and prove the basic properties of generating functions.
* Use generating functions to solve a variety of combinatorial problems.
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| **Course Content:** | This course examines classical and modern developments in graph theory and additive combinatorics, with a focus on topics and themes that connect the two subjects, the course also introduces students to current research topics and open problems. The course covers Graphs and Their Relatives, Special Types of Graphs, Graphs and Matrices, Graph Models and Distance, Properties of Trees, Spanning Trees, Counting Trees, Trails, Circuits, Paths, Cycles, Planarity, Colorings, Matchings, Ramsey Theory, Combinatorics. |
| **Literature:** | “Combinatorics and Graph Theory 2nd Edition”, John M. Harris, Jeffry L. Hirst and Michael J. Mossinghoff, 2008. |
| **Type of Teaching:** | 4 hours/week in lectures |
| **Pre-requisites:** | None |
| **Preparation Modules:** |  |
| **Frequency:** | Yearly in Fall Semester  |
| **Requirements for credit points:** | For the award of credit points, it is necessary to pass the module exam. It contains:Three examinations during the academic semester, Assignments, Report, Seminar and Final examination.**Student's attendance is required in all classes**. |
| **Credit point:** | 5 |
| **Grade Distribution:** | 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 -           Three examinations during the academic semester = 24%.-           Assignments = (6%).- Report and Seminar = (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. |
| **Work load:** | The workload is 150 hrs. It is the result of 60 hrs. attendance and 90 hrs. self-studies (Assignments, preparation for exam and applications). |