

Form (H)
Short course description

Course title: Combinatorics and Graph Theory (2)	Course number and code: MATH 433
Previous course requirement: MATH 431	Language of the course: English
Course level: 8th	Effective hours: 4 (3+2+0)

Course description

Partitions of sets. Stirling numbers. Partitions of integers. Ferrers diagrams. Euler's identity. Ordered sets. Dilworth's theorem. Linear extensions. Combinatorial designs. Block designs. Latin squares. Connectivity of graphs. Blocks. Edge connectivity. Matching. Hall's theorem. Directed graphs. Tournaments. Networks. Connectivity and networks.

Course objectives

To introduce students to:
1- Partitions of sets and integers,
2- Ordered sets,
3- Combinatorial designs,
4- Connectivity of graphs,
5- Matching in graphs,
6- Networks.

Learning outcomes (understanding, knowledge, and intellectual and scientific skills)

After studying this course, the student is expected to be able to:

1- Find Stirling numbers of the second kind,
2- Use Ferrers diagrams to obtain results about partitions of integers,
3- Use Dilworth's theorem and its dual to decompose a poset into chains and antichains,
4- Construct orthogonal families of Latin squares,
5- Construct matchings in bipartite graphs and use Hall's theorem,
6- Use networks to find properties related to connectivity.

Textbook adopted and supporting references

Title of the book	Author's name	Publisher's name	Date of publication
Introductory Combinatorics	Richard A. Brualdi	Prentice- Hall, New Jersey, 1999	1999
Applied Combinatorics,	Fred S. Roberts	Prentice-Hall. New Jersey	1984
A First Look at Graph Theory	John Clark and Derek Allan Holton	World Scientific Publishing Company, Singapore	1991
Introductory Combinatorics	Kenneth P. Bogart.	Harcourt Brace Jovanovich, Orlando	1990