

# MTH366 Fundamentals of Graph Theory

**Level:** 3

**Credit Units:** 5 Credit Units

**Language:** ENGLISH

**Presentation Pattern:** EVERY JAN

## **Synopsis:**

MTH366 Fundamentals of Graph Theory will introduce fundamental principles, techniques and algorithms in Graph Theory. The emphasis of the course will be on applications of the results presented to solve problems. Additionally, the course will teach students how algorithms taught in the course are implemented using Python.

## **Topics:**

- Edges and Cycles
- Bipartite Graphs
- Trees
- Connectivity
- Eulerian Multigraphs
- Hamiltonian Graphs
- Matching
- Covering
- Independence
- Planar Graphs
- Vertex Coloring
- Digraphs

## **Textbooks:**

Khee Meng Koh, Kah Loon Ng and Eng Guan Tay: Graph Theory Undergraduate Mathematics 1st Edition World Scientific  
ISBN-13: 9789814641616

**Learning Outcome:**

- Show how to prove a mathematical statement in graph theory.
- Determine whether given graphs are Hamiltonian/semi-Hamiltonian, Eulerian/semi-Eulerian and/or planar.
- Calculate the chromatic number, dominance number or independence number of a given graph.
- Apply algorithms and theorems covered in the course to graph theory problems.
- Compute edge connectivity/vertex connectivity, weights of spanning trees and/or number of spanning trees of a given graph.
- Construct examples/counter-examples of graphs to given mathematical statements on graph theory.

**Assessment Strategies - Regular Semester (Evening Class):**

<b>Components</b>	<b>Description</b>	<b>Weightage Allocation (%)</b>
Overall Continuous Assessment	COMPUTER MARKED ASSIGNMENT 1	6
	TUTOR-MARKED ASSIGNMENT 1	12
	TUTOR-MARKED ASSIGNMENT 2	12
Overall Examinable Components	Written Exam	70
<b>Total</b>		<b>100</b>

\*The information listed is subject to review and change.