

University of Sri Jayewardenepura
Department of Mathematics
Semester I - 2020

AMT 313 1.0 Computational Discrete Mathematics

Lecturer-in-Charge	Lecture Room	Email	Time
Dr. Jayantha Lanel	Math Lab	ghjlanel@sjp.ac.lk	Mon : 9a.m.-10.00a.m.

Objectives

The objectives of this course are to

- learn basic concepts in computational discrete mathematics,
- use appropriate software to carry out computation arising in discrete mathematics,
- understand real world computational discrete mathematics problems.

Course Syllabus

1. Graph Representation
 - 1.1. Data Structures for Graphs
 - 1.2. Modifying, Classifying, and Displaying Graphs
 - 1.3. Basic Graph Embeddings
 - 1.4. Improving Graph Embeddings
 - 1.5. Storing and Editing Graphs
2. Generating Graphs
 - 2.1. Building Graphs from other Graphs
 - 2.2. Regular Structures
 - 2.3. Trees
 - 2.4. Random Graphs
 - 2.5. Relation and Functional Graphs
3. Properties of Graphs
 - 3.1. Graph Traversals
 - 3.2. Connectivity
 - 3.3. Cycles in Graphs
 - 3.4. Graph Coloring
 - 3.5. Cliques, Vertex Covers and Independent Sets

Learning Outcomes

By the end of this class, students will be

- able to understand the basic graph theory concepts,
- able to perform basic computation in graph related problems,
- familiar with real world computational discrete mathematics problems and their graph theory formulations.

References

- *Graph Theory and Its Applications* by Jonathan L. Gross and Jay Yellon.
- Jerrold W. Grossman, *Discrete Mathematics (An Introduction to Concepts, Methods, and Applications)*, First Edition, Macmillan Publishing Company, 1990.

Assessment Criterion

Continuous Assessments (Assignments and Quizzes)	40%
End of Semester Examination	60%

Method of Continuous Assessment

1. Assignments will be assigned frequently and will always be collected and evaluated.
2. Unannounced quizzes (maximum of 5) will be given randomly during lectures.
3. There will be a group project worth 15% of your final grade. Your group will need to choose material related to computational discrete mathematics (which is not in the content of this syllabus), prepare a written report on it, and present it in class.

