

UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN MATHEMATICS
SYLLABUS WITH EFFECT FROM 2020-2021

BMA-DSEB2

ELECTIVE-II / III: GRAPH THEORY

Inst.Hrs : 6
Credits : 5

YEAR: III
SEMESTER: VI

Learning outcomes:

Students will acquire knowledge

- To describe and apply some basic algorithms for graph.
- To model real world problems using graph theory.

UNIT I

Graphs and Subgraphs: Introduction- Definition and examples, degrees, sub graphs, isomorphism, independent sets and coverings, intersection graphs and line graphs, matrices, operations on graphs

Chapter 2 Sections 2.0 – 2.9 (Omit section 2.5)

UNIT II

Degree sequences and Connectedness: Degree sequences and graphic sequences – simple problems. Walks, trails, paths, connectedness and components, blocks, connectivity – simple problems.

Chapter 3 Sections 3.0 – 3.2 , Chapter 4 Sections 4.0 – 4.4

UNIT III

Eulerian and Hamiltonian graphs - Chapter 5 Sections 5.0 – 5.2

UNIT IV

Trees : Characterisation of Trees, Centre of a Tree -simple problems.

Planarity : Definition and properties, characterization of planar graphs.

Chapter 6 Sections 6.0 – 6.2 , Chapter 8 Sections 8.0 – 8.2

UNIT V

Directed Graphs: Definition and basic properties, paths and connections, digraphs and matrices, tournaments - Chapter 10 Sections 10.0 – 10.4

Content and treatment as in

“Invitation to Graph Theory”, by S.Arumugam and S.Ramachandran, Scitech Publications (India) Pvt. Ltd., Chennai 17.

Reference:

1. A first look at graph theory by John Clark and Derek Allan Holton, Allied publishers.
2. Graph Theory by S.Kumaravelu and SusheelaKumaravelu, Publishers authors C/o 182 Chidambara Nagar, Nagarkoil.

e-Resources:

1. <https://nptel.ac.in>.
2. <https://mathonline.wikidot.com>.
3. <http://ebooks.lpude.in/graphtheory>.