Module Syllabus:

Course Title: Graph Theory
Course Code: 250351
Semester: Second 2005/2006
Lecturer : Amin Witno
Office Room: 819 (Ext. 341)
Office Hours: Sunday–Thursday 1–2
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Short Description:

This course is an introduction to Graph Theory and its applications, covering topics in Graph Isomorphisms, Trees and its applications, Bipartite Graphs and Matchings, Euler and Hamiltonian Graphs, Graph Coloring, Planar Graphs, Matrical Representations, Digraphs and Networks, with numerous graph algorithms throughout.

Topics by the Week:

Week	Dates	Topics
1	26/2 – 2/3	Introduction to the uses of Graphs, basic definitions, Graphs with special properties, Degree Sequence of a graph
2	5/3 – 9/3	Isomorphism of Graphs, Subgraphs, Self-Complementary Graphs
3	12/3 – 16/3	Trees, Acyclic Graphs, Spanning Trees, Depth-First Search Algorithm, Kirchoff's Algorithm
4	19/3 – 23/3	Weighted Graphs, Minimal Spanning Trees, Kruskal's Algorithm and Prim's Algorithm
5	26/3 – 30/3	Bipartite Graphs, A Coloring Algorithm
6	2/4 – 6/4	Matching, Hall's Marriage Theorem
7	9/4 – 13/4	Vertex Coloring, Sequential Coloring Algorithm, Maximum Color-Degree Coloring Algorithm
8	16/4 – 20/4	Planar Graphs, Euler's Formula, Kuratowski's Theorem, The Four Color Theorem
9	23/4 – 27/4	Shortest Paths, Dijkstra's Algorithm, Euler Walks
10	30/4 – 4/5	The Chinese Postman Problem, Hamilton Cycles, The Traveling Salesman Problem
11	7/5 – 11/5	Adjacency and Incidence Matrices, The Distance Matrix
12	14/5 – 18/5	From A to D Algorithm, Floyd-Warshall Algorithm for weighted graphs
13	21/5 – 25/5	Digraphs, The One Way Street Algorithm, Tournaments and Hamilton Paths
14	28/5 – 1/6	Acyclic Digraphs, Rooted Trees, Bellman's Algorithm
15	4/6 – 8/6	Review for Final Exam
16	10/6 – 18/6	Final Exam will be held in this period

Mark Distribution:

Quiz 1	21/03/2006	05%
Exam 1	04/04/2006	20%
Quiz 2	25/04/2006	05%
Exam 2	09/05/2006	20%
Final Exam	11/06/2006	50%

References:

- Goodaire and Parmenter, Discrete Mathematics with Graph Theory, 3rd Edition 2006, Prentice Hall
- Buckley and Lewinter, A Friendly Introduction to Graph Theory, 2003, Prentice Hall
- Reinhard Diestel, Graph Theory, 3rd Edition 2005, Springer Verlag
- Bondy and Murty, Graph Theory with Applications, 1976, Elsevier

Course Notes:

Revision Notes can be downloaded from Amin Witno Website. There are also links to some graph theory e-books for self-reading which you can find at the site.

Websites:

- Basic Sciences Department- **http://www.philadelphia.edu.jo/math**
- Amin Witno Website- **http://www.witno.com/**