



Course Specification

Course Name:[Discrete Structures]

Course Code:[MA112]

I. Basic Course Information

Major or minor element of program:[General]

Department offering the course:[Faculty]

Academic level:[100 Level]

Semester in which course is offered:[First (fall) Semester]

Course pre-requisite(s): [N/A]

Credit Hours:3

Contact Hours Through:

Lecture	Tutorial*	Practical*	Total
2.5	1.5	0.0	4.0

* 1.5 hours for **either** Tutorial or Practical

Approval date of course specification:September 2014

II. Overall Aims of Course

[To provide students the ability to formulate problem in logical manner and give them problem solving capabilities along with a formal way of thinking. Learning propositional logic enables the students to relate structures in real life with the structures in computer science.]

III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
[K12]	[I5]	[P10]	[G2,G6]



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IV. Intended Learning Outcomes of Course (ILOs)

a. Knowledge and Understanding

- K.1 Describe the problem formally.
- K.2 Recognize different methods to attack a problem.
- K.3 Locate and classify the main versions of structures.
- K.4 Recognize relationships between objects.
- K.5 Recognize counting techniques.]

b. Intellectual/Cognitive Skills

- I.1 Analyze and test a problem.
- I.2 Plan how to solve a problem.
- I.3 Organize the relationships between this problem and other objects.
- I.4 Assess the different alternative solutions to solve the problem to select the optimal one.
- I.5 Evaluate the solution's efficiency and effectiveness to solve that problem.]

c. Practical/Professional Skills

- P.1 Prepare a plan to solve a problem.
- P.2 Use some of available commercial software systems to apply the suggested plan.
- P.3 Measure the feasibility of the applied plan, possibly by using some computer systems.]

d. General and Transferable Skills

- G.1 Team working skills.
- G.2 Oral skills.
- G.3 Communication skills.]

V. Course Matrix Contents

	Main Topics / Chapters	Duration (Weeks)	Course ILOs Covered by Topic (By ILO Code)			
			K & U	I.S.	P.S.	G.S.
1-	Sets and functions]	2]	[]	[]	[]	[]
2-	Graph theory]	3]	[K1,K2,K3,K4,K5	[]	[]	[]
3-	Numbering System]	1]	[]	[I1,I2,I3,I4,I5	[]	[]
4-	Propositional Calculus]	2]	[]	[I1,I2,I3,I4,I5	[]	[]
5-	Propositional Equivalence]	2]	[]	[I1,I2,I3,I4,I5	[P1,P2,P3	[]
6-	Relations]	2]	[K1,K2,K3,K4,K5	[]	[]	[G1,G2,G3
7-	Symbolic programming]	1]	[]	[]	[]	[G1,G2,G3
	Net Teaching Weeks	13				



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VI. Course Weekly Detailed Topics / hours / ILOs

Week No.	Sub-Topics	Total Hours	Contact Hours	
			Theoretical Hours	Practical Hours*
1	[Sets and functions; definition and operations of sets]	[2.5]	[2.5]	
2	[Sets and functions; Venn Diagram, Set Builder]	[4]	[2.5]	[1.5]
3	[Graph Theory - Finite State Machine definition and components]	[4]	[2.5]	[1.5]
4	[Graph Theory - Finite State Machine design]	[4]	[2.5]	[1.5]
5	[Graph Theory- Finite State Automata definition and Design]	[4]	[2.5]	[1.5]
6	[Numbering Systems]	[4]	[2.5]	[1.5]
7	Midterm Exam			
8	[Propositional Calculus; definition, connectors, introduction to truth table]	[4]	[2.5]	[1.5]
9	[Propositional Calculus; Construction of truth table]	[4]	[2.5]	[1.5]
10	[Propositional equivalence; definitions, equivalence using truth table]	[4]	[2.5]	[1.5]
11	[Propositional equivalence; equivalence using Conjunction, Disjunction and Negation properties, Maple software]	[4]	[2.5]	[1.5]
12	[Relations; definition, representations]	[4]	[2.5]	[1.5]
13	[Relations; properties]	[4]	[2.5]	[1.5]
14	[Symbolic programming; representing operators with different ways]	[4]	[2.5]	[1.5]
15	Final Exam			
Total Teaching Hours		51	33	18

* No Practical/Tutorial during the first week of the semester



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VII. Teaching and Learning Methods

Teaching/Learning Method	Selected Method	Course ILOs Covered by Method (By ILO Code)			
		K & U	Intellectual Skills	Professional Skills	General Skills
Lectures & Seminars	<input checked="" type="checkbox"/>	[K1, K2, K3, K4, K5]	[]	[]	[]
Tutorials	<input type="checkbox"/>	[]	[]	[]	[]
Computer lab Sessions	<input checked="" type="checkbox"/>	[K1, K2, K3, K4, K5]	[]	[P1, P2, P3]	[]
Practical lab Work	<input checked="" type="checkbox"/>	[]	[I1, I2, I3, I4, I5]	[P1, P2, P3]	[]
Reading Materials	<input type="checkbox"/>	[]	[]	[]	[]
Web-site Searches	<input type="checkbox"/>	[]	[]	[]	[]
Research & Reporting	<input type="checkbox"/>	[]	[]	[]	[]
Problem Solving / Problem-based Learning	<input type="checkbox"/>	[]	[]	[]	[]
Projects	<input type="checkbox"/>	[]	[]	[]	[]
Independent Work	<input type="checkbox"/>	[]	[]	[]	[]
Group Work	<input checked="" type="checkbox"/>	[]	[]	[]	[G1, G2, G3]
Case Studies	<input type="checkbox"/>	[]	[]	[]	[]
Presentations	<input checked="" type="checkbox"/>	[]	[]	[]	[G1, G2]
Simulation Analysis	<input type="checkbox"/>	[]	[]	[]	[]
Others (Specify):	<input type="checkbox"/>	[]	[]	[]	[]

VIII. Assessment Methods, Schedule and Grade Distribution

Assessment Method	Selected Method	Course ILOs Covered by Method (By ILO Code)				Assessment Weight / Percentage	Week No.
		K & U	I.S.	P.S.	G.S.		
Midterm Exam	<input checked="" type="checkbox"/>	[]	[]	[]	[]	[20%]	7
Final Exam	<input checked="" type="checkbox"/>	[K1, K2, K3, K4, K5]	[]	[]	[]	60%	15
Quizzes	<input checked="" type="checkbox"/>	[K1, K2, K3, K4, K5]	[]	[]	[]	[0%]	[6]
Course Work	<input checked="" type="checkbox"/>	[]	[I1, I2, I3, I4, I5]	[P1, P2, P3]	[]	[5%]	[13]
Report Writing	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]
Case Study Analysis	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]
Oral Presentations	<input checked="" type="checkbox"/>	[]	[]	[]	[G1, G2, G3]	[0%]	[10]
Practical	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]
Group Project	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]
Individual Project	<input checked="" type="checkbox"/>	[]	[]	[P1, P2, P3]	[]	[15%]	[12]
Others (Specify):	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]



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IX. List of References

Essential Text Books	<ul style="list-style-type: none">• [Susanna S.EPP, “Discrete Mathematics with Applications”, PWS Publishing Company, 2010]
Course notes	<ul style="list-style-type: none">• [Lecture notes that the doctor writes during the lectures• Discrete Structure module in Maple]
Recommended books	<ul style="list-style-type: none">• [Richard Johnson “Discrete Mathematics”, Macmillan Publishing Company.• Susanna S.EPP, “Discrete Mathematics with Applications”, PWS Publishing Company, 2003• Kollman & Busby and Ross “Discrete Mathematical Structures”.• Steven Roman, "An Introduction to Discrete Mathematics", Handbook, Harcourt Brace Jovanovich, Academic Press, 1989.]
Periodicals, Web sites, etc ...	<ul style="list-style-type: none">• [Maple Web site (Maple for Discrete Mathematical Structure)]

X. Facilities required for teaching and learning

<p>List the facilities required</p> <ul style="list-style-type: none">• Computer labs• Maple Software materials]
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Course coordinator: [Prof. Reda Abdel-Wahab]

Head of Department: Prof. Imane Aly Saroit
Vice Dean for Education and Student affairs

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