



Course Specification

Course Name: [Fault Tolerant Computer Systems]

Course Code: [IT413]

I. Basic Course Information

Major or minor element of program:[Major]

Department offering the course:[Information Technology Department]

Academic level:[300 Level]

Semester in which course is offered:[Second (Spring) Semester]

Course pre-requisite(s): [Computers Architecture [IT 311]]

Credit Hours:3

Contact Hours Through:

Lecture	Tutorial*	Practical*	Total
2.5	0.0	1.5	4.0

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

Approval date of course specification:[January 2015]

II. Overall Aims of Course

Introduce the student to the basic concepts of fault tolerant computer systems, different types of faults and the methods of faults diagnosis and error recovery.]

III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
[K1,K2,K6,K22]	[I1,I2,I19]	[P9,P17]	[G1,G2,G6]



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IV. Intended Learning Outcomes of Course (ILOs)

a. Knowledge and Understanding

On completing the course, students should be able to:

- K.1 List the different types computer architectures.
- K.2 Define the basic concepts of fault-tolerant systems.
- K.3 Recognize the different types of computers system faults.
- K.4 Recognize the different design strategies for fault-tolerant systems.
- K.5 Identify the different error recovery mechanisms.]

b. Intellectual/Cognitive Skills

On completing the course, students should be able to:

- I.1 Explain and compare the different types of computer faults.
- I.2 Analyze and identify the different components of a fault-tolerant system.
- I.3 Discuss and compare the different design strategies.
- I.4 Explain and compare different error recovery mechanisms.]

c. Practical/Professional Skills

On completing the course, students should be able to:

- P.1 Measure different faults using the appropriate error recovery approach.
- P.2 Resolve fault and security issues and communicate the solutions.]

d. General and Transferable Skills

On completing the course, students should be able to:

- G.1 Improve presentation skills.
- G.2 Develop team work skills.
- G.3 Search in available data and knowledge resources.
- G.4 Improve report writing skills.]

V. Course MatrixContents

	Main Topics / Chapters	Duration (Weeks)	Course ILOs Covered by Topic (By ILO Code)			
			K & U	I.S.	P.S.	G.S.
1-	[Systems and network components]	[1]	[K1]	[]	[]	[]
2-	[System faults - key terms, network and service outages)]	[3]	[K2,K3]	[I1, I2]	[]	[]
3-	[Design strategies for network survivability]	[3]	[K3, K4,K5]	[I2,I3]	[]	[G1]
4-	[Improving network security via fault-tolerance mechanisms]	[2]	[K3,K4,K5]	[I2,I3,I4]	[P1,P2]	[G1]
5-	[Network fault-tolerance and MPLS-based recovery]	[2]	[K4,K5]	[I4]	[P1,P2]	[G2,G3,G4]
6-	[Network fault-tolerance and In-service software upgrades]	[2]	[K4,K5]	[I4]	[P1,P2]	[G2,G3,G4]
	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	Systems and network components]	[2.5]	[2.5]	
2	System faults - key terms, network and service outages]	[4]	[2.5]	[1.5]
3	System faults - key terms, network and service outages]	[4]	[2.5]	[1.5]
4	System faults - key terms, network and service outages]	[4]	[2.5]	[1.5]
5	Design strategies for network survivability]	[4]	[2.5]	[1.5]
6	Design strategies for network survivability]	[4]	[2.5]	[1.5]
7	Midterm Exam			
8	Design strategies for network survivability]	[4]	[2.5]	[1.5]
9	Improving network security via fault-tolerance mechanisms]	[4]	[2.5]	[1.5]
10	Improving network security via fault-tolerance mechanisms]	[4]	[2.5]	[1.5]
11	Network fault-tolerance and MPLS-based recovery]	[4]	[2.5]	[1.5]
12	Network fault-tolerance and MPLS-based recovery]	[4]	[2.5]	[1.5]
13	Network fault-tolerance and In-service software upgrades]	[4]	[2.5]	[1.5]
14	Network fault-tolerance and In-service software upgrades]	[4]	[2.5]	[1.5]
15	Final Exam			
Total Teaching Hours		51	33	18

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

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	[✓]	[All]	[All]	[]	[]
Tutorials	[]	[]	[]	[]	[]
Computer lab Sessions	[]	[]	[]	[]	[]
Practical lab Work	[✓]	[All]	[All]	[P1,P2]	[G1]
Reading Materials	[]	[]	[]	[]	[]
Web-site Searches	[✓]	[All]	[All]	[]	[G4]
Research & Reporting	[]	[]	[]	[]	[]
Problem Solving / Problem-based Learning	[]	[]	[]	[]	[]



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Projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Independent Work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Group Work	<input checked="" type="checkbox"/>	All	All	P1,P2	G1,G2,G3
Case Studies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Presentations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Simulation Analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others (Specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<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"/>	All	All	<input type="checkbox"/>	<input type="checkbox"/>	15%	7
Final Exam	<input checked="" type="checkbox"/>	All	All	<input type="checkbox"/>	<input type="checkbox"/>	60%	15
Quizzes	<input checked="" type="checkbox"/>	All	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%	9
Course Work	<input checked="" type="checkbox"/>	All	All	<input type="checkbox"/>	All	5%	10
Report Writing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Case Study Analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oral Presentations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practical	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	P1	G3,G4	10%	12
Group Project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Individual Project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others (Specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IX. List of References

Essential Text Books	<ul style="list-style-type: none"> Fault - Tolerant IP and MPLS Networks by Cisco Systems, 2006
Course notes	<ul style="list-style-type: none"> Lecture slides and notes
Recommended books	<ul style="list-style-type: none"> None
Periodicals, Web sites, etc ...	<ul style="list-style-type: none"> Various

X. Facilities required for teaching and learning

[List the facilities required] <ul style="list-style-type: none"> Computer Data show
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Course coordinator:[Prof.Hoda Onsi]

Head of Department:[Prof. Hesham El Mahdy]

Date: [January 2015]