



## Course Specification

**Course Name:** Embedded Systems

**Course Code:** [IT414]

### 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): [Microprocessors [IT 312] ]

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

Familiarize the student with the basic concepts of embedded systems and their applications.

### III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
[K2,K14,K17 ]	[I12,I18,I19 ]	[P12,P18 ]	[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 Define the basic concepts of embedded systems.
- K.2 Define and explain basic organization aspects of an embedded system.
- K.3 Understand how to troubleshoot the embedded system and mastering different troubleshooting tools used. ]

##### b. Intellectual/Cognitive Skills

On completing the course, students should be able to:

- I.1 Analyse an embedded system and define its components.
- I.2 Discuss the disciplines used in development of an embedded system.
- I.3 Discuss and analyze a given application or case study proposing solutions and their expected results. ]

##### c. Practical/Professional Skills

On completing the course, students should be able to:

- P.1 Use appropriate tools to analyze and design embedded systems.
- P.2 Use the knowledge acquired from the course in manipulating a simple embedded system. ]

##### d. General and Transferable Skills

On completing the course, students should be able to:

- G.1 Improve presentation skills.
- G.2 Improve team work 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-	Revision on basics of microprocessors ]	1 ]	[K1 ]	[ ]	[ ]	[ ]
2-	Introduction - Basic concepts of embedded systems ]	[2 ]	[K1 ]	[I1 ]	[ ]	[ ]
3-	Disciplined development - organization aspects of embedded systems ]	[2 ]	[K2 ]	[I1,I2 ]	[ ]	[ ]
4-	Installing embedded systems building blocks ]	[2 ]	[ ]	[I1,I3 ]	[P1,P2 ]	[ ]
5-	Troubleshooting ]	2 ]	[K3 ]	[I3 ]	[P1,P2 ]	[ ]
6-	Troubleshooting tools ]	2 ]	[K3 ]	[I3 ]	[P1 ]	[G1,G2 ]
7-	Applications and case studies ]	2 ]	[ ]	[I3 ]	[P1,P2 ]	[G1,G2 ]
	<b>Net Teaching Weeks</b>	<b>13</b>				



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VI. Course Weekly Detailed Topics / hours / ILOs

Week No.	Sub-Topics	Total Hours	Contact Hours	
			Theoretical Hours	Practical Hours*
1	Revision on basics of microprocessors	2.5	2.5	
2	Introduction - Basic concepts of embedded systems	4	2.5	1.5
3	Introduction - Basic concepts of embedded systems	4	2.5	1.5
4	Disciplined development - organization aspects of embedded systems	4	2.5	1.5
5	Disciplined development - organization aspects of embedded systems	4	2.5	1.5
6	Installing embedded systems building blocks	4	2.5	1.5
7	<b>Midterm Exam</b>			
8	Installing embedded systems bldg blocks	4	2.5	1.5
9	Troubleshooting	4	2.5	1.5
10	Troubleshooting	4	2.5	1.5
11	Troubleshooting tools	4	2.5	1.5
12	Troubleshooting tools	4	2.5	1.5
13	Applications and case studies	4	2.5	1.5
14	Applications and case studies	4	2.5	1.5
15	<b>Final Exam</b>			
<b>Total Teaching Hours</b>		<b>51</b>	<b>33</b>	<b>18</b>

\* 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	<input checked="" type="checkbox"/>	All	All		
Tutorials	<input type="checkbox"/>				
Computer lab Sessions	<input type="checkbox"/>				
Practical lab Work	<input checked="" type="checkbox"/>			All	
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"/>	K3	All		All
Case Studies	<input checked="" type="checkbox"/>	All	All		
Presentations	<input type="checkbox"/>				
Simulation Analysis	<input type="checkbox"/>				
Others (Specify):	<input type="checkbox"/>				



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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.		
All Midterm Exam	[✓]	[All]	[All]	[ ]	[ ]	[15%]	7
Final Exam	[✓]	[All]	[All]	[ ]	[ ]	60%	15
Quizzes	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Course Work	[✓]	[All]	[All]	[ ]	[ ]	[10%]	[9]
Report Writing	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Case Study Analysis	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Oral Presentations	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Practical	[✓]	[ ]	[All]	[All]	[ ]	[10%]	[11]
Group Project	[✓]	[K3]	[All]	[All]	[All]	[5%]	[12]
Individual Project	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Others (Specify):	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

IX. List of References

<b>Essential Text Books</b>	<ul style="list-style-type: none"> <li>[Embedded Systems Building Blocks, Second Edition by Jean J. Labrosse, 2002]</li> </ul>
<b>Course notes</b>	<ul style="list-style-type: none"> <li>[Lecture Slides and Notes]</li> </ul>
<b>Recommended books</b>	<ul style="list-style-type: none"> <li>[Embedded Systems and Computer Architecture, First Edition by G. R. Wilson, 2002]</li> <li>[The Art of Designing Embedded Systems by Jack G. Ganssle, 2000]</li> </ul>
<b>Periodicals, Web sites, etc ...</b>	<ul style="list-style-type: none"> <li>[Various]</li> </ul>

X. Facilities required for teaching and learning

<ul style="list-style-type: none"> <li>[Computer and Data Show]</li> <li>[Computer Labs]</li> </ul>
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Course coordinator: [Dr. Khaled Mostafa]

Head of Department: Prof. Hesham El Mahdy

Date: [January 2015]