



## Course Specification

**Course Name:** [Multimedia ]

**Course Code:** [IT433]

### I. Basic Course Information

Major or minor element of program: [Both Major and Minor]

Department offering the course: [Information Technology Department]

Academic level: [300 Level]

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

Course pre-requisite(s): [Programming-1 (CS 112) ]

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: September 2014

### II. Overall Aims of Course

- Understand the relevance and underlying infrastructure of the multimedia systems.
- Understand core multimedia technologies and standards (Digital Audio, Graphics, Video, VR, data transmission/compression)
- Be aware of factors involved in multimedia systems performance, integration and evaluation ]

### III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
[K14,K17,K21 ]	[I4,I15 ]	[P3,P13,P17 ]	[G5,G9 ]



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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 issues surrounding multimedia, including the role of and design of multimedia Systems.
- K.2 Define digital audio, graphics and video data formats.
- K.3 Define the underlying concepts and representations of sound, pictures and video, data compression and transmission, integration of media, multimedia authoring, and delivery of multimedia. ]

##### b. Intellectual/Cognitive Skills

On completing the course, students should be able to:

- I.1 Analyze multimedia systems components; understand its technologies and the factors that affect their performance.
- I.2 Examine the concepts and representations of sound, pictures and video to multimedia data compression and transmission. ]

##### c. Practical/Professional Skills

On completing the course, students should be able to:

- P.1 Demonstrate implementation skills for Audio/Video data representation including analog and digital representations.
- P.2 Demonstrate multimedia authoring and programming skills for media applications.
- P.3 Apply the multimedia authoring frameworks to multimedia applications. ]

##### d. General and Transferable Skills

On completing the course, students should be able to:

- G.1 Implement and test the multimedia algorithms.
- G.2 Compare the performance of various algorithms including hardware/software trade-offs. ]

#### 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-	[Introduction: Multimedia applications and requirements : Huffman Coding ]	[3 ]	[K1 ]	[I1,I2 ]	[P1 ]	[G1,G2 ]
2-	[Audio/Video fundamentals including analog and digital representations, human perception, and audio/video equipment, applications ]	[3 ]	[K2 ]	[I1,I2 ]	[P1,P2 ]	[G1,G2 ]
3-	[Audio and video compression including perceptual transform coders for images/video hardware/software trade-offs. Image and video processing applications and algorithms. ]	[3 ]	[K2,K3 ]	[I1,I2 ]	[P1,P2 ]	[G1,G2 ]



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4-	[Multimedia Programming Frameworks: Java for Quicktime, Java Media Framework ]	[4 ]	[K3 ]	[I1,I2 ]	[P1,P2,P3 ]	[G1,G2 ]
	<b>Net Teaching Weeks</b>	<b>13</b>				

VI. Course Weekly Detailed Topics / hours / ILOs

Week No.	Sub-Topics	Total Hours	Contact Hours	
			Theoretical Hours	Practical Hours*
1	[Introduction: Multimedia applications and requirements : Huffman Coding ]	[2.5 ]	[2.5 ]	
2	[Compression Techniques, Lossless Compression algorithmes, LZW ]	[4 ]	[2.5 ]	[1.5 ]
3	[Lossless Compression algorithm : Huffman Coding ]	[4 ]	[2.5 ]	[1.5 ]
4	[Audio/Video fundamentals including analog and digital representations, human perception, and audio/video equipment, applications ]	[4 ]	[2.5 ]	[1.5 ]
5	[(Lab) Lossless Compression algorithm: Adaptive Huffman Coding. ]	[4 ]	[2.5 ]	[1.5 ]
6	[(Lab) Lossless Compression algorithm : Arithmetic Coding ]	[4 ]	[2.5 ]	[1.5 ]
7	<b>Midterm Exam</b>			
8	[Audio and video compression including perceptual transform coders for images/video hardware/software trade-offs. Image and video processing applications and algorithms. ]	[4 ]	[2.5 ]	[1.5 ]
9	[Application and performance comparison of various coding algorithms including hardware/software trade-offs. ]	[4 ]	[2.5 ]	[1.5 ]
10	[Image and video processing applications and algorithms. ]	[4 ]	[2.5 ]	[1.5 ]
11	[(Lab) Lossless Compression algorithm : Binary Arithmetic Coding ]	[4 ]	[2.5 ]	[1.5 ]
12	[(Lab) Lossy Compression algorithm : Predictive Coding ,Feed Forward , Feed Backward ]	[4 ]	[2.5 ]	[1.5 ]
13	[(Lecture) Multimedia Programming Frameworks: Java for Quicktime, Java Media Framework ]	[4 ]	[2.5 ]	[1.5 ]
14	[(Lab) Lossy Compression algorithm : Linear predictors ]	[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



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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 type="checkbox"/>	[K1,K2,K3]	[I1,I2]	<input type="checkbox"/>	[G1,G2]
Tutorials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer lab Sessions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practical lab Work	<input type="checkbox"/>	[K2,K3]	[I2]	[P1,P2,P3]	[G1,G2]
Reading Materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Web-site Searches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research & Reporting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Problem Solving / Problem-based Learning	<input type="checkbox"/>	[K2,K3]	[I1,I2]	[P1,P2,P3]	[G1,G2]
Projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Independent Work	<input type="checkbox"/>	<input type="checkbox"/>	[I2]	[P1,P2,P3]	[G1,G2]
Group Work	<input type="checkbox"/>	[K1,K2,K3]	[I2]	[P1,P2,P3]	[G1,G2]
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 type="checkbox"/>	[K1,K2,K3]	[I1,I2]	<input type="checkbox"/>	<input type="checkbox"/>	[20 %]	7
Final Exam	<input type="checkbox"/>	[K1,K2,K3]	[I1,I2]	<input type="checkbox"/>	<input type="checkbox"/>	60%	15
Quizzes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Course Work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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 type="checkbox"/>	<input type="checkbox"/>	[I1,I2]	[P1,P2,P3]	[G1,G2]	[20 %]	[Every Week]
Individual Project	<input type="checkbox"/>	<input type="checkbox"/>	[I1,I2]	[P1,P2,P3]	[G1,G2]	[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"/>
Others (Specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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#### IX. List of References

<b>Essential Text Books</b>	<ul style="list-style-type: none"><li>• Introduction to Data Compression, Khalid Sayoud, 2008</li></ul>
<b>Course notes</b>	<ul style="list-style-type: none"><li>• [None ]</li></ul>
<b>Recommended books</b>	<ul style="list-style-type: none"><li>• Understanding Networked Multimedia, Fluckiger, Prentice Hall, (ISBN 0-13-190992-4)</li><li>• Design for Multimedia Learning, Boyle, Prentice Hall, (ISBN 0-13-242215-8)</li><li>•</li><li>•</li></ul>
<b>Periodicals, Web sites, etc ...</b>	<ul style="list-style-type: none"><li>• [None ]</li></ul>

#### X. Facilities required for teaching and learning

<ul style="list-style-type: none"><li>• [Matlab tool,C#.NET, Java ]</li></ul>
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**Course coordinator:**[ Prof. Khaled Mostafa]

**Head of Department:** Prof. Reda Abd el-Wahab

**Date:** September 2014