



University/Academy: Arab Academy for Science and Technology & Maritime Transport

Faculty/Institute: College of Computing and Information Technology

Program: B. Sc. In Computer Science

Course title	Multimedia Acquisition and Communications
Course code	CS454

### Form no. (11A): Knowledge and skills matrix for a course

Course content	Week study	Knowledge	Intellectual skills	Professional skills	General skills
Introduction	1	<ul style="list-style-type: none"> <li>Know the elements of multimedia systems</li> <li>Define basic terminology and concepts of multimedia</li> <li>Describe the multimedia applications</li> </ul>		<ul style="list-style-type: none"> <li>Evaluate different multimedia tools</li> </ul>	
Text Overview	2	<ul style="list-style-type: none"> <li>Explain text representations in multimedia data</li> </ul>	<ul style="list-style-type: none"> <li>Identify text attributes</li> <li>Interpret basic design principles</li> </ul>	<ul style="list-style-type: none"> <li>Practice implementation skills for data representation in poster analysis</li> </ul>	
Graphics And Image Data Processing	3	<ul style="list-style-type: none"> <li>Explain procedures of image capture and image display.</li> <li>Define resolution and quantisation.</li> <li>Know about colour and colour spaces, storage of images in memory, and display devices</li> </ul>	<ul style="list-style-type: none"> <li>Compare theoretically between the different color spaces.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate the suitability of various image representations for different applications</li> </ul>	
Fundamental Concepts in video	4	<ul style="list-style-type: none"> <li>Know video coding and video content acquisition.</li> </ul>	<ul style="list-style-type: none"> <li>Compare current computer vision capabilities against</li> </ul>	<ul style="list-style-type: none"> <li>Carry out an experiment on analog vs digital Video</li> </ul>	

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		<ul style="list-style-type: none"> <li>Clarify the effects of digitization on video content.</li> </ul>	human vision.	<ul style="list-style-type: none"> <li>Evaluate the current emerging technologies</li> </ul>	
Basics of Digital Audio	5	<ul style="list-style-type: none"> <li>Know audio coding and audio content acquisition.</li> </ul>	<ul style="list-style-type: none"> <li>Compare between different digital audio formats</li> </ul>	<ul style="list-style-type: none"> <li>Carry out an experiment on the digitization of sound.</li> </ul>	<ul style="list-style-type: none"> <li>Enhance the ability of justifying one's answers orally in front of professor and peers.</li> </ul>
Quantization of Audio	6	<ul style="list-style-type: none"> <li>Know about quantizer, quantization error, and quantization noise.</li> <li>Explain sound compression, transmission, and authoring.</li> <li>Explain in depth various Audio formats.</li> </ul>	<ul style="list-style-type: none"> <li>Compare between mid-riser and mid-tread</li> <li>Analyse the stochastic process involved in quantization</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate Signal to Noise Ratio (SNR)</li> <li>Practice digital audio to analog Conversion</li> <li>Practice the use of Musical Instrument Digital Interface (MIDI).</li> </ul>	
7th week Exam	7				<ul style="list-style-type: none"> <li>Enhance the ability of justifying one's answers in written mode.</li> </ul>
Lossless Compression Algorithms	8	<ul style="list-style-type: none"> <li>Know about transparency, compression ratio, transcoding and editing</li> <li>Explain downsampling and compressed representation scalability</li> </ul>	<ul style="list-style-type: none"> <li>Differentiate between different lossless algorithms with respect to aforementioned criteria.</li> </ul>	<ul style="list-style-type: none"> <li>Gain hands-on experience in: Run-Length Coding, Variable-Length Coding (VLC), Dictionary-based Coding, and Arithmetic Coding.</li> </ul>	<ul style="list-style-type: none"> <li>Coach the team spirit through collaborative mini projects</li> </ul>

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Lossy Compression Algorithms	9	<ul style="list-style-type: none"> <li>Investigate different Lossy Compression algorithms</li> </ul>	<ul style="list-style-type: none"> <li>Analyse the efficacy of lossy and lossless compression.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate distortion Measures, the Rate-Distortion Theory, Quantization, Transform Coding and Discrete Cosine Transform and Wavelet-Based Coding</li> </ul>	
Image Compression Standards	10	<ul style="list-style-type: none"> <li>Explain color profile and syntax and structure of JPEG Image compression standard.</li> </ul>			
Intro to Multimedia Networks 1	11	<ul style="list-style-type: none"> <li>Know the basics of Computer and Multimedia Networks.</li> <li>Expalin access networks and physical media.</li> </ul>	<ul style="list-style-type: none"> <li>Identify the network structure.</li> <li>Analyse different Internet protocol stacks.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate the factors that affect the performance of multimedia systems components and technologies.</li> </ul>	<ul style="list-style-type: none"> <li>Inspect the researchable subtopics in the field</li> </ul>
12th week Exam	12				<ul style="list-style-type: none"> <li>Enhance the ability of justifying one's answers in written mode.</li> </ul>
Intro to Multimedia Networks 2	13	<ul style="list-style-type: none"> <li>Explain application, transport &amp; Network Layers.</li> </ul>	<ul style="list-style-type: none"> <li>Identify the application architectures.</li> <li>Analyse Web and HTTP, Network layer connection, connection-less service and Transport Layer — TCP and UDP.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate the technologies and the factors that affect their performance.</li> </ul>	
Multimedia Network Applications 1	14	<ul style="list-style-type: none"> <li>Know the basics of Multimedia Network Applications</li> </ul>	<ul style="list-style-type: none"> <li>Identify the classes of MM applications: stored streaming, live streaming and interactive (real-time)</li> </ul>	<ul style="list-style-type: none"> <li>Gain hands-on experience in streaming stored audio and video and interactive Multimedia Applications</li> </ul>	

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Multimedia Network Applications 2	15	<ul style="list-style-type: none"> <li>Explain in details different Protocols and Architectures</li> </ul>	<ul style="list-style-type: none"> <li>Identify various protocols for real-time interactive applications RTP,RTCP,SIP</li> <li>Analyse QoS guarantees</li> </ul>	<ul style="list-style-type: none"> <li>Practice specific and mechanisms for QoS architectures.</li> </ul>	

**Course Instructor**

Name:

Signature:

**Head of Department**

Name:

Signature: