

## Subject Description Form

<b>Subject Code</b>	COMP 5422
<b>Subject Title</b>	Multimedia Computing, Systems and Applications
<b>Credit Value</b>	3
<b>Level</b>	5
<b>Pre-requisite/Exclusion</b>	Nil
<b>Objectives</b>	<p>The objectives of this subject are to:</p> <ol style="list-style-type: none"> <li>1. To provide students with knowledge in fundamentals of multimedia, e.g. compression standards, data formats, media characteristics, storage and transmission requirements;</li> <li>2. To provide students with knowledge of a wide spectrum of multimedia information processing techniques;</li> <li>3. To train students with the ability to apply the knowledge in multimedia system and application development;</li> <li>4. To equip students with the ability to appreciate new and innovative solutions of multimedia systems and applications.</li> </ol>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a. understand the various characteristics of different media;</li> <li>b. understand the requirements and techniques of processing multimedia;</li> <li>c. generalize the knowledge and skills in problem solving involving multimedia databases; and</li> <li>d. conduct case study in multimedia applications.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<ul style="list-style-type: none"> <li>• <b>Multimedia System Primer:</b> Introduction to different multimedia platforms, systems, tools and applications; characteristics of different media and current trend</li> <li>• <b>Data Representation, Coding and Compression:</b> Data representation, processing and analysis for Sound/Audio, Image and Graphics, Video and Animation; Coding requirements, Entropy and Hybrid Coding, Compression techniques and standards: JPEG, MPEG, DVI, ASF, etc.</li> <li>• <b>Multimedia Content Analysis and Information Retrieval:</b> Multimedia contents: Color, shape, texture, motion, etc. Content analysis techniques: Color histogram, shape analysis, motion analysis, etc. Retrieval techniques: video segmentation, key frame selection, etc.</li> <li>• <b>Multimedia Indexing:</b> Multidimensional data structures, K-d trees, R-trees, R+ and R* trees, Comparison of different data structures.</li> <li>• <b>Multimedia Information Networking:</b> Video streaming, transmission characteristics, protocol support for multimedia networking, multicast techniques.</li> <li>• <b>Selected Topics in Multimedia Computing, Systems and</b></li> </ul>

	<b>Applications:</b> e.g., New MPEG standards, Multimedia Information Hiding and Watermarking, VoiceXML.					
<b>Teaching/Learning Methodology</b>	39 hours of class activities including - lecture, tutorial, lab, workshop seminar where applicable					
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	Specific Assessment Methods/Tasks	% weighting	Intended subject learning outcomes to be assessed			
			a	b	c	d
	Assignments, Tests & Projects	55	✓	✓	✓	
	Final Examination	45	✓	✓	✓	✓
	<b>Total</b>	<b>100</b>				
<b>Student study effort expected</b>	<b>Class Contact:</b>					
	Class activities (lecture, tutorial, lab)				39 hours	
	<b>Other student study effort:</b>					
	Assignments, Quizzes, Projects, Exams				65 hours	
	<b>Total student study effort</b>				<b>104 hours</b>	
<b>Reading list and references</b>	<i>Books</i>					
	(1). Li, Ze-Nian and Drew Mark S., 2004, Fundamentals of multimedia, Pearson/Prentice Hall. (2). Lewis, Richard , 2005, Digital media: An introduction, Prentice Hall. (3). Borko Furht (ed), 1999, Handbook of Multimedia Computing. CRC Press. (4). Alberto Del Bimbo, 1999, Visual Information Retrieval. Morgan Kaufmann. (5). Raghavan S.V. and Tripathi S.K., 1998, Networked multimedia systems: Concepts, architecture, and design, Prentice Hall.					
	<i>Journals</i>					
	(1). IEEE Multimedia (2). IEEE Trans. on Multimedia (3). ACM SIG Multimedia (4). Multimedia Systems (5). Multimedia Tools & Applications					