

Subject Description Form

Subject Code	COMP319
Subject Title	Introduction to Multimedia Computing
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: COMP305 Co-requisite: Nil Exclusion: COMP419
Objectives	<ul style="list-style-type: none"> • To provide the foundation knowledge of multimedia computing, e.g. media characteristics, compression standards, multimedia representation, data formats, multimedia technology development. • To provide programming training in multimedia computing, multimedia system design and implementations.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <p><i>Professional/academic knowledge and skills</i></p> <p>(a) understand the characteristics of different media; understand the representations of different multimedia data; understand different data formats; be able to take into considerations in multimedia system designs;</p> <p>(b) understand the characteristics of human's visual system; understand the characteristics of human's audio system; be able to take into considerations in multimedia techniques design and implementation;</p> <p>(c) understand different compression principles; understand different compression techniques; understand different multimedia compression standards; be able to design and develop multimedia systems according to the requirements of multimedia applications.</p> <p>(d) program multimedia data and be able to design and implement media applications;</p> <p><i>Attributes for all-roundedness</i></p> <p>(e) learn independently and search for the information required in solving problems.</p> <p>Alignment of Programme Outcomes:</p> <p>Programme Outcome 1: This subject contributes to having students practice their communication skills and demonstration ability with project presentation.</p>

	<p>Programme Outcome 2: This subject contributes to forming the global outlook that can affect the way computing systems are developed and used.</p> <p>Programme Outcome 4: This subject contributes to developing student critical thinking through lectures and lab exercises on solving problems. They will also practice choosing and evaluating the solutions for different technique problems.</p> <p>Programme Outcome 5: This subject contributes to problem solving with programming skills through lab exercise and project with proper design and implementation.</p> <p>Programme Outcome 6: This subject contributes to follow closely the advancement in information technology and their impact to the industrial need.</p> <p>Programme Outcome 7: This subject contributes to team work with group-based project for students to practice team spirit.</p> <p>Programme Outcome 8: This subject contributes to solve problems and develop solutions with computing and information technologies in multimedia area.</p>								
<p>Subject Synopsis/ Indicative Syllabus</p>	<table border="1"> <thead> <tr> <th data-bbox="462 783 1433 821" style="text-align: center;">Topic</th> </tr> </thead> <tbody> <tr> <td data-bbox="462 821 1433 957"> <p>1. Overview of multimedia computing Definitions, terms, terminologies, characteristics and requirements of different media; components of multimedia systems.</p> </td> </tr> <tr> <td data-bbox="462 957 1433 1171"> <p>2. Human's visual and audio system Characteristics of human visual system, light and visible light; human retina structure and functions; non-perceptual uniform color models and perceptual uniform color models; Characteristics of human's audio system, frequency response and magnitude range.</p> </td> </tr> <tr> <td data-bbox="462 1171 1433 1314"> <p>3. Multimedia data representation and analysis Representation of sound/audio, image and video; speech generation, analysis and software; image analysis, display, and printing.</p> </td> </tr> <tr> <td data-bbox="462 1314 1433 1457"> <p>4. Multimedia coding and compression Coding requirements; compression principles; entropy and hybrid coding; compression standards: JPEG, MPEG, and etc.</p> </td> </tr> <tr> <td data-bbox="462 1457 1433 1600"> <p>5. Multimedia technology development Multimedia history, technology development, challenging problem, research difficulty, multimedia industry</p> </td> </tr> </tbody> </table> <p>Laboratory Experiments and other Practical Work:</p> <table border="1"> <thead> <tr> <th data-bbox="462 1717 1433 1776" style="text-align: center;">Topic</th> </tr> </thead> <tbody> <tr> <td data-bbox="462 1776 1433 1950"> <ol style="list-style-type: none"> 1. Introduction to Matlab and the user interface 2. Programming using Matlab 3. Basic operations in Matlab. 4. Functions in Matlab. 5. Image processing using Matlab. </td> </tr> </tbody> </table>	Topic	<p>1. Overview of multimedia computing Definitions, terms, terminologies, characteristics and requirements of different media; components of multimedia systems.</p>	<p>2. Human's visual and audio system Characteristics of human visual system, light and visible light; human retina structure and functions; non-perceptual uniform color models and perceptual uniform color models; Characteristics of human's audio system, frequency response and magnitude range.</p>	<p>3. Multimedia data representation and analysis Representation of sound/audio, image and video; speech generation, analysis and software; image analysis, display, and printing.</p>	<p>4. Multimedia coding and compression Coding requirements; compression principles; entropy and hybrid coding; compression standards: JPEG, MPEG, and etc.</p>	<p>5. Multimedia technology development Multimedia history, technology development, challenging problem, research difficulty, multimedia industry</p>	Topic	<ol style="list-style-type: none"> 1. Introduction to Matlab and the user interface 2. Programming using Matlab 3. Basic operations in Matlab. 4. Functions in Matlab. 5. Image processing using Matlab.
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Teaching/Learning Methodology	A mix of lectures and lab sessions is used to deliver the various topics in this subject. Lectures are conducted to initiate students with the concepts and techniques of multimedia computing that are reinforced by in-class exercises and quizzes. Lab sessions will be used to illustrate the practical problems and to train multimedia programming ability. Students are given the opportunity to gain hands-on experience on designing and implementing a multimedia system.																																											
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="5">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> </tr> </thead> <tbody> <tr> <td>1. Quizzes</td> <td rowspan="2">55%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>2. Project</td> <td>✓</td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>3. Examination</td> <td>45%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Total</td> <td>100 %</td> <td colspan="5"></td> </tr> </tbody> </table> <p>Continuous assessments consist of a project and several quizzes, which are designed to facilitate students to achieve intended learning outcomes. The quizzes are designed to drive students to review how comprehensively and correctly they have understood the knowledge concepts, principles, and theories taught in the subject. The project is designed to enhance students' ability to acquire the understanding and using different multimedia computing principles, techniques, tools to solve a real problem through team work.</p> <p>Examination will evaluate student's understanding and usage of multimedia computing knowledge, e.g. concepts, principles, techniques, and standards.</p>					Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					a	b	c	d	e	1. Quizzes	55%	✓	✓	✓	✓		2. Project	✓		✓	✓	✓	3. Examination	45%	✓	✓	✓	✓	✓	Total	100 %					
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	▪ Lecture				26 Hrs.																																							
	▪ Laboratory				13 Hrs.																																							
	Other student study effort:																																											
	▪ Prepare the quizzes				30 Hrs.																																							
	▪ Design and implement the project				37 Hrs.																																							
	▪ Prepare the examination				10 Hrs.																																							
	Total student study effort					116 Hrs.																																						
Reading List and References	Reference Books: 1. Z.N. Li and M.S. Drew, Fundamentals of Multimedia. Prentice Hall, 2003.																																											

	2. K. Jeffay and H. Zhang, Readings in Multimedia Computing and Networking. Morgan Kaufmann, 2002.
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