

## Subject Description Form

<b>Subject Code</b>	COMP 5414
<b>Subject Title</b>	Computer Architecture
<b>Credit Value</b>	3
<b>Level</b>	5
<b>Pre-requisite/ Exclusion</b>	Nil
<b>Objectives</b>	This subject aims to provide students with fundamental principles and comprehensive knowledge of computer systems and organization. The students will learn the basic principles of computer architecture, the operations of the major components of a computer, how the components are interconnected, and some recent trends in computer design. This subject is intended to provide graduates of non-computing disciplines with the necessary background so the students can proceed with their MSc studies in information technology and systems.
<b>Intended Learning Outcomes</b>	After completing the subject, students should be able to: <ul style="list-style-type: none"> <li>a) have an understanding of basic organization and architecture of computers;</li> <li>b) possess the knowledge of number systems and digital logics;</li> <li>c) have an understanding of computer components, their functions and interconnection, computer memory, cache memory, I/O and operating system support;</li> <li>d) possess the knowledge of the organization of central processing units; and</li> <li>e) have an understanding of the organization of parallel and multiple processors.</li> </ul>
<b>Subject Synopsis/ Indicative Syllabus</b>	<ul style="list-style-type: none"> <li>• <b>Basic Principles</b> Overview of computer systems Number systems: binary, octal, decimal, hexadecimal.</li> <li>• <b>Computer Organization</b> Computer Functions and Interconnection Computer Memory Systems and Cache Memory Operating System Support</li> <li>• <b>Central Processing Units</b> Computer Arithmetic register organization, instruction pipelining Reduced Instruction Set Computers Machine and Assembly Languages</li> <li>• <b>Parallel Organization</b> Multiple Processor Organization Symmetric Multiprocessor</li> </ul>
<b>Teaching/Learning Methodology</b>	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	e
	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>	<p>(1) Stallings, W., 2012, Computer Organization and Architecture; 9<sup>th</sup> ed., Prentice-Hall.</p> <p>(2) Patterson, D. A. and Hennessy, J. L., 2013, Computer Organization &amp; Design: The hardware/software interface, 5<sup>th</sup> ed, Morgan Kaufman.</p> <p>(3) Britton, R., 2003, MIPS Assembly Language Programming, Prentice-Hall.</p> <p>(4) Hamacher, V.C., 2002, Computer Organization, 5<sup>th</sup> ed., McGraw-Hill.</p>						