

1.	Name of Course/Module	Software Engineering Fundamentals
2.	Course Code	TCS2411
3.	Status of Subject	Core for B.IT Artificial Intelligence
4.	MQF Level/Stage	Bachelor Degree – MQF Level 6
5.	Version (state the date of the last Senate approval)	June 2012
6.	Requirement for Registration	TCP1241 Computer Programming II
7.	Name(s) of academic/teaching staff	Lee Chin Poo Low Cheng Yaw Ooi Shih Yin
8.	Semester and Year offered	Trimester 2 (Gamma Level)
9.	Objective of the course/module in the programme :	
	To introduce a formal approach to the state-of-the-art techniques in software design and development and provide a means for students to apply the techniques using various tools.	
10.	Learning Outcomes :	
	At the completion of the subject, students should be able to:	
	LO1: Identify software engineering paradigm/model to solve the problems based on domain problems correctly. (Cognitive, Level 1)	
	LO2: Apply software project management, software engineering, software quality assurance and software configuration management processes during developing the software. (Cognitive, Level 3)	
	LO3: Produce good documentations and specifications in software engineering. (Cognitive, Level 3)	
	LO4: Demonstrate the use of notation and techniques in performing software requirement analysis, design, coding, testing and maintenance phases. (Cognitive, Level 3)	
11.	Synopsis:	
	The major areas of study include: Role of Software Engineering and Engineer, Software Engineering Paradigms, Software Project Management, Project Planning, Software Metrics, Software Requirement Analysis, Software Specifications, Software Design, Software Quality, Software Testing, Software Maintenance and Control, Computer Aided Software Engineering, and Software Development Project.	
	Bidang pengajian meliputi: Peranan Kejuruteraan Perisian dan Jurutera, Paradigma Kejuruteraan Perisian, Pengurusan Projek Perisian, Perancangan Project, Metriks Perisian, Analisa Keperluan Perisian, Spesifikasi Perisian, Rekabentuk Perisian, Kualiti Perisian, Pengujian Perisian, Kawalan dan Penyelenggaraan Perisian, Kejuruteraan Perisian dengan Bantuan Komputer (CASE), dan Projek Perisian.	
12.	Mapping of Subject to Programme Outcomes :	
	Programme Outcomes	<b>% of Contribution</b>
	PO1: Apply soft skills in work and career related activities	20

	PO2: Demonstrate knowledge and understanding of fundamental concepts, principles and best practices	40
	PO3: Analyse the requirements to address problems or opportunities in relevant domains or organisations	30
	PO5: Blend innovative mind and entrepreneurial skills	10
13.	Assessment Methods and Types :	
	Method and Type	Description/Details
	Test	Percentage
	Assignment	20%
	Final Exam	Report & Presentation
		20%
		60%
14.	Details of Subject	
	Topics	Mode of Delivery
		Lecture
		Lab
	<b>1. Introduction</b> Role of software engineering & engineer. Software Engineering Paradigms. Software Engineering & Models. Software engineering principles.	2
	<b>2. Project Management</b> Metrics. Estimation Model. Decomposition Technique & planning tools. Software Project Planning & Control: Gantt Chart, PERT/CPM & Others, Work Breakdown Structure (WBS).	5
	<b>3. Requirement Analysis &amp; Design</b> Principles. Prototyping. Specification & Tools. Data Flow Oriented. Transform Flow. Transaction Analysis. Data Structure Oriented. Logical Construction of system. Object-Oriented Design.	7
	<b>4. Software Specifications</b> Classification of specification. Operational specifications: data flow diagram, state transition diagrams. Description specification: ER diagram, logic specification and algebraic specification.	3
	<b>5. Software Quality</b> Verification and validation. Test cases & design. Approaches to verification & testing. Debugging. Factors affecting quality. Review Techniques. Quality Metrics. Reliability & Performance. Quality Standards - ISO 9000 & Capability Maturity Model (CMM).	4
	<b>6. Software Maintenance &amp; Control</b> Maintainability. Software Configuration Management. Monitoring & Controlling Projects Problems in maintenance & control. Evaluation.	4
	<b>7. Computer Aided Software Engineering</b> CASE tools - analysis tools, project management tools, configuration management tools, editors, linkers, code generators, debuggers, testing tools & user-interface management tools. Integrated CASE Environments. CASE Workbenches.	3

	<b>Total</b>	<b>28</b>	<b>28</b>
15.	<b>Laboratory</b> <ul style="list-style-type: none"> <li>• Prototyping tools - Screen design, report formatting, and validation.</li> <li>• CASE tools - System modelling, system design, repository administration.</li> </ul>		
16.	<b>Total Student Learning Time (SLT)</b>	<b>Face to Face (Hour)</b>	<b>Total Guided and Independent Learning</b>
	Lecture	28	28
	Tutorials	-	-
	Laboratory/Practical	28	14
	Assignment	-	12
	Mid Term Test	1	4
	Final Exam	2	20
	Quizzes	-	-
	Sub Total	59	78
	Total SLT	$137/40 = 3.425 \Rightarrow 3$	
17.	Credit Value	3	
18.	<b>Reading Materials :</b>		
	<b>Textbook</b>	<b>Reference Materials</b>	
	1. Roger S Pressman, "Software Engineering: A Practitioner's Approach", 7th Ed. McGraw Hill, 2009.	1. Shari Lawrence Pfleeger & Joanne M. Atlee, "Software Engineering: Theory and Practice", 3rd Ed, Pearson, 2006. 2. Ian Sommerville, "Software Engineering", 8th Ed, Addison Wesley, 2007. 3. Sue A. Conger, "The New Software Engineering", International Thomson, 1994.	
19.	<b>Appendix (to be compiled when submitting the complete syllabus for the programme) :</b> <ol style="list-style-type: none"> <li>1. Mission and Vision of the University and Faculty</li> <li>2. Mapping of Programme Objectives to Vision and Mission of Faculty and University</li> <li>3. Mapping of Programme Outcome to Programme Objectives</li> <li>4. Programme Objective and Outcomes (Measurement and Descriptions)</li> </ol>		