

SUMMARY OF INFORMATION ON EACH COURSE

1.	Name of Course	Software Verification and Validation	
2.	Course Code	TSE3251	
3.	Status of Course [Applies to (cohort)]		
4.	MQF Level/Stage Note : Certificate – MQF Level 3 Diploma – MQF Level 4 Bachelor – MQF Level 6 Masters – MQF Level 7 Doctoral – MQF Level 8	Bachelor – MQF Level 6	
5.	Version (State the date of the Senate approval – history of previous and current approval date)	Previous: June 2014 Current: June 2016	
6.	Pre-Requisite	TSE2101 Software Engineering Fundamentals	
7.	Name(s) of academic/teaching staff	Chan Gaik Yee Rosalind Deena Kumari	
8.	Semester and Year offered	Trimester 2 (Delta Level)	
9.	Objective of the course in the programme : To provide knowledge and expose students to software verification and validation (V&V) techniques that ensure the resulting software product satisfies its documented specifications and meets the expectation of the stakeholders and users.		
10.	Justification for including the course in the programme : This subject provides the knowledge and exposes students to software verification and validation (V&V) techniques that ensure the resulting software product satisfy its documented specifications and meet the expectation of the stakeholders and users.		
11.	Course Learning Outcomes :	Domain	Level
	LO1 Recognize software verification & validation (V&V) objectives, terminologies, issues, strategies, management and reporting.	Cognitive	1
	LO2 Interpret the issues, methods and techniques in software testing for both software core engines and human-computer interfaces.	Cognitive	2

SUMMARY OF INFORMATION ON EACH COURSE

	LO3 Apply concepts learnt on software testing and methods of software reviews, software problem analysis and reporting.	Cognitive					3		
	LO4 Develop software V&V implementation requirements following established standards.	Cognitive					4		
12.	Mapping of Learning Outcomes to Programme Outcomes :								
	Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
	LO1							X	
	LO2							X	
	LO3								X
	LO4							X	X
13.	Assessment Methods and Types :								
	Method and Type	Description/Details					Percentage		
	Assignment	Group assignment					20%		
	Test	Written					20%		
	Quiz	Based on case study/tutorial/lab					10%		
	Final Exam	Written					50%		
	14.	Mapping of assessment components to learning outcomes (LOs)							
Assessment Components		LO1	LO2	LO3	LO4				
Final Exam		X	X	X					
Test		X	X						
Assignment				X	X				
Quiz		X	X						
15.		Details of Course							
	Topics	Mode of Delivery (eg : Lecture, Tutorial, Workshop, Seminar, etc.) Indicate allocation of SLT (lecture, tutorial, lab) for each subtopic							
		Lecture (Hour)				Tutorial (Hour)			

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1. Software Verification & Validation. Introduction, the needs and the importance of conducting proper software verification and validation. IEEE Standard for Software Verification and Validation, IEEE Standard for Software Test Documentation. Definitions of V & V, terminologies and foundations as defined in the IEEE standard document.	2	0
2. Software V & V Management Objectives and constraints of V & V. Planning of V & V. Documenting the V & V strategies, including tests and other artifacts. Metrics and measurement, V & V involvement at various points in the software lifecycle.	6	6
3. Software Reviews Software Desk Checking and Walkthroughs, Inspections. Software Reviews reporting and documentation.	6	6
4. Software Testing Software testing hierarchy, Unit testing, Integration testing, System and acceptance testing. Exception handling. Coverage analysis and Structure Based Testing or White box testing techniques. Black box functional testing techniques. Developing test cases based on use cases, decision table, state diagram and operational profile. Testing across software quality Attributes. Regression testing. Automated testing tools. Deployment processes.	8	8
5. Human-Computer-Interface (HCI) Testing The variety of aspects of usefulness and usability. Heuristic evaluation. Cognitive Walkthroughs. User testing approaches. Testing techniques for web sites. Formal experiments to test hypotheses about specific HCI controls.	4	4

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	6. Software Problem Analysis and Reporting Analyzing software failure reports. Debugging faults and isolation techniques. Defect analysis. Problem tracking.	2	2
	Total Student Learning Time (SLT)	Face to Face / Guided Learning	Independent Learning
	Lecture	28	28
	Tutorials	26	26
	Quiz	1	1
	Presentation	0	0
	Assignment	0	24
	Mid Term Test	1	3
	Final Exam	2	20
	Sub Total	58	102
	Total SLT	160	
16.	Credit Value	4	
17.	Reading Materials :		
	Textbooks		
	Nil		
	Reference Material (including 'Statutes' for Law)		
	-Ron Patton, Software Testing (2nd Edition), Sams Publishers, 2005 -IEEE Standard for Software Verification and Validation -IEEE Standard for Software Test Documentation -Aditya P Mathur, Foundations of Software Testing, Pearson Education, 2008 -M G Limaye, Software Testing: Principles, Techniques and Tools, Tata McGraw-Hill Education, 2009. -Anirban Basu, Software Quality Assurance, Testing and Metrics, Prentice-Hall, 2015. -Kshirasagar Naik and Priyadarshi Tripathy, Software Testing and Quality Assurance: Theory and Practice, John Wiley & Sons, 2011.		

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Appendix (to be compiled when submitting the complete syllabus for the programme) :

1. Mission and Vision of the University and Faculty
2. Programme Objectives or Programme Educational Objectives
3. Programme Outcomes (POs)
4. Mapping of POs to the 8 MQF domain
5. Summary of the Bloom's Taxonomy's Domain Coverage in all the Los in the format below :

Subject	Learning Outcomes (please state the learning Outcomes)	Bloom's Taxonomy Domain		
		Affective	Cognitive	Psychomotor
TSE3251	Learning Outcome 1		1	
	Learning Outcome 2		2	
	Learning Outcome 3		3	
	Learning Outcome 4		4	

6. Summary of LO to PO measurement
7. Measurement and Tabulation of result for LO achievement
8. Measurement Tabulation of result for PO achievement