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SUMMARY OF INFORMATION ON EACH COURSE

1.	Name of Course	Software Evolution and Maintenance
2.	Course Code	TSE3351
3.	Status of Course [Applies to (cohort)]	Specialization Elective (BCS – Software Engineering)
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	Ho Sin Ban Chua Sook Ling @ Linda Chua
8.	Semester and Year offered	Trimester 2 (Delta Level)
9.	Objective of the course in the programme : This course provides students with an overview of concepts, processes and activities in software evolution, software configuration management, software change management, software maintenance, and software maintenance methods and tools.	
10.	Justification for including the course in the programme : The major areas covered are software evolution processes, software evolution activities, software configuration management, software change management, software maintenance, and software maintenance support and tools.	

11.	Course Learning Outcomes :	Domain	Level
	LO1. Explain the important issues and needs for proper software configuration management	Cognitive	Level 2
	LO2. Apply the software evolution processes and activities	Cognitive	Level 3
	LO3. Examine the issues and control activities for software change management and their impact to the organization and the customer	Cognitive	Level 4

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12. Mapping of Learning Outcomes to Programme Outcomes :

Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
LO1									X
LO2								X	
LO3							X		

13. Assessment Methods and Types :

Method and Type	Description/Details	Percentage
Assignment	Practical assignment	35
Mid-Term Test	Written	15
Final Exam	Written	50

14. Mapping of assessment components to learning outcomes (LOs)

Assessment Components	LO1	LO2	LO3	
Assignment		X	X	
Mid-Term Test	X	X		
Final Exam	X	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)	Lab (Hour)
1. Software Evolution Processes Introduction to the subject. Basic concepts of evolution and maintenance. Relationships between evolving entities Models of software evolution Cost models of evolution. Planning for evolution.	2	2

	2.Software Evolution Activities Working with legacy systems. Program comprehension and reverse engineering. System and process re-engineering for technical and business. Software Impact analysis. Software migration for technical and business. Software Refactoring. Program transformation. Data reverse engineering.	6	6
	3.Software Configuration Management IEEE Standard for Software Configuration Management Plans Software configuration items. Software revision control. Software version releases. Software configuration tools and support. Distribution and backup.	6	6
	4.Software Change Management Drivers for change. Change control processes and documentation. Change requirements. Control and approval authority. Monitoring and reporting of software changes. Software error reporting and error resolution. Software change management reviews.	8	8
	5.Software Maintenance Concepts and issues in software maintenance and support. Software maintenance categories. Maintenance measures and cost. Maintenance support organization. Software maintenance activities.	4	4
	6.Maintenance and Support Tools Tools for long term software support. Software licensing terms and warranties. Maintenance and support contract. Customer Relationship Management (CRM) tools. Maintenance support logging and reporting tools.	2	2

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	Total Student Learning Time (SLT)	Face to Face / Guided Learning	Independent Learning
	Lecture	28	28
	Tutorials	-	-
	Laboratory/Practical	28	28
	Presentation	-	-
	Assignment	-	21
	Mid Term Test	1	4
	Final Exam	2	20
	Sub Total	59	101
	Total SLT	160	
16.	Credit Value	160/40 = 4	
17.	Reading Materials :		
	Textbooks		
	Priyadarshi Tripathy , and Kshirasagar Naik, “Software Evolution and Maintenance: A Practitioner's Approach”, John Wiley & Sons, ISBN: 9780470603413, 2015.		
	Bruegge, B. & Dutoit, A.H., “Object-Oriented Software Engineering”, 3rd Edition, Pearson Prentice Hall, 2010.		
	Grubb, P. & Takang, A.A., “Software Maintenance: Concepts and Practice”, 2nd Edition, ISBN 981-238-426-X (pbk), World Scientific Press, 2003.		
	Reference Material (including ‘Statutes’ for Law)		
	Selected reading materials, including case studies on software evolution and maintenance will be provided to students online at the course website.		

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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 0utcomes)	Bloom's Taxonomy Domain		
		Affective	Cognitive	Psychomotor
TSE3351	Learning Outcome 1		2	
	Learning Outcome 2		3	
	Learning Outcome 3		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