UNIVERSITI SAINS MALAYSIA

SEMESTER I, ACADEMIC SESSION 2024/2025

COURSE PLANNER

PUSAT PENGAJIAN SAINS KOMPUTER

Course Code	**CSE241/CMM341**
Course Title	Foundations of Software Engineering
Course Lecturer	Assoc. Prof. Dr. Wan Mohd Nazmee Wan Zainon & Dr. Lim Chia Yean
Email	nazmee@usm.my, cylim@usm.my
Course Units	4

	Breakdown of Units	***Contact Hours***
Lectures	3	3 hours x 14 weeks
Tutorials	1	1 hour x 14 weeks

Breakdown of Assessments	Examination	50% (2 hours)
	Test	20% - 10% (Test I-1 hour) + 10% (Test II-1 hour)
	Project Report	20% - 10% (Report 1) + 10% (Report II)
	Involvement in Planning	10% (Presentation)
Type of Course	Core (Common)	

Course Synopsis	This course describes the foundations of software engineering including aspects of software processes, requirements engineering, system modelling, system architecture and system design, system implementation, system testing, system maintenance and project management. The focus is on the discipline required as best practices using Agile methods.
Course Learning Outcomes (CLO)	**At the end of this course the students will be able to:** 1. Distinguish the basic concepts of software engineering principles, requirements engineering, software system development processes, process and evolution of systems, and project management.. 2. Differentiate the different phases of software development. 3. Demonstrate relevant leadership skills in a team to manage a system development project. 4. Display planning and digital skills using project management tools for the systems development process through a group project.

CLO - PLO Mapping

CLO	***Descriptions***	***PLO***	***LT***	***SS***	***Assessment Methods***
1.	Distinguish the basic concepts of software engineering principles, requirements engineering, software system development processes, process and evolution of systems, and project management.	PLO1	C4	-	Peperiksaan Akhir (PA)/Final exam, Ujian /Test (13),
2.	Differentiate the different phases of software development.	PLO3	C4	CTPS2	Peperiksaan Akhir (PA)/Final exam, Ujian /Test (13), Laporan /Report (37)
3.	Demonstrate relevant leadership skills in a team to manage a system development project.	PLO9	A3	TS2	Penglibatan dalam Perancangan/ Involvement in Planning (41)
4.	Display planning and digital skills using project management tools for the systems development process through a group project.	PLO10	P2	CTPS2	Laporan /Report (37)

Constructive Alignment (Detailing Delivery and Assessment Methods)

CLO	PLO	Delivery Method	Final Exam	Test	Assignment / Project etc.
				#Test – Marks	Type (Description) - Marks
Distinguish the basic concepts of software engineering principles, requirements engineering, software system development processes, process and evolution of systems, and project management.	PLO1	Lectures & Tutorials	Final Exam – 50 marks	Test 1 – 100 marks	
Differentiate the different phases of software development.	PLO3	Lectures & Tutorials	Final Exam – 50 marks	Test 2 – 100 marks	Report 1 – 100 marks (10%)
Demonstrate relevant leadership skills in a team to manage a system development project.	PLO9	Problem-Based Learning (PBL)			Involvement in Planning (Presentation)– 100 marks – 10%
Display planning and digital skills using project management tools for the systems development process through a group project.	PLO10	Problem-Based Learning (PBL)			Report 2 (Digital Use) –100 marks (10%)
		Total Marks	*100*	*200*	*300*
		Total Percentage (CW)	*50%*	*20%*	*30%*
		Overall Percentage	*100%*		

Main References

1. Ian Sommerville, Software Engineering, 10th Edition, Pearson, 2016.
2. David Kung, ISE Object-Oriented Software Engineering: An Agile Unified Methodology, 1st Edition, Mc-Graw Hill, 2023

Additional References

1. Satzinger, J. W., Jackson, R. B. and Burd, S. D. (2015). System Analysis and Design In A Changing World, 7th Edition, Course Technology CENGAGE Learning.
2. Ronald J. L. (2018). Introduction to Software Engineering, CRC Press.

COURSE SYLLABUS AND PLANNER

No	*Topics*	*Week*	*Ref*	*Coursework activities*	*STUDENT LEARNING TIME (SLT)*			
					Face to Face (F2F)			*Non-face to face (NF2F)*
					Physical Lecture	*Online Lecture / Others*	*Tutorial*	*Async (Online)*
1	**Course Overview** **Introduction to Software Engineering** a. Professional software development b. Software engineering ethics	1	Chap. 1	*Project: Group Formation* *Project: Proposal Due*	3			1 * Online discussions
2	**Software Processes** a. Software process models b. Process activities c. Coping with change d. Process improvement	2	Chap. 2		3			1 * Online discussions
3	**Agile Software Development** a. Agile methods b. Agile development technique c. Agile project management d. Scaling Agile methods	3	Chap. 3		3		1 * Online tutorial	
4	**Requirements Engineering** a. Functional and non-functional requirements b. Requirements engineering process c. Requirements d. Requirements validation e. Requirements change	4	Chap. 4		3		1 * Online tutorial	
5	**System Modeling** a. Context models b. Interaction models c. Structural models d. Behavioral models e. Model-driven architectures	5	Chap. 5		3		1 * Online tutorial	
6	**Architectural Design & Implementation I** a. Architectural design decisions b. Architectural views & patterns c. Application architectures d. Object-oriented design using UML	6	Chap. 6			2 (Recorded/ Online)	1 * Online tutorial	1 * Simple Quiz (formative)
7	**Architectural Design & Implementation II** a. Implementation issues b. Open-source development	7	Chap. 7	*Test I* *Project:* ***Report 1 Due***	2	1 (Test 1) *F2F- Venue to be confirmed	1 * Online tutorial	
MID SEMESTER BREAK (WEEK 8)								

8	**Software Testing** a. Development testing b. Test-driven development c. Release testing d. User testing	9	Chap. 8		3		1 * Online tutorial	
9	**Software Evolution** a. Evolution processes b. Legacy system c. System maintenance	10	Chap. 9		2		1 * Online tutorial	1 * Quiz (formative)
10	**Project Management** a. Risk management b. Managing people c. Teamwork	11	Chap. 22		3		1 * Online tutorial	
11	**Project planning** a. Software pricing b. Maintenance c. Plan-driven development and project scheduling d. Agile planning e. Estimation techniques f. Cost modeling	12	Chap. 23		3		1 *Online Class Revision	
12	**Quality Management** a. Software quality b. Software standards c. Reviews and inspections d. Quality management and agile development e. Software measurement	13	Chap. 24		3		1 * Online Class Revision	
13	**Configuration Management** a. Version management b. System building c. Change management d. Release management	14	Chap. 25	*Test II*	3	1 *Test II *F2F- Venue to be confirmed		1 * Online discussions
14	**Project & Project presentation**	15		*Project:* ***Report 2 (Final) Due*** *Involvement in Planning (presentation)*		1 *Project presentation		1 * Online discussions
REVISION WEEK (WEEK 16)								
	Total Contact Hours				*37*	*3*	*10*	*6*
	OVERALL TOTAL HOURS				*56*			

CLASS POLICY
▪ All assignments MUST be submitted before or on the specified date. Late submission of assignments without any reasons and without permission from the lecturer(s) will not be accepted. The grade for late submission (even with permission) will be reduced as determined by the lecturer(s). ▪ Tests will be conducted on the specified dates while quizzes will be conducted without prior notice during lecture/tutorial. Replacement of tests or quizzes will only be allowed if students are sick and have medical certificate (MC) or exemption letter for university activities. The lecturer has the rights of whether or not to give the replacement test or quizzes. If a student is caught cheating, he/she will be barred from continuing the test and will get an F grade. ▪ Students who copied or plagiarized other's work or let their work be copied or plagiarized will get an automatic F grade for the work, test or the whole coursework component as determined by the lecturer(s). The said student will be reported to the university's disciplinary board. ▪ The attendance to lectures and tutorials will be taken at the discretion of the lecturer(s). Students should participate in class activities, e-learning and other online forums (if any). ▪ Students should appreciate any facilities provided. Students who are caught misusing or abusing the given facilities will be barred from using the service. The school has the right to penalise each misuse of any facility. ▪ All students are required to dress neatly according to the dress code of the university while attending lectures or during any class related meetings. ▪ Students are reminded to switch off their hand phones during lectures and tutorials. Sending short messages is also not allowed during those times. If a student is found breaking the rules purposely, the student will get a penalty towards his/her course work grade. ▪ Students who caused disturbance in class will be asked to leave the room.