	Universitas Negeri Surabaya **Faculty of Engineering** **, Information Technology Education Undergraduate Study Program**	**Document Code**

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Software engineering	8320703085	Compulsory Study Program Subjects	T=3	P=0	ECTS=4.77	4	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Drs. Bambang Sujatmiko, M.T.	.....	Drs. Bambang Sujatmiko, M.T.

Learning model	**Project Based Learning**	
Program Learning Outcomes (PLO)	**PLO study program which is charged to the course**	
	PLO-8	Mastering the concepts and implementation in developing software engineering, games, intelligent multimedia, and network computer engineering.
	PLO-13	Able to develop innovative educational products or learning resources using scientific design-based strategies to support teaching activities that can be integrated with ICT.
	Program Objectives (PO)	
	PO - 1	CPMK 2-1 Students are able to explain and compare various software development methods and understand the context in which these approaches can be used
	PO - 2	CPMK 3-1 Students model and analyze structured design and object-oriented design (example: UML and DFD).
	PO - 3	CPMK 5-1 Students are able to explain the scope of software maintenance problems and demonstrate the use of tools and techniques in the software engineering process.
	PO - 4	CPMK 5-2 Students are able to apply software development methods in simple projects
	PO - 5	CPMK 8-1 Students are able to work together in teams to actively complete the final project.
	PLO-PO Matrix	

P.O	PLO-8	PLO-13
PO-1		
PO-2		
PO-3		
PO-4		
PO-5		

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PO-1																
PO-2																
PO-3																
PO-4																
PO-5																

Short Course Description	This Software Engineering course provides software engineering concepts, software project management, various software development methodologies, software requirements analysis, system principles and modeling with DFD, creating database systems using ERD, interface design (Display Worksheet and Semantic Nets), RPL project design and implementation.
References	**Main :**

1. Pressman, R. S., Software Engineering: A Practitioner 19s Approach, 8th Edition, McGraw-Hill, 2008
2. Sommerville, I., Software Engineering 8th Edition, Addison-Wesley, 2007.
3. Siahaan, Daniel., Analisa Kebutuhan Dalam Rekayasa Perangkat Lunak, ANDI, Yogyakarta, 2012
4. Insap Santoso, 2009, Interaksi Manusia dan Komputer, Andi Offset, Yogyakarta.
5. Kendall, dan Kendall, 2003, Analisis dan Perancangan Sistem Jilid 1, Prenhallindo, Jakarta
6. Marlinda, Linda, S.Kom, 2004, Sistem Basis Data, Andi Offset, Yogyakarta.

Supporters:	
1. Wibawa, R. P., Susanti, M. D. E. ., & Palupi, G. S. (2023). Pengembangan Website sebagai Sarana Pemasaran UMKM Rooslin. PROSIDING SEMINAR NASIONAL PENGABDIAN KEPADA MASYARAKAT, 3(1), 86–93. https://doi.org/10.33086/snpm.v3i1.1235	
Supporting lecturer	Martini Dwi Endah Susanti, S.Kom., M.Kom.

Week-	**Final abilities of each learning stage (Sub-PO)**	**Evaluation**		**Help Learning, Learning methods, Student Assignments, [Estimated time]**		**Learning materials [References]**	**Assessment Weight (%)**
		Indicator	**Criteria & Form**	**Offline (*offline*)**	**Online (*online*)**		
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
1	Understand the concepts and definitions of Software and Engineering in Software.	1. Explain the meaning of engineering and engineering in software 2. Explaining the benefits in Software Engineering (RPL) 3. Explain the engineering objectives of software 4. Provide examples of the relationship between RPL and other sciences 5. Define examples of software and criteria for good software	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10 **Form of Assessment** : Participatory Activities	Explaining examples of software, sorting software based on type and function, discussing software development stages. 3 X 50	Carrying out learning with a scientific approach through the Project Based Learning method with the syntax 1. Formulating the focus of the problem, 2. Organizing and analyzing data logically, 3. Algorithmic thinking, 3. Creating a project schedule, 5. Project monitoring and evaluation, and 6. Evaluation. Carried out online 3 x 50	**Material:** Students can explain 1. the meaning of engineering and engineering in software, 2. the benefits of Software Engineering (RPL), 3. the purpose of software engineering, and provide examples of the relationship between RPL and other sciences. **Reference:** *Pressman, RS, Software Engineering: A Practitioner 19's Approach, 8th Edition, McGraw-Hill, 2008*	5%
2	Understand the concept of software project management	1. Explain the meaning of project management and software project management 2. Defining software project management boundaries (MPPL) 3. Explain the differences between software project development and other projects 4. Defining the stages in MPPL 5. Explain the need for good planning, monitoring and control in MPPL 6. Name PL project stakeholders	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10 **Form of Assessment** : Participatory Activities, Practical Assessment	Students define the relationship between project management and software products. Discuss the importance of project management in 3 X 50 software development	Carrying out learning with a scientific approach through the Project Based Learning method with the syntax 1. Formulating the focus of the problem, 2. Organizing and analyzing data logically, 3. Algorithmic thinking, 3. Creating a project schedule, 5. Project monitoring and evaluation, and 6. Evaluation. Carried out online 3 x 50	**Material:** Students are able to 1. Describe the prototype development model and its stages, 2. RAD development model and its stages, 3. Spiral development model and its stages, and State the advantages and benefits of each development model, and Identify the development model and model stages from case studies **References:** *Pressman, RS, Software Engineering: A Practitioner 19's Approach, 8th Edition, McGraw-Hill, 2008*	5%

3	Understand software requirements and software requirements analysis techniques	1. Explain software requirements. 2. Mention software requirements analysis techniques 3. Explains needs analysis techniques using questionnaire surveys 4. Explain the techniques of needs analysis using interviews 5. Explains needs analysis techniques using observation 6. Explains requirements analysis techniques using document analysis	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment, Practical Assessment	Carrying out learning with a scientific approach through the Project Based Learning method in groups with the syntax 1. Formulating the focus of the problem, 2. Organizing and analyzing data logically, 3. Algorithmic thinking, 3. Creating a project schedule, 5. Monitoring and evaluating the project, and 6. Evaluation. Carried out online 3 X 50	Carrying out learning with a scientific approach through the Project Based Learning method in groups with the syntax 1. Formulating the focus of the problem, 2. Organizing and analyzing data logically, 3. Algorithmic thinking, 3. Creating a project schedule, 5. Monitoring and evaluating the project, and 6. Evaluation. Carried out online 3 x 50	**Material:** Students are able to 1. Explain the meaning of project management and software project management, 2. Define the boundaries of software project management (MPPL), 3. Explain the differences between software project development and other projects, 4. Define the stages in MPPL, 5. Explain the need for good planning, monitoring and control in MPPL, and 6. Mention PL project stakeholders **Bibliography:** *Pressman, RS, Software Engineering: A Practitioner 19s Approach, 8th Edition, McGraw-Hill, 2008*	5%

4	Understand software requirements and software requirements analysis techniques	1. Explain software requirements. 2. Mention software requirements analysis techniques 3. Explains needs analysis techniques using questionnaire surveys 4. Explain the techniques of needs analysis using interviews 5. Explains needs analysis techniques using observation 6. Explains requirements analysis techniques using document analysis	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	Students were given a case study in the form of conditions at MSME Rooslin which were hampered by marketing facilities. Students are asked to identify and analyze the needs that exist in Rooslin MSMEs as a basis for system/software development. 3 X 50	Carrying out learning with a scientific approach through the Project Based Learning method in groups with the syntax 1. Formulating the focus of the problem, 2. Organizing and analyzing data logically, 3. Algorithmic thinking, 3. Creating a project schedule, 5. Monitoring and evaluating the project, and 6. Evaluation. Carried out online 3 x 50	**Material:** Students are able to 1. explain software requirements, 2. Mention software requirements analysis techniques, 3. Explain requirements analysis techniques using questionnaire surveys, 4. Explain requirements analysis techniques using interviews, 5. Explain requirements analysis techniques using observation , and 6. Explain requirements analysis techniques using document analysis. **Reference:** *Pressman, RS, Software Engineering: A Practitioner 19s Approach, 8th Edition, McGraw-Hill, 2008* **Material:** User Needs Analysis **Literature:** *Wibawa, RP, Susanti, MDE ., & Palupi, GS (2023). Website Development as a Marketing Means for MSMEs Rooslin. PROCEEDINGS OF THE NATIONAL SEMINAR ON COMMUNITY SERVICE, 3(1), 86–93. https://doi.org/...*	5%

5	Understand the concept of system modeling	1. Explain the meaning of system modeling. 2. Explain the purpose of system modeling 3. Explain the various types of system modeling 4. Explain the concept of use case system modeling 5. Explains the concept of DFD system modeling	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	Modeling the system based on the case study that was established in Week 4. 3 X 50	Carrying out learning with a scientific approach through the Project Based Learning method in groups with the syntax 1. Formulating the focus of the problem, 2. Organizing and analyzing data logically, 3. Algorithmic thinking, 3. Creating a project schedule, 5. Monitoring and evaluating the project, and 6. Evaluation. Carried out online 3 x 50	**Material:** Students are able to explain 1. the meaning of system modeling, 2. the objectives of system modeling, 3. various types of system modeling, 4. the concept of use case system modeling, 5. the concept of DFD system modeling. **Reader:** *Pressman, RS, Software Engineering: A Practitioner 19s Approach, 8th Edition, McGraw-Hill, 2008* **Material:** System Modeling **References:** *Wibawa, RP, Susanti, MDE ., & Palupi, GS (2023). Website Development as a Marketing Means for MSMEs Rooslin. PROCEEDINGS OF THE NATIONAL SEMINAR ON COMMUNITY SERVICE, 3(1), 86–93. https://doi.org/...*	5%
6	Understanding Database Concepts	1. Explain the basic concepts of databases and database systems. 2. Explain the components of a database system. 3. Explain the advantages and disadvantages of database systems. 4. Explain the purpose of database design. 5. Explain the concept of database design. 6. Explain the concept of Entity Relational Diagram (ERD) 7. Explain the concept of Class Diagrams	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	Carry out data design on case studies that have been determined in Week 4. 3 X 50	Carrying out learning with a scientific approach through the Project Based Learning method in groups with the syntax 1. Formulating the focus of the problem, 2. Organizing and analyzing data logically, 3. Algorithmic thinking, 3. Creating a project schedule, 5. Monitoring and evaluating the project, and 6. Evaluation. Carried out online 3 x 50	**Material:** Students are able to explain 1. the basic concepts of databases and database systems, 2. database system components, 3. advantages and disadvantages of database systems, 4. database design objectives, 5. database design concepts, and 6. Entity Relational Diagram (ERD) concepts) **Bibliography:** *Pressman, RS, Software Engineering: A Practitioner 19s Approach, 8th Edition, McGraw-Hill, 2008*	5%

7	Understand the concept of software interface design	1. Explain the concept of interface design. 2. Mention the principles of user interface. 3. Explain design documentation. 4. Explain the application program categories. 5. Explains design using various approaches. 6. Mention the interface components. 7. Mention the sequence of dialogue design. 8. Explains text-based design	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10 **Form of Assessment** : Participatory Activities	Carry out interface design on case studies that have been determined in Week 4. 3 X 50	Carrying out learning with a scientific approach through the Project Based Learning method in groups with the syntax 1. Formulating the focus of the problem, 2. Organizing and analyzing data logically, 3. Algorithmic thinking, 3. Creating a project schedule, 5. Monitoring and evaluating the project, and 6. Evaluation. Carried out online 3 x 50	**Material:** Students are able to 1. Explain the concept of interface design, 2. State the principles of user interfaces, 3. Explain design documentation, 4. Explain application program categories, 5. Explain design using various approaches, 6. Mention interface components, 7. Mention the sequence of dialogue design, and 8. Explain text-based design. **Reference:** *Pressman, RS, Software Engineering: A Practitioner 19s Approach, 8th Edition, McGraw-Hill, 2008*	0%
8	Students can analyze the RPL stages based on case studies of UTS questions	1. Students can define the concept of RPL 2. Students can mention RPL development models 3. Students can mention the concept of project management 4. Students can analyze RPL needs based on UTS question cases 5. Students can design a DFD system based on UTS question cases 6. Students can design an ERD system based on UTS question cases 7. Students can design LKT systems based on UTS question cases	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10 **Form of Assessment** : Practice/Performance, Test	Sub Summative Exam (UTS) 2 X 50	Sub Summative Exam (UTS) 2 x 50	**Material:** All material and competencies that have been taught at previous meetings **Reference:** *Pressman, RS, Software Engineering: A Practitioner 19s Approach, 8th Edition, McGraw-Hill, 2008*	20%
9	Skilled in software requirements (PL) specifications	1. Identifying PL functional needs. 2. Identify non-functional PL needs. 3. Identify user requirements. 4. Identify system requirements. 5. Identify interface requirements. 6. Identifying documentation requirements	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10	Prepare a Software Requirements Specification document based on the case study that was determined in Week 4 3 X 50			0%

10	Skilled in system modeling with activity diagrams	1. Understand the concept of activity diagrams 2. Create activity diagrams from the use case specifications that have been created 3. Create activity diagrams using UML tools 4.	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10	Prepare activity diagrams based on case studies that have been determined 3 X 50			0%
11	Skilled in Entity relational diagram (ERD) modeling	1. Creating Class Diagrams with UML tools 2. Create entities and fill in the attributes of each entity using UMK tools. 3. Create relationships between tables/entities and determine cardinality between entities/tables 4. 5. 6.	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10	Exercises, Discussions, Presentations 3 X 50			0%
12	Skilled in interface design	1. Create an interface design according to the number of processes in DFD modeling on the Display Worksheet (LKT). 2. Creating semantic nets. 3. Implementing interfaces in developer programs	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10	Discussion Practice, Presentation 3 X 50			0%
13	Skilled in interface design	1. Create an interface design according to the number of processes in DFD modeling on the Display Worksheet (LKT). 2. Creating semantic nets. 3. Implementing interfaces in developer programs	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10	Discussion Practice, Presentation 3 X 50			0%
14	Skilled in creating RPL program applications			Exercise 9 X 50			0%
15	Skilled in creating RPL applications/programs	1. Create a database with the SQL Server tool from the PDM power designer generated results. 2. Relating interface design in Visual Basic with SQL Server database. 3. Create an RPL project program	**Criteria:** 1. Participation = 20% 2. Tasks = 30% 3. UTS = 20% 4. UAS = 30% 5. NA = ((2xP)(3xT) (2xUTS) (3xUAS))/10	Exercise 9 X 50			0%

16				The Final Semester Examination (UAS) is in the form of 3 x 50 Final Course Project presentations	The Final Semester Examination (UAS) is in the form of 3 x 50 Final Course Project presentations		0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	13.76%
2.	Project Results Assessment / Product Assessment	6.26%
3.	Portfolio Assessment	6.26%
4.	Practical Assessment	3.75%
5.	Practice / Performance	10%
6.	Test	10%
		50.03%

Notes

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.