	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 Verification and Validation	8320703098		**T=3**	**P=0**	**ECTS=4.77**	5	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	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)	
	PLO-PO Matrix	

P.O	PLO-8	PLO-13

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

Short Course Description	This course discusses the systematic and comprehensive development of basic concepts, principles and procedures in carrying out verification and validation in the field of software development. Verification and validation techniques discussed in this course include: Independent Verification and Validation (IV&V) methods, Inductive and Deductive Fault Analysis, Test Benches, Design for Testability, and Accelerated Test methods and standards.	
References	**Main :**	
	1. Engel, Avner. 2010. Verification, Validation, and Testing of Engineered Systems. Wiley Publisher. Roache, Patrick J. 2009. Fundamentals of Verification and Validation. Oberkampf, William L., Roy, Christopher J. 2010. Verification and Validation in Scientific Computing. Cambridge University Press. Stoker, Edward. 2014. Verification, Validation and Testing: Theory and Practice.	
	Supporters:	
Supporting lecturer	Dwi Fatrianto Suyatno, S.Kom., M.Kom. 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	Students can understand theory and be able to practice the testing process in software engineering, and understand the benefits of testing activities	Students will get: 1. An explanation of the material that will be studied during one semester 2. An explanation of the references used 3. An explanation of the lecture rules Students will be able to: 4. Students will be able to give examples of simple tests		3 X 50			0%
2	Students understand the basic concepts of data, information and knowledge	1. After attending this lecture, students will be able to explain the definitions of testing and quality 2. Objectives of Software Testing 3. concepts and basics of testing		3 X 50			0%
3	Students can mention the Software Life cycle and Software Testing life cycle	After attending this lecture, students will be able to: 1. explain the software life cycle 2. software testing cycle		3 X 50			0%
4	Students understand software testing methods	After attending this course, students will be able to: 1. Students can explain testing techniques, explain black box and white box testing methods 3. Students can give examples of making test cases i		3 X 50			0%
5	Students understand software testing methods	After attending this course, students will be able to: 1. explain the white box testing method2. explain the creation of a test flowgraph3. provide examples of test cases		3 X 50			0%
6	Students can explain software quality assurance techniques1. Explain quality assurance techniques 2. Explains the inspection process, walkthrough, code review	After attending this lecture, students will be able to explain and differentiate the quality of software		3 X 50			0%

7				3 X 50			0%
8	Students can explain the testing process	After attending this lecture, students can explain the software testing process		3 X 50			0%
9	Students can explain the test results	Students can explain the results of software testing based on the activities they have carried out		3 X 50			0%
10	Students can explain and create software testing documentation	Students can create software testing documentation		3 X 50			0%
11	Students understand the concept of Implementation	Students can explain functional test activities, data conversion, cut over systems and plan user training		3 X 50			0%
12	Students understand the concept of maintenance	Students can explain activities at the maintenance stage		3 X 50			0%
13	Students understand the concept of maintenance	Students can explain activities at the maintenance stage		3 X 50			0%
14				Review, Practice and Questions 3 X 50			0%
15				3 X 50			0%
16							0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
		0%

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.