



**Universitas Negeri Surabaya
Faculty of Engineering,
Electrical Engineering Masters Study Program**

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date										
Modeling and Simulation	2010102008		T=2	P=0	ECTS=4.48	1	July 17, 2024										
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator											
			Unit Three Kartini, S.T., M.T., Ph.D.											
Learning model	Case Studies																
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																
	Program Objectives (PO)																
	PLO-PO Matrix																
		P.O															
	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 modeling and simulation course equips students to know the concepts, principles and stages as well as implementation in modeling and simulation. Various models and methods will also be discussed, including the Monte Carlo method, Genetic Algorithm and models for generating random numbers. It is hoped that several case studies given in this course will provide a more realistic picture in carrying out the modeling and simulation stages																
References	Main :																
	1. Law, A. M. and W. D. Kelton, "Simulation Modeling and Analysis," 5th ed., McGraw-Hill, Boston, 2020 Christopher A. Chung, "Simulation Modeling Handbook A Practical Approach," CRC Press, 2010																
	Supporters:																
Supporting lecturer	Unit Three Kartini, S.T., M.T., Ph.D.																
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	1. Able to explain the basic meaning of modeling.2. Able to explain the basic meaning of simulation.	1. Accurate explanation of modeling accompanied by application examples.2. Accurate explanation of modeling accompanied by application examples.	Criteria: 1.Student Final Grade: 2.Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10	Lectures and discussions, SelfDirected Learning(2 x 50) 2 X 50			0%										

2	<p>- Able to explain the meaning of type and modeling process. - Able to explain the meaning of type and simulation process.</p>	<p>1. Accurate explanation of the type and modeling process accompanied by application examples 2. Accurate explanation of the type and simulation process accompanied by application examples</p>	<p>Criteria: 1.The assessment criteria are carried out by looking at aspects: 2.1. Participation: carried out by observing student activities (weight 2) 3.2. UTS: carried out with an assessment during the middle of the semester (weight 2) 4.3. UAS: carried out every semester to measure all indicators (weight 3) 5.4. Task: carried out on each indicator (weight 3) 6.Student Final Grade: 7.Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10.</p>	<p>Lectures and discussions, SelfDirected Learning(2 x 50) 2 X 50</p>			0%
3	<p>-Able to solve problems by modeling for implementation in Matlab. -Able to use simulation methods in Matlab for problems in the field of electrical engineering</p>	<p>1. Accuracy of modeling to the problem.2. The accuracy of simulation methods in Matlab applications in the field of electrical engineering</p>	<p>Criteria: 1.The assessment criteria are carried out by looking at aspects: 2.1. Participation: carried out by observing student activities 3.2. UTS: carried out with an assessment during the middle of the semester (weight 2) 4.3. UAS: carried out every semester to measure all indicators (weight 3) 5.4. Task: carried out on each indicator (weight 3) 6.Student Final Grade: 7.Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10.</p>	<p>Lectures and discussions, presentations, Project Based Learning 2 X 50</p>			0%

4	Able to carry out input data sets. Able to carry out analysis of input data sets	1. Accuracy of collecting input data.2. Accuracy of analysis of input data sets.	Criteria: 1.. The assessment criteria are carried out by looking at aspects: 2.1. Participation: carried out by observing student activities 3.2. UTS: carried out with an assessment during the middle of the semester (weight 2) 4.3. UAS: carried out every semester to measure all indicators (weight 3) 5.4. Task: carried out on each indicator (weight 3) 6.Student Final Grade: 7.Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10	Lectures and discussions presentations 2 X 50		0%
5	Able to explain linear congruential generators. Able to explain other types of generators. Able to test random number generators	1. Accuracy of explaining the linear congruential generator problem.2. Accuracy describes problems with other types of generators3. Accuracy of testing random number generators	Criteria: 1.The assessment criteria are carried out by looking at aspects: 2.1. Participation: carried out by observing student activities 3.2. UTS: carried out with an assessment during the middle of the semester (weight 2) 3. UAS: carried out every semester to measure all indicators (weight 3) 4.4. Task: carried out on each indicator (weight 3) 5.Student Final Grade: 6.Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10.	Lectures and discussions, 2 X 50 presentations		0%

6	-Able to explain generating random variables	Accuracy of modeling generating random variables (generating random variables, continuous random variables, discrete random variables, random processes and arrival processes)	Criteria: 1.1. UTS: carried out with an assessment during the middle of the semester (weight 2) 2.2. UAS: carried out every semester to measure all indicators (weight 3) 3.3. Task: carried out on each indicator (weight 3) 4. Student Final Grade: 5. Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10. The assessment criteria are carried out by looking at the following aspects: 6. Participation: carried out by observing student activities	Lectures and discussions, 2 X 50 presentations			0%
7	-Able to explain generating random variables	Accuracy of modeling generating random variables (generating random variables, continuous random variables, discrete random variables, random processes and arrival processes)	Criteria: 1.1. UTS: carried out with an assessment during the middle of the semester (weight 2) 2.2. UAS: carried out every semester to measure all indicators (weight 3) 3.3. Task: carried out on each indicator (weight 3) 4. Student Final Grade: 5. Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10. The assessment criteria are carried out by looking at the following aspects: 6. Participation: carried out by observing student activities	Lectures and discussions, 2 X 50 presentations			0%
8	Midterm exam	Understanding of material during meetings 1 to 7		2 X 50			0%
9							0%
10							0%
11							0%

12							0%
13							0%
14							0%
15							0%
16							0%

Evaluation Percentage Recap: Case Study

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** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities 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.**