	Universitas Negeri Surabaya Faculty of Engineering, Undergraduate Study Program in Informatics Engineering	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Computational Science	5520203132		T=3	P=0	ECTS=4.77	3	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Aditya Prapanca, S.T., M.Kom.

Learning model	**Case Studies**	
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**	
	Program Objectives (PO)	
	PO - 1	Students are able to write basic commands (functions) in Matlab.
	PO - 2	Students are able to create programs in Matlab
	PO - 3	Students are able to understand computing time and error analysis
	PO - 4	Students understand the material on fixed point and wavelet iteration and are able to apply it in Matlab
	PLO-PO Matrix	

P.O
PO-1
PO-2
PO-3
PO-4

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																

Short Course Description	In this course, students are trained to be able to write basic commands (functions), programs in Matlab, understand computing time and analyze errors in a problem as well as understand fixed point iteration, wavelets and be able to apply them in Matlab. Apart from that, you also do practice questions with precision and accuracy. As home practice, students are given assignments both independently and in groups. The assessments taken include grades from activity in class, assignments both individually and in groups, quizzes, mid-semester exams and final semester exams.	
References	**Main :**	

1. Sianipar, RH. 2018. “Komputasi untuk Sains & Teknik dengan Matlab”. Penerbit ANDI. Yogyakarta
2. Sutrisno, I. 2009. “Pemrograman Komputer dengan Software MATLAB Disertai Contoh dan Aplikasi Skripsi & Thesis”. ITS Press. Surabaya.

Supporters:	

Supporting lecturer	Prof. Dr. I Gusti Putu Asto Buditjahjanto, S.T., M.T. Dr. Yuni Yamasari, S.Kom., M.Kom. Dr. Ricky Eka Putra, 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	Able to understand general computer science material and assessment provisions during lectures	Students are enthusiastic about carrying out computer science lectures.	**Criteria:** presence **Form of Assessment** : Participatory Activities	lectures and discussions 60			4%
2	Able to write basic commands (functions) in the Matlab programming language.	Accuracy in writing basic commands (functions) in the Matlab programming language.	**Criteria:** Activities and tasks: Provide practice questions regarding basic commands (functions) in the Matlab programming language **Form of Assessment** : Participatory Activities, Portfolio Assessment	presentation of concepts, practice questions and discussions			3%
3			**Criteria:** Activities and tasks: Provide practice questions regarding programs using the Matlab application.	presentation of concepts, practice questions and discussions			4%
4	Able to display two-dimensional and three-dimensional graphs of a function using the Matlab application.	Accuracy in displaying two-dimensional and three-dimensional graphs of a function using the Matlab application.	**Criteria:** Activities and tasks: Provide practice questions about two-dimensional and three-dimensional graphs of a function using the Matlab application. **Form of Assessment** : Portfolio Assessment	presentation of concepts, practice questions and discussions			3%
5	Able to display two-dimensional and three-dimensional graphs of a function using the Matlab application.	Accuracy in displaying two-dimensional and three-dimensional graphs of a function using the Matlab application.	**Criteria:** Activities and tasks: Provide practice questions about two-dimensional and three-dimensional graphs of a function using the Matlab application. **Form of Assessment** : Portfolio Assessment	presentation of concepts, practice questions and discussions			4%
6	Able to create programs to sort numbers from large to small and from small to large and so on.	Accuracy in making programs to sort numbers from large to small and from small to large and so on.	**Criteria:** Activities and tasks: Provide practice questions about the program for sorting numbers from large to small and from small to large and so on.	presentation of concepts, practice questions and discussions			3%

7	Able to understand beta and gamma functions and can apply them to Matlab applications.	Accuracy in making programs regarding beta and gamma functions in Matlab applications	**Criteria:** Activities and tasks: Provide practice questions about programs regarding beta and gamma functions in Matlab applications **Form of Assessment** : Portfolio Assessment	presentation of concepts, practice questions and discussions			4%
8	Midterm exam		**Form of Assessment** : Test				20%
9	Able to analyze error values in a problem.	Accuracy in finding error values in a problem	**Criteria:** Providing practice questions about the program regarding finding error values in a problem. **Form of Assessment** : Portfolio Assessment	presentation of concepts, practice questions, and discussions			4%
10	Able to calculate the computing time of an algorithm.	Accuracy in calculating the computing time of an algorithm.	**Criteria:** Activities and tasks: Provide practice questions about calculating the computing time of an algorithm. **Form of Assessment** : Portfolio Assessment	presentation of concepts, practice questions, and discussions			3%
11	Able to understand fixed point iteration material	Accuracy in working on problems regarding fixed point iteration	**Criteria:** Activities and tasks: Provide practice questions regarding fixed point iteration **Form of Assessment** : Project Results Assessment / Product Assessment, Portfolio Assessment	presentation of concepts, practice questions, and discussions			4%
12	Able to understand fixed point iteration material	Accuracy in working on problems regarding fixed point iteration	**Criteria:** Activities and tasks: Provide practice questions regarding fixed point iteration **Form of Assessment** : Project Results Assessment / Product Assessment, Portfolio Assessment	presentation of concepts, practice questions, and discussions			3%
13	Able to apply the fixed point iteration method in Matlab.	Accuracy in creating fixed point iteration method programs in Matlab	**Criteria:** Activities and tasks: Provide practice questions regarding the fixed point iteration method program in Matlab **Form of Assessment** : Portfolio Assessment				4%

14	Able to understand wavelet material.	Accuracy in working on questions about wavelets.	**Criteria:** Activities and tasks: Provide practice questions about wavelets. **Form of Assessment** : Portfolio Assessment	presentation of concepts, practice questions, and discussions			3%
15	Able to apply the wavelet method in Matlab applications.	Accuracy in making programs using the wavelet method in the Matlab application	**Criteria:** Activities and tasks: Provide practice questions regarding programs using the wavelet method in the Matlab application. **Form of Assessment** : Portfolio Assessment				4%
16	Final exams						0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	5.5%
2.	Project Results Assessment / Product Assessment	3.5%
3.	Portfolio Assessment	34%
4.	Test	20%
		63%

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.