	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
Internet of Things		5520203139		T=3	P=0	ECTS=4.77	7	July 18, 2024
AUTHORIZATION		SP Developer		Course Cluster Coordinator			Study Program Coordinator	
		....		....			Aditya Prapanca, S.T., M.Kom.	

Learning model	Project Based Learning

Program Learning Outcomes (PLO)	PLO study program that is charged to the course	
	PLO-6	Able to analyze, design, build and evaluate user interfaces and interactive applications based on user needs and transdisciplinary scientific developments (COM-01)
	Program Objectives (PO)	
	PO - 1	Understand the state-of-the-art of IoT, IoT applications, IoT architecture, and technologies that lead to current challenges
	PLO-PO Matrix	

P.O	PLO-6
PO-1	

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																

Short Course Description	This course discusses History, IoT Architecture, Resource Management, IoT Data Management and Analytics, Communication Protocols, Internet of Things Application, Security, Identity Management and Authentication, Privacy, Standardization and Regulatory Limitations

References	Main :	
	1. Buyya Rajkumar, Dastjerdi Amir Vahid, 2016, Internet of Things – Principles and Paradigms, Cambridge: Morgan Kaufmann 2. Tjahyaningtijas, Ahmad, Baskoro, Agung, 2022. INOVASI PROGRAM SMK PUSAT KEUNGGULAN: PEMANFAATAN TRAINER PLC-HMI BERBASIS PEMBELAJARAN PROYEK UNTUK MENINGKATKAN KOMPETENSI SISWA SMKN 7 SURABAYA	
	Supporters:	

Supporting lecturer	Agus Prihanto, S.T., 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 mention the concept of ecosystem and IoT architecture	Able to explain open source semantic web infrastructure for managing IoT resources in the cloud	**Criteria:** 1.presentation 2.respond **Form of Assessment** : Participatory Activities	-Each meeting requires 1 group to present -duration 15 minutes		**Material:** Evolution of the Definition of the Internet of Things **Literature:** **Material:** IoT Architecture **Library:** **Material:** Library Resource Management **:** **Material:** Library Data Management **:** **Material:** Communication Protocol **Library:**	10%
2	Students can mention the concept of ecosystem and IoT architecture	Able to explain open source semantic web infrastructure for managing IoT resources in the cloud	**Criteria:** 1.presentation 2.respond **Form of Assessment** : Participatory Activities	-Each meeting requires 1 group to present -duration 15 minutes		**Material:** Evolution of the Definition of the Internet of Things **Literature:** **Material:** IoT Architecture **Library:** **Material:** Library Resource Management **:** **Material:** Library Data Management **:** **Material:** Communication Protocol **Library:**	8%
3	Students can mention the concept of ecosystem and IoT architecture	Able to explain the device/cloud collaboration framework for Intelligence Applications	**Criteria:** quizzes	lectures, discussions, practice questions			4%
4	Students can mention the concept of ecosystem and IoT architecture	Able to explain Fog Computing: Principles, Architecture and Applications	**Criteria:** 1.presentation 2.respond	lectures, discussions, practice questions			4%
5	Students can name various forms of IoT solutions and enablers	Able to explain Virtualization on Embedded Boards as Enabling Technology for Cloud of Things	**Criteria:** 1.presentation 2.respond **Form of Assessment** : Participatory Activities	lecture discussion practice questions			8%
6	Students can name various forms of IoT solutions and enablers	Able to explain Virtualization on Embedded Boards as Enabling Technology for Cloud of Things	**Criteria:** 1.presentation 2.respond **Form of Assessment** : Participatory Activities	lecture discussion practice questions			8%

No	Learning outcome	Indicator	Assessment	Learning methods			Weight
7	Students can name various forms of IoT solutions and enablers	able to explain micro virtual machines (micro Vms) for cloud assisted cyber physical systems (CPS)	**Criteria:** 1.presentation 2.respond **Form of Assessment** : Participatory Activities	lecture discussion practice questions			8%
8	Midterm exam						0%
9	Students know the theory about Knowledge and Data Management in IoT	Able to explain Stream Processing in IoT: Foundations, State-of-the-Art, and future directions	**Criteria:** 1.presentation 2.respond	lectures, discussions, practice questions 3x50			10%
10	Students know the theory about Knowledge and Data Management in IoT	Able to explain the Framework for Distributed Data Analysis in IoT	**Criteria:** 1.presentation 2.respond	lectures, discussions, practice questions 3x50			8%
11	Students know Reliability, Security, and Privacy in IoT	Able to explain Security and Privacy in IoT		lectures, discussions, practice questions			0%
12	Students know Reliability, Security, and Privacy in IoT	Able to explain Security and Privacy in IoT		lectures, discussions, practice questions			0%
13	Students know Reliability, Security, and Privacy in IoT	Able to explain Governing Internet of Things: Issues, Approaches and New Paradigms	**Criteria:** 1.presentation 2.respond 3.task **Form of Assessment** : Participatory Activities	lectures, discussions, practice questions			0%
14	Students know Reliability, Security, and Privacy in IoT	Able to explain about TinyTO: Two-Way Authentication for Primary Devices in IoT	**Criteria:** 1.presentation 2.respond 3.task **Form of Assessment** : Participatory Activities	lectures, discussions, practice questions			0%
15	Students know Reliability, Security, and Privacy in IoT	Able to explain about TinyTO: Two-Way Authentication for Primary Devices in IoT	**Criteria:** 1.presentation 2.respond 3.task **Form of Assessment** : Participatory Activities	lectures, discussions, practice questions			0%
16	Final exams						0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	42%
		42%

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.