



**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
Internet of Things (IoT)	2010102033		T=2 P=0 ECTS=4.48	3	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Prof. Dr. I.G.P. Asto Buditjahjanto, S.T.,M.T.	Unit Three Kartini, S.T., M.T., Ph.D.

Learning model	Case Studies
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Program Learning Outcomes (PLO)	PLO study program that is charged to the course						
	Program Objectives (PO)						
PO - 1	Students provide a comprehensive understanding of the concepts, technologies, and applications of digitally connected environments.						
PO - 2	Students are able to explain how physical devices, sensors, and software interact with each other over a network to collect, transmit, and analyze data in real-time.						
PO - 3	Students are able to explain the basic concepts of IoT, the general architecture that supports device connections, and the potential revolution brought by the Internet of Things						
PO - 4	Students are able to analyze how connected devices, sensors and systems can be used to improve efficiency, comfort and quality of life.						
	PLO-PO Matrix						
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>P.O</td></tr> <tr><td>PO-1</td></tr> <tr><td>PO-2</td></tr> <tr><td>PO-3</td></tr> <tr><td>PO-4</td></tr> </table>		P.O	PO-1	PO-2	PO-3	PO-4
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PO-1							
PO-2							
PO-3							
PO-4							

PO Matrix at the end of each learning stage (Sub-PO)																																																																																																						
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Short Course Description	- Provides a comprehensive understanding of the concepts, technologies and applications of digitally connected environments. - Learn how physical devices, sensors, and software interact with each other over networks to collect, transmit, and analyze data in real-time. - Discusses the basic concepts of IoT, the general architecture that supports device connections, and the potential revolution brought by the Internet of Things. - Explains how connected devices, sensors, and systems can be used to improve efficiency, comfort, and quality of life. - Discusses security, privacy, and ethical issues related to the use of IoT technology.
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References	<p>Main :</p> <ol style="list-style-type: none"> MySQL for the Internet of Things, Charles Bell, Apress, 2016 <p>Supporters:</p> <ol style="list-style-type: none"> The Internet of Things and Big Data Analytics Integrated Platforms and Industry Use Cases, Pethuru Raj, T. Poongodi, Balamurugan Balusamy, and Manju Khari, CRC Press, 2020 Internet of Things and Big Data Technologies for Next Generation Healthcare, Chintan Bhatt, Nilanjan Dey, Amira S. Ashour, Springer, 2017
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Supporting lecturer		Prof. Dr. I Gusti Putu Asto Buditjahjanto, S.T., M.T.					
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 are able to explain The Internet of Things and Data	explains The Internet of Things and Data	Form of Assessment : Participatory Activities, Tests	Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: The Internet of Things and Data: IOT Solutions Library: MySQL for the Internet of Things, Charles Bell, Apress, 2016	4%
2	Hardware for IoT Solutions	Able to analyze and present Hardware for IoT Solutions	Form of Assessment : Participatory Activities, Practice/Performance	Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: Hardware for IOT Solutions: Microcontrollers Library: MySQL for the Internet of Things, Charles Bell, Apress, 2016	4%
3	Hardware for IoT Solutions	Able to analyze and present Hardware for IoT Solutions	Criteria: 4 Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Practical Assessment, Practical / Performance	Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: Hardware for IOT Solutions: Low-Powered Computing Platforms Reference: MySQL for the Internet of Things, Charles Bell, Apress, 2016	5%
4	Able to analyze and present How IoT Data Is Stored	Able to analyze and present How IoT Data Is Stored	Form of Assessment : Practice/Performance, Test	• Presenting Material, Question and Answer and Discussion 2x 50"	• Presenting Material, Question and Answer and Discussion 2x 50"	Material: How IOT Data Is Stored: Distributed IOT Library: MySQL for the Internet of Things, Charles Bell, Apress, 2016	4%
5	Able to analyze and present Data Transformation	Students are able to analyze and present Data Transformation	Forms of Assessment : Participatory Activities, Portfolio Assessment, Practice / Performance	Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: Data Transformation: Making Sense of IOT Data Library: MySQL for the Internet of Things, Charles Bell, Apress, 2016	4%
6	Able to analyze and present Data Transformation	Students are able to analyze and present Data Transformation	Forms of Assessment : Participatory Activities, Portfolio Assessment, Practical Assessment, Tests	Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: Data Transformation: Annotation & Aggregation Library: MySQL for the Internet of Things, Charles Bell, Apress, 2016	4%
7	Able to analyze and present MySQL Primer Getting Started	Students are able to analyze and present MySQL Primer Getting Started	Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Practices / Performance	Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: MySQL Primer: Getting Started & How Data Is Stored and Retrieved Reference: MySQL for the Internet of Things, Charles Bell, Apress, 2016	4%

8	UTS		Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Project Based Testing 2x 50"	Project Based Testing 2x 50"	Material: UTS Reader: <i>MySQL for the Internet of Things, Charles Bell, Apress, 2016</i> Material: UTS Library: <i>The Internet of Things and Big Data Analytics Integrated Platforms and Industry Use Cases, Pethuru Raj, T. Poongodi, Balamurugan Balusamy, and Manju Khari, CRC Press, 2020</i> Material: UTS Library: <i>Internet of Things and Big Data Technologies for Next Generation Healthcare, Chintan Bhatt, Nilanjan Dey, Amira S. Ashour, Springer, 2017</i>	20%
9	Able to analyze and present MySQL Primer	Students are able to analyze and present MySQL Primer		Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: MySQL Primer: Common MySQL Commands and Concepts & Planning Database Storage for IOT Data Library: <i>MySQL for the Internet of Things, Charles Bell, Apress, 2016</i>	4%
10	Able to analyze and present Building Low-Cost MySQL Data Nodes	Students are able to analyze and present Building Low- Cost MySQL Data Nodes	Form of Assessment : Participatory Activities	Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: Building Low-Cost MySQL Data Nodes: Introducing the Raspberry Pi, Raspberry Pi Tutorial & MySQL Installation and Setup Library: <i>MySQL for the Internet of Things, Charles Bell, Apress, 2016</i>	4%
11	Able to analyze and present Building Low-Cost MySQL Data Nodes	Students are able to analyze and present Building Low- Cost MySQL Data Nodes	Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: Building Low-Cost MySQL Data Nodes: Other Platforms, MySQL Clients: How to Connect and Save Data Introducing Connector/Arduino Reference: <i>MySQL for the Internet of Things, Charles Bell, Apress, 2016</i>	4%
12	Able to analyze and present High Availability IoT Solutions	Students are able to analyze and present High Availability IoT Solutions	Form of Assessment : Participatory Activities	Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: High Availability IOT Solutions: What Is High Availability?, High Availability Options for IOT Solutions with MySQL Reference: <i>MySQL for the Internet of Things, Charles Bell, Apress, 2016</i>	4%

13	Able to analyze and present High Availability IoT Solutions	Students are able to analyze and present High Availability IoT Solutions		Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: High Availability IOT Solutions: High Availability Techniques Library: MySQL for the Internet of Things, Charles Bell, Apress, 2016	4%
14	Able to explain and Demonstration of High Availability Techniques	Students are able to explain and demonstrate High Availability Techniques	Form of Assessment : Participatory Activities	Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"		4%
15	Able to analyze and present a Demonstration of High Availability Techniques	Students are able to analyze and present a Demonstration of High Availability Techniques	Form of Assessment : Participatory Activities	Presenting Material, Question and Answer and Discussion 2x 50"	Presenting Material, Question and Answer and Discussion 2x 50"	Material: Demonstration of High Availability Techniques: High Availability IOT Nodes Library: MySQL for the Internet of Things, Charles Bell, Apress, 2016	4%
16			Form of Assessment : Participatory Activities	2x 50" UAS	2x 50" UAS	Material: UAS Library: MySQL for the Internet of Things, Charles Bell, Apress, 2016 Material: UAS Library: The Internet of Things and Big Data Analytics Integrated Platforms and Industry Use Cases, Pethuru Raj, T. Poongodi, Balamurugan Balusamy, and Manju Khari, CRC Press, 2020 Material: UAS Library: Internet of Things and Big Data Technologies for Next Generation Healthcare, Chintan Bhatt, Nilanjan Dey, Amira S. Ashour, Springer, 2017	23%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	59.91%
2.	Project Results Assessment / Product Assessment	14.58%
3.	Portfolio Assessment	2.33%
4.	Practical Assessment	2.25%
5.	Practice / Performance	7.91%
6.	Test	5%
		91.98%

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.