	Universitas Negeri Surabaya **Faculty of Social and Legal Sciences** **Geography Education Masters Study Program**		**Document Code**

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Geographic Information Science Concepts and Technology	8710202032	Compulsory Study Program Subjects	**T=2**	**P=0**	**ECTS=4.48**	1	July 18, 2024

AUTHORIZATION	**SP Developer**	**Course Cluster Coordinator**	**Study Program Coordinator**
	Dr. Eko Budiyanto, M.Si	....	Dr. Sukma Perdana Prasetya, S.Pd., M.T.

Learning model	**Project Based Learning**

Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**
	PLO-9 — Mastering the dynamics of regional problems based on the concepts and approaches of geographic science to solve problems of structuring regional potential using geographic technology
	Program Objectives (PO)
	PLO-PO Matrix

P.O	PLO-9

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 lecture develops students' knowledge of SAIG concepts and technology. The lecture explains the concepts and technology applied to SAIG, modeling concepts, spatial analysis, spatial statistics, spatial information systems, webgis, and the development of environmental detection devices based on microcontrollers, sensors, and IoT. Students who have taken this course are expected to be able to develop applicable concepts and technology in the SAIG field.

References	**Main :**	
	Supporters:	

Supporting lecturer	Dr. Eko Budiyanto, S.Pd., M.Si.

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 develop basic concepts of SAIG (Able to develop basic concepts of GISc)	1.Explain the basic concepts of SAIG (Explain the basic concepts of GISc) 2.Describe the latest SAIG concepts (Describe the latest GISc concepts)	**Form of Assessment** : Participatory Activities				5%
2	Get to know the technology in SAIG (Get to know the technology in GISc)	1.Get to know the technology in SAIG (Get to know the technology in GISc) 2.Understand the characteristics of technology for SAIG applications (Understand the characteristics of technology for GISc applications)	**Form of Assessment** : Participatory Activities, Tests				5%
3	Able to develop spatial modeling (Able to develop spatial modeling)	1.Outlining spatial modeling theory (Outlining spatial modeling theory) 2.Practicing spatial model development (Practice spatial model development)	**Criteria:** 30 **Form of Assessment** : Portfolio Assessment, Test				5%
4	Able to understand and develop digital spatial processing methods (Able to understand and develop digital spatial processing methods)	1.Elaborating the concept of digital spatial data processing 2.Applying digital spatial data processing techniques (Applying digital spatial data processing techniques)	**Form of Assessment** : Participatory Activities, Tests				5%
5	Able to understand and apply the concept of spatial analysis (Able to understand and apply the concept of spatial analysis)	1.Deciphering the concept of spatial analysis (Deciphering the concept of spatial analysis) 2.Apply one concept of spatial analysis (Apply one concept of spatial analysis)	**Form of Assessment** : Participatory Activities, Tests				5%

6	Able to understand the concept of morphological analysis (Able to understand the concept of morphological analysis)	1.Explain the concept of morphological analysis (Explain the concept of morphological analysis) 2.Applying morphological analysis techniques (Apply morphological analysis techniques)	**Form of Assessment** : Participatory Activities, Portfolio Assessment				5%
7	Able to understand spatial statistical methods (Able to understand spatial statistical methods)	1.Explain spatial statistical methods (Describe spatial statistical methods) 2.Applying spatial statistical techniques (Apply spatial statistical techniques)	**Form of Assessment** : Participatory Activities, Portfolio Assessment				5%
8	UTS		**Form of Assessment** : Test				5%
9	Able to develop spatial databases (Able to develop spatial databases)	1.Explain database concepts (Explain database concepts) 2.Developing spatial database systems (Developing spatial database systems)	**Form of Assessment** : Project Results Assessment / Product Assessment				5%
10	Able to develop WebGIS-based information systems (Able to develop WebGIS-based information systems)	1.Explain the concept of WebGIS-based Information Systems (Explain the concept of WebGIS-based Information Systems) 2.Understand spatial programming techniques for WebGIS development (Understand spatial programming techniques for WebGIS development)	**Form of Assessment** : Project Results Assessment / Product Assessment				5%

No							
11	Able to understand the Basic Microcontrollers and Sensors for Environmental Detection Devices	1. Explain the basics of microcontrollers and sensors (Explain the basics of microcontrollers and sensors) 2. Understand digital sensor data acquisition and processing techniques (Understand digital sensor data acquisition and processing techniques)	**Form of Assessment** : Assessment of Project Results / Product Assessment, Practices / Performance				5%
12	Able to understand the concept of Internet of Thinks (Internet of Thinks)	1. Explain IoT concepts (Explain IoT concepts) 2. Develop IoT models for digital spatial applications (Develop IoT models for digital spatial applications)	**Forms of Assessment** : Project Results Assessment / Product Assessment, Practical Assessment				5%
13	Development of Spatial Information System and Web GIS Tools (Development of Spatial Information System and Web GIS Tools)	1. Developing GIS Web-Based Geographic Information System devices (Developing GIS Web-Based Geographic Information System devices) 2. Case Studies (Case Studies)	**Form of Assessment** : Project Results Assessment / Product Assessment				10%
14		1. Develop microcontroller and sensor-based environmental detection devices (Develop microcontroller and sensor-based environmental detection devices) 2. Case Studies (Case Studies)	**Criteria:** 5 **Form of Assessment** : Assessment of Project Results / Product Assessment, Practices / Performance				10%
15	Development of IoT-based Realtime Applicative Devices	1. Develop IoT-based real-time applicative devices (Develop IoT-based real-time applicative devices) 2. Case Studies (Case Studies)	**Form of Assessment** : Project Results Assessment / Product Assessment				10%
16			**Form of Assessment** : Project Results Assessment / Product Assessment				10%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	17.5%
2.	Project Results Assessment / Product Assessment	50%
3.	Portfolio Assessment	7.5%
4.	Practical Assessment	2.5%
5.	Practice / Performance	7.5%
6.	Test	15%
		100%

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.