



Universitas Negeri Surabaya
Faculty of Social and Legal Sciences
Geography Education Undergraduate Study Program

Document
Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Land Surveying	8720202076	Engineering Geography	T=2	P=0	ECTS=3.18	2	July 17, 2024
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator	
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Learning model Project Based Learning

Program Learning Outcomes (PLO) PLO study program that is charged to the course

PLO-8 Able to obtain, process, analyze, present geosphere data and information using geospatial technology in integrated geographic studies with in-depth urban studies that support regional sustainability

Program Objectives (PO)

PO - 1 Demonstrate a responsible attitude for planning, measuring, calculating and plotting measurement results

PO - 2 Able to demonstrate independent and collaborative performance that produces quality maps

PO - 3 Able to apply mapping theory in sustainable regional planning and development

PO - 4 Able to process, analyze, present data and information on areas mapped using a theodolite for geographical learning and research

PLO-PO Matrix

P.O	PLO-8
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 Land Surveying is a course that implements mapping theory (basic understanding of Land Surveying, coordinate systems, positioning, polygon measurement methods, tachimetric method measurements, drawing topographic maps and determining area areas). Assessment is carried out by performance, written tests and portfolios.

- References** **Main :**
1. Heinz, Frick. 1989. Ilmu dan alat ukur tanah. Yogyakarta : Kanisius
 2. Basuki, Slamet. 2006. Ilmu Ukur Tanah. Yogyakarta: Universitas Gadjah Mada Press
 3. Abidin Hasanuddin Z., 2008. Penentuan posisi dengan GPS dan aplikasinya. Jakarta : Pradnya Paramita
 4. Suyono Sastrodarsono, Masayosi Takasahi. 1997. Pengukuran topografi dan teknik pemetaan. Jakarta: Pradnya Paramita.
 5. Muzayanah, Eko. 2020. Buku Ajar Ilmu Ukur Tanah. Unesa Press

Supporters:

	<p>1. Abidin Hasanuddin Z., 2002. Survei dengan GPS. Jakarta : Pradnya Paramita 6. 2. Muzayanah, Eko. 2021. Petunjuk Praktikum Ukur Tanah.</p>						
Supporting lecturer	<p>Dr. Muzayanah, S.T., M.T. Dr. Eko Budiyanto, S.Pd., M.Si. Putu Wirabumi, S.Si., M.Sc.</p>						
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 implement Land Measurement concepts in preparing mapping plans (coordinate systems, types of surveys and maps)	Explain the concept of land measuring	Criteria: description rubric Form of Assessment : Participatory Activities	Cooperative Learning 2 X 50		Material: definition of Land Surveying Literature: <i>Basuki, Slamet. 2006. Land Surveying. Yogyakarta: Gadjah Mada University Press</i> Material: Definition of Land Surveying References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisiu</i>	5%
2	Able to analyze the horizontal position of measurement data	1. Understanding azimuth 2. Able to analyze flat distances 3. Able to analyze the coordinates of the aiming point	Criteria: performance rubric Form of Assessment : Project Results Assessment / Product Assessment	Project Base Learning 2 X 50		Material: understanding azimuth Reader: <i>Basuki, Slamet. 2006. Land Surveying. Yogyakarta: Gadjah Mada University Press</i> Material: analyzing flat distances and new coordinates References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisiu</i>	5%

3	Able to analyze the horizontal position of measurement data	<ol style="list-style-type: none"> 1. Understanding azimuth 2. Able to analyze flat distances 3. Able to analyze the coordinates of the aiming point 	<p>Criteria: performance rubric</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Project Base Learning 2 X 50		<p>Material: definition of azimuth Reader: <i>Basuki, Slamet. 2006. Land Surveying. Yogyakarta: Gadjah Mada University Press</i></p> <hr/> <p>Material: calculating flat distances and coordinates of new points References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisiu</i></p>	5%
4	Able to operate a theodolite, read measuring tanks, calculate distances and analyze aiming point coordinates	<ol style="list-style-type: none"> 1. Theodolite setting 2. Sets initial coordinates 3. Read the measuring tank 4. Analyze distance from measurement data 5. Analyze the coordinates of the aiming point from the measurement data 	<p>Criteria: performance rubric</p> <p>Form of Assessment : Assessment of Project Results / Product Assessment, Practices / Performance</p>	Project Base Learning 2 X 50		<p>Material: using GPS to determine the coordinates of point 0. Reference: <i>Abidin Hasanuddin Z., 2008. Determining position using GPS and its applications. Jakarta : Pradnya Paramita</i></p> <hr/> <p>Material: theodolite setting Reference: <i>Muzayanah, Eko. 2020. Textbook of Soil Surveying. Unesa Press</i></p> <hr/> <p>Material: theodolite setting Reference: <i>Muzayanah, Eko. 2021. Land Measuring Practical Instructions.</i></p>	5%

5	Able to operate a theodolite, read measuring tanks, calculate distances and analyze aiming point coordinates	<ol style="list-style-type: none"> 1.Theodolite setting 2.Sets initial coordinates 3.Read the measuring tank 4.Analyze distance from measurement data 5.Analyze the coordinates of the aiming point from the measurement data 	<p>Criteria: performance rubric</p> <p>Form of Assessment : Assessment of Project Results / Product Assessment, Practices / Performance</p>	Project Base Learning 2 X 50		<p>Material: using GPS to determine coordinates Reference: <i>Abidin Hasanuddin Z., 2008. Determining position using GPS and its applications. Jakarta : Pradnya Paramita</i></p> <hr/> <p>Material: theodolite setting Reference: <i>Muzayanah, Eko. 2020. Textbook of Soil Surveying. Unesa Press</i></p> <hr/> <p>Material: theodolite setting Reference: <i>Muzayanah, Eko. 2021. Land Measuring Practical Instructions.</i></p>	5%
6	Able to create polygon mapping areas	<ol style="list-style-type: none"> 1.Explaining polygons 2.Prepare field surveys (plans, equipment, survey instruments) 	<p>Criteria: 5%</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Cooperative Learning Problem Base Learning 4 X 50		<p>Material: definition of polygons Reader: <i>Basuki, Slamet. 2006. Land Surveying. Yogyakarta: Gadjah Mada University Press</i></p> <hr/> <p>Material: making polygons References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisius</i></p> <hr/> <p>Material: survey preparation Bibliography: <i>Muzayanah, Eko. 2020. Textbook of Soil Surveying. Unesa Press</i></p>	5%

7	Able to create polygon mapping areas	1.Explaining polygons 2.Field survey preparation (sketch, instruments and equipment)	Criteria: performance rubric Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Practices / Performance	Cooperative Learning Problem Base Learning 4 X 50		Material: polygons References: Heinz, Frick. 1989. <i>Science and land measuring tools</i> . Yogyakarta: Kanisius Material: making polygons Reader: Basuki, Slamet. 2006. <i>Land Surveying</i> . Yogyakarta: Gadjah Mada University Press Material: survey preparation Bibliography: Muzayanah, Eko. 2020. <i>Textbook of Soil Surveying</i> . Unesa Press	5%
8	UTS	3	Criteria: able to calculate coordinates Form of Assessment : Portfolio Assessment	offline 2 X 50		Material: calculating coordinates Reader: Basuki, Slamet. 2006. <i>Land Surveying</i> . Yogyakarta: Gadjah Mada University Press	5%

9	Able to analyze height differences in the mapping area	<ol style="list-style-type: none"> 1.Explain the height difference 2.Obtaining high difference data 3.Analyze the height difference in measurement results 	<p>Criteria: performance rubric</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Project Base Learning 8 X 50		<p>Material: different heights References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisius</i></p> <hr/> <p>Material: different heights Reader: <i>Basuki, Slamet. 2006. Land Surveying. Yogyakarta: Gadjah Mada University Press</i></p> <hr/> <p>Material: calculating height differences References: <i>Muzayanah, Eko. 2020. Textbook of Soil Surveying. Unesa Press</i></p> <hr/> <p>Material: determining the elevation of point 0 Reference: <i>Abidin Hasanuddin Z., 2002. Surveying with GPS. Jakarta : Pradnya Paramita 6.</i></p>	5%
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10	Able to analyze coordinates and height differences in mapping areas	<ol style="list-style-type: none"> 1.Explain the height difference 2.Obtaining high difference data 3.Analyze the height difference in measurement results 	<p>Criteria: performance rubric</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Project Base Learning 8 X 50		<p>Material: different heights References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisius</i></p> <hr/> <p>Material: different heights Reader: <i>Basuki, Slamet. 2006. Land Surveying. Yogyakarta: Gadjah Mada University Press</i></p> <hr/> <p>Material: calculating height differences References: <i>Muzayanah, Eko. 2020. Textbook of Soil Surveying. Unesa Press</i></p> <hr/> <p>Material: finding the elevation of point 0 References: <i>Abidin Hasanuddin Z., 2002. Surveying with GPS. Jakarta : Pradnya Paramita 6.</i></p>	10%
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11	Able to analyze coordinates and height differences in mapping areas	<ol style="list-style-type: none"> 1.Explain the height difference 2.Obtaining high difference data 3.Analyze the height difference in measurement results 	<p>Criteria: performance rubric</p> <p>Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Practices / Performance</p>	Project Base Learning 8 X 50	Problem base learning (assistance with performance results)	<p>Material: different heights References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisius</i></p> <hr/> <p>Material: different heights Reader: <i>Basuki, Slamet. 2006. Land Surveying. Yogyakarta: Gadjah Mada University Press</i></p> <hr/> <p>Material: calculating height differences References: <i>Muzayanah, Eko. 2020. Textbook of Soil Surveying. Unesa Press</i></p> <hr/> <p>Material: finding the elevation of point 0 References: <i>Abidin Hasanuddin Z., 2002. Surveying with GPS. Jakarta : Pradnya Paramita 6.</i></p>	10%
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12	Able to analyze coordinates and height differences in mapping areas	<ol style="list-style-type: none"> 1.Explain the height difference 2.Obtaining high difference data 3.Analyze the height difference in measurement results 	<p>Criteria: performance rubric</p> <p>Form of Assessment : Project Results Assessment / Product Assessment, Portfolio Assessment</p>	Project Base Learning 8 X 50	Project base learning (Results assistance)	<p>Material: different heights References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisius</i></p> <hr/> <p>Material: different heights Reader: <i>Basuki, Slamet. 2006. Land Surveying. Yogyakarta: Gadjah Mada University Press</i></p> <hr/> <p>Material: calculating height differences References: <i>Muzayanah, Eko. 2020. Textbook of Soil Surveying. Unesa Press</i></p> <hr/> <p>Material: finding the elevation of point 0 References: <i>Abidin Hasanuddin Z., 2002. Surveying with GPS. Jakarta : Pradnya Paramita 6.</i></p>	10%
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13	Able to create maps of measurement results using geospatial technology	<ol style="list-style-type: none"> 1. Create topographic maps 2. Create a situation map 	<p>Criteria: performance rubric</p> <p>Form of Assessment : Participatory Activities, Practice/Performance</p>	Project Base Learning 4 X 50		<p>Material: plotting coordinates Reader: <i>Basuki, Slamet. 2006. Land Surveying. Yogyakarta: Gadjah Mada University Press</i></p> <hr/> <p>Material: coordinate plotting References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisius</i></p> <hr/> <p>Material: plotting coordinates References: <i>Suyono Sasrodarsono, Masayosi Takasahi. 1997. Topographic measurements and mapping techniques. Jakarta: Pradnya Paramita.</i></p> <hr/> <p>Material: plotting coordinates Reference: <i>Abidin Hasanuddin Z., 2002. Surveying with GPS. Jakarta : Pradnya Paramita 6.</i></p>	10%
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14	Able to create maps of measurement results using geospatial technology	<ol style="list-style-type: none"> 1. Create topographic maps 2. Create a situation map 	<p>Criteria: performance rubric</p> <p>Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Practices / Performance</p>	Project Base Learning 4 X 50		<p>Material: plotting coordinates Reader: <i>Basuki, Slamet. 2006. Land Surveying. Yogyakarta: Gadjah Mada University Press</i></p> <hr/> <p>Material: coordinate plotting References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisius</i></p> <hr/> <p>Material: plotting coordinates References: <i>Suyono Sasrodarsono, Masayosi Takasahi. 1997. Topographic measurements and mapping techniques. Jakarta: Pradnya Paramita.</i></p> <hr/> <p>Material: plotting coordinates Reference: <i>Abidin Hasanuddin Z., 2002. Surveying with GPS. Jakarta : Pradnya Paramita 6.</i></p>	10%
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15	Able to analyze the area of the mapping area	Analyze the area	<p>Criteria: performance rubric</p> <p>Form of Assessment : Project Results Assessment / Product Assessment, Portfolio Assessment</p>	Project Base Learning 4 X 50	assistance with performance results	<p>Material: plotting coordinates Reader: <i>Basuki, Slamet. 2006. Land Surveying. Yogyakarta: Gadjah Mada University Press</i></p> <p>Material: coordinate plotting References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisius</i></p> <p>Material: plotting coordinates References: <i>Suyono Sastrodarsono, Masayosi Takasahi. 1997. Topographic measurements and mapping techniques. Jakarta: Pradnya Paramita.</i></p> <p>Material: plotting coordinates Reference: <i>Abidin Hasanuddin Z., 2002. Surveying with GPS. Jakarta : Pradnya Paramita 6.</i></p>	3%
16	UAS	portfolio	<p>Criteria: portfolio</p> <p>Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment</p>	offline		<p>Material: compiling a project report References: <i>Heinz, Frick. 1989. Science and land measuring tools. Yogyakarta: Kanisius</i></p> <p>Material: portfolio Library:</p>	2%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	19%
2.	Project Results Assessment / Product Assessment	50.5%
3.	Portfolio Assessment	12.17%
4.	Practice / Performance	18.33%
		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.