	INSTITUT TEKNOLOGI SEPULUH NOPEMBER **FACULTY OF CIVIL, PLANNING AND GEO ENGINEERING** **DEPARTMENT OF GEOMATICS ENGINEERING** **UNDERGRADUATE PROGRAM**	**Document Code**

SEMESTER LEARNING PLAN (SLP)

COURSE NAME	CODE	COURSE GROUP	CREDITS		SEMESTER	Compilation Date
Earth Science	CM234102	Geodesy and Geodynamics	T=2	P=1	2	-

AUTHORIZATION	SLP DEVELOPER	COURSE GROUP COORDINATOR	HEAD OF UNDERGRADUATE PROGRAM
	Putra Maulida, S.T., M.T., Ph.D.		Putra Maulida, ST, MT, Ph.D

Learning Outcome (LO)	**Expected Learning Outcomes (ELO) that Imposed in the Course**	
	ELO-4	Able to apply mathematics, science, and engineering in the fields of geodesy, surveying, hydrography, remote sensing, photogrammetry, geographic information systems, and cadastral to gain a thorough. understanding of the principles of engineering.
	Course Learning Outcomes (CLO)	
	CLO-1	Able to understand basic general concepts of earth science: atmosphere, hydrosphere, lithosphere, and biosphere
	CLO-2	Understand the physical processes due to earth phenomena
	CLO-3	Have knowledge of social and physical geography
	CLO-4	Have knowledge about environmental natural resources and disaster

<table>
<tr><td></td><td></td><td>Matrix ELO – CLO
<table>
<tr><td>CLO</td><td>ELO-4</td></tr>
<tr><td>CLO-1</td><td>V</td></tr>
<tr><td>CLO-2</td><td>V</td></tr>
<tr><td>CLO-3</td><td>V</td></tr>
<tr><td>CLO-4</td><td>V</td></tr>
</table></td></tr>
<tr><td>Course Description</td><td colspan="2">In this course students learn about general concepts: basic concepts of Earth Sciences: atmosphere, hydrosphere, lithosphere and biosphere, basic concepts: Geodesy and Geomatics Engineering, Geophysical and Meteorological Engineering, Geological and Mineralogical Engineering, Petroleum and Mining Engineering. And Social and Physical Geography Techniques and basic concepts of Geodesy: reference ellipsoides, geometric ellipsoids, coordinate systems, Geodetic problem solving, coordinate transformation.</td></tr>
<tr><td>Course Materials</td><td colspan="2">1. Basic concepts of Earth Sciences: atmosphere, hydrosphere, lithosphere and biosphere,
2. Basic concepts: Geodesy and Geomatics Engineering, Geophysical and Meteorological Engineering, Geological and Mineralogical Engineering, Petroleum and Mining Engineering.
3. Basic concepts of Geodesy: reference ellipsoides, geometric ellipsoids, coordinate systems, problem solving Geodesy, coordinate transformation.
4. Basic concepts of Social and Physical Geography.
5. Natural resource, environmental and disaster problems.</td></tr>
<tr><td rowspan="3">References</td><td colspan="2">Main References :</td></tr>
<tr><td colspan="2">1. Bomford. Geodesy. 1975. Oxford University Press.
2. Richardus, Adler. Map Projections for Geodetic, Cartographers, Geographers. 1972. NHPC. Amsterdam.
Additional References :</td></tr>
<tr><td colspan="2">1. Kervyn, M. Kervyn, F. Goossens, R. Rowland, S. K. and Ernst. G. G. J. 2007. Mapping volcanic terrain using high-resolution and 3D satellite remote sensing. Geological Society, London, Special Publications 283: 5-30
2. Lagios, E. Vassilopoulou, S. Sakkas, V. Dietrich, V. Damiata, B.N. Ganas, A. 2007. Testing satellite and ground thermal imaging of low-temperature fumarolic fields: The dormant Nisyros Volcano (Greece). < http://www.remsenslab.geol.uoa.gr > . dikunjungi pada tanggal 21 Maret 2012, jam 13.30.
3. Turcotte, Donald, Schubert, Gerald. Geodynamics, 2001, Cambridge University Press</td></tr>
<tr><td>Lecturer</td><td colspan="2">Akbar Kurniawan, ST, MT
Putra Maulida, ST, MT, Ph.D</td></tr>
</table>

	Husnul Hidayat, ST, MT						
Prerequisite	No Prerequisite						
Class/ Week	**Lesson Learning Outcome (Sub-CLO)**	**Evaluation**		**Forms of Learning, Learning methods, Student Assignments/Task, [Estimated time]**		**Learning Materials [References]**	**Weight (%)**
		Indicator	**Criteria**	**Offline**	**Online**		
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
1	Able to explain the basic concepts of Earth Sciences: atmosphere, hydrosphere, lithosphere and biosphere,		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lecturer, Teacher-centered learning [1 x 45’]		Explain the basic concepts of Earth Sciences	5
				Lecturer, Teacher-centered learning [1 x 45’]		Explain the concept of atmosphere, hydrosphere	
				Lecturer, Teacher-centered learning [1 x 45’]		Explain the concepts of lithosphere and biosphere,	
2	Able to explain basic concepts: Geodesy and Geomatics Engineering.		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lecturer, Teacher-centered learning [1 x 45’]		Explain the Concept of Geodesy Engineering	5
				Lecturer, Teacher-centered learning [1 x 45’]		Explain about Geomatics Engineering	
				Lecturer, Teacher-centered learning [1 x 45’]		Geomatics Engineering	

				Discussion, Student-centered learning [1 x 45’]		Examples of actual case studies	
3	Able to explain basic concepts: Geodesy and Geomatics Engineering.		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lecturer, Teacher-centered learning [1 x 45’]		Explain the basic concepts of Social Geography Engineering	10
				Lecturer, Teacher-centered learning [1 x 45’]		Explain the basic concepts of Social Geography	
				Lecturer, Teacher-centered learning [1 x 45’]		Able to explain the basic concepts of the relationship of Social and Physical Geography Techniques	
				Lecturer, Teacher-centered learning [1 x 45’]		Explain problems in the field of Geography	
				Exercise and assignment, Student-centered learning [1 x 45’]			
4-5	Able to explain the basic concepts of Social Geography Engineering		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lecturer, Teacher-centered learning [2 x 45’]		Explain the basic concepts of Social Geography Engineering	10
				Lecturer, Teacher-centered learning [2 x 45’]		Explain the application of Social Geography Techniques	

				Lecturer, Problem-based learning [2 x 45’]		Explain problems in the field of social geography	
				Exercise and assignment, Student-centered learning [1 x 45’]			
6	Able to explain the basic concepts of the basic concepts of Physical Geography Engineering		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lecturer, Teacher-centered learning [1 x 45’]		Explain the basic concepts of Physical Geography Engineering	10
				Lecturer, Teacher-centered learning [1 x 45’]		Explain the application of Physical Geography Techniques	
				Lecturer, Teacher-centered learning [1 x 45’]		Explain problems in the field of Physical Geography	
				Assignment, Student-centered learning [1 x 45’]			
7	Able to explain the definition of the basic concept of Geodesy: reference ellipsoide		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lecturer, Teacher-centered learning [1 x 45’]		Explain the basic concepts of Geodesy	10
				Lecturer, Teacher-centered learning [1 x 45’]		Explain the basic concepts of Geodesy: Ellipsoida	
				Lecturer, Teacher-centered learning [1 x 45’]		Explain the basic concepts of Geodesy: Ellipsoida References	

				Project assignment, Student-centered learning []		Explain the basic concepts of Earth Sciences	
8	**Midterm Evaluation / Midterm Exam**						**50**
9-10	Able to explain the understanding of the basic concept of Geodesy: geometric ellipsoids		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lecturer, Teacher-centered learning [2 x 45’]		Explain the basic concepts of Geodesy: Geometric	15
				Lecturer, Teacher-centered learning [2 x 45’]		Explains the basic concepts of Geodesy: geometric ellipsoids	
				Discussion, Problem-based learning [2 x 45’]		Explain the basic concepts of Geodesy: Ellipsoid Geometry References	
				Assignment, Student-centered learning [2 x 45’]			
11	Able to explain the understanding of the basic concepts of Geodesy: coordinate system		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lecturer, Teacher-centered learning [2 x 45’]		Explain the basic concepts of Geodesy: General Coordinate System	10
				Lecturer, Teacher-centered learning [2 x 45’]		Explain the basic concepts of Geodesy: Specific Coordinate Systems	
				Discussion, Problem-based learning [2 x 60']		Explain the basic concepts of Geodesy: the Coordinate Reference System	

				Assignment , Student-centered learning []			
12-13	Able to explain the understanding of the basic concepts of Geodesy: Geodetic problem solving, coordinate transformation.		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lecturer , Teacher-centered learning [1 x 45’]		Explain the basic concept of Geodesy: the solution to the problem of Geodetic	15
				Discussion, Student-centered learning [1 x 45’]		Geodetic problem solving, coordinate transformation.	
				Assignment , Problem-based learning [1 x 60']		Explain the basic concepts of Geodesy: the Coordinate Reference System	
14	Able to explain the understanding of natural resource problems, the environment		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lecturer , Teacher-centered learning [1 x 45’]		Able to explain the understanding of natural resource problems	5
				Lecturer , Teacher-centered learning [1 x 45’]		Able to explain the understanding of environmental problems	
				Discussion , Student-centered learning [1 x 45’]		Explain and study problems	
				Assignment , Student-centered learning [1 x 45’]			

15	Able to explain the understanding of natural resource problems, natural disasters		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lecturer , Teacher-centered learning [1 x 45’]		Able to explain the understanding of natural resource problems	5
				Lecturer , Teacher-centered learning [1 x 45’]		Able to explain the understanding of the problem of disaster	
				Latihan, Student-centered learning [1 x 45’]		Explain and study problems	
				Tugas, Student-centered learning [1 x 45’]			
16	**Final Semester Evaluation / Final Semester Examination**						**100**