	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 FOR LEARNING	8710202018		T=2 P=0 ECTS=4.48	2	April 28, 2023

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Dr. Eko Budiyanto, M.Si	Dr. Muzayanah, ST. M.T	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-5	Able to solve scientific problems through research and development activities using geographic technology based on scientific principles
	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)	
	PO - 1	Have an enthusiastic attitude to always update understanding of Geographic Information Science concepts and learning by utilizing various learning sources
	PO - 2	Mastering concepts related to basic topics in Geographic Information Science and the geography learning process
	PO - 3	Able to develop logical, systematic thinking, and able to communicate topics in geographic information science
	PLO-PO Matrix	

P.O	PLO-5	PLO-9
PO-1		
PO-2		
PO-3		

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																

Short Course Description	Discusses the applied concepts of geographic information science, the use of geographic information science and technology in understanding spatial concepts, the application of geographic information science as a geographic learning media, the production of learning media based on geographic information science

References

Main :

1. Keranen, K.; Malone, L.; Wagner, M. 2018. Teach with GIS Implementation Guide for the Classroom. ESRI.
2. DESA. 2000. Handbook on Geographic Information System and Digital Mapping. New York; UN
3. Fotheringham, A.S.; Brunsdon, C.; Charlton, M. 2000. Quantitative Geography: Perspective on Spatial Data Analysis. London; SAGE Publication
4. Holoway, S.L. ; Rice, S.P. ; Valentine, G. 2003. Key Concept in Geography. London; SAGE Publication
5. Liu, G. J.; Mason, P.J. 2009. Essential Image Processing and GIS for Remote Sensing. London ; Wiley-Blackwell
6. Schowengerdt, R.A. 2007. Remote Sensing: Models and Methods for Image Processing-Third Edition. Amsterdam; Elsevier
7. Brimicombe, A. 2010. GIS, Environmental Modeling and Engineering-Second Edition. London; CRC Press
8. McCoy, R.M. 2005. Field Methods in Remote Sensing. New York; The Guilford Press
9. Onsrud, H.; Kuhn, W. 2016. Advancing Geographic Information Science: The Past and Next Twenty Years. Needham; GDI Association Press
10. O'Brien, L. 1992. Introducing Quantitative Geography: Measurement, Methods and Generalised Linear Models. London; Routledge
11. Fragher, M. 2018. WebGIS for Geography Education: Towards a GeoCapabilities Approach. ISPRS Int. J. Geo-Inf. 2018, 7, 111; doi:10.3390/ijgi7030111
12. Panula, E.Y.; Jeronen, E.; Lemmetty, P. 2020. Teaching and Learning Methods in Geography Promoting Sustainability. Educ. Sci. 2020, 10, 5; doi:10.3390/educsci10010005

	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	Mastering the applied concepts of geographic information science in geography learning	Students explain the applied concepts of geographic information science for geography learning	**Criteria:** Grade A if you achieve completeness greater than 75% Grade B if you achieve completeness between 60% - 75% Grade C if you achieve completeness between 50% - 60% Grade D if you achieve completeness less than 50% **Form of Assessment** : Project Results Assessment / Product Assessment	Face to face, lectures and discussions, literature study and independent assignments 2 X 50	Face to face, lectures and discussions, literature study and independent assignments 2 x 50	**Material:** geographic information science in geography learning **Readers:** *Panula, EY; Jeronen, E.; Lemmetty, P. 2020. Teaching and Learning Methods in Geography Promoting Sustainability. Educ. Sci. 2020, 10, 5; doi:10.3390/educsci10010005*	5%
2	Able to select and apply geographic information science technology for the geography learning process	1.Explaining geographic information science technology in geographic study themes 2.Applying geographic information science technology for geography learning appropriately	**Criteria:** 1.Grade A if you achieve completeness greater than 75% 2.Grade B if you achieve completeness between 60% - 75% 3.Grade C if you achieve completeness between 50% - 60% 4.Grade D if you achieve less than 50% completeness **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Face to face, lectures and discussions, practice and independent assignments 2 X 50	Face to face, lectures and discussions, practice and independent assignments 2 x 50	**Material:** geographic information science in geography learning **Readers:** *Panula, EY; Jeronen, E.; Lemmetty, P. 2020. Teaching and Learning Methods in Geography Promoting Sustainability. Educ. Sci. 2020, 10, 5; doi:10.3390/educsci10010005*	5%
3	Able to select and apply geographic information science technology for the geography learning process	1.Explaining geographic information science technology in geographic study themes 2.Applying geographic information science technology for geography learning appropriately	**Criteria:** 1.Grade A if you achieve completeness greater than 75% 2.Grade B if you achieve completeness between 60% - 75% 3.Grade C if you achieve completeness between 50% - 60% 4.Grade D if you achieve less than 50% completeness **Form of Assessment** : Participatory Activities	Face to face, lectures and discussions, practice and independent assignments 2 X 50	face to face, lectures and discussions, practice and independent assignments 2 x 50	**Material:** geographic information science technology for the geography learning process **Readers:** *Panula, EY; Jeronen, E.; Lemmetty, P. 2020. Teaching and Learning Methods in Geography Promoting Sustainability. Educ. Sci. 2020, 10, 5; doi:10.3390/educsci10010005* **Material:** geographic information science technology for the geography learning process **Reference:** *Fragher, M. 2018. WebGIS for Geography Education: Towards a GeoCapabilities Approach. ISPRS Int. J. Geo-Inf. 2018, 7, 111; doi:10.3390/ijgi7030111*	10%

4	Able to select and apply geographic information science technology for the geography learning process	1.Explaining geographic information science technology in geographic study themes 2.Applying geographic information science technology for geography learning appropriately	**Criteria:** 1.Grade A if you achieve completeness greater than 75% 2.Grade B if you achieve completeness between 60% - 75% 3.Grade C if you achieve completeness between 50% - 60% 4.Grade D if you achieve less than 50% completeness **Form of Assessment** : Project Results Assessment / Product Assessment	Face to face, lectures and discussions, practice and independent assignments 2 X 50	Face to face, lectures and discussions, practice and independent assignments 2 x 50	**Material:** geographic information science technology for the geography learning process **Reference:** *Fragher, M. 2018. WebGIS for Geography Education: Towards a GeoCapabilities Approach. ISPRS Int. J. Geo-Inf. 2018, 7, 111; doi:10.3390/ijgi7030111* **Material:** geographic information science technology for the geography learning process **References:** *Holoway, SL ; Rice, S.P. ; Valentine, G. 2003. Key Concept in Geography. London; SAGE Publications*	0%
5	Able to obtain and utilize spatial data in the geography learning process	1.Explain the types and characteristics of spatial data for geography learning 2.Apply terrestrial and non-terrestrial spatial data acquisition techniques 3.Applying spatial data in the geography learning process	**Criteria:** 1.Grade A if you achieve completeness greater than 75% 2.Grade B if you achieve completeness between 60% - 75% 3.Grade C if you achieve completeness between 50% - 60% 4.Grade D if you achieve less than 50% completeness **Form of Assessment** : Participatory Activities	Lectures and discussions, Presentation of independent work results, Tasks for obtaining and applying spatial data in the geography learning process 2 X 50	Lectures and discussions, Presentation of independent work results, Tasks for obtaining and applying spatial data in the process of learning geography 2 x 50	**Material:** spatial data in the geography learning process **Library:** *DESA. 2000. Handbook on Geographic Information Systems and Digital Mapping. New York; UN* **Material:** spatial data in the geography learning process **References:** *Keranen, K.; Malone, L.; Wagner, M. 2018. Teach with GIS Implementation Guide for the Classroom. ESRI.*	10%
6	Able to obtain and utilize spatial data in the geography learning process	1.Explain the types and characteristics of spatial data for geography learning 2.Apply terrestrial and non-terrestrial spatial data acquisition techniques 3.Applying spatial data in the geography learning process	**Criteria:** 1.Grade A if you achieve completeness greater than 75% 2.Grade B if you achieve completeness between 60% - 75% 3.Grade C if you achieve completeness between 50% - 60% 4.Grade D if you achieve less than 50% completeness **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Lectures and discussions, Presentation of independent work results, Tasks for obtaining and applying spatial data in the geography learning process 2 X 50	Lectures and discussions, Presentation of independent work results, Tasks for obtaining and applying spatial data in the geography learning process 2 x 50	**Material:** spatial data in the geography learning process **References:** *Keranen, K.; Malone, L.; Wagner, M. 2018. Teach with GIS Implementation Guide for the Classroom. ESRI.* **Material:** spatial data in the geography learning process **Library:** *DESA. 2000. Handbook on Geographic Information Systems and Digital Mapping. New York; UN*	10%

7	Able to obtain and utilize spatial data in the geography learning process	1. Explain the types and characteristics of spatial data for geography learning 2. Apply terrestrial and non-terrestrial spatial data acquisition techniques 3. Applying spatial data in the geography learning process	**Criteria:** 1. Grade A if you achieve completeness greater than 75% 2. Grade B if you achieve completeness between 60% - 75% 3. Grade C if you achieve completeness between 50% - 60% 4. Grade D if you achieve less than 50% completeness **Form of Assessment** : Participatory Activities	Lectures and discussions, Presentation of independent work results, Tasks for obtaining and applying spatial data in the geography learning process 2 X 50	Lectures and discussions, Presentation of independent work results, Tasks for obtaining and applying spatial data in the geography learning process 2 x 50	**Material:** spatial data in the geography learning process **References:** *Keranen, K.; Malone, L.; Wagner, M. 2018. Teach with GIS Implementation Guide for the Classroom. ESRI.* **Material:** spatial data in the geography learning process **Library:** *DESA. 2000. Handbook on Geographic Information Systems and Digital Mapping. New York; UN*	10%
8	Midterm Evaluation / Midterm Exam		**Criteria:** 1. Grade A if you achieve completeness greater than 75% 2. Grade B if you achieve completeness between 60% - 75% 3. Grade C if you achieve completeness between 50% - 60% 4. Grade D if you achieve less than 50% completeness	2 X 50			6%
9	Able to develop geography learning methods based on geographic information science	1. Explains geographic information science-based geography learning methods 2. Developing geography learning methods based on geographical information science	**Criteria:** 1. Grade A if you achieve completeness greater than 75% 2. Grade B if you achieve completeness between 60% - 75% 3. Grade C if you achieve completeness between 50% - 60% 4. Grade D if you achieve less than 50% completeness **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Lectures, discussions and group assignments 2 X 50	Lectures, discussions and group assignments 2 x 50	**Material:** science-based geography learning methods, geographical information. **References:** *Onsrud, H.; Kuhn, W. 2016. Advancing Geographic Information Science: The Past and Next Twenty Years. Needham; GDI Association Press* **Material:** science-based geography learning methods, geographical information. **Reference:** *Panula, EY; Jeronen, E.; Lemmetty, P. 2020. Teaching and Learning Methods in Geography Promoting Sustainability. Educ. Sci. 2020, 10, 5; doi:10.3390/educsci10010005*	10%

10	Able to develop geography learning methods based on geographic information science	1. Explains geographic information science-based geography learning methods 2. Developing geography learning methods based on geographical information science	**Criteria:** 1. Grade A if you achieve completeness greater than 75% 2. Grade B if you achieve completeness between 60% - 75% 3. Grade C if you achieve completeness between 50% - 60% 4. Grade D if you achieve less than 50% completeness **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Lectures, discussions and group assignments 2 X 50	Lectures, discussions and group assignments 2 x 50	**Material:** geographic information science-based geography learning methods **References:** *Fragher, M. 2018. WebGIS for Geography Education: Towards a GeoCapabilities Approach. ISPRS Int. J. Geo-Inf. 2018, 7, 111; doi:10.3390/ijgi7030111* **Material:** science-based geography learning methods, geographical information. **Reference:** *Panula, EY; Jeronen, E.; Lemmetty, P. 2020. Teaching and Learning Methods in Geography Promoting Sustainability. Educ. Sci. 2020, 10, 5; doi:10.3390/educsci10010005*	10%
11	Able to develop geography learning methods based on geographic information science	1. Explains geographic information science-based geography learning methods 2. Developing geography learning methods based on geographical information science	**Criteria:** 1. Grade A if you achieve completeness greater than 75% 2. Grade B if you achieve completeness between 60% - 75% 3. Grade C if you achieve completeness between 50% - 60% 4. Grade D if you achieve less than 50% completeness **Form of Assessment** : Participatory Activities	Lectures, discussions and group assignments 2 X 50	Lectures, discussions and group assignments 2 x 50	**Material:** science-based geography learning methods, geographical information. **References:** *Onsrud, H.; Kuhn, W. 2016. Advancing Geographic Information Science: The Past and Next Twenty Years. Needham; GDI Association Press*	10%
12	Able to develop geographic information science-based learning media	1. Designing geographic information science-based learning media 2. Developing science-based geographic information media	**Criteria:** 1. Grade A if you achieve completeness greater than 75% 2. Grade B if you achieve completeness between 60% - 75% 3. Grade C if you achieve completeness between 50% - 60% 4. Grade D if you achieve less than 50% completeness	Lectures, discussions and independent assignments 2 X 50	Lectures, discussions and independent assignments 2 x 50	**Material:** geographical information science-based geography learning methods\ **Reference:** *Brimicombe, A. 2010. GIS, Environmental Modeling and Engineering-Second Edition. London; CRC Press*	10%
13	Able to develop geographic information science-based learning media	1. Designing geographic information science-based learning media 2. Developing science-based geographic information media	**Criteria:** 1. Grade A if you achieve completeness greater than 75% 2. Grade B if you achieve completeness between 60% - 75% 3. Grade C if you achieve completeness between 50% - 60% 4. Grade D if you achieve less than 50% completeness **Form of Assessment** : Participatory Activities	Lectures, discussions and independent assignments 2 X 50	Lectures, discussions and independent assignments 2 x 50	**Material:** science-based geography learning media, geographical information. **References:** *Holoway, SL; Rice, S.P. ; Valentine, G. 2003. Key Concept in Geography. London; SAGE Publications* **Material:** science-based geography learning media, geographical information. **Reference:** *Panula, EY; Jeronen, E.; Lemmetty, P. 2020. Teaching and Learning Methods in Geography Promoting Sustainability. Educ. Sci. 2020, 10, 5; doi:10.3390/educsci10010005*	10%

14	Able to solve geography learning cases by utilizing geographic information science	1. Discuss up-to-date geography learning topics 2. Solving geography learning cases using geographic information science	**Criteria:** 1. Grade A if you achieve completeness greater than 75% 2. Grade B if you achieve completeness between 60% - 75% 3. Grade C if you achieve completeness between 50% - 60% 4. Grade D if you achieve less than 50% completeness **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Lectures, discussions and independent assignments 2 X 50	Lectures, discussions and independent assignments 2 x 50	**Material:** learning geography by utilizing geographical information science. **Reference:** *Panula, EY; Jeronen, E.; Lemmetty, P. 2020. Teaching and Learning Methods in Geography Promoting Sustainability. Educ. Sci. 2020, 10, 5; doi:10.3390/educsci10010005*	10%
15	Able to solve geography learning cases by utilizing geographic information science	1. Discuss up-to-date geography learning topics 2. Solving geography learning cases using geographic information science	**Criteria:** 1. Grade A if you achieve completeness greater than 75% 2. Grade B if you achieve completeness between 60% - 75% 3. Grade C if you achieve completeness between 50% - 60% 4. Grade D if you achieve less than 50% completeness **Form of Assessment** : Participatory Activities	Discussion and group assignments 2 X 50	Discussion and group assignments 2 x 50	**Material:** learning geography by utilizing geographical information science. **Reference:** *Panula, EY; Jeronen, E.; Lemmetty, P. 2020. Teaching and Learning Methods in Geography Promoting Sustainability. Educ. Sci. 2020, 10, 5; doi:10.3390/educsci10010005*	0%
16	Final exams		**Criteria:** 1. Grade A if you achieve completeness greater than 75% 2. Grade B if you achieve completeness between 60% - 75% 3. Grade C if you achieve completeness between 50% - 60% 4. Grade D if you achieve less than 50% completeness	Written exam / performance reporting 2 X 50			6%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	72.5%
2.	Project Results Assessment / Product Assessment	27.5%
		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.