	Universitas Negeri Surabaya Faculty of Social Sciences and Law Geography Education Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Cosmography *)	8720202092	Physical Geography	T=2	P=0	ECTS=3.18	1	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Dra. Ita Mardiani Zain, M.Kes.	Drs. Bambang Hariyanto, M.Pd.	Dr. Nugroho Hari Purnomo, S.P., M.Si.

Learning model	**Project Based Learning**

Program Learning Outcomes (PLO)

PLO study program that is charged to the course

Program Objectives (PO)

PO - 1	Able to analyze regional characteristics and regionalization (regionalization) in the context of natural resources and disasters based on geographic principles and approaches to support sustainable development
PO - 2	Able to demonstrate independent and collaborative performance that produces quality and measurable results in calculations and concepts in the study of the universe
PO - 3	Demonstrate a responsible attitude towards work in the field of calculations and concepts in the study of the universe independently

PLO-PO Matrix

P.O
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	Conduct studies and provide insight into the universe and its contents galaxies, stars, solar system, movements of the earth, moon and eclipses, calendars, as well as paintings of the celestial sphere and their influence on human life as well as realizing the greatness of God who has created this universe. Learning is carried out for one semester using a project based learning approach with demonstration methods, discussions, as well as individual and group assignments. Assessment is carried out through written, performance and portfolio tests.

References

Main :

1. Anessudin, Mir. 1999. The Universe . Toronto, Canada : Al-Attique Publisher Inc.
2. MGMP Geografi DKI Jakarta. 1993. Kosmografi. Jakarta: Erlangga
3. Perdana, Sukma., Kosmografi . Surabaya. Unesa Pres
4. Simamora, P. 1988. Ilmu Falak (Kosmografi) . Jakarta : CV. Pedjuang Bangsa
5. Siswanto, Joko. 2005. Orientasi Kosmologi. Yogyakarta. Gadjah Mada University Press
6. Soedjana E. Mamat. 1993. Pengantar Kosmografi . Surabaya. University Press IKIP Surabaya
7. Yahya, Harun. 2002. Menyibak Rahasia Alam Semesta. Jakarta : Insan Kamil

Supporters:

Supporting lecturer	Dra. Ita Mardiani Zain, M.Kes. Dr. Sukma Perdana Prasetya, S.Pd., 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 meaning of cosmography	Describe the meaning of cosmography Describe the object of cosmography study Explain the benefits of cosmography	**Criteria:** 1. Assessment sheet 1 is used to assess students' mastery of knowledge regarding insights about the universe and its contents galaxies, stars, solar systems, the movement of the earth, the moon and eclipses. The assessment contained in Assessment Sheet 1 is carried out during the Mid-Semester Examination (UTS). 2. Assessment Sheet 1. Consists of 5 essay questions. 3. Weight of Questions No. 1-5 = 20 4. The assessment contained in Assessment Sheet 2 is carried out during the Final Semester Examination (UAS) to assess students' mastery of knowledge about the calendar and celestial coordinates. **Form of Assessment** : Participatory Activities	Pulpit lectureDiscussion 2 X 50	-	**Material:** cosmography **Reference:** *Simamora, P. 1988. Astrology (Cosmography). Jakarta : CV. National Warrior*	10%
2	Students are able to describe the universe and all its contents and processes	Explaining the process of the universe	**Criteria:** 1. Assessment sheet 1 is used to assess students' mastery of knowledge regarding insights about the universe and its contents galaxies, stars, solar systems, the movement of the earth, the moon and eclipses. The assessment contained in Assessment Sheet 1 is carried out during the Mid-Semester Examination (UTS). 2. Assessment Sheet 1. Consists of 5 essay questions. 3. Weight of Questions No. 1-5 = 20 **Form of Assessment** : Project Results Assessment / Product Assessment	Pulpit lectureDiscussion 2 X 50	-	**Material:** The universe **Reader:** *Yahya, Harun. 2002. Uncovering the Secrets of the Universe. Jakarta : Human Kamil*	10%

3	Students are able to explain the meaning of cosmography Students are able to describe the universe/universe and all its contents and processes USS Students are able to describe the composition of the Solar System Students are able to analyze the process of earth movement and its influence on life on the earth's surface Students are able to describe the sun, moon and the process of eclipses	Describe the meaning of cosmography Describe the object of study of cosmography Explain the benefits of the science of cosmography Explain the process of the universe Explaining the arrangement of the solar system Explaining the classification of the sun and planets Explaining the circulation of planets, aspects and phases of planets Explaining rotational motion Explaining revolutionary motion Explaining the influence of the earth's movement on life on the earth's surface Explaining solar eclipses Explaining earth eclipses	**Criteria:** 1. Assessment sheet 1 is used to assess students' mastery of knowledge regarding insights about the universe and its contents galaxies, stars, solar systems, the movement of the earth, the moon and eclipses. The assessment contained in Assessment Sheet 1 is carried out during the Mid-Semester Examination (UTS). 2. Assessment Sheet 1. Consists of 5 essay questions. 3. Weight of Questions No. 1-5 = 20 4. Weight of Question No. 1 = 20 5. Weight of question no. 2 = 80 6. Assessment sheet 3 is used to observe student discipline and responsibility in carrying out/completing each assignment given. 7. The assessment in Assessment Sheet 3 is carried out during lectures in the Cosmography course. **Form of Assessment** : Project Results Assessment / Product Assessment, Portfolio Assessment	Lecture pulpitDiscussionAssignmentDemonstration 8 X 50	-	**Material:** solar system **Bibliography:** *Anessudin, Mir. 1999. The Universe. Toronto, Canada : Al-Attique Publisher Inc.* **Material:** solar system **References:** *Perdana, Sukma., Cosmography . Surabaya. Unesa Pres* **Material:** Solar system **Reference:** *MGMP Geography of DKI Jakarta. 1993. Cosmography. Jakarta: Erlangga*	5%
4	Students are able to explain the meaning of cosmography Students are able to describe the universe/universe and all its contents and processes USS Students are able to describe the composition of the Solar System Students are able to analyze the process of earth movement and its influence on life on the earth's surface Students are able to describe the sun, moon and the process of eclipses	Describe the meaning of cosmography Describe the object of study of cosmography Explain the benefits of the science of cosmography Explain the process of the universe Explaining the arrangement of the solar system Explaining the classification of the sun and planets Explaining the circulation of planets, aspects and phases of planets Explaining rotational motion Explaining revolutionary motion Explaining the influence of the earth's movement on life on the earth's surface Explaining solar eclipses Explaining earth eclipses	**Criteria:** 1. Assessment sheet 1 is used to assess students' mastery of knowledge regarding insights about the universe and its contents galaxies, stars, solar systems, the movement of the earth, the moon and eclipses. The assessment contained in Assessment Sheet 1 is carried out during the Mid-Semester Examination (UTS). 2. Assessment Sheet 1. Consists of 5 essay questions. 3. Weight of Questions No. 1-5 = 20 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Tests	Lecture pulpitDiscussionAssignmentDemonstration 8 X 50	-	**Material:** solar system **Bibliography:** *Anessudin, Mir. 1999. The Universe. Toronto, Canada : Al-Attique Publisher Inc.* **Material:** solar system **References:** *Perdana, Sukma., Cosmography . Surabaya. Unesa Pres* **Material:** Solar system **Reference:** *MGMP Geography of DKI Jakarta. 1993. Cosmography. Jakarta: Erlangga*	5%

5	Students are able to explain the meaning of cosmography Students are able to describe the universe/universe and all its contents and processes USS Students are able to describe the composition of the Solar System Students are able to analyze the process of earth movement and its influence on life on the earth's surface Students are able to describe the sun, moon and the process of eclipses	Describe the meaning of cosmography Describe the object of study of cosmography Explain the benefits of the science of cosmography Explain the process of the universe Explaining the arrangement of the solar system Explaining the classification of the sun and planets Explaining the circulation of planets, aspects and phases of planets Explaining rotational motion Explaining revolutionary motion Explaining the influence of the earth's movement on life on the earth's surface Explaining solar eclipses Explaining earth eclipses	**Criteria:** 1.Assessment sheet 1 is used to assess students' mastery of knowledge regarding insights about the universe and its contents galaxies, stars, solar systems, the movement of the earth, the moon and eclipses. The assessment contained in Assessment Sheet 1 is carried out during the Mid-Semester Examination (UTS). 2.Assessment Sheet 1. Consists of 5 essay questions. 3.Weight of Questions No. 1-5 = 20 4.Assessment sheet 3 is used to observe student discipline and responsibility in carrying out/completing each assignment given. 5.The assessment in Assessment Sheet 3 is carried out during lectures in the Cosmography course. **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Tests	Lecture pulpitDiscussionAssignmentDemonstration 8 X 50	-	**Material:** solar system **Bibliography:** *Anessudin, Mir. 1999. The Universe. Toronto, Canada : Al-Attique Publisher Inc.* **Material:** solar system **References:** *Perdana, Sukma., Cosmography . Surabaya. Unesa Pres* **Material:** Solar system **Reference:** *MGMP Geography of DKI Jakarta. 1993. Cosmography. Jakarta: Erlangga*	5%
6	Students are able to explain the meaning of cosmography Students are able to describe the universe/universe and all its contents and processes USS Students are able to describe the composition of the Solar System Students are able to analyze the process of earth movement and its influence on life on the earth's surface Students are able to describe the sun, moon and the process of eclipses	Describe the meaning of cosmography Describe the object of study of cosmography Explain the benefits of the science of cosmography Explain the process of the universe Explaining the arrangement of the solar system Explaining the classification of the sun and planets Explaining the circulation of planets, aspects and phases of planets Explaining rotational motion Explaining revolutionary motion Explaining the influence of the earth's movement on life on the earth's surface Explaining solar eclipses Explaining earth eclipses	**Criteria:** 1.Assessment sheet 1 is used to assess students' mastery of knowledge regarding insights about the universe and its contents galaxies, stars, solar systems, the movement of the earth, the moon and eclipses. The assessment contained in Assessment Sheet 1 is carried out during the Mid-Semester Examination (UTS). 2.Assessment Sheet 1. Consists of 5 essay questions. 3.Weight of Questions No. 1-5 = 20 **Form of Assessment** : Assessment of Project Results / Product Assessment, Practices / Performance	Lecture pulpitDiscussionAssignmentDemonstration 8 X 50		**Material:** solar system **Bibliography:** *Anessudin, Mir. 1999. The Universe. Toronto, Canada : Al-Attique Publisher Inc.* **Material:** solar system **References:** *Perdana, Sukma., Cosmography . Surabaya. Unesa Pres* **Material:** Solar system **Reference:** *MGMP Geography of DKI Jakarta. 1993. Cosmography. Jakarta: Erlangga*	5%

7	Students are able to explain the meaning of cosmography Students are able to describe the universe/universe and all its contents and processes USS Students are able to describe the composition of the Solar System Students are able to analyze the process of earth movement and its influence on life on the earth's surface Students are able to describe the sun, moon and the process of eclipses	Describe the meaning of cosmography Describe the object of study of cosmography Explain the benefits of the science of cosmography Explain the process of the universe Explaining the arrangement of the solar system Explaining the classification of the sun and planets Explaining the circulation of planets, aspects and phases of planets Explaining rotational motion Explaining revolutionary motion Explaining the influence of the earth's movement on life on the earth's surface Explaining solar eclipses Explaining earth eclipses	**Criteria:** 1. Assessment sheet 1 is used to assess students' mastery of knowledge regarding insights about the universe and its contents galaxies, stars, solar systems, the movement of the earth, the moon and eclipses. The assessment contained in Assessment Sheet 1 is carried out during the Mid-Semester Examination (UTS). 2. Assessment Sheet 1. Consists of 5 essay questions. 3. Weight of Questions No. 1-5 = 20 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Tests	Lecture pulpitDiscussionAssignmentDemonstration 8 X 50	-	**Material:** solar system **Bibliography:** *Anessudin, Mir. 1999. The Universe. Toronto, Canada : Al-Attique Publisher Inc.* **Material:** solar system **References:** *Perdana, Sukma., Cosmography . Surabaya. Unesa Pres* **Material:** Solar system **Reference:** *MGMP Geography of DKI Jakarta. 1993. Cosmography. Jakarta: Erlangga*	5%
8	UTS	Describe the meaning of cosmography Describe the object of study of cosmography Explain the benefits of the science of cosmography Explain the process of the universe Explaining the arrangement of the solar system Explaining the classification of the sun and planets Explaining the circulation of planets, aspects and phases of planets Explaining rotational motion Explaining revolutionary motion Explaining the influence of the earth's movement on life on the earth's surface Explaining solar eclipses Explaining earth eclipses	**Criteria:** Complete > 69 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	test 2 x 50	-		0%

9	Students are able to explain the date (calendar)	Explaining the syamsiah date Explaining the qomariah date	**Criteria:** 1. Assessment sheet 5 is used to assess students in determining the location of places using tka and declination or tka and tkab stars by painting the celestial sphere with equatorial coordinates 2. Assessment sheet 5 is used to observe student discipline and responsibility in carrying out/completing each assignment given. 3. The assessment in Assessment Sheet 5 is carried out during lectures in the Cosmography course. **Form of Assessment** : Project Results Assessment / Product Assessment, Portfolio Assessment	Lecture pulpit Discussion Assignment 2 X 50		**Material:** calendar Reference **:** *Simamora, P. 1988. Astrology (Cosmography). Jakarta : CV. National Warrior*	10%
10	Students are able to paint celestial bodies on the celestial sphere based on the horizon coordinate system	Distinguish between natural, apparent, true/definite horizons. Draw vertical lines, horizon lines, circles	**Criteria:** 1. Assessment sheet 6 is used to assess students in painting solar flares on March 21/September 23, June 21 and December 22 2. Assessment sheet 6 is used to observe student discipline and responsibility in carrying out/completing each assignment given. 3. The assessment in Assessment Sheet 6 is carried out during lectures in the Cosmography course. **Form of Assessment** : Project Results Assessment / Product Assessment	Lecture pulpit Demonstration Performance Assignment 2 X 50	-	**Material:** celestial bodies **Reference:** *Anessudin, Mir. 1999. The Universe. Toronto, Canada : Al-Attique Publisher Inc.*	5%

11	Students are able to paint the celestial sphere and the attitude of the celestial sphere based on the equator/equator coordinates	Drawing the celestial sphere, vertical line, and horizon line Determining points S, U, N, Z Determining the pole height of a place Drawing the axis line and celestial equator Determining E, Q, KLU, KLS Drawing the horizon circle and celestial equator circle Determining point B, T (SBUT) Calculate the star time (WB) if known Ascencio Recta (AR) and Star Hour Angle (SJB) Determine the Aries Point with the help of WB calculated from E (upper culmination of Aries) to the West at a known angle Determine the declination foot point (K) with the help of AR calculated from the Aries point to the vertical direction at a known angle. Determine the position of the star with the help of the declination of the star calculated from K to the star at a known angle. Make the path of the star by making lines and circles parallel to the celestial equator. Painting WB, AR, declination of stars, and SJB Drawing parallactic triangles of stars Drawing the daily circulation of stars Calculating TKA of stars Drawing azimuths of stars in equatorial coordinates Drawing heights of stars in equatorial coordinates	**Criteria:** 1. Assessment sheet 4 is used to assess students in painting the celestial sphere with equatorial coordinates 2. Assessment sheet 4 is used to observe student discipline and responsibility in carrying out/completing each assignment given. 3. The assessment in Assessment Sheet 4 is carried out during lectures in the Cosmography course. **Form of Assessment** : Assessment of Project Results / Product Assessment, Practices / Performance	Pulpit lecture, 4 X 50 Assignment Performance Demonstration		**Material:** celestial spheres **Reference:** *Anessudin, Mir. 1999. The Universe. Toronto, Canada : Al-Attique Publisher Inc.*	5%

12	Students are able to paint the celestial sphere and the attitude of the celestial sphere based on the equator/equator coordinates	Drawing the celestial sphere, vertical line, and horizon line Determining points S, U, N, Z Determining the pole height of a place Drawing the axis line and celestial equator Determining E, Q, KLU, KLS Drawing the horizon circle and celestial equator circle Determining point B, T (SBUT) Calculate the star time (WB) if known Ascencio Recta (AR) and Star Hour Angle (SJB) Determine the Aries Point with the help of WB calculated from E (upper culmination of Aries) to the West at a known angle Determine the declination foot point (K) with the help of AR calculated from the Aries point to the vertical direction at a known angle. Determine the position of the star with the help of the declination of the star calculated from K to the star at a known angle. Make the path of the star by making lines and circles parallel to the celestial equator. Painting WB, AR, declination of stars, and SJB Drawing parallactic triangles of stars Drawing the daily circulation of stars Calculating TKA of stars Drawing azimuths of stars in equatorial coordinates Drawing heights of stars in equatorial coordinates	**Criteria:** 1.Assessment sheet 4 is used to assess students in painting the celestial sphere with equatorial coordinates 2.Assessment sheet 4 is used to observe student discipline and responsibility in carrying out/completing each assignment given. 3.The assessment in Assessment Sheet 4 is carried out during lectures in the Cosmography course. **Form of Assessment** : Assessment of Project Results / Product Assessment, Practices / Performance	Pulpit lecture, 4 X 50 Assignment Performance Demonstration	-	**Material:** celestial spheres **Reference:** *Anessudin, Mir. 1999. The Universe. Toronto, Canada : Al-Attique Publisher Inc.*	5%

13	Students are able to determine the position/location of the earth's surface using star declination and culmination height	Determining the position/location of the earth's surface using the height of the upper culmination (TKA) and declination of stars Determining the position/location of the earth's surface using the help of TKA and TKB of stars	**Criteria:** 1. Assessment sheet 5 is used to assess students in determining the location of places using tka and declination or tka and tkab stars by painting the celestial sphere with equatorial coordinates 2. Assessment sheet 5 is used to observe student discipline and responsibility in carrying out/completing each assignment given. 3. The assessment in Assessment Sheet 5 is carried out during lectures in the Cosmography course. **Form of Assessment** : Project Results Assessment / Product Assessment	Lecture pulpit Demonstration Performance Assignment Lecture pulpit Demonstration Performance Performance Assignment 2 X 50		**Material:** location **Bibliography:** *Perdana, Sukma., Cosmography . Surabaya. Unesa Pres*	10%
14	Students are able to determine the position/location of the earth's surface using star declination and culmination height	Determining the position/location of the earth's surface using the height of the upper culmination (TKA) and declination of stars Determining the position/location of the earth's surface using the help of TKA and TKB of stars	**Criteria:** 1. Assessment sheet 5 is used to assess students in determining the location of places using tka and declination or tka and tkab stars by painting the celestial sphere with equatorial coordinates 2. Assessment sheet 5 is used to observe student discipline and responsibility in carrying out/completing each assignment given. 3. The assessment in Assessment Sheet 5 is carried out during lectures in the Cosmography course. **Form of Assessment** : Project Results Assessment / Product Assessment, Portfolio Assessment	Lecture pulpit Demonstration Performance Assignment Lecture pulpit Demonstration Performance Performance Assignment 2 X 50	-	**Material:** location **Bibliography:** *Perdana, Sukma., Cosmography . Surabaya. Unesa Pres*	10%

15	Students are able to paint the celestial sphere and the attitude of the celestial sphere based on the ecliptic coordinate system	Determining the position of celestial bodies on the celestial sphere based on ecliptic coordinates, namely astronomical longitude and astronomical latitude	**Criteria:** 1. Assessment sheet 7 is used to assess students in painting the celestial sphere with ecliptic coordinates 2. Assessment sheet 7 is used to observe student discipline and responsibility in carrying out/completing each assignment given. 3. The assessment in Assessment Sheet 7 is carried out during lectures in the Cosmography course. **Forms of Assessment** : Project Results Assessment / Product Assessment, Portfolio Assessment, Practical Assessment, Practice / Performance	Lecture pulpit Demonstration Performance Assignment 2 X 50	-	**Material:** Painting the celestial sphere **Reader:** *Siswanto, Joko. 2005. Cosmological Orientation. Yogyakarta. Gadjah Mada University Press*	9%
16	UAS		**Criteria:** Complete > 69 **Form of Assessment** : Project Results Assessment / Product Assessment, Test	2 x 50			0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	15.01%
2.	Project Results Assessment / Product Assessment	52.26%
3.	Portfolio Assessment	14.75%
4.	Practical Assessment	2.25%
5.	Practice / Performance	9.75%
6.	Test	5.01%
		99.03%

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.