	Universitas Negeri Surabaya **Faculty of Mathematics and Natural Sciences** **Biology Undergraduate Study Program**	**Document Code**

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Virology*	4620102190	Microbiology	**T=2**	**P=0**	**ECTS=3.18**	6	April 28, 2023

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Prof. Dr. Mahanani Tri Asri, M. Si.	Prof. Dr. Mahanani Tri Asri, M. Si.	Dr. H. Sunu Kuntjoro, S.Si., M.Si.

Learning model	**Project Based Learning**

Program Learning Outcomes (PLO)

PLO study program that is charged to the course

PLO-7	Able to work independently and collaboratively, as well as responsibly, in completing various tasks in class, in the laboratory and in the field.

Program Objectives (PO)

PO - 1	Able to appreciate the biology of viruses, prions and their role in everyday life Able to apply virological concepts to overcome existing problems in an environment that supports their professionalism Able to apply logical, critical, systematic and innovative thinking in order to develop or apply virological science in their environment Able to work independently , responsible, both as an individual and in a group, and able to work together in solving problems related to virology

PLO-PO Matrix

P.O	PLO-7
PO-1	

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																

Short Course Description	This course examines the concept of virology (virions and prions) which includes the basic structure of viruses and prions, diversity, taxonomy, reproduction, infection mechanisms, molecules, ecology and the role of viruses (animals and plants) in everyday life. This course is presented in theoretical form)

References

Main :

1. Asri, M.T., 2014 Virologi I. Surabaya:Pustaka Radja.
2. Cann, A.J. 2005. Principles of Molecular Virology . 4 th ed . Oxford: Elsevier.
3. Carter, J. And V. Sounders, 2007. Virology: Principles and Aplications . John Willey A Sons, Ltd. Chichester

Supporters:

1. 1. Fauquet, C.M., M.A. Mayo, J. Maniloff, U. Desselberger, L.A. Ball. 2005. Virus Taxonomy.Amsterdam: Elsevier Academic Press. 2. Madigan, M.T., J.M. Martinko, D.A. Stahl, dan D.P. Clark. 2012. Biology of Microorganism. Boston: Pearson. 3. Tortora, G. J., B. R. Funke, dan C. L. Case. 2007. Microbiology An Introduction.San Fransisco: Addison Wesley Longman, Inc.

Supporting lecturer	MUSLIMIN IBRAHIM Prof. Dr. Mahanani Tri Asri, M.Si. Guntur Trimulyono, S.Si., M.Sc. Lisa Lisdiana, S.Si., M.Si., Ph.D.

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	Understanding the development of the science of Virology	1. Explain the scope of Virology 2. Explain the meaning of prions 3. Explain the difference between viruses and prions	**Criteria:** 1. Criteria: Indicators achieved through process assessment 2. Essay and multiple choice questions are accessed together on UTS and UAS 3. Performance questions are integrated during learning **Form of Assessment** : Participatory Activities	The lecturer facilitates student-centered learning through group discussions and is responsible for finding concepts (based on literature review). Face to face: 2 Create a resume of cases involving viruses and prions for the next meeting	Online learning is carried out if MK participants are taking part in KKN or work practice internships with Platform: LMS Learning method: Presentation, discussion Estimated time: 2x50 minutes 2x50 minutes	**Material:** Learning Material: history of virology and prions, understanding and distinguishing characteristics between viruses and prions. **Reader:** *Asri, MT, 2014 Virology I. Surabaya: Pustaka Radja.* **Material:** Material: Distinguishing Characteristics of Viruses and Prions **References:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	0%
2	Understand the basic structure and function of viruses and prions	1. Identify the basic structure of viruses in prions 2. Identify the basic shape and structure of viruses based on authentic cases of disease caused by viruses 3. Create a timeline of the project to be carried out which essentially contains: a. Identify the basic structure of viruses (bacteria, plants, RNA and DNA viruses) and prions b. Identify the function of each basic part of viruses and prions c. Identify the mechanism of prion infection and reproduction of bacteriophages, plant viruses, RNA and DNA based on the diseases found d. How to prevent transmission and spread of viruses e. Create posters and present poster results	**Criteria:** 1. Observation of student activities in groups when creating a time line and carrying out time line 1, namely identifying the basic structure of viruses and prions. By dividing kelp: 1 Bacteriophage 2. Plant viruses 3. RNA viruses 4. DNA viruses 2. Essay questions are assessed together at USS 3. Performance questions are integrated during learning **Form of Assessment** : Project Results Assessment / Product Assessment	PJBL: Identification of the basic structure of viruses and prions that cause authentic/viral diseases from various cases in the environment, the results of interviews with sufferers, or library sources, with results in the form of a. Activity timeline b. The results of identifying the basic structure of the virus/prion are in the form of a 4 X 50 report	Online method is used if MK participants are doing KKN or MPK: Platform: Lecture using LMS Method: Kelp discussion according to Kelp theme 4 x 50 minutes	**Material:** Material: Identify the basic structure of viruses and prions that cause authentic/viral diseases from various cases in the environment. **References:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	5%

3	Distinguish the function of each structural component in viruses and prions	Identify the function of each component as a distinguishing characteristic between viruses and prions based on cases of authentic/viral diseases that exist around us	**Criteria:** Observation of student activities in groups when creating a time line and carrying out time line 1, namely identifying the basic structure of viruses and prions. By dividing kelp: 1 Bacteriophage 2. Plant viruses 3. RNA viruses 4. DNA viruses **Form of Assessment** : Project Results Assessment / Product Assessment	Learning model: PJBL: Identifying the differences between viruses and prions in terms of structure and function based on authentic disease cases around us through interviews, other library sources (internet) with results in the form of: a. The results of identifying the function of each component of the basic structure of the virus/prion are in the form of a 2 X 50 minute report	Online meetings are held if students taking this MK are currently studying or MPK with Platform: LMS Learning method: Presentation, discussion Estimated time: 2x50 minutes	**Material:** Identify the function of each component as a distinguishing characteristic between viruses and prions **Reference:** *Asri, MT, 2014 Virology I. Surabaya: Pustaka Radja.* **Material:** Identify various cases of authentic/viral diseases around us. **Reference:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	4%
4	Understanding the mechanisms of reproduction and infection of viruses and prions in host cells	1. Explain the reproductive mechanisms of Prions, plant viruses, RNA viruses, and DNA viruses	**Criteria:** Observation of student activities in groups (1 to 4) when working on timeline 3 in accordance with the Kelp assignment, namely the reproduction mechanism of viruses and prions based on authentic disease cases that exist around us **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Learning model: PJBL: Identifying reproductive mechanisms between viruses and prions based on authentic disease cases around us in various library sources with results in the form of: a. Results of analysis of the reproduction mechanisms of viruses and prions based on authentic disease cases around us 6 X 50 (meetings 4.5 and 6)	Offline meetings are held if students taking this MK are currently studying or MPK using the LMS platform Method: Kelp discussion according to the Kelp theme Estimated time: 6 x 50 minutes (3 meetings at meetings 4, 5 and 6)	**Material:** Identification of mechanisms of reproduction and infection of viruses and prions **Reference:** *Asri, MT, 2014 Virology I. Surabaya: Pustaka Radja.* **Material:** Case studies of authentic/viral diseases around us. **Reference:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	6%
5	Understanding the mechanisms of reproduction and infection of viruses and prions in host cells	1. Explain the reproductive mechanisms of Prions, plant viruses, RNA viruses, and DNA viruses	**Criteria:** Observation of student activities in groups (1 to 4) when working on timeline 3 in accordance with the Kelp assignment, namely the reproduction mechanism of viruses and prions based on authentic disease cases that exist around us **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Learning model: PJBL: Identifying reproductive mechanisms between viruses and prions based on authentic disease cases around us in various library sources with results in the form of: a. Results of analysis of the reproduction mechanisms of viruses and prions based on authentic disease cases around us 2 X 50 minutes	Platform: LMS Method: kelp discussion according to the kelp theme Estimated time: 2x50 minutes	**Material:** Identification of mechanisms of reproduction and infection of viruses and prions **Reference:** *Asri, MT, 2014 Virology I. Surabaya: Pustaka Radja.* **Material:** Case studies of authentic/viral diseases around us. **Reference:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	5%

6	Understanding the mechanisms of reproduction and infection of viruses and prions in host cells	1. Explain the reproductive mechanisms of Prions, plant viruses, RNA viruses, and DNA viruses	**Criteria:** Observation of student activities in groups (1 to 4) when working on timeline 3 in accordance with the Kelp assignment, namely the reproduction mechanism of viruses and prions based on authentic disease cases that exist around us **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Learning model: PJBL: Identifying reproductive mechanisms between viruses and prions based on authentic disease cases around us in various library sources with results in the form of: a. Results of analysis of the reproduction mechanisms of viruses and prions based on authentic disease cases around us 2 X 50 minutes	Platform: LMS Method: kelp discussion according to the kelp theme Estimated time: 2x50 minutes	**Material:** Identification of mechanisms of reproduction and infection of viruses and prions **Reference:** *Asri, MT, 2014 Virology I. Surabaya: Pustaka Radja.* **Material:** Case studies of authentic/viral diseases around us. **Reference:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	5%
7	Understand how to detect, symptoms, prevention and control of pathogenic viruses	Identifying ways to detect, symptoms, prevent and control viruses and prions that cause disease around us	**Criteria:** 1. Observation of student activities in groups (1 to 4) when working on timeline 4 in accordance with the Kelp assignment, namely how to detect, prevent and control viruses and prions based on authentic disease cases that exist around us 2. Essay questions are assessed together at USS 3. Performance questions are integrated during learning **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	PJBL learning model: Identify preventing and controlling viruses and prions based on authentic disease cases around us in various library sources with results in the form of: Results of analysis of viral and prion reproduction mechanisms based on authentic disease cases around us Estimated Time 2 X 50 minutes	Platform: LMS Method: kelp discussion according to the kelp theme Estimated time: 2 x50 minutes	**Material:** Identify ways to detect, symptoms, prevent and control diseases caused by viruses and prions around us. **Library:** *Asri, MT, 2014 Virology I. Surabaya: Pustaka Radja.* **Material:** Case examples of diseases caused by viruses **References:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	5%
8	U.S.S		**Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Tests	essay test 2 X 50			10%

9	Design a poster about viruses and prions and socialize/present it to the public in the form of a poster	1. Design a poster about viruses and prions: structure and function, reproductive mechanisms, how to detect, prevent and control viruses/prions that cause authentic disease 2. Socialize/present to the public in the form of a poster	**Criteria:** 1.1. Observing student activities in groups (1 to 4) when working on timeline 5 in accordance with the Kelp assignment, namely designing posters and 2. Observing presentations l poster 2.Essay questions are assessed together at USS 3.Performance questions are integrated during learning **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Learning model: Discussion about the 5th timeline (designing a poster) and presenting the resulting poster. Estimated time: 6 x50 minutes (for meetings 9, 10 and 11)	Platform: LMS online method is carried out when MK participants are in KKK or MPK. Method: kelp discussion according to theme and presentation Estimated time: 6 x50 minutes (for meetings 9, 10 and 11)	**Material:** Designing posters and presentations References: articles on the internet, all recommended literature **References:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	10%
10	Design a poster about viruses and prions and socialize/present it to the public in the form of a poster	1. Design a poster about viruses and prions: structure and function, reproductive mechanisms, how to detect, prevent and control viruses/prions that cause authentic disease 2. Socialize/present to the public in the form of a poster	**Criteria:** 1.1. Observing student activities in groups (1 to 4) when working on timeline 5 in accordance with the Kelp assignment, namely designing posters and 2. Observing presentations l poster 2.Essay questions are assessed together at USS 3.Performance questions are integrated during learning **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Learning model: Discussion about the 5th timeline (designing a poster) and presenting the resulting poster. Estimated time: 6 x50 minutes (for meetings 9, 10 and 11)	Platform: LMS online method is carried out when MK participants are in KKK or MPK. Method: kelp discussion according to theme and presentation Estimated time: 6 x50 minutes (for meetings 9, 10 and 11)	**Material:** Designing posters and presentations References: articles on the internet, all recommended literature **References:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	10%
11	Design a poster about viruses and prions and socialize/present it to the public in the form of a poster	1. Design a poster about viruses and prions: structure and function, reproductive mechanisms, how to detect, prevent and control viruses/prions that cause authentic disease 2. Socialize/present to the public in the form of a poster	**Criteria:** 1.1. Observing student activities in groups (1 to 4) when working on timeline 5 in accordance with the Kelp assignment, namely designing posters and 2. Observing presentations l poster 2.Essay questions are assessed together at USS 3.Performance questions are integrated during learning **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Learning model: Discussion about the 5th timeline (designing a poster) and presenting the resulting poster. Estimated time: 6 x50 minutes (for meetings 9, 10 and 11)	Platform: LMS online method is carried out when MK participants are in KKK or MPK. Method: kelp discussion according to theme and presentation Estimated time: 6 x50 minutes (for meetings 9, 10 and 11)	**Material:** Designing posters and presentations References: articles on the internet, all recommended literature **References:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	10%

12	Grouping viruses into certain taxa according to the description of their characteristics	1. Explain the principles of virus classification. 2. Determine the general characteristics of certain representative viruses	**Criteria:** 1. Observation of student activities in groups classifying viruses based on representative examples 2. Essay questions are assessed together at USS 3. Performance questions are integrated during learning **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Learning model: cooperative (Group discussion) Estimated time: 2 x50 minutes	Platform: LMS online meetings are held if the MK participants are KKN or MPK with Method: Discussion and presentation Estimated time: 2 x 50 minutes	**Material:** Grouping viruses into certain taxa according to the description of their characteristics. **Reference:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	5%
13	Understanding the positive role of viruses in human life	1. Explain the role of viruses as bioinsecticides 2. Explain the role of viruses in genetic engineering (as vectors)	**Criteria:** 1. Observation of student activities in groups 2. Essay questions are assessed together at USS 3. Performance questions are integrated during learning **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Learning Model: PBL Based on cases of pests controlled with viral bioinsecticides Estimated time: 2 x50 minutes	Online meetings are held if the MK participants are currently studying or MPK Platform: LMS Method: discussion and presentation Estimated time: 2 x 50 minutes	**Material:** Material: Identifying the positive role of viruses in human life **Reference:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	5%
14	Explain the molecular genetics of viruses and virus ecology	Explain the molecular genetics of viruses and various environmental factors that influence the development and spread of pathogenic viruses	**Criteria:** 1. Observation of student activities in groups discussing virus molecules and their ecology based on cases found 2. Essay questions are assessed together at USS 3. Performance questions are integrated during learning **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Learning Model: PBL Based on genetic and ecological studies of cases of disease caused by currently viral viruses Estimated time: 2 x 50 minutes	Online learning is carried out if the MK participants are currently studying or MPK Platform: LMS Method: discussion and presentation Estimated time: 2 x 50 minutes	**Material:** Material: Describing the molecular genetics of viruses and virus ecology. **Reference:** *Cann, AJ 2005. Principles of Molecular Virology. 4th ed. Oxford: Elsevier.*	5%
15	Understand how to detect based on symptoms, prevention and control of pathogenic viruses	Explains how to detect, prevent and control viruses that cause disease in plants	**Criteria:** 1. Guiding students to look for cases of plant diseases caused by viruses and look for ways to detect, prevent and control them 2. Essay questions are assessed together at USS 3. Performance questions are integrated during learning **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Learning model: : PBL Case study of various diseases caused by viruses in plants looking at how to detect/symptoms, prevent and control Estimated time: 2 x50 minutes	Online perte,uam is carried out if the MK participants are currently studying or MPK using Platform: LMS Method: discussion and presentation Estimated time: 2 x 50 minutes	**Material:** Describe how to detect/symptoms, prevent and control pathogenic viruses in plants. **Reference:** *Carter, J. And V. Sounders, 2007. Virology: Principles and Applications. John Willey A Sons, Ltd. Chichester*	5%

16	UAS		**Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Tests	essay test 2x 50 minutes	case study essay test 2x 50 minutes		10%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	42.16%
2.	Project Results Assessment / Product Assessment	51.16%
3.	Test	6.66%
		99.98%

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.