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

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Animal Systematics	8420504220	Compulsory Study Program Subjects	**T=4**	**P=0**	**ECTS=6.36**	4	October 23, 2022

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-7	Able to demonstrate knowledge of biology at the molecular, cell and organism levels and their interactions with the environment.
	PLO-10	Able to design and carry out experiments in biology learning to obtain, analyze and interpret data to solve problems
	Program Objectives (PO)	
	PO - 1	Mastering the concept of Animal Systematics.
	PO - 2	Able to analyze numerical taxonomy and phylogenetics of animals using computer software.
	PO - 3	Able to design and carry out research in the field of Animal Systematics and able to process, analyze, interpret and document research data.
	PO - 4	Able to apply transferable skills to develop eco-commitment in an effort to realize the character of "Faith, Smart, Independent, Honest, Caring and Resilient (Jelita's Dream)".
	PO - 5	Able to communicate the results of Animal Systematics research in the form of scientific articles.
	PLO-PO Matrix	

P.O	PLO-7	PLO-10
PO-1		
PO-2		
PO-3		
PO-4		
PO-5		

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																
PO-5																

Short Course Description	This course discusses the concept of animal systematics, scientific nomenclature, special characteristics/differentiating characters and general characteristics, description, identification, classification and diversity of animals including the Phylum Porifera, Cnidaria, Platyhelminthes, Nemathelminthes, Annelida, Mollusca, Arthropods, Echinoderms and Chordata. Apart from that, this course also reviews the benefits of these animals for human life, kinship relationships between taxa and research methods both in morphology and DNA which are studied using computer programs (Information technology/IT). Learning is carried out with a student centered approach using the flipped learning model, practicum and Project Based Learning which is carried out honestly and independently
References	**Main :**

1. Ambarwati R, Faizah U, Rahayu DA, 2019. Sistematika Hewan 1: Teori dan Praktik. Surabaya: Unesa University Press
2. Faizah U, Ambarwati R, Rahayu DA, 2019. Sistematika Hewan 2: Teori dan Praktik. Surabaya: Unesa University Press
3. International Commission on Zoological Nomenclature. 1999. International Code of Zoological Nomenclature. London: The International Trust for Zoological Nomenclature
4. Kardong, K.V. 2018. Vertebrates: Comparative Anatomy, Function, Evolution 8th edition. New York: McGrawHill Companies, Inc.
5. Mayr, E and Peter DA. 1991. Principles of Systematic Zoology. Singapore: McGraw Hill, Inc
6. Pechenik, J.A. 2015. Biology of The Invertebrates, 7th edition. New York: McGraw-Hill International.
7. Pough FH, Janis CM, Heiser JB. 2013. Vertebrate Life, 9th edition. Boston: Pearson

Supporters:

1. Ambarwati R & Faizah U, 2017. Colour and Morphometric Variation of Donacid Bivalves from Nepa Beach, Madura Island, Indonesia Biosaintifika: Journal of Biology & Biology Education 9(3).
2. Ambarwati R & Trijoko. 2010. Morfologi Fungsional Kerang Batik Paphia undulata (Bivalvia: Veneridae). Berk. Penel. Hayati 16 (1): 83–86.
3. Ambarwati R dan Trijoko. 2011. Kekayaan Jenis Anadara (Bivalvia: Arcidae) di Perairan Pantai Sidoarjo. Berk. Penel. Hayati; Special Topics in Zoology; 4B: 1-7.
4. Ambarwati, R., & Irawan, B. (2020). The population of Solen sp.(bivalvia: Solenidae) from Pamekasan, Indonesia. Ecology, Environment, and Conservation, 26, S199-S204.
5. Ambarwati, R., Purnomo, T., Fitrihidajati, H., Rachmadiarti, F., Rahayu, D. A., & Faizah, U. (2021, December). Morphological Variations of Meretrix sp. from Bancaran, Madura, Indonesia. In International Joint Conference on Science and Engineering 2021 (IJCSE 2021) (pp. 214-217). Atlantis Press.
6. Ambarwati, R., Purnomo, T., Fitrihidajati, H., Rachmadiarti, F., Rahayu, D. A., & Faizah, U. (2021, December). Morphological Variations of Meretrix sp. from Bancaran, Madura, Indonesia. In International Joint Conference on Science and Engineering 2021 (IJCSE 2021) (pp. 214-217). Atlantis Press.
7. Ambarwati, R., Rahayu, D. A., & Faizah, U. (2019, December). The potency and food safety of Lamp Shells (Brachiopoda: Lingula sp.) as Food Resources. In Journal of Physics: Conference Series (Vol. 1417, No. 1, p. 012039). IOP Publishing.
8. Atlanta, V., Ambarwati, R., Rahayu, D. A., & Mujiono, N. (2022). Diversity of bivalves on the north coast of Lamongan, East Java, Indonesia. Biodiversitas Journal of Biological Diversity, 23(8).
9. Ambarwati, R., Rahayu, D. A., Rachmadiarti, F., & Khaleyla, F. (2021). DNA barcoding of lamp shells (Brachiopoda: Lingula anatina) from Probolinggo, East Java, Indonesia. Biodiversitas Journal of Biological Diversity, 22(4).
10. Faizah, Ulfi; Solihin, Dedy Duryadi, Tumbelaka, Ligaya ITA. 2009. Karakteristik Marka Genetik Daerah Cytochrome B sebagai Acuan Konservasi Genetik Harimau Sumatera. Berkala Penelitian Hayati. Edisi Khusus No. 3B.
11. Faizah, Ulfi; Solihin, Dedy Duryadi, Tumbelaka, Ligaya ITA. 2011. Perbandingan Karakteristik Marka Genetik Cytochrome B Berdasarkan Keragaman Genetik Basa Nukleotida dan Asam Amino pada Harimau Sumatera. Berkala Penelitian Hayati Edisi Khusus No. 4B Tahun 2011
12. Faizah, Ulfi; Solihin, Dedy Duryadi, Tumbelaka, Ligaya ITA. 2011. Asam Amino Spesifik pada Daerah Cytochrome B sebagai Penanda Genetik Harimau Sumatera (Panthera tigris sumatrae). Zoo Indonesia 20 (2): 27-33
13. Rahayu D, Nugroho E, & Listyorini D, 2019. DNA Barcoding Ikan Introduksi Khas Telaga Sari, Kabupaten Pasuruan. Biotropika: Journal of Tropical Biology, 7(2), 51-62.
14. Rahayu, D., Rahayu, D. A., Ambarwati, R., & Faizah, U. (2019, December). Biodiversity of Invertebrates in Kemantren Coast, Lamongan. In Mathematics, Informatics, Science, and Education International Conference (MISEIC 2019) (pp. 7-13). Atlantis Press
15. Yolanda, R., & Lheknim, V. (2020). Mysids resource from Songkhla Lagoon, southern Thailand. In IOP Conference Series: Earth and Environmental Science (Vol. 416, No. 1, p. 012017). IOP Publishing
16. Yolanda, R., Sawamoto, S., & Lheknim, V. (2019). A new species in the genus Heteromysoides (Crustacea, Mysida, Mysidae) from Songkhla Lagoon, southern Thailand. Zoosystematics and Evolution, 95, 535.
17. Yolanda, R., Sawamoto, S., & Lheknim, V. (2022). Redescription of Nanomysis siamensis WM Tattersall, 1921 (Crustacea: Mysida) after 100 years, with an update of its distribution in the Songkhla Lagoon System, southern Thailand. Zootaxa, 5125(1), 75-91.

Supporting lecturer	Reni Ambarwati, S.Si., M.Sc. Dr. Ulfi Faizah, S.Pd., M.Si. Rofiza Yolanda, S.Si, M.Si, Ph.D. Dwi Anggorowati Rahayu, S.Si., 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	1. Understand the principles of animal systematics and nomenclature in taxonomy. 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character	1. Explaining the RPS from the Animal Systematics MK 2. Explaining the RPS from the Animal Systematics MK 3. Provides an introduction to the Animal Systematics course. 4. Provides an introduction to the Animal Systematics course. 5. Identify the position of Kingdom Animalia in the classification system. 6. Explains the principles of scientific nomenclature of animals based on the International Commission on Zoological Nomenclature (ICZN). 7. Apply the principles of scientific nomenclature of animals. 8. Explain the principles of identification. 9. Compare morphological descriptions, analytical descriptions, and diagnostic descriptions. 10. Explain the implementation of weekly practicum. 11. Explain the implementation of field practicum. 12. Explain the implementation of an independent research project. 13. Explain the outline of the task implementation timeline. 14. Explain the outline of the task implementation timeline.	**Criteria:** Participation is an assessment of students' positive activities as well as their honest, independent and responsible character (weight 2). The UTS test as a UTS score is carried out to assess all relevant indicators through written tests for meeting activities 1-7, (weight 2). Assessment of project assignment reports and practicum reports is considered an assignment (weight 3). The UAS test as a UAS score is carried out to assess all relevant indicators through a written test for meeting activities 9-15, (weight 3). The final NA is (participation valuex2) (Task valuex3) (UTS valuex2) (UAS valuex3) divided by 10 **Form of Assessment** : Participatory Activities, Tests	Presentations, discussions, explanations about weekly practicums, field practicums and independent research project assignments. 6x50	Flipped Learning, asynchronous learning at Vinesa: • Studying teaching materials • Working on 6x50 LKM	**Material:** Introduction, nomenclature, classification, description **References:** *Ambarwati R, Faizah U, Rahayu DA, 2019. Animal Systematics 1: Theory and Practice. Surabaya: Unesa University Press*	3%
2	1. Understand the special characteristics/differentiating and general characters, description, identification, classification and diversity of the Phylum Porifera 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character	1. Explain the differentiating/special characters of Porifera 2. Describe the general character of Porifera 3. Explain the diversity of Porifera 4. Explain the role of Porifera 5. Identify Porifera specimens 6. Describe Porifera specimens 7. Classifying Porifera specimens	**Criteria:** Participation is an assessment of students' positive activities as well as their honest, independent and responsible character (weight 2). The UTS test as a UTS score is carried out to assess all relevant indicators through written tests for meeting activities 1-7, (weight 2). Assessment of project assignment reports and practicum reports is considered an assignment (weight 3). The UAS test as a UAS score is carried out to assess all relevant indicators through a written test for meeting activities 9-15, (weight 3). The final NA is (participation valuex2) (Task valuex3) (UTS valuex2) (UAS valuex3) divided by 10 **Forms of Assessment** : Participatory Activities, Practical Assessment, Tests	Presentation and Discussion, 6x50 practicum	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Porifera **References:** *Ambarwati R, Faizah U, Rahayu DA, 2019. Animal Systematics 1: Theory and Practice. Surabaya: Unesa University Press* **Material:** Porifera **Reference:** *Pechenik, JA 2015. Biology of The Invertebrates, 7th edition. New York: McGraw-Hill International.*	3%

3	1. Understand the special characteristics/differentiating and general characters, description, identification, classification and diversity of the Phylum Cnidaria. 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character.	1. Explain the differentiating/special characters of Cnidaria 2. Describe the general characteristics of Cnidarians 3. Explain the diversity of Cnidarians 4. Explain the role of Cnidarians 5. Identifying Cnidaria specimens 6. Describe a specimen of Cnidaria	**Forms of Assessment** : Participatory Activities, Practical Assessment, Tests	Presentation, discussion, practicum Cnidaria 6x50	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Cnidaria **References:** *Ambarwati R, Faizah U, Rahayu DA, 2019. Animal Systematics 1: Theory and Practice. Surabaya: Unesa University Press* **Material:** Cnidaria **Bibliography:** *Pechenik, JA 2015. Biology of The Invertebrates, 7th edition. New York: McGraw-Hill International.*	3%
4	1. Understand the special characteristics/differentiating and general characters, description, identification, classification and diversity of the Phylum Platyhelminthes. 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character. 3. Able to design research in the field of Animal Systematics that is relevant to the realities of life in the management of biological resources.	1. Explain the distinguishing/special characters of Platyhelminthes 2. Describe the general characters of Platyhelminthes 3. Explain the diversity of Platyhelminthes 4. Explain the role of Platyhelminthes 5. Identify Platyhelminthes specimens 6. Describe a specimen of Platyhelminthes 7. Classifying Platyhelminthes specimens 8. Plan the implementation of research by determining the appropriate background: 9. Determine research objectives and related matters consistently.	**Criteria:** Participation is an assessment of students' positive activities as well as their honest, independent and responsible character (weight 2). The UTS test as a UTS score is carried out to assess all relevant indicators through written tests for meeting activities 1-7, (weight 2). Assessment of project assignment reports and practicum reports is considered an assignment (weight 3). The UAS test as a UAS score is carried out to assess all relevant indicators through a written test for meeting activities 9-15, (weight 3). The final NA is (participation valuex2) (Task valuex3) (UTS valuex2) (UAS valuex3) divided by 10 **Form of Assessment** : Project Results Assessment / Product Assessment, Test	Presentations, discussions, practicums, project assignments (project based learning) 6x50	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Platyhelminthes **References:** *Ambarwati R, Faizah U, Rahayu DA, 2019. Animal Systematics 1: Theory and Practice. Surabaya: Unesa University Press* **Material:** Platyhelminthes **Bibliography:** *Pechenik, JA 2015. Biology of The Invertebrates, 7th edition. New York: McGraw-Hill International.*	6%
5	1. Understand the special characteristics/differentiating and general characters, description, identification, classification and diversity of the Phylum Nemathelminthes. 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character. 3. Able to design research in the field of Animal Systematics that is relevant to the realities of life in the management of biological resources.	1. Explain the distinguishing/special characters of Nemathelminthes 2. Explain the general characteristics of Nemathelminthes 3. Explain the diversity of Nemathelminthes 4. Explain the role of Nemathelminthes 5. Identify Nemathelminthes specimens 6. Describe a specimen of Nemathelminthes 7. Classifying Nemathelminthes specimens 8. Determine the project design plan which includes appropriate implementation methods and schedules.	**Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Tests	presentation, discussion, practicum, project assignment (project based learning) 6x50	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Nemathelminthes **References:** *Ambarwati R, Faizah U, Rahayu DA, 2019. Animal Systematics 1: Theory and Practice. Surabaya: Unesa University Press* **Material:** Nemathelminthes **Bibliography:** *Pechenik, JA 2015. Biology of The Invertebrates, 7th edition. New York: McGraw-Hill International.*	8%

6	1. Understand the special characteristics/differentiating and general characters, description, identification, classification and diversity of the Phylum Annelida and Mollusca. 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character. 3. Able to carry out research in the field of Animal Systematics, both field and non-field research/morphology and DNA research in accordance with procedures.	1. Explain the differentiating/special characters of Annelida and Mollusca 2. Explain the general characters of Annelida and Mollusca 3. Explain the diversity of Annelida and Mollusca 4. Explain the role of Annelida and Mollusca 5. Identify specimens of Annelida and Mollusca 6. Describe specimens of Annelida and Mollusca 7. Classifying Annelida and Mollusca specimens	**Criteria:** Participation is an assessment of students' positive activities as well as their honest, independent and responsible character (weight 2). The UTS test as a UTS score is carried out to assess all relevant indicators through written tests for meeting activities 1-7, (weight 2). Assessment of project assignment reports and practicum reports is considered an assignment (weight 3). The UAS test as a UAS score is carried out to assess all relevant indicators through a written test for meeting activities 9-15, (weight 3). The final NA is (participation valuex2) (Task valuex3) (UTS valuex2) (UAS valuex3) divided by 10 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Tests	Presentations and discussions, practicums, project assignments (project based learning) 6x50	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Annelida **References:** *Ambarwati R, Faizah U, Rahayu DA, 2019. Animal Systematics 1: Theory and Practice. Surabaya: Unesa University Press* **Material:** Mollusca **References:** *Ambarwati R, Faizah U, Rahayu DA, 2019. Animal Systematics 1: Theory and Practice. Surabaya: Unesa University Press* **Material:** Annelida **Bibliography:** *Pechenik, JA 2015. Biology of The Invertebrates, 7th edition. New York: McGraw-Hill International.* **Material:** Bivalves **Literature:** *Ambarwati R & Trijoko. 2010. Functional morphology of the Batik Mussel Paphia undulata (Bivalvia: Veneridae). Berk. Penel. Life 16(1): 83–86.* **Material:** diversity of bivalves **References:** *Atlanta, V., Ambarwati, R., Rahayu, DA, & Mujiono, N. (2022). Diversity of bivalves on the north coast of Lamongan, East Java, Indonesia. Biodiversity Journal of Biological Diversity, 23(8).*	8%

7	1. Understand the special characteristics/differentiating and general characters, description, identification, classification and diversity of the Phylum Arthropoda. 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character. 3. Able to document research data well	1. Explain the differentiating/special characteristics of Arthropods 2. Describe the general characteristics of Arthropods 3. Explain the diversity of Arthropods 4. Explain the role of Arthropods 5. Identifying Arthropod specimens 6. Describe Arthropod specimens 7. Classifying Arthropod specimens 8. Produce data that is relevant to research	**Criteria:** Participation is an assessment of students' positive activities as well as their honest, independent and responsible character (weight 2). The UTS test as a UTS score is carried out to assess all relevant indicators through written tests for meeting activities 1-7, (weight 2). Assessment of project assignment reports and practicum reports is considered an assignment (weight 3). The UAS test as a UAS score is carried out to assess all relevant indicators through a written test for meeting activities 9-15, (weight 3). The final NA is (participation valuex2) (Task valuex3) (UTS valuex2) (UAS valuex3) divided by 10 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Practical Assessment, Tests	Presentations, Discussions, Practicums, Project assignments (project based learning) 6x50	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Arthropods **References:** *Ambarwati R, Faizah U, Rahayu DA, 2019. Animal Systematics 1: Theory and Practice. Surabaya: Unesa University Press* **Material:** Mysida **References:** *Yolanda, R., Sawamoto, S., & Lheknim, V. (2019). A new species in the genus Heteromysoides (Crustacea, Mysida, Mysidae) from Songkhla Lagoon, southern Thailand. Zoosystematics and Evolution, 95, 535.* **Material:** Crustacea **References:** *Yolanda, R., Sawamoto, S., & Lheknim, V. (2022). Redescription of Nanomysis siamensis WM Tattersall, 1921 (Crustacea: Mysida) after 100 years, with an update of its distribution in the Songkhla Lagoon System, southern Thailand. Zootaxa, 5125(1), 75-91.*	8%
8	UTS	UTS	**Criteria:** UTS	UTS 6 X 50		**Material:** - **Library:**	0%
9	1. Understand the special characteristics/differentiating and general characters, description, identification, classification and diversity of the Phylum Echinodermata and Phylum Cordata. 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character. 3. Able to process, analyze and interpret/synthesize so as to produce new knowledge/information/solutions.	1. Explain the distinguishing/special characteristics of Echinodermata 2. Describe the general characteristics of Echinoderms 3. Explain the diversity of Echinoderms 4. Explain the role of Echinoderms 5. Analyze the relationship between Echinoderms and Chordata 6. Explain the characteristics of Chordata 7. Explain the classification of Chordata 8. Explain the role of chordates 9. Identify Echinodermata specimens 10. Describe Echinodermata specimens 11. Classifying Echinodermata specimens	**Criteria:** Participation is an assessment of students' positive activities as well as their honest, independent and responsible character (weight 2). The UTS test as a UTS score is carried out to assess all relevant indicators through written tests for meeting activities 1-7, (weight 2). Assessment of project assignment reports and practicum reports is considered an assignment (weight 3). The UAS test as a UAS score is carried out to assess all relevant indicators through a written test for meeting activities 9-15, (weight 3). The final NA is (participation valuex2) (Task valuex3) (UTS valuex2) (UAS valuex3) divided by 10 **Form of Assessment** : Project Results Assessment / Product Assessment, Test	Presentations, discussions, practicums, project assignments (project based learning) 6x50	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Echinoderms **References:** *Ambarwati R, Faizah U, Rahayu DA, 2019. Animal Systematics 1: Theory and Practice. Surabaya: Unesa University Press* **Material:** Echinoderms **Bibliography:** *Pechenik, JA 2015. Biology of The Invertebrates, 7th edition. New York: McGraw-Hill International.* **Material:** Chordata **Library:** *Kardong, KV 2018. Vertebrates: Comparative Anatomy, Function, Evolution 8th edition. New York: McGrawHill Companies, Inc.*	8%

10	1. Understand the special characteristics/distinguishing and general characteristics, description, identification, classification and diversity of Pisces 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character 3. Able to document research data well	1. Explain the distinctive/special character of Pisces - Chondrichthyes 2. Explains the general character of Pisces - Chondrichthyes 3. Explains the general character of Pisces - Chondrichthyes 4. Explains the role of Pisces - Chondrichthyes 5. Identifying Pisces specimens - Chondrichthyes 6. Describe the Pisces specimen - Chondrichthyes 7. Classify Pisces specimens - Chondrichthyes 8. Identifying Pisces - Osteichthyes specimens 9. Describe the Pisces specimen - Osteichthyes 10. Classifying Pisces specimens - Osteichthyes 11. Organizing data to make data easier to read 12. Manage the research process appropriately 13. Make decisions based on the data obtained whether or not to carry out further research processes to add data	**Form of Assessment** : Project Results Assessment / Product Assessment, Test	Presentations and discussions, practicums, project assignments (project based learning) 6x50	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Pisces **References:** *Faizah U, Ambarwati R, Rahayu DA, 2019. Animal Systematics 2: Theory and Practice. Surabaya: Unesa University Press* **Material:** Pisces **References:** *Pough FH, Janis CM, Heiser JB. 2013. Vertebrate Life, 9th edition. Boston: Pearson*	8%
11	1. Understand the special characteristics/distinguishing and general characteristics, description, identification, classification and diversity of the Pisces class 2. Able to create a phenogram of phenetic relationships of a taxon using Ntysc 2.01 software 3. Able to analyze the numerical taxonomy of a phenetic relationship which includes synapomorphy characters, apomorphy characters, and automorphic characters as well as the similarity value of the resulting phenetic taxon relationships. 4. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character. 5. Able to analyze and interpret to produce new knowledge/information or a solution.	1. Make a phenogram of phenetic relationships in the Super class Pisces 2. Analyze the phenetic relationships in the Super class Pisces 3. Analyze the similarity value of the phenetic relationships of taxa in the Super class Pisces	**Criteria:** Participation is an assessment of students' positive activities as well as their honest, independent and responsible character (weight 2). The UTS test as a UTS score is carried out to assess all relevant indicators through written tests for meeting activities 1-7, (weight 2). Assessment of project assignment reports and practicum reports is considered an assignment (weight 3). The UAS test as a UAS score is carried out to assess all relevant indicators through a written test for meeting activities 9-15, (weight 3). The final NA is (participation valuex2) (Task valuex3) (UTS valuex2) (UAS valuex3) divided by 10 **Form of Assessment** : Project Results Assessment / Product Assessment, Test	Presentation, Discussion, Practicum, Project Assignment (project based learning) 6x50	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Numerical Taxonomy **References:** *Faizah U, Ambarwati R, Rahayu DA, 2019. Animal Systematics 2: Theory and Practice. Surabaya: Unesa University Press* **Material:** Pisces **Library:** *Kardong, KV 2018. Vertebrates: Comparative Anatomy, Function, Evolution 8th edition. New York: McGrawHill Companies, Inc.*	8%

12	1. Understand the special characteristics/differentiating and general characters, description, identification, classification and diversity of the Amphibia class. 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character 3. Able to write the results of research conducted in the form of scientific articles	1. Explain the differentiating/special characteristics of Amphibia 2. Explain the general character of Amphibia 3. Explain the diversity of Amphibia 4. Explain the role of Amphibia 5. Identify Amphibia specimens 6. Describe the Amphibia specimen 7. Classifying Amphibia specimens 8. Communicate research results	**Criteria:** Participation is an assessment of students' positive activities as well as their honest, independent and responsible character (weight 2). The UTS test as a UTS score is carried out to assess all relevant indicators through written tests for meeting activities 1-7, (weight 2). Assessment of project assignment reports and practicum reports is considered an assignment (weight 3). The UAS test as a UAS score is carried out to assess all relevant indicators through a written test for meeting activities 9-15, (weight 3). The final NA is (participation valuex2) (Task valuex3) (UTS valuex2) (UAS valuex3) divided by 10 **Form of Assessment** : Project Results Assessment / Product Assessment	Presentations and discussions, practicums, project assignments (project based learning) 6x50	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Amphibia **References:** *Faizah U, Ambarwati R, Rahayu DA, 2019. Animal Systematics 2: Theory and Practice. Surabaya: Unesa University Press* **Material:** Amphibia **Literature:** *Pough FH, Janis CM, Heiser JB. 2013. Vertebrate Life, 9th edition. Boston: Pearson*	10%
13	1. Understand the special characteristics/differentiating and general characters, description, identification, classification and diversity of the Reptile class. 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character. 3. Able to present research results in the form of scientific work	1. Explain the distinguishing/special characteristics of Reptiles 2. Describe the general character of Reptilia 3. Explain the diversity of reptiles 4. Explain the role of Reptiles 5. Identify Reptile specimens 6. Describe Reptilia specimens 7. Classifying Reptile specimens 8. Communicate research results widely.	**Criteria:** Participation is an assessment of students' positive activities as well as their honest, independent and responsible character (weight 2). The UTS test as a UTS score is carried out to assess all relevant indicators through written tests for meeting activities 1-7, (weight 2). Assessment of project assignment reports and practicum reports is considered an assignment (weight 3). The UAS test as a UAS score is carried out to assess all relevant indicators through a written test for meeting activities 9-15, (weight 3). The final NA is (participation valuex2) (Task valuex3) (UTS valuex2) (UAS valuex3) divided by 10 **Form of Assessment** : Project Results Assessment / Product Assessment	Presentations and discussions, Practicum, Project assignments (project based learning) 6x50	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Reptiles **References:** *Faizah U, Ambarwati R, Rahayu DA, 2019. Animal Systematics 2: Theory and Practice. Surabaya: Unesa University Press*	13%

14	1. Understand the special characteristics/differentiating and general characters, description, identification, classification and diversity of the Aves class 2. Able to apply transferable skills to develop eco-commitment in an effort to realize the Dream of Jelita character. 3. Follow up on research results by planning to communicate them in wider scientific forums (submit journals or attend seminars/Student Creativity Program (PKM)/other scientific activities)	1. Explain the differentiating/special characteristics of Aves 2. Describes the general character of Aves 3. Explain the diversity of Aves 4. Explaining the role of Aves 5. Do birding/bird watching in the surrounding environment 6. Identifying birds 7. Describe birds 8. Classifying birds 9. Plan to apply research results contextually.	**Criteria:** Participation is an assessment of students' positive activities as well as their honest, independent and responsible character (weight 2). The UTS test as a UTS score is carried out to assess all relevant indicators through written tests for meeting activities 1-7, (weight 2). Assessment of project assignment reports and practicum reports is considered an assignment (weight 3). The UAS test as a UAS score is carried out to assess all relevant indicators through a written test for meeting activities 9-15, (weight 3). The final NA is (participation valuex2) (Task valuex3) (UTS valuex2) (UAS valuex3) divided by 10 **Form of Assessment** : Project Results Assessment / Product Assessment, Test	Presentations and discussions, practicums, project assignments (project based learning) 6x50	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Aves **References:** *Faizah U, Ambarwati R, Rahayu DA, 2019. Animal Systematics 2: Theory and Practice. Surabaya: Unesa University Press* **Material:** Aves **Library:** *Kardong, KV 2018. Vertebrates: Comparative Anatomy, Function, Evolution 8th edition. New York: McGrawHill Companies, Inc.*	9%

15	1. Understand the special characteristics/differentiating and general characters, description, identification, classification and diversity of the Mammalia class. 2. Able to create cladograms using several bioinfomatics software (bioedit, clustal x and mega 5) 3. Able to analyze phylogenetic topology using the Neighbor Joining and Maximum Parsimony methods 4. Able to analyze genetic distances using Mega 5 software with the Kimura 2 Parameter Model calculation model.	1. Explain the distinguishing/special characters of Mammalia 2. Explain the general character of Mammalia 3. Explain the diversity of Mammalia 4. Explain the role of Mammalia 5. Collect data on at least 10 mammalian taxa from Genbank. 6. Create an appropriate cladogram from the data obtained using several bioedit software, clustal x and mega 5 7. Accurately analyzing phylogenetic topology using the Neighbor Joining method 8. Accurately analyzing phylogenetic topology using the Maximum Parsimony method. 9. Analyzing genetic distances using Mega 5 software with the Kimura 2 Parameter Model calculation model. 10. Concluding the results of the data analysis carried out.	**Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Tests	Presentation and discussion, 6x50 practical	Flipped Learning, asynchronous learning at Vinesa: • Study teaching materials • Actively discuss in forums	**Material:** Mammals **References:** *Faizah U, Ambarwati R, Rahayu DA, 2019. Animal Systematics 2: Theory and Practice. Surabaya: Unesa University Press* **Material:** Molecular phylogenetics **References:** *Faizah U, Ambarwati R, Rahayu DA, 2019. Animal Systematics 2: Theory and Practice. Surabaya: Unesa University Press* **Material:** DNA Barcoding **References:** *Rahayu D, Nugroho E, & Listyorini D, 2019. DNA Barcoding of Typical Introduced Fish in Telaga Sari, Pasuruan Regency. Biotropics: Journal of Tropical Biology, 7(2), 51-62.* **Material:** Genetic markers **References:** *Faizah, Ulfi; Solihin, Dedy Duryadi, Tumbelaka, Ligaya ITA. 2011. Comparison of the Characteristics of Cytochrome B Genetic Markers Based on Genetic Diversity of Nucleotide Bases and Amino Acids in Sumatran Tigers. Biological Research Periodical Special Edition No. 4B 2011*	5%
16			**Form of Assessment** : Test	UAS	UAS	**Material:** - **Library:**	0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	12.51%
2.	Project Results Assessment / Product Assessment	51.51%
3.	Practical Assessment	4%
4.	Test	32.01%
		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** 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.