	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
Endocrinology*	4620102060		T=2 P=0 ECTS=3.18	7	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	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-6	Able to apply logical, critical, systematic and innovative thinking in the context of developing or implementing science and/or technology according to their field of expertise.
	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.
	PLO-11	Able to apply transferable skills in biology to develop ecopreneurship (eco-innovation, eco-opportunity, eco-commitment)
	PLO-13	Able to demonstrate basic knowledge of cell and molecular biology, organismal biology, ecology and evolution to analyze current biological issues
	Program Objectives (PO)	
	PLO-PO Matrix	

P.O	PLO-6	PLO-7	PLO-11	PLO-13

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

Short Course Description	Examining theories and proving processes in everyday life that occur in animal bodies related to the endocrine system, cellular mechanisms of hormone action, physiological effects of metabolic hormones and developmental hormones, as well as the work of hormones in invertebrate animals.
References	**Main :**

1. Hadley, Mac.E ., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall
2. MelmedSholmo, 2005, Endocrinology - Basic and Clinical Principles, New York Human Press.
3. Schmidt-Nielsen, K. 1997. Animal Physiology: Adaptation and Environment . 6th Edition. Cambridge: Cambridge University Press.
4. Rose. R.W., Kuswanti, N. 1998. Development of Endothermy in a tasmanian marsupials, Betongia gaimardi and its response to cold and noradrenaline. . Journal Comp. Physiol B, 168:359-363.
5. Rose. R.W., Kuswanti, N. 2004. Thyroid function and the development of endothermy in a marsupial, the Tasmanian bettong, Bettongia gaimard. . General and Comparative Endocrinology Journal 136, 17-22

Supporters:

1. Jurnal Endokrinologi terbaru

Supporting lecturer	Dr. Nur Kuswanti, M.Sc.St. Dr. Raharjo, M.Si. Nur Qomariyah, S.Pd., M.Sc. Erlix Rakhmad Purnama, S.Si., M.Si. Firas Khaleyla, 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	Understanding the development of endocrinology	1. Explain the history of the development of endocrinology 2. Explaining the Scientific Aspects of Endocrinology 3. Explain the concept of Homeostasis 4. Explaining Neuroendocrine Integration	**Criteria:** 1. Participation 20% 2. Duty 30% 3. UTS 20% 4. UAS 30% **Form of Assessment** : Participatory Activities	Presentation, discussion 2 X 50	Learning with LMS 2x50	**Material:** Development of endocrinology. **Library:** *Latest Endocrinology Journal* **Material:** Aspects of Endocrinology Science. **References:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Homeostasis Concept **References:** *Schmidt-Nielsen, K. 1997. Animal Physiology: Adaptation and Environment. 6th Edition. Cambridge: Cambridge University Press.* **Material:** Doctrinal Neurointegration **References:** *Schmidt-Nielsen, K. 1997. Animal Physiology: Adaptation and Environment. 6th Edition. Cambridge: Cambridge University Press.*	5%
2	Understanding the vertebrate endocrine system	1. Group various types of glands and their hormones. 2. Explain the meaning of hormones 3. Grouping general chemistry reporters 4. Grouping special chemical reporters 5. Explain hormone synthesis 6. Explain the mechanism of hormone delivery to target cells/tissues 7. Explain metabolism and hormone circulation	**Criteria:** 1. Participation 20% 2. Duty 30% 3. UTS 20% 4. UAS 30% **Form of Assessment** : Participatory Activities	Expository, discussion 2 X 50	Learning with LMS 2x50	**Material:** Types of glands and their hormones. **References:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Understanding hormones. **References:** *MelmedSholmo, 2005, Endocrinology - Basic and Clinical Principles, New York Human Press.* **Material:** Chemical reporter. **References:** *Schmidt-Nielsen, K. 1997. Animal Physiology: Adaptation and Environment. 6th Edition. Cambridge: Cambridge University Press.* **Material:** Metabolism and hormone circulation. **References:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall*	5%

3	Understand the general mechanism of hormone action	1. Explain cell receptors and hormone action. 2. Explain eicosanoids and hormone action 3. Explain hormone receptors 4. Explain the termination of hormone action	**Criteria:** 1. Duty 30% 2. Participation 20% 3. UTS 20% 4. UAS 30% **Form of Assessment** : Participatory Activities	Expository, discussion 2 X 50	Learning in LMS 2x50	**Material:** Receptors and how hormones work **References:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Eicosanoid **Bibliography:** *MelmedSholmo, 2005, Endocrinology - Basic and Clinical Principles, New York Human Press.* **Material:** Termination of hormone action. **Reference:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall*	5%
4	Understand the types and how pituitary hormones work	1. Explain how anterior pituitary hormones work. 2. Explain how posterior pituitary hormones work. 3. Explain the pathways of the hypothalamus and pituitary	**Criteria:** 1. Participation 20% 2. Duty 30% 3. UTS 20% 4. UAS 30% **Form of Assessment** : Participatory Activities, Tests	Presentation, discussion 2 X 50		**Material:** Anterior pituitary hormones **Reference:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Posterior pituitary hormones **Reference:** *MelmedSholmo, 2005, Endocrinology - Basic and Clinical Principles, New York Human Press.* **Material:** Relationship between the pituitary and hypothalamus **References:** *MelmedSholmo, 2005, Endocrinology - Basic and Clinical Principles, New York Human Press.*	6%
5	Understanding pituitary hormones	1. Explain the Anatomy of the Pituitary 2. Comparing Somatotropin and prolactin 3. Explain Glycoprotein Hormones	**Criteria:** 1. Participation 20% 2. Duty 30% 3. UTS 20% 4. UAS 30% **Form of Assessment** : Test	Presentation, discussion 2 X 50		**Material:** Pituitary gland **Bibliography:** *MelmedSholmo, 2005, Endocrinology - Basic and Clinical Principles, New York Human Press.* **Material:** Somatotropin and prolactin **References:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Glycoprotein Hormones **References:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall*	5%

6	Understanding pituitary hormones	1.Explaining the Pro-opio melano cortin Hormone. 2.Explain pituitary neurohormones 3.Explain the Pathophysiology of the Pituitary	**Criteria:** 1.assignment 30% 2.Participation 20% 3.UTS 20% 4.UAS 30% **Form of Assessment** : Participatory Activities, Tests	Presentation, discussion 2 X 50		**Material:** Proopiomelanocortin hormone **References:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Neurohypophysal hormones **References:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Pituitary Pathophysiology **Library:** *Latest Journal of Endocrinology*	4%
7	Understanding hypothalamic endocrine	1.· Explain the structure and function of the hypothalamus. 2.· Explain Thyrotropin Releasing Hormone (TRH)	**Criteria:** 1.assignment 30% 2.Participation 20% 3.UTS 20% 4.UAS 30% **Form of Assessment** : Participatory Activities, Tests	Presentation, discussion 2 X 50		**Material:** Structure and function of the Hypothalamus **References:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Thyrotropin Releasing Hormone (TRH) **References:** *MelmedSholmo, 2005, Endocrinology - Basic and Clinical Principles, New York Human Press.*	5%
8	UTS	UTS	**Criteria:** UTS **Form of Assessment** : Participatory Activities, Tests	UTS 2 X 50			15%
9	Understanding hypothalamic endocrine	1.Explain the control of hypothalamic pituitary hormones 2.Explain the role of CNS neurohormones. 3.Explain how neurohormonal control 4.Explain the hypothalamic hypophyseal feedback mechanism	**Criteria:** 1.Participation 20% 2.Duty 30% 3.UAS 30% **Form of Assessment** : Participatory Activities	Presentation, discussion 2 X 50		**Material:** Hypothalamic hormones **Bibliography:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** CNS Neurohormones. **References:** *Schmidt-Nielsen, K. 1997. Animal Physiology: Adaptation and Environment. 6th Edition. Cambridge: Cambridge University Press.* **Material:** Hypothalamic hypophysial feedback mechanism. **Reference:** *Latest Journal of Endocrinology*	5%

10	Understanding the physiological role of neurohypophysial hormones	1. Explain the Physiological Role of the hormones oxytocin, Vasopressin, and Vasotocin · 2. Explain the mechanism of action of the hormones oxytocin, Vasopressin, and Vasotocin	**Criteria:** 1. Duty 30% 2. Participation 20% 3. UAS 30% **Form of Assessment** : Participatory Activities	Presentation and discussion 2 X 50		**Material:** Oxytocin hormone, Vasopressin, and Vasotocin **Library:** *Latest Endocrinology Journal*	5%
11	Understanding melanotropic hormone	· Explain the synthesis and chemistry of the melanotropin hormone. · Explain the control of MSH secretion · Explain the control of dopaminergic · Explain the control of neuropeptide Y	**Criteria:** 1. Duty 30% 2. Participation 20% 3. UAS 30%	presentation and discussion 2 X 50			0%
12	Understand the physiological role of pancreatic hormone and metabolic regulation	1. · Explain the Insulin Hormone · 2. Explaining the Glucagon Hormone · 3. Explain insulin removal therapy	**Criteria:** 1. Duty 30% 2. Participation 20% 3. UAS 30% **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Tests	presentation and discussion 2 X 50		**Material:** Insulin and Glucagon Hormones **Library:** *Latest Endocrinology Journal* **Material:** Insulin removal therapy **Reference:** *Latest Journal of Endocrinology*	10%
13	Understand the physiological role of growth hormone	1. Explain the role of the hormones somatotropin and somatomedin in the growth process · 2. Explain the insulin hormone in the growth process · 3. Explain the hormone Prolactin in the growth process	**Criteria:** 1. Duty 30% 2. Participation 20% 3. UAS 30% **Form of Assessment** : Participatory Activities	Presentation and discussion 2 X 50		**Material:** Somatotropin and somatomedin **References:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Insulin hormone **Reference:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Prolactin hormone **Reference:** *MelmedSholmo, 2005, Endocrinology - Basic and Clinical Principles, New York Human Press.*	5%
14	Understand the structure and function of adrenal steroid hormones.	1. · Explain how to control hormone secretion and synthesis. · 2. Explain the mechanism of action of adrenal steroid glucocorticoids	**Criteria:** 1. Duty 30% 2. Participation 20% 3. UAS 30% **Form of Assessment** : Participatory Activities	discussions and lectures 2 X 50		**Material:** Secretion and synthesis of adrenal steroid glucocorticoid hormones. **Reference:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Mechanism of action of adrenal steroid glucocorticoids. **Reference:** *Latest Journal of Endocrinology*	5%

15	Understand the structure and function of adrenal steroid hormones.	1.· Explain the mechanism of action of the adrenal steroid Aldosterone. · 2.Describe the circulation and metabolism of adrenal steroid hormones	**Criteria:** 1.Duty 30% 2.Participation 20% **Form of Assessment** : Participatory Activities, Tests	discussion and presentation 2 X 50		**Material:** circulation and metabolism of adrenal steroid hormones. **Reference:** *Hadley, Mac.E., 2007., Endocrinology. 6th Edition, New Jersey., Prentice Hall* **Material:** Mechanism of action of the adrenal steroid Aldosterone. **Reference:** *Latest Journal of Endocrinology*	5%
16	UAS	UAS	**Criteria:** UAS **Form of Assessment** : Participatory Activities	UAS 2x50	UAS 2x50		15%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	70.83%
2.	Project Results Assessment / Product Assessment	3.33%
3.	Test	25.83%
		99.99%

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.