



**Course Module**  
**Department of Animal Science**  
**Faculty of Animal Science**  
**Universitas Brawijaya**

Module Name	Biology
Module Level	Undergraduate Study Program of Animal Science
Code	PEF61006
Subtitle	-
Course	Biology
Semester (s)	1
Person responsible for the module	Dr. Achadiyah Rahmawati, S.Pt, M.Si
Lecturer	<ol style="list-style-type: none"> <li>1. Dr. Achadiyah Rahmawati, S.Pt, M.Si</li> <li>2. Dr.Ir. Ita Wahyu Nursita,Msc</li> <li>3. Prof. Dr. Ir. Woro Busono,MS</li> <li>4. Prof. Dr.Ir. Gatot Ciptadi,DESS</li> <li>5. Prof. Dr.Ir. Ifar Subagyo,M.Agr.St</li> <li>6. Dr.Ir. Nurul Isnaini ,MP</li> <li>7. Dr.Ir. Sri Wahyuningsih ,Msi</li> <li>8. Dr.Ir.Eko Widodo,Msc</li> <li>9. Dr. Ir. Mashudi, M.Agr.Sc</li> <li>10. Dr. Drh. Rositawati Indrati, MP</li> <li>11. Ir. Hanief Eko Sulisty, MP</li> <li>12. Aulia Puspita Anugra Yekti,Spt,MP,Msc</li> <li>13. Asri Nurul Huda,Spt,MP,Msc</li> <li>14. Artharini Irsyammawati,Spt,MP</li> <li>15. Poespitasari Hazanah Ndaru, S.Pt.MP</li> </ol>
Language	Indonesian language
Relation to Curriculum	Study Program: Animal Science Specialization: Animal Science Type: <del>Compulsory</del> / <del>Non-Compulsory</del>
Type of Teaching, Contact Hours	<ol style="list-style-type: none"> <li>1. <i>Lecture: 100 minutes/meeting (14 meetings)</i></li> <li>2. <i>Practicum 50 minutes/meeting (14 meetings)</i></li> <li>3. <i>Structured assignments/quiz/group presentation</i></li> </ol>
Workload	<ol style="list-style-type: none"> <li>1. <i>Lecture: 100 minutes/meeting (14 meetings)</i></li> <li>2. <i>Practicum 50 minutes/meeting (14 meetings)</i></li> <li>3. <i>Structured Assignments/quiz/group presentation</i></li> <li>4. <i>Presentation: 80% of the total attendance</i></li> </ol>
Credit points	3 credits or 5.1 (ECTS)
Requirements According to the Examination Regulations	-
Recommended Prerequisite	-

<p>Module Objectives / Intended Learning Outcomes</p>	<p>ILO</p> <ol style="list-style-type: none"> <li>1. Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science (LO 6)</li> <li>2. Able to involve themselves in the learning process and discussion on an ongoing basis (LO 10)</li> </ol> <p>Course Learning Outcomes:</p> <ol style="list-style-type: none"> <li>1. Able to identify and explain the function of cell organelles and animal and plant tissues</li> <li>2. Able to explain the process of growth and development of animal and plant cells and cell membrane transport</li> <li>3. Able to explain the gametogenesis process including spermatogenesis and oogenesis and able to identify the structure and function of oocyte and spermatozoa cells</li> <li>4. Able to explain the factors that affect plant growth and development</li> </ol>
	<p>Objectives:</p> <p>This course will discuss the anatomy and function of intra-cellular material, the concept of metabolism, the concept of somatic cell division and gamete cells (Gametogenesis), the concept of cellular growth and respiration, photosynthesis in plants, the structure and function of genetic material, anatomy and various functions. tissue, the principles of general adaptation of animals, classification of animals, introduction of microscopic tools used in observation at a microscopic scale and SOP of biological observation in a laboratory.</p>
	<p>Knowledge:</p> <p>Able to identify and explain the function of cell organelles and animal and plant tissues</p>
	<p>Skills</p> <p>Cognitive</p> <p>Able to explain the process of growth and development of animal and plant cells and cell membrane transport.</p> <p>Phycomotoric</p> <p>Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science</p>

	<p>Competences</p> <p>Students can involve themselves in the learning process and discussion on an ongoing basis</p>
Content	<p>After completing this course students are able to:</p> <ol style="list-style-type: none"> <li>1. Identify and explain the function of cell organelles and animal tissues</li> <li>2. Explain the process of growth and development of animal and and transport of cell membranes</li> <li>3. Explain the gametogenesis process including spermatogenesis and oogenesis and identify the structure and function of oocytes and spermatozoa cells</li> <li>4. Explain the factors influencing plant growth and development</li> </ol> <p>The topics include:</p> <ol style="list-style-type: none"> <li>1. Introduction <ul style="list-style-type: none"> <li>● Overview of Biological Science and Related/Associated Sciences</li> <li>● Relationship Between Biology and Environment <ul style="list-style-type: none"> <li>- Description of Ecology and Diversity (Biodiversity)</li> </ul> </li> <li>● Parameters of Animal and Plant Life <ul style="list-style-type: none"> <li>- Respiration, Metabolism, Reproduction</li> </ul> </li> <li>● Basics of Classification of Organisms <ul style="list-style-type: none"> <li>- Taxonomy of Organism Systematics</li> </ul> </li> </ul> </li> <li>2. Introduction to microscopes and how to use it <ul style="list-style-type: none"> <li>- The definition of microscopes</li> <li>- Types of microscopes and their functions</li> <li>- Parts of microscope parts and their functions</li> <li>- How to use and care for a microscope</li> </ul> </li> <li>3. Animal and plant cellular systems <ul style="list-style-type: none"> <li>● Histological Structure of Animal and Plant Cells, Differences between Prokaryotic and Eukaryotic, Recognizing DNA as the Blue Print in Life (DNA, RNA, T RNA, etc.)</li> <li>● Animal cell division and development, cell growth and development, including totipotent, pluripotent, cell differentiation and determination</li> <li>● Molecular Transport Functions Between Cells, Carrier Proteins, Extra and Intra Cellular,</li> <li>● Diffusion, Osmosis, Active Transport</li> </ul> </li> <li>4. Anatomical structures of various animal cells and tissues <ul style="list-style-type: none"> <li>● Know the Types of Cells, Unicellular and Multi Cellular, Cellular Networks (astigmatism, Squamous, etc.)</li> <li>● Cellular and Systema Tissues, Organ Composer Tissues, Organs as Composing Systema, Basic Functions of Systema (Respiration, Reproduction, Circulation, Excretion,</li> </ul> </li> </ol>

	<p>Digestion)</p> <ol style="list-style-type: none"> <li>5. The proliferation of animal and plant cells <ul style="list-style-type: none"> <li>● S Phase, G1 Phase, M Phase (Mitosis and Meiosis), and G2 Phase</li> </ul> </li> <li>6. Animal division and development <ul style="list-style-type: none"> <li>● Know Somatic and Asomatic Cells</li> <li>● Mechanism of Cell Development, Hyperplasia and Hypertropia, Aging Cells, and Necrotic Cells</li> <li>● Reproduction, Sexual and Asexual</li> <li>● Gametogenesis, oocyte structure and spermatozoa</li> </ul> </li> <li>7. Anatomical structures of plant tissues and organs <ul style="list-style-type: none"> <li>● Plant tissues, organs, and systems</li> <li>● Photosynthesis, Respiration, Transpiration, Translocation, and Reproduction in plants</li> <li>● Roots as Nutrient Transport (N)</li> </ul> </li> <li>8. Planting and development of plants <ul style="list-style-type: none"> <li>● Vegetative and Generative Structures</li> <li>● Growth and Development of Plants (primary and secondary crops)</li> <li>● Factors affecting planting and development of plants</li> </ul> </li> </ol>
<p>Study and Examination Requirements and Forms of Examination</p>	<ul style="list-style-type: none"> <li>- Examination requirements: A minimum of 80% attendance to attend the final exam</li> <li>- Forms of examination: Multiple choices and Essay</li> </ul> <p>The Final Score Component:</p> <ul style="list-style-type: none"> <li>- The final score of all the components of the PBM evaluation &gt;44</li> </ul> <p>The final score component:</p> <ul style="list-style-type: none"> <li>- Midterm Exam 30%</li> <li>- Final Exam 30%</li> <li>- Practicum 20%</li> <li>- Structured Assignments 10%</li> <li>- Quiz 10%</li> </ul> <p>A : 80 &lt; Final Score ≤ 100  B+ : 75 &lt; Final Score ≤ 80  B : 69 &lt; Final Score ≤ 75  C+ : 60 &lt; Final Score ≤ 69  C : 55 &lt; Final Score ≤ 60  D : 50 &lt; Final Score ≤ 55  D+ : 44 &lt; Final Score ≤ 50  E : 0 &lt; Final Score ≤ 44</p>
<p>Media Employed</p>	<p>Projector and screens, Zoom application, Google Classroom, e-book, WA Group</p>

Reading List

1. Textbooks of Biology of Animal Sciences, 2020.
2. Campbell, N. A., J. B. Reece, L. A. Urry, M. L. Cain, S. A. Wasserman, P. V. Minorsky and R. B. Jackson. 2008. *Biology 8<sup>th</sup> Edition*. USA: Pearson Benjamin Cummings.