

**Module Handbook**

Modul Name	Developmental Biology
Modul Level	Bachelor
Abbreviation, if applicable:	BIU 304
Sub---heading, if applicable:	-
Courses included in the module, if applicable:	-
Semester	Even
Module Coordinator	Prof. Win Darmanto, Ph.D
Lectures	Prof. Win Darmanto, Ph.D
Language	Bahasa Indonesia
Classification within the curriculum:	<del>Compulsory Course</del> / Elective Studies
Teaching format/ class hours per week during semester	300 minutes/ week
Workload per semester	100 min lecture + 100 min structural assignment + 100 min self-assignment x 13 weeks; total 3900 min = 65 hours 65/25 = 2.6 ECTS
Credit point	2
Requirements	Vertebrate Embryology
Learning goals/competencies	<b>General Competence (Knowledge)</b> Students are able to understand the role of some cells and tissues substance in the process of development organism from embryo to adult animals properly.  <b>Specific Competence</b> <ol style="list-style-type: none"><li>1. Students understand the basic animal development, starting from ovum, zygote, embryo, until a mature man/woman.</li><li>2. Students could explain the role of nucleic acid (DNA/RNA nucleus) during the development</li><li>3. Student could explain the role of substations cell (nucleus and cytoplasm protein) during the development process</li><li>4. Student could explain the role of gene regulation in the development.</li><li>5. Student could analyze the connection of gene expression with its function in cell/tissue during organ development</li><li>6. Student understand the function of each parts of ovum and spermatozoa, which play roles in fertilization</li><li>7. Student could analyze the role of several proteins in the ovum which play roles in fertilization</li><li>8. Student understand the role of fertilization as a starting point of zygote development</li><li>9. Student understand cleavage as the starting point of the appearance of multicellular individuals</li><li>10. Student could analyze the relationship between type of ovum and number of yolks with type of cleavage</li><li>11. Students understand the gastrulation process in mammal's embryo.</li><li>12. Students could analyze embryonic cell movement process and embryonic cell reorganizing process, during gastrulation</li></ol>

	<p>13. Student are able to explain the neutralization process, the process of neural tube formation, and brain nerve tissue and peripheral nerve formation</p> <p>14. Student could explain the role of cell communication as the basis of morphogenesis</p> <p>15. Student could analyze the function of extracellular protein as morphogenesis guidance</p> <p>16. Students could explain the induction and responsive in embryonal tissue</p> <p>17. Students could analyze the mechanism of organ development, after neurulation</p> <p>18. Student could explain the origin of tissue member, the condition of the induction developments member, explain the development of members and several gens that affect it.</p> <p>19. Student could explain the origin of sex tissue, the development of sex organs, and the role of chromosome and hormone in the development of sex organ</p> <p>20. Student could present the international scientific journal, in accordance with the rules of scientific papers writing</p> <p>21. Students are able to explain a question in an essay</p>
Content	Introduction of animal development; to analyze the factors that affecting the development of animals, such as: the substance of the cell, nucleus, cytoplasm, genetic substance, and hormone; to shows the fate of cells, to make schematic induction of primary or secondary processes, and the development of sex.
Soft skill Attribute	discipline and argumentation
Study/ exam achievements	<p>Students are considered to be competent and pass if at least get 40% of maximum. Final score (NA) is calculated as follow: Paper project (25%), mid exam (30%), final exam (35%), soft skill (10%)</p> <p>Final index is defined as follow:</p> <p>A : 75 - 100</p> <p>AB : 70 - 74.99</p> <p>B : 65 - 69.99</p> <p>BC : 60 - 64.99</p> <p>C : 55 - 59.99</p> <p>D : 40 - 54.99</p> <p>E : 0 - 39.99</p>
Form of media	LCD
Learning Method	Class and discussion
Literature	<p>a. Developmental Biology, by Scott F. Gilbert, 5<sup>th</sup> Edition, Sinauer Associates, Publishers, 1997.</p> <p>b. Biology of Development Systems, by Philip Grant, 1978.</p> <p>c. Carlson, BM. 1998. Pattern's foundation of embryology, McGraw-Hill Book Co. New York</p> <p>d. Journal Congenital Anomalies</p> <p>e. Journal Development, Growth, and Differentiation.</p>
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