



THE MODULE HANDBOOK

Magister Biology Study Program

FACULTY OF BIOLOGY

BIOCHEMICAL SIGNALING SYSTEM

Course code	BIMB202203
Course level	Magister
Semester/ term	Even
Course coordinator(s)	Dr. Yekti Asih Purwestri, M.Si.
Lecture(s)	Dr. Rarastoeti Pratiwi, M.Sc. Dr. Tri Rini Nurungtyas, M.Sc. Woro Anindito Sri Tunjung, M.Sc., Ph.D.
Language	Indonesian
Classification within the Curriculum	Compulsory course for Biochemistry Laboratory
Teaching format/ class hours per week during the semester	This course is organized every week with time allocation of 100 minutes. Learning method is delivered using Teaching Centered Learning and Student Centered Learning combined with Collaborative Learning, Case Based Learning and Problem Learning (Journal presentation)
Workload	Estimated working hour: 5 hours/week.
Credits	2 credits
Requirements	-
Program Learning Outcome	<p>KN1. The graduates are demonstrating knowledge and comprehend biological theories, includes all aspects of biological studies at various levels in the organization of life (Knowledge);</p> <p>GS1. The graduates are able to develop logical, critical, systematic, and creative thinking through scientific concept and research (General Skills);</p> <p>GS2. The graduates are able to manage research data and make decisions in solving biological problems based on analytical or experimental studies and critical analysis of information (General Skills);</p> <p>GS3. The graduates are able to formulate and communicate scientific idea effectively (written and spoken) with at least one international language based on scientific rules, procedures, and ethics in the form of academic writing (General Skills)</p>



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Course Learning Outcome	<p>a. Understanding a comprehensive knowledge of biochemical signal transduction pathways involving the receptors, cascade signaling and cell response as the basis for analyzing the molecular mechanisms of biotic and abiotic adaptation of organisms</p> <p>b. Integrate basic knowledge of biochemical signaling systems to develop life sciences</p> <p>c. Understanding and interpreting data in scientific journals in related fields of biochemical signals as a mechanism of adaptation of organisms (animals, plants and microorganisms)</p> <p>d. Using various scientific sources to analyze problems related to biochemical signaling system as a mechanism of adaptation of organisms</p> <p>e. Communicating scientific works related to biochemical signaling system as a mechanism of adaptation of organisms in oral and written</p>
Course Description	<p>This course aims to understand cellular communication that involve signals perception by cellular receptors, signaling cascade and cellular responses of organisms(animals, plants and microorganisms) in order to adapt to environmental changes. This adaptation mechanism is studied through molecular approaches to reveal basic strategies, capacities and adaptation mechanisms involving biomolecules network. The topics including receptors signal, signaling cascade and response of gene exoression in transcriptional and translational level, response organisms to oxidative stress and many journals related to biochemical adaptation to biotic and abiotic stress.</p> <p>The evaluation is based on the midterm and final examination and the student's ability in creating a good presentation related wth the topics of biochemical adaptation of organisms (animal, plant, microorganism) to abiotic and abiotis stress.</p>
Assessments	<p>a. Midterm exam: 35%</p> <p>b. Final Exam: 35%</p> <p>c. Quiz: 5%</p> <p>d. Review Journal: 10%</p> <p>e. Presentation: 15%</p>
Study Media	Online (Gmeet), Video and Journal presentation
Literature	<p>a. Berg,J.M., Tymochka, J.L. and L.Stryer, 7th, pdf, W.H. Freeman & Co.</p>



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- b. Buchanan, B.B.; Gruissem, W. and R.I. Jones, (2001), *Biochemistry and Molecular Biology of Plants*, 3rd ed. , American Society of Plant Physiologist, Maryland USA
- c. Edwards, C ed. (1990), *Microbiology of Extreme Environment*, Open university Press, Milton Keynes
- d. Hochachka, P. and G.N. Somero (1984), *Biochemical Adaptation*, W.B.Saunders, Princeton University Press, Princeton
- e. Hochachka, P. and G.N. Somero (2002), *Biochemical adaptation: Mechanism and process physiological evolution*. Oxford University Press.
- f. Lehninger, A.L.; Nelson, D.I. & M.M.Cox, (2018) *Principles of Biochemistry*, 4th ed., (pdf)
- g. Journals related to biochemical adaptation
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