

Module Description

MPKP 428 Bioorganic Chemistry

Module Name	Bioorganic Chemistry
Module level, if applicable	Undergraduate Program
Code, if applicable	MPKP 427
Subtitle, if applicable	-
Course, if applicable	-
Semester(s) in which the module is taught	7 th Semester
Module coordinator(s):	Dr. M. Agus Wibowo, M.Si
Lecturer	Dr. M. Agus Wibowo, M.Si. Afghani Jayuska, S.Si., M.Si. Puji Ardiningsih, S.Si., M.Si. Dr. Ari Widiyantoro, S.Si., M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Elective Courses for the Undergraduate Program in Chemistry
Type of teaching, contact hours	• Lecture (Face-to-face lecture): 12 • Assignment: 2 • Presentation: 2
Workload	<i>(Estimated) Total workload: 2 x 2.83 hours = 5.66 hours per week.</i> <i>Contact hours (lecture): 2 x 0.83 hours = 1.66 hours per week.</i> <i>Private study including examination preparation, specified in hours: 2 x 2 hours = 4 hours</i> <i>2 x 50 minutes lectures,</i> <i>2 x 60 minutes structured activity,</i> <i>2 x 60 minutes individual activity,</i> <i>79.33 total hours</i>
Credit points	2 (3.34 ECTS)
Requirements according to the examination regulations	Registered in this course Minimum 75% attendance in this course
Learning goals/competencies:	Intended Learning Outcomes (ILO) After taking this course, students will be able to: 1. LO-1 2. LO-3

Module objectives	1. Students are able to explain the basic concepts of bioorganic chemistry, oxidative stress, and the role of reactive oxygen and nitrogen species in the development and pathomechanism of diseases. 2. Students are able to analyze the role of antioxidants in maintaining body homeostasis and their relationship to disease prevention. 3. Students are able to explain the role of secondary metabolites (antimicrobial, anticancer, antigout, antiobesity, antihypertensive, anti-inflammatory) in disease prevention and treatment. 4. Students are able to evaluate the mechanisms of action of phenolic compounds and other bioactive compounds in disease prevention and treatment. 5. Students are able to design and conduct bioactivity assays of secondary metabolites and interpret the results in the context of disease prevention and treatment.					
Content:	1. Introduction to the course, scope of bioorganic chemistry 2. Reactive Oxygen Species (ROS) and their role in diseases 3. Reactive Nitrogen Species (RNS) and their role in diseases 4. Antioxidants and their role in maintaining body balance 5. Secondary metabolites and their roles in disease prevention and treatment (antimicrobial, anticancer, antigout, antiobesity, antihypertensive, anti-inflammatory) 6. Phenolic compounds and their role in health 7. Bioactivity assays of secondary metabolites 8. Presentation of assignments/case studies on bioactivity					
Attribute Soft skills:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting					
Recommended prerequisites	-					
Study and examination requirements and forms of examination	Students are considered competent and pass if they at least get 50% of the maximum final grade. The final grade (NA) is calculated based on the following : <table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>10%</td></tr></table>		Assessment Components	Percentage Contribution	Participation	10%
Assessment Components	Percentage Contribution					
Participation	10%					

	Assignment	20%
	Mid-semester test	30 %
	Final semester test	40%
	Total	100%
Mid and final-semester tests are carried out as project exams.		
Learning Methods	Face-to-face teaching method Project-based learning	
Media employed	whiteboard; powerpoint presentation; video presentation; e-learning system; marine biota and seawater	
Reading list	1. Smith, J.G. (2010). General, Organic and Biological Chemistry. McGraw-Hill Higher Education. 2. Denniston, K.J., Topping, J.J., and Caret, R.L. (2008). General, Organic and Biochemistry, 6th edition. McGraw-Hill Higher Education 3. Crowe, J., Bradshaw, T. and Monk, P. (2006), Chemistry for the Biosciences: The Essential Concepts, Oxford University Press, Oxford. 4. Horton, H.R., Moran, L.A., Scrimgeour, K.G., Perry, M.D., and Rawn, J.D. (2006). Principles of Biochemistry, 4th Edition. Pearson International Edition 5. Vranken, D.V., and Weiss, G.A. (2013). Introduction to Bioorganic Chemistry and Chemical Biology, Garland Sciences.	