



Module Descriptions

Module designation	Environmental Chemistry (MPK6251)
Semester(s) in which the module is taught	4
Person responsible for the module	<i>Dra. Regina Tutik Padmaningrum, MSi</i>
Language	<i>Indonesia</i>
Relation to curriculum	<i>Compulsory / elective / specialisation</i>
Teaching methods	<i>Lecture, discussion, project</i>
Workload (incl. contact hours, self-study hours)	Total workload of the activity is 91 hours per semester for 16 weeks which consist of: <i>100 minutes/week for class learning</i> <i>120 minutes/week for structured activities</i> <i>120 minutes/week for individual study</i>
Credit points	<i>2 sks (3.2 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>General Chemistry</i>
Module objectives/intended learning outcomes	<p><i>On successful completion of the course students should be able to:</i></p> <ol style="list-style-type: none"> <i>1. Demonstrate concern and responsibility for efforts to prevent and reduce environmental pollution</i> <i>2. Analyze air, water, and soil quality, as well as pollutants and their impact on the global/regional environment, such as global warming, ozone depletion, acid rain, etc.</i> <i>3. Propose appropriate solutions to reduce or minimize the impact of air, water, and land pollution based on critical and logical arguments.</i> <i>4. Collaborate with friends to explore solutions to environmental pollution problems.</i>
Content	<ol style="list-style-type: none"> <i>1. Water: water quality, water pollution, water management</i> <i>2. Soil: soil quality, soil pollution, land management</i> <i>3. Air: air quality, air pollution, air management</i> <i>4. How to detect and measure pollutants</i> <i>5. Biogeochemical cycles</i> <i>6. How to analyze DO, COD, and BOD</i> <i>7. Bioremediation and phytoremediation</i> <i>8. Clean energy and green chemistry</i>
Examination forms	<i>Essay, project report, written tests</i>

Study and examination requirements	<p>Minimum attendance at lectures is 75%</p> <p>Final score (NA) is calculated as follows:</p> <table border="1" data-bbox="571 297 1305 506"> <thead> <tr> <th>Learning Outcome</th> <th>Weight (%)</th> <th>Technique of Assesment</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5</td> <td>Participation</td> </tr> <tr> <td>1, 2, 3,</td> <td>10</td> <td>Precentation</td> </tr> <tr> <td>1, 2, 3, 4</td> <td>50</td> <td>Project</td> </tr> <tr> <td>2, 3</td> <td>15</td> <td>Mid-term Written Test</td> </tr> <tr> <td>2, 3</td> <td>20</td> <td>Final Exam Written Test</td> </tr> </tbody> </table>	Learning Outcome	Weight (%)	Technique of Assesment	1	5	Participation	1, 2, 3,	10	Precentation	1, 2, 3, 4	50	Project	2, 3	15	Mid-term Written Test	2, 3	20	Final Exam Written Test
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Reading list	<ol style="list-style-type: none"> Ibanez, J. G., Hernandez-Esparza, M., Doria-Serrano, C., Fregoso-Infante, A., & Singh, M. M. (2010). Environmental chemistry: fundamentals. Springer Science & Business Media. Girard, J. (2013). Principles of environmental chemistry. Jones & Bartlett Publishers. Dara, S. S., & Mishra, D. D. (2006). A textbook of environmental chemistry and pollution control. S. Chand Publishing. Bleam, W. F. (2016). Soil and environmental chemistry. Academic Press. Hanif, M. A., Nadeem, F., Bhatti, I. A., & Tauqeer, H. M. (2020). Environmental Chemistry: A Comprehensive Approach. John Wiley & Sons. Jacob, D. J. (1999). Introduction to atmospheric chemistry. Princeton university press. Priyambodo, E. (2022). Modul Kimia Lingkungan: Tinjauan dari Aspek Socio-Scientific Issue 																		

Prepared by	Verified by:	Authorized by:
		
Dra. Regina Tutik Padmaningrum, MSi		Program Study Coordinator