Module Descriptions

Module designation	Environmental Chemistry (MPK6251)
Semester(s) in which the module is taught	4
Person responsible for the module	*Dra. Regina Tutik Padmaningrum, MSi*
Language	*Indonesia*
Relation to curriculum	*Compulsory ~~/ elective / specialisation~~*
Teaching methods	*Lecture, discussion, project*
Workload (incl. contact hours, self-study hours)	Total workload of the activity is 91 hours per semester for 16 weeks which consist of*:* *100 minutes/week for class learning* *120 minutes/week for structured activities* *120 minutes/week for individual study*
Credit points	*2 sks (3.2 ECTS)*
Required and recommended prerequisites for joining the module	*General Chemistry*
Module objectives/intended learning outcomes	*On successful completion of the course students should be able to:* 1. Demonstrate concern and responsibility for efforts to prevent and reduce environmental pollution 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. 3. Propose appropriate solutions to reduce or minimize the impact of air, water, and land pollution based on critical and logical arguments. 4. Collaborate with friends to explore solutions to environmental pollution problems.
Content	1. Water: water quality, water pollution, water management 2. Soil: soil quality, soil pollution, land management 3. Air: air quality, air pollution, air management 4. How to detect and measure pollutants 5. Biogeochemical cycles 6. How to analyze DO, COD, and BOD 7. Bioremediation and phytoremediation 8. Clean energy and green chemistry
Examination forms	Essay, project report, written tests

<table>
<tr><td>Study and examination requirements</td><td>Minimum attendance at lectures is 75%
Final score (NA) is calculated as follows:
<table>
<tr><th>Learning Outcome</th><th>Weight (%)</th><th>Technique of Assesment</th></tr>
<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>
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<tr><td>Reading list</td><td>1. Ibanez, J. G., Hernandez-Esparza, M., Doria-Serrano, C., Fregoso-Infante, A., & Singh, M. M. (2010). Environmental chemistry: fundamentals. Springer Science & Business Media.
2. Girard, J. (2013). Principles of environmental chemistry. Jones & Bartlett Publishers.
3. Dara, S. S., & Mishra, D. D. (2006). A textbook of environmental chemistry and pollution control. S. Chand Publishing.
4. Bleam, W. F. (2016). Soil and environmental chemistry. Academic Press.
5. Hanif, M. A., Nadeem, F., Bhatti, I. A., & Tauqeer, H. M. (2020). Environmental Chemistry: A Comprehensive Approach. John Wiley & Sons.
6. Jacob, D. J. (1999). Introduction to atmospheric chemistry. Princeton university press.
7. Priyambodo, E. (2022). Modul Kimia Lingkungan: Tinjauan dari Aspek Socio-Scientific Issue</td></tr>
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Prepared by	Verified by:	Authorized by:
		
Dra. Regina Tutik Padmaningrum, MSi		Program Study Coordinator