

MODUL ENVIRONMENTAL POLLUTION CONTROL



MASTER PROGRAM OF ENVIRONMENTAL SCIENCE
SCHOOL OF POSTGRADUATE STUDIES
DIPONEGORO UNIVERSITY

A Modul Descriptions :

Modul design	Environmental Pollution Control
Modul level, if applicable	
Code, if applicable	P-CIL-8-209
Subtitles, if applicable	
Courses, if applicable	
Semester(s) in which the Modul is taught	2 nd Semester
Person responsible for the Modul	Dr. Ing,- Sudarno Utomo, ST, MSc
Lecturer	1. Dr. Ing,- Sudarno Utomo, ST, MSc 2. Dr. Ir. Bambang Yulianto, DEA 3. Prof. Dr. Tri Retnaningsih Soeprbowati, M.App.Sc
Language	<i>Indonesian and English</i>
Relations to curriculum	
Type of teaching, contact hours	<i>Studying:1 x 120 minutes x 16 meetings = 32 hours/week Q&A:1x 20 minutes 16 meetings = 5.3 hours/week Discussion:1x 20 minutes 16 meetings = 5.3 hours/week Presentation:1x 20 minutes 16 meetings = 5.3 hours/week Individual assignments: 36 minutes/day = 3 hours/week</i>
Workload	<i>(Estimated) workload, divided into contact hours (lecture, exercise, laboratory session, etc.) and private study, including examination preparation, specified in hours,¹ and in total.</i>
Credit points	<i>2 credits / 4 ECTS</i>
Requirements according to the examination regulations	<i>Minimum attendance of lectures 75%</i>
Recommended prerequisites	<i>eg existing competences in...</i>

Modul objectives/intended learning outcomes	Student able to analyzing pollution problems, classifying pollution sources, knowing pollution materials, characterizing waste, pollution cycles, pollution impacts, prevention, control and prevention
Content	This course examines the analysis of pollution problems, classification of pollution sources: water, soil, air, toxicology of heavy metals, food and medicine, pesticides; pollution materials, waste characteristics, pollution cycles, pollution impacts, prevention, control and prevention: supervision, determination/estimation of environmental quality (water, air, and land).
Study and examination requirements and forms of examination	<ul style="list-style-type: none"> · <i>Open book and close book</i> · <i>Multiple choice, case studies, interviews</i>
Media employed	<i>Powerpoint, youtube, website</i>
Reading List	<ol style="list-style-type: none"> 1. Liu, D.H.F., and B.G. Liptak. 2000. Air Pollution. CRC Press. Florida. 2. Noel de Nevers. 2000. Air Pollution Control Engineering. University of Utah, Chemical engineering. McGraw-Hill International 3. Moestikahadi. (2001). Pencemaran Udara. ITB. Bandung 4. Soemirat, Y. 2003. Environmental Toxicology. UGM. Yogyakarta. 5. Wardhana, W.A. 2004. Impact of Environmental Pollution. Andi. Yogyakarta. 6. A. Tresna Sastrawijaya. 2009. Pencemaran Lingkungan. Rineka Cipta. Jakarta.



SEMESTER STUDY PLAN

Study program: Master of Environmental Science

Faculty: School Of Postgraduated Studies

Subject:		Environmental Pollution Control	Code: P-CIL-8-209	Credit:2 (4 ECTS)	Smt:2		
Supporting lecturer:		<ol style="list-style-type: none"> 1. Dr. Ing,- Sudarno Utomo, ST, MSc 2. Dr. Ir. Bambang Yulianto, DEA 3. Prof. Dr. Tri Retnaningsih Soeprbowati, M.App.Sc 					
Learning Outcomes Subject:		studentacant analyzing pollution problems, classifying pollution sources, knowing pollution materials, characterizing waste, pollution cycles, pollution impacts, prevention, control and prevention					
Short Description of Courses:		This course examines the analysis of pollutant problemsaran, classification of pollution sources: water, soil, air, toxicology of heavy metals, food and medicine, pesticides; pollution material, waste characteristics, pollution cycle, pollution impact, prevention, control and prevention: supervision, determination/estimation of environmental quality (water, air, and land).					
1	2	3	4	5	6	7	
Week	Final Ability of each learning stage	Study Materials/ Subjects	Learning methods	Workload	Student Learning Experience	Evaluation	
						Criteria & Indicators	Weight (%)
1.	Introduction/ Lecture contract	Understand the preparation before face-to-face lectures and the obligation to report face-to-face lectures	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: · <i>Lecture = 1x 120 minutes</i> · <i>Q&A = 1 x 20 minutes</i> · <i>Discussion = 1 x 20 minutes</i> · <i>Presentation = 1 x 20 minutes</i> <i>Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)</i>	Students know the lecture system	Activity	5

2	Students are able to explain and understand and analyze pollution problems	Pollution problem analysis	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: · Lecture = 1x 120 minutes · Q&A = 1 x 20 minutes · Discussion = 1 x 20 minutes · Presentation = 1 x 20 minutes Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)	Read recommended Modules and libraries; Discussion of learning outcomes; Presentation of the results of the discussion	Criteria: Accuracy and mastery of theory Non-test form: Student activity and Task Presentation	5
3	Students are able to explain and understand and analyze the problem of pollution part 2	Pollution problem analysis	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: · Lecture = 1x 120 minutes · Q&A = 1 x 20 minutes · Discussion = 1 x 20 minutes · Presentation = 1 x 20 minutes Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)	Read recommended Modules and libraries; Discussion of learning outcomes; Presentation of the results of the discussion	Criteria: Accuracy and mastery of theory Non-test form: Student activity and Task Presentation	5
4	Students are able to classify sources of pollution: water, soil, air, heavy metal toxicology, food and medicine, pesticide	classification of pollution sources: water, soil, air, heavy metal toxicology,	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: · Lecture = 1x 120 minutes · Q&A = 1 x 20 minutes	a. Discussion of the previous week's homework b. Students listen to the lecturer's explanation and answer the	Accuracy and Completeness and the truth explanation as well accuracy understanding	5

		food and medicine, pesticide		<ul style="list-style-type: none"> · Discussion = 1 x 20 minutes · Presentation = 1 x 20 minutes <i>Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)</i>	lecturer's questions, as well as discuss		
5	Students are able to classify sources of pollution: water, soil, air, heavy metal toxicology, food and medicine, pesticide part 2	classification of pollution sources: water, soil, air, heavy metal toxicology, food and medicine, pesticide	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: <ul style="list-style-type: none"> · Lecture = 1x 120 minutes · Q&A = 1 x 20 minutes · Discussion = 1 x 20 minutes · Presentation = 1 x 20 minutes <i>Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)</i>	a. Discussion of the previous week's homework b. Students listen to the lecturer's explanation and answer the lecturer's questions, as well as discuss	Accuracy and Completeness and the truth explanation as well accuracy understanding	5
6	Students can understand and understand water management, water pollution that occurs in the environment, pollutants and their sources.	1. Water management techniques. 2. Wastewater treatment	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: <ul style="list-style-type: none"> · Lecture = 1x 120 minutes · Q&A = 1 x 20 minutes · Discussion = 1 x 20 minutes · Presentation = 1 x 20 minutes <i>Individual Tasks (Self Work) = 1 x 36</i>	a. Students listen to the lecturer's explanation and answer the lecturer's questions, as well as discuss b. Discussion of the results of the previous week's group assignments	Completeness and the truth explanation as well accuracy understanding	5

				<i>minutes/day (16 weeks)</i>			
7	Students can understand and understand water management, water pollution that occurs in the environment, pollutants and their sources.	1. Characteristics of wastewater. 2. Integrated water management	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: · <i>Lecture = 1x 120 minutes</i> · <i>Q&A = 1 x 20 minutes</i> · <i>Discussion = 1 x 20 minutes</i> · <i>Presentation = 1 x 20 minutes</i> <i>Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)</i>	a. Students listen to the lecturer's explanation and answer the lecturer's questions, as well as discuss b. Discussion of the results of the previous week's group assignments	Completeness and the truth explanation as well accuracy understanding	5
8	Students can understand and understand air pollution and noise that occurs in the environment and control over it	1. Effects of air and noise pollution. 2. Sources and criteria for noise.	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: · <i>Lecture = 1x 120 minutes</i> · <i>Q&A = 1 x 20 minutes</i> · <i>Discussion = 1 x 20 minutes</i> · <i>Presentation = 1 x 20 minutes</i> <i>Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)</i>	Students listen to the lecturer's explanation and answer the lecturer's questions, as well as discuss	Completeness and the truth explanation as well accuracy understanding	5
9	Students can understand and understand air pollution and noise that occurs in the environment and control over it	1. Traffic noise prediction. 2. Noise control	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: · <i>Lecture = 1x 120 minutes</i>	Students listen to the lecturer's explanation and answer the	Completeness and the truth explanation as well accuracy understanding	5

				<ul style="list-style-type: none"> · Q&A = 1 x 20 minutes · Discussion = 1 x 20 minutes · Presentation = 1 x 20 minutes <i>Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)</i>	lecturer's questions, as well as discuss		
10	Mid Term Examination (UTS)	Meeting Material 1- 9	Written test	216 minutes of processing time or the equivalent of 0.25 ECTS	Students working on UTS questions	Completeness and the truth explanation as well accuracy understanding	10
11	Students can understand and understand the pollution that occurs in the soil, pollutants and their sources	Pollution that occurs on the ground. Pollutants and sources of pollution.	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: <ul style="list-style-type: none"> · Lecture = 1x 120 minutes · Q&A = 1 x 20 minutes · Discussion = 1 x 20 minutes · Presentation = 1 x 20 minutes <i>Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)</i>	a. Students listen to the lecturer's explanation and answer the lecturer's questions, as well as discuss b. Discussion of the results of the previous week's group assignments (influence diagram)	Completeness and the truth explanation as well accuracy understanding	5
12	Students can understand and understand the installation and management of waste treatment	1. Waste treatment plant. 2. Waste treatment management.	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: <ul style="list-style-type: none"> · Lecture = 1x 120 minutes · Q&A = 1 x 20 	a. Students listen to the lecturer's explanation and answer the lecturer's questions, as well as discuss	Completeness and the truth explanation as well accuracy understanding	5

				<ul style="list-style-type: none"> minutes · Discussion = 1 x 20 minutes · Presentation = 1 x 20 minutes <p>Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)</p>	b. Discussion of the results of the previous week's group assignments		
13	Students can understand and understand about radiation and its effects on the environment.	<ol style="list-style-type: none"> 1. Biological effects of radiation. 2. Radiation Exposure 3. Radioactive waste. 4. Protection against radiation. 	Lectures, questions and answers, and discussions	<p>216minutes (0.25 ECTS)</p> <p>Consist of:</p> <ul style="list-style-type: none"> · Lecture = 1x 120 minutes · Q&A = 1 x 20 minutes · Discussion = 1 x 20 minutes · Presentation = 1 x 20 minutes <p>Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)</p>	<ol style="list-style-type: none"> a. Students listen to the lecturer's explanation and answer the lecturer's questions, as well as discuss b. Discussion of the results of the previous week's group assignments 	Completeness and the truth explanation as well accuracy understanding	5
14	Students can understand and understand about water, air and soil pollution and its effects on the environment	Water, air and soil pollution and their effects on the environment	Lectures, questions and answers, and discussions	<p>216minutes (0.25 ECTS)</p> <p>Consist of:</p> <ul style="list-style-type: none"> · Lecture = 1x 120 minutes · Q&A = 1 x 20 minutes · Discussion = 1 x 20 minutes · Presentation = 1 x 20 minutes <p>Individual Tasks (Self Work) = 1 x 36</p>	<ol style="list-style-type: none"> a. Students listen to the lecturer's explanation and answer the lecturer's questions, as well as discuss b. Discussion of the results of the previous week's group assignments 	Completeness and the truth explanation as well accuracy understanding	5

				<i>minutes/day (16 weeks)</i>			
15	Able to understand and understand Countermeasures, control and prevention Quality control, determination/estimation environment (water, air and soil)	Prevention, control and prevention Quality control, determination/estimation environment (water, air and soil)	Lectures, questions and answers, and discussions	216minutes (0.25 ECTS) Consist of: · <i>Lecture = 1x 120 minutes</i> · <i>Q&A = 1 x 20 minutes</i> · <i>Discussion = 1 x 20 minutes</i> · <i>Presentation = 1 x 20 minutes</i> <i>Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)</i>	a. Students listen to the lecturer's explanation and answer the lecturer's questions, as well as discuss b. Discussion of the results of the previous week's group assignments	Completeness and the truth explanation as well accuracy understanding	5
16	Final Examination (UAS)	Meeting Materials 1-15 (resume material)	Written test	330 minutes of processing time or the equivalent of 0.25 ECTS	Students working on UAS questions	Completeness and the truth explanation as well accuracy understanding	20
8.Reference List:		<ol style="list-style-type: none"> 1. Environmental Science, Soeriatmadja, ITB, 1987. 2. Environmental Pollution, Satrawijaya, A. Tresna, Rineka Cipta, Jakarta, 1991. 3. McGraw-Hill Encyclopedia of Environmental Science and Engineering (3rd Edition). McGraw-Hill, Inc. 1993. 4. The Environment and Its Sustainability Imam Soepardi, Alumni, Bandung, 1994. 5. Sims, J. Activated sludge, Environmental Encyclopedia. Detroit. 2003 6. Minister of Environment Regulation No. 13 of 2010 7. Introduction to ISO 14001, Cokorda Prapti Mahandari, Gunadarma University, 2004 8. Conningham, WilliamP., and Barbara Woodworth Saigo. 1985. Environmental Science, A Global Concern. Jubuque-USA: Win. C. Brown Publisher. 9. Connel& Miller. 1995. Chemical Pollution Ecotoxicology. UI Press Jakarta. 10. Darmono.1995. Metals in the Biology of Living Things. UI. Jakarta. 11. Mahida,UN. 1986. Water pollution. Rajawali, Jakarta. 12. Mason.CF. 1991. Biology of Freshwater Pollution. John Willey & Sons Inc. New York. 					

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| | <ol style="list-style-type: none">13. Miller,G. Tylor. 1986. Environmental Science, An Introduction. Wadsworth Publishing Company, Bronsons. California.14. Sastrawijaya.1991. Environmental pollution. Rineka Cipta. Jakarta.15. SoemarwotoO. 1988. Environmental Impact Analysis. UGM Press Yogyakarta16. Soemirat,Y. 2003. Environmental Toxicology. UGM. Yogyakarta.17. Wardhana,W.A. 2004. Impact of Environmental Pollution. Andi. Yogyakarta. |
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