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:	**1. Dr. Ing,- Sudarno Utomo, ST, MSc** **2. Dr. Ir. Bambang Yulianto, DEA** **3. Prof. Dr. Tri Retnaningsih Soeprobowati, 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: ◦ *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)*	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		◦ *Discussion = 1 x 20 minutes* ◦ *Presentation = 1 x 20 minutes* *Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)*	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: ◦ *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)*	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: ◦ *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*	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

				minutes/day (16 weeks)			
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: ◦ *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)*	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: ◦ *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)*	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: ◦ *Lecture = 1x 120 minutes*	Students listen to the lecturer's explanation and answer the	Completeness and the truth explanation as well accuracy understanding	5

				◦ *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)*	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: ◦ *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)*	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: ◦ *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

				minutes ◦ *Discussion = 1 x 20 minutes* ◦ *Presentation = 1 x 20 minutes* *Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)*	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.	1. Biological effects of radiation. 2. Radiation Exposure 3. Radioactive waste. 4. Protection against radiation.	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)*	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	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*	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

				minutes/day (16 weeks)			
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: ◦ *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)*	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:

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2. Environmental Pollution, Satrawijaya, A. Tresna, Rineka Cipta, Jakarta, 1991.
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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 Concorn. 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.

	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 Yogyakarta 16. Soemirat,Y. 2003. Environmental Toxicology. UGM. Yogyakarta. 17. Wardhana,W.A. 2004. Impact of Environmental Pollution. Andi. Yogyakarta.