



RENCANA PEMBELAJARAN SEMESTER (RPS)
PROGRAM STUDI S1 PENDIDIKAN TEKNIK BANGUNAN
JURUSAN TEKNIK SIPIL, FAKULTAS TEKNIK, UNIVERSITAS NEGERI PADANG

COURSES	CODE	GROUP OF COURSES	SCU		SEM	VERSION
			Teori	Prakt		
Environmental Engineering	SIP2.61.6301	Study Program Compulsory Courses	2	0	6	1
Responsible Lecturer	Dr. Nurhasan Syah, M.Pd, Yaumal Arbi, MT		the signature of the responsible lecturer			
Information	Dean of the Faculty of Engineering		Head of the Civil Engineering Department		Study Program Coordinator Building Engineering Education	
	Dr. Fahmi Rizal, M.Pd., M.T NIP. 195912041985031004		Faisal Ashar, Ph.D. NIP. 19750103 200312 1001		Drs. Revian Body, MSA. NIP. 19600103 198503 1003	
Graduate Learning Outcomes	Learning Achievement of Graduate Study Programs <ol style="list-style-type: none"> Able to apply basic science knowledge (mathematics, natural sciences) and other multidisciplinary disciplines which become the foundation for the field of Building Engineering Vocational Education in carrying out professional work in their respective fields (Knowledge and Understanding). <ol style="list-style-type: none"> Able to show good understanding and implement basic mathematical concepts to solve various problems in the field of building engineering. Have a high understanding and can implement basic concepts of physics and chemistry (natural sciences) in the field of building engineering. Have a high understanding and can implement the basic principles of basic engineering (mechanics, engineering drawings, materials science) in the field of building engineering. Able to think critically and creatively in identifying, formulating, problem-solving, evaluating various problems in the 					

field of Building Engineering Vocational Education with the most appropriate and effective scientific method (Engineering analysis, investigations and assessment).

- 2.1. Able to identify various technical problems in the field of building engineering
- 2.2. Able to analyze various technical problems in the field of building engineering
- 2.3. Able to evaluate various technical problems in the building sector
- 2.4. Able to communicate Engineering Analysis, Investigation and Assessment materials to students/training.
- 3. Have a reliable ability in designing, implementing and supervising engineering design works.
 - 3.1. Able to realize work drawings in collaboration with various related parties.
 - 3.2. Able to manage building engineering work by paying attention to environmental, social, health and safety aspects.
 - 3.3. Able to supervise the implementation of building engineering work
 - 3.4. Able to communicate Engineering Design material to students.
- 4. Have reliable abilities in designing, implementing and evaluating the learning process in Building Engineering Vocational Education (Education design).
 - 4.1. Able to design curriculum and learning process in building engineering.
 - 4.2. Able to implement, control, evaluate and improve the quality of the learning process
 - 4.3. Able to develop effective, efficient, and attractive learning media.
- 5. Having the ability to adapt and innovate to the development of science and technology and implement it into educational goals and professional work by considering possible non-technical risks (Engineering practice).
 - 5.1. Able to innovate and develop technology in the field of building engineering by considering social, economic and environmental aspects.
 - 5.2. Able to analyze environmental conditions in the planning, implementation and supervision of buildings.
 - 5.3. Implement information technology and computers into the planning, implementation, and supervision processes of buildings.
- 6. Have social and managerial competence, work together, communicate effectively, have entrepreneurial character, are environmentally friendly and aware of the importance of lifelong learning (transferable and soft skills).
 - 6.1. Able to work creatively, innovatively, collaboratively, be careful, responsible, responsive to environmental changes.

Course Learning	Learning Achievement of Course (CPMK)
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Outcomes	CPMK		CPL
	1. Understand the environmental crisis that occurs due to population surges		2.4, 3.2, 6.1, 6.2, 6.3
	2. Understand about water pollution and its impacts		2.4, 5.2, 6.2, 6.3
	3. Understand about the solid waste management		2.4, 5.2, 6.2, 6.3
	4. Understand about air pollution and its impacts		2.4, 5.2, 6.2, 6.3
	5. Students can analyze the environmental impact that occurs from a building engineering job		2.4, 3.2, 3.4, 5.2, 6.1, 6.2, 6.3
	6. Understand appropriate technology that is suitable for reducing environmental impact		2.4, 5.1, 6.2
	7. Understand sustainable development		5.2, 6.2, 6.3
Short descriptions of course	This course provides knowledge about the environmental impacts that have occurred at this time due to civil engineering work, which includes, environmental crises due to population surges, water pollution, waste pollution, air pollution, AMDAL, appropriate technology, and sustainable development as one of the solutions to the impact that happened.		
References	Utama (RU) :		
	1. Dikti, Rekayasa Lingkungan, Gunadarma Press, Jakarta. 1997.		
	2. Srikandi Fardiaz, Polusi air dan udara, Kanisius, Yogyakarta. 1992.		
	3. Tchobanoglous G., Theisen H., Vigil S.A., : Integrated Solid Waste Management, McGraw Hil Inc, NY-1993.		
4. SNI tentang pengelolaan sampah di indonesia			
5. Otto Soemarwoto, Analisis Mengenai Dampak Lingkungan. Gajah Mada University Press, 2009.			
6. Moetikahadi Soedomo & Moh. Irsyad, Modul Analisa Udara, 1993.			
7. Izarul Machdar, Pengantar Pengendalian Pencemaran: Pencemaran Air, Pencemaran Udara, dan kebisingan. Budi Utama, 2018			
Pendukung (RP)			
1. Notodarmodjo, Pencemaran Tanah dan Air Tanah, Penerbit ITB, 2005.			
2. Soedomo, M. Kumpulan Karya ilmiah dalam bidang Pencemaran Udara, Penerbit ITB, Bandung, 1999			
3. Peraturan Pemerintah 16 tahun 2005, Pengembangan Sistem Penyediaan Air Minum.			
4. Dr. Nao Tanaka, Teknologi Tepat Guna & Dunia Alternatif, Gramedia, 2015			
Learning Media	Software:	Hardware:	
		Komputer, LCD Projector dan Papan tulis dan perangkatnya	
Team Teaching			
Assessment	UTS, UAS, Tugas mandiri & kelompok, Presentasi kelompok		
Requirements Subject	Tidak ada		

MATERI PEMBELAJARAN

Minggu	Kompetensi yang hendak dicapai	Bahan Kajian	Metode dan Strategi Pembelajaran	Tugas / assignment	Kriteria / Indikator Penilaian	Referensi
(1)	CPMK-1.1: [CPL-2.4, 3.2] Students can explain: 1. Understanding the environment from various sources 1. 2. Knowing the pollution that has occurred at this time	Introduction to Environmental Engineering, understanding the environment from various sources, environmental pollution.	Description of the material [1x75 '] Question and answer [1x10 '] Discussion [1x15 ']	Make a summary and description of the material presented in the resume book	Able to explain the understanding of the environment and the kinds of pollution that have occurred	RU-1
(2)	CPMK-1.2: [CPL-6.1, 6.2, 6.3] Students can explain: 1. Environmental impacts due to population increases 1. 2. Relationship between social, economy and environment (3 pillars)	Environmental crisis due to human population increase, three pillars of the environment and their relationship.	Description of the material [1x75 '] Question and answer [1x10 '] Discussion [1x15 ']	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book. • Group discussion 	Able to explain the environmental impacts that occur due to the increase in population and the relationship between the three pillars of the environment	RU-1
(3)	CPMK-2.1: [CPL-2.4, 5.2] Students can explain: 1. Cases of water pollution that have occurred 1. 2. The cause of water pollution	Causes of water pollution, the impact of pollution and pollution cases that have occurred,	Description of the material [1x75 '] Question and answer [1x10 '] Discussion [1x15 ']	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book. • Group discussion 	Able to explain the causes of water pollution and their impacts as well as cases of water pollution	RU-1 RU-2 RU-7 RP-3
(4)	CPMK-2.2: [CPL-6.2, 6.3] Students can explain: 1. Prevention of water pollution	Regulations on water pollution, ways to prevent water pollution and ways to overcome them	Description of the material [1x75 '] Question and answer [1x10 '] Discussion [1x15 ']	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book. 	Able to understand and be active in the regulations, ways of preventing and	RU-1 RU-2 RU-7 RP-3

Minggu	Kompetensi yang hendak dicapai	Bahan Kajian	Metode dan Strategi Pembelajaran	Tugas / assignment	Kriteria / Indikator Penilaian	Referensi
	1. 2. Tackling water pollution			<ul style="list-style-type: none"> Group presentation 	overcoming the cases discussed	
(5)	CPMK-3 : [CPL-2.4, 5.2, 6.2, 6.3] Students can explain: 1. Soil contamination by solid waste (garbage) 2. How to prevent 1. 3. How to overcome	Land pollution by garbage, waste management	Description of the material [1x75 ' Question and answer [1x10 ' Discussion [1x15 '	<ul style="list-style-type: none"> Make a summary and description of the material presented in the resume book. Group discussion 	Able to explain the impact of soil pollution by waste and know waste management	RU-3 RU-4 RP-1
(6)	CPMK-4.1: [CPL-2.4, 5.2] Students can explain: 1. Cases of air pollution 2. Types of pollutant sources 1. 3. How to measure air quality	Sources of air pollution, how to measure air quality and causes of air pollution due to its impact	Description of the material [1x75 ' Question and answer [1x10 ' Discussion [1x15 '	<ul style="list-style-type: none"> Make a summary and description of the material presented in the resume book. Group discussion 	Able to explain air pollution and know how to take air samples	RU-2 RU-6 RU-7 RP-2
(7)	CPMK-4.2: [CPL-6.2, 6.3] Students can explain: The impact of air pollution Mid-Semester Evaluation through Mid-Semester Examination	<ul style="list-style-type: none"> Depletion of the ozone layer Global warming Greenhouse effect Sea level rise 	Description of the material [1x75 ' Question and answer [1x10 ' Discussion [1x15 '	<ul style="list-style-type: none"> Make a summary and description of the material presented in the resume book. Group presentation 	Be able to explain the impact of air pollution.	RU-2 RU-6 RU-7 RP-2
(8)	Mid-Semester Evaluation through Mid-Semester Examination					
(9)	CPMK-5.1: [CPL-2.4, 3.2, 3.4, 5.2] Students can explain: 1. Definition of AMDAL 2. AMDAL process 1. 3. Benefits of	Definition, the process of preparation and benefits of AMDAL	Description of the material [1x75 ' Question and answer [1x10 ' Discussion [1x15 '	<ul style="list-style-type: none"> Make a summary and description of the material presented in the resume book. Group discussion 	Able to explain the meaning, process and benefits of AMDAL	RU-1 RU-5

Minggu	Kompetensi yang hendak dicapai	Bahan Kajian	Metode dan Strategi Pembelajaran	Tugas / assignment	Kriteria / Indikator Penilaian	Referensi
	AMDAL					
(10)	CPMK-5.2: [CPL-2.4, 3.2, 3.4, 5.2] Students can explain: Methods of forecasting major and significant impacts	The method of forecasting the major and significant impacts of engineering construction works	Description of the material [1x75 ' Question and answer [1x10 ' Discussion [1x15 '	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book. • Group discussion 	Able to explain methods of estimating the big and important impacts of a building engineering work	RU-1 RU-5
(11)	CPMK-5.3: [CPL-2.4, 3.2, 3.4, 5.2] Students can explain: Large and important impact evaluation methods	Large and essential impact evaluation methods	Description of the material [1x75 ' Question and answer [1x10 ' Discussion [1x15 '	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book. • Group discussion 	Be able to explain the large and important impact evaluation methods of a building engineering work	RU-1 RU-5
(12)	CPMK-5.4: [CPL-2.4, 3.2, 3.4, 5.2, 6.1, 6.2, 6.3] Students can explain: Supervision procedures and legal processes related to Amdal and environmental permits	Supervision and law enforcement of the AMDAL process and environmental permits	Description of the material [1x75 ' Question and answer [1x10 ' Discussion [1x15 '	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book. • Group discussion 	Able to explain supervision and legal aspects of the AMDAL and environmental permit processes	RU-1 RU-5
(13)	CPMK-5.5: [CPL, 6.1, 6.2, 6.3] Students can explain: 1. Principles of RKL 1. 2. Principles of RPL	Environment Management plan	Description of the material [1x75 ' Question and answer [1x10 ' Discussion [1x15 '	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book. • Group discussion 	Able to explain the principles and methods of making RKL and RPL	RU-1 RU-5
(14)	CPMK-6: [CPL-2.4, 5.1 6.2] Students can explain and design	Environmental monitoring plan	Description of the material [1x75 ' Question and answer [1x10 ' Discussion [1x15 '	Make a summary and description of the material presented in the resume book.	Able to explain and design appropriate tools according to the	RU-1 RP-4

Minggu	Kompetensi yang hendak dicapai	Bahan Kajian	Metode dan Strategi Pembelajaran	Tugas / assignment	Kriteria / Indikator Penilaian	Referensi
	Appropriate technology in environmental management				problems given	
(15)	<p>CPMK-7: [CPL-5.2, 6.2 6.3]</p> <p>Students can understand: Sustainable development concepts course provides knowledge about the environmental impacts that have occurred at this time due to civil engineering work, which includes, environmental crises due to population surges, water pollution, waste pollution, air pollution, AMDAL, appropriate technology, and sustainable development as one of the solutions to the impact that happened.</p>	The concept of sustainable development as an environmental solution	<p>Description of the material [1x75 ']</p> <p>Question and answer [1x10 ']</p> <p>Discussion [1x15 ']</p>	Make a summary and description of the material presented in the resume book	Able to explain the concept of sustainable development and how to implement it	RU-1 RU-5
(16)	Final Semester Evaluation (Evaluation which is intended to determine the final achievement of student learning outcomes)					

Catatan : 1 sks = (50' TM + 60' BT + 60' BM)/Minggu
 TM = Tatap Muka (Kuliah)
 BT = Belajar Terstruktur.

BM = Belajar Mandiri
 PS = Praktikum Simulasi (160 menit/minggu)
 PL = Praktikum Laboratorium (160 menit/minggu)

T = Teori (aspek ilmu Pengetahuan)
 P = Praktek (aspek ketrampilan kerja)

Keterkaitan CPMK dengan CPL dan Metode Assesment

	Assesment	Bobot (%)	CPL-1			CPL-2				CPL-3				CPL-4			CPL-5			CPL-6			
			1	2	3	1	2	3	4	1	2	3	4	1	2	3	1	2	3	1	2	3	
CPMK-1.1	UTS. 1	5							V		V												
CPMK-1.2	Presentasi	5																		V	V	V	
CPMK-2.1	UTS. 2	5							V										V				
CPMK-2.2	Presentasi	5																			V	V	
CPMK-3	UTS. 3	5							V										V		V	V	
CPMK-4.1	UTS. 4	5							V										V				
CPMK-4.2	Presentasi	10																			V	V	
CPMK-5.1	UAS. 1	5							V		V		V						V				
CPMK-5.2	UAS. 2	5							V		V		V						V				
CPMK-5.3	UAS. 3	5							V		V		V						V				
CPMK-5.4	UAS. 4	5							V		V		V						V				
CPMK-5.5	Presentasi	20																			V	V	V
CPMK-6	UAS. 5	5							V									V			V		
CPMK-7	UAS. 6	5																	V		V	V	
Kehadiran		10																					
TOTAL		100																					

Komponen Penilaian

Ujian Tengah Semester	: 20 %
Ujian Akhir Semester	: 30 %
Tugas Presentasi	: 40 %
<u>Kehadiran</u>	: 10 %
Total	: 100 %

Deskripsi Tingkat Penilaian

	Excellent	Good	Satisfy	Fail
Deskripsi	Mampu mendeskripsikan dengan benar dan lengkap	Mampu mendeskripsikan dengan benar tapi kurang lengkap	Mampu mendeskripsikan tapi kurang jelas dan kurang lengkap	Tidak mampu mendeskripsikan
Formulasi	Mampu memformulasikan dengan benar dan lengkap	Mampu memformulasikan dengan benar tapi kurang lengkap	Mampu memformulasikan tapi kurang jelas dan kurang lengkap	Tidak mampu memformulasikan
Menghitung	Mampu menghitung dengan benar dan lengkap	Mampu menghitung dengan benar tapi kurang lengkap	Mampu menghitung tapi kurang jelas dan kurang lengkap	Tidak mampu menghitung
Analisis	Mampu menganalisis dengan benar dan lengkap	Mampu menganalisis dengan benar tapi kurang lengkap	Mampu menganalisis tapi kurang jelas dan kurang lengkap	Tidak mampu menganalisis

Sistem Penilaian

Nilai Angka	Nilai Mutu	Angka Mutu	Sebutan Mutu	Nilai Angka	Nilai Mutu	Angka Mutu	Sebutan Mutu
85 – 100	A	4.0	Dengan pujian	55 – 59	C	2.0	Cukup
80 – 84	A-	3.6	Sangat baik sekali	50 – 54	C-	1.6	Kurang cukup
75 – 79	B+	3.3	Baik sekali	40 – 49	D	1.0	Kurang
70 – 74	B	3.0	Baik	≤ 39	E	0.0	Gagal
65 – 69	B-	2.6	Cukup Baik	-	T	-	Tertunda
60 – 64	C+	2.3	Lebih dari cukup				



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SOAL UJIAN TENGAH SEMESTER

Matakuliah : Rekayasa Lingkungan
Kode / SKS : SIP2.61.6301
Sifat Ujian : Close Book
Dosen : Yaumal Arbi, MT
Waktu : 60 menit
Bobot nilai maksimal : 20 point

No	Soal	Bobot
1	Jelaskan apa yang dimaksud dengan pencemaran lingkungan menurut UU no 32 tahun 2009 dan jelaskan hubungan antara 3 pilar lingkungan hidup ?	5
2	Jelaskan dengan singkat kasus pencemaran air yang pernah terjadi dan dampak dari pencemaran tersebut, beikan solusi penegahan dan penanggulangan menurut pendapat saudara ?	5
3	Jelaskan proses pengelolaan sampah menurut UU 18 tahun 2008 ?	5
4	Jelaskan perbedaan pencemar udara primer dan pencemar udara sekunder ?	5
<hr/> Total Score		<hr/> 20



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SOAL UJIAN AKHIR SEMESTER

Matakuliah : Rekayasa Lingkungan
Kode / SKS : SIP2.61.6301
Sifat Ujian : Close Book
Dosen : Yaumal Arbi, MT
Waktu : 60 menit
Bobot Nilai Maksimal : 30 point

No	Soal	Bobot
1	Jelaskan dengan singkat proses penyusunan dokumen AMDAL?	5
2	Jelaskan dampak besar dan penting yang akan terjadi dari sebuah pembangunan Gedung?	5
3	Jelaskan tata cara penggunaan metode matrik dalam proses evaluasi dampak?	5
4	Jelaskan macam2 sanksi administrasi dan sanksi pidana dalam AMDAL?	5
5	Jelaskan tentang apa yang dimaksud dengan teknologi tepat guna dan berikan contohnya?	5
6	Jelaskan konsep pembangunan berkelanjutan yang diterapkan di Indonesia?	5
Total Score		30



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SOAL TUGAS MATA KULIAH

Matakuliah	: Rekayasa Lingkungan
Kode / SKS	: SIP2.61.6301
Sifat Tugas	: Diskusi dan Presentasi Kelompok
Dosen	: Yaumal Arbi, MT
Waktu presentasi	: 60 menit
Bobot nilai	: 40 point

Kelompok	Soal	Nilai maks
1	Diskusikan dan presentasi tentang dampak lingkungan akibat lonjakan populasi manusia	5
2	Diskusikan dan presentasi tentang kasus pencemaran air yang terjadi di Indonesia	5
3	Diskusikan dan presentasi tentang dampak pencemaran udara meliputi <ul style="list-style-type: none">• Penipisan lapisan ozone• Pemanasan global• Efek rumah kaca• Naiknya muka air laut	10
4	Diskusikan dan presentasi tentang Rencana pengelolaan lingkungan (RKL) dan Rencana pemantauan lingkungan (RPL)	20
