



**BRAWIJAYA UNIVERSITY FACULTY OF ENGINEERING
UNDERGRADUATE URBAN AND REGIONAL PLANNING STUDY PROGRAMME**

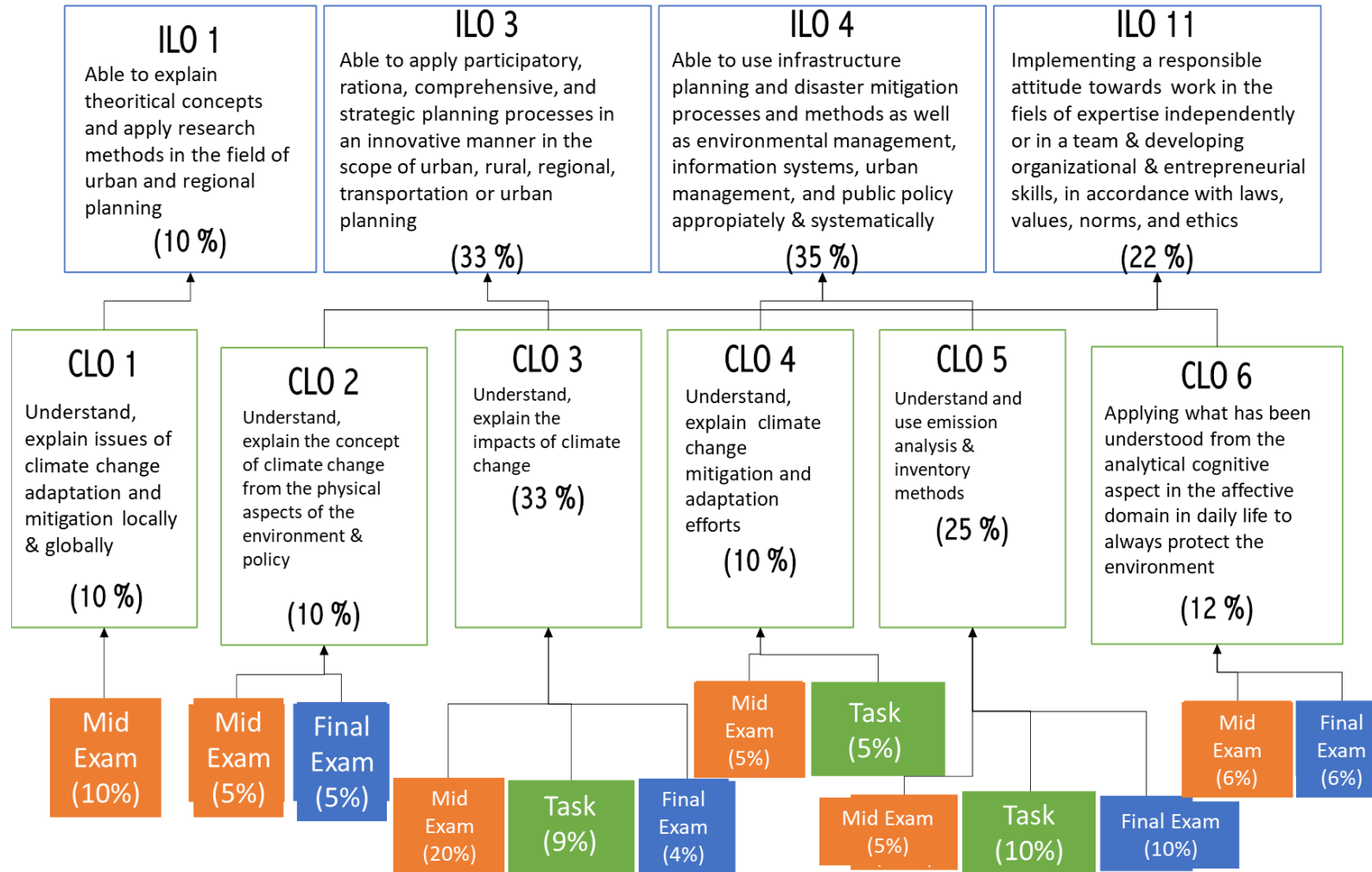
SEMESTER LEARNING PLAN

SUBJECT	CODE	SUBJECT SCOPE	WEIGHT (credits)	SEMESTER	Date of Preparation
ENVIRONMENTAL MANAGEMENT RELATED TO CLIMATE CHANGE	TKW62016	Urban Settlements	3	6	August 2023
AUTHORIZATION	RPS (SEMESTER LEARNING PLAN) DEVELOPER LECTURER		SUBJECT COORDINATOR		HEAD OF UNDERGRADUATE STUDY PROGRAMME
	CHRISTIA MEIDIANA Signature		CHRISTIA MEIDIANA Signature		SEPTIANA HARIYANI Signature
LEARNING OUTCOMES (CP)	ILO – UNDERGRADUATE URP STUDY PROGRAMME (which is supported by MK)				
	[ILO 1] Able to explain theoretical concepts and apply research methods in the field of urban and regional planning; [ILO 3] Able to apply innovative participatory, comprehensive rational and strategic planning processes in the scope of urban settlement planning, villages, cities, regions, transportation or urban design; [ILO 4] Able to use processes and methods of infrastructure planning and disaster mitigation; as well as environmental management, information systems, city management, and public policy; [ILO 11] Apply an attitude of responsibility for work in their field of expertise independently or in a team and develop organizational and entrepreneurial skills, in accordance with laws, values, norms and ethics.				
	CLO				
	1. Understand, explain local and global climate change adaptation and mitigation issues [ILO 1]. 2. Understand and explain the meaning of climate change from the physical environment and policy aspects [ILO 11]. 3. Understand and explain the impacts of climate change [ILO 3] 4. Understand and explain climate change mitigation and adaptation efforts [ILO 4]. 5. Understand and use emission analysis and inventory methods [ILO 4] 6. Apply what has been understood from the analytical cognitive aspect in the affective domain in everyday life to always protect the environment [ILO 11].				
	SUB CLO				
	1. Explain the general definition of renewable energy and recent developments in the world 2. Explain the definition of biomass (waste) as renewable energy and the impact of utilization from 3 aspects 3. Explain the definition of RDF as renewable energy and the impact of utilization from 3 aspects 4. Able to calculate the potential of biogas as renewable energy. 5. Explain the social & economic, technical aspects of Solar power as RE 6. Calculating the technical aspects of wind power as ET				

	- Describe case studies of solar and wind power utilization as RE. - Explain the social & economic, technical aspects of biomass (algae) as RE - Explain the case study of biomass utilization (algae) as RE - Explain the social & economic, technical aspects of tidal power as RE - Explain the social & economic, technical aspects of organic waste power as RE - Describe case studies of technical utilization of tidal power as RE - Explain the social & economic, technical aspects of hydropower as RE - Describe case studies of technical utilization of geothermal or water power as RE
BRIEF DESCRIPTION OF THE COURSE	This course provides students with insights into renewable energy that can be used as an alternative solution to the problem of fossil-based energy crisis with all its impacts.
OVERVIEW	- Causes of climate change - Climate change related policies - Calculation method of factors causing (sources) of climate change - supporting activities to reduce factors that cause climate change - Climate change mitigation and adaptation scenarios
OVERVIEW	MAIN - Ministry of Environment, Forests and Climate Change, Government of India. A Framework for Climate Change Vulnerability Assessments. 2014. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, India. Project on Climate Change Adaptation in Rural Areas of India. - Thomas Downing & Anand Patwardhan. 2005. Assessing Vulnerability for Climate Adaptation. CIAT Book Chapters. - Robin Bing Rong. 2010. GIS-Based Climate Change Adaptation Decision Support Tool (ADST): Indices to Assess Agricultural Vulnerability - Arief Anshory Yusuf & Herminia Francisco. 2009. Climate Change Vulnerability Mapping for Southeast Asia. SIDA - Alexander, L. V., P. Uotila, and N. Nicholls, 2013. Influence of sea surface temperature variability on global temperature and precipitation extremes. JOURNAL OF GEOPHYSICS. CXVIII: 1-16 - Alexander, L. V., et al., 2006. Global observed changes in daily climate extremes of temperature and precipitation. JOURNAL OF GEOPHYSICS. CXI - Bates, Bryson, et al. 2008. Climate Change and Water. Geneva: Intergovernmental Panel on Climate Change. - Dai, A., 2013. Increasing drought under global warming in observations and models (online). III: 52-58 - Wang, X. L. L., and V. R. Swail, 2006. Climate change signal and uncertainty in projections of ocean wave heights. XXVI: 109-126 - Dangermond, J. and Artz, M.. 2010t, Climate Change is a Geographic Problem. ESRI SUPPORT - Trofimenko, N. 2011. Climate Change: Current Issues. Kiel Institute for the World Economy. - UNFCCC. 2007 Climate Change: Impacts, Vulnerabilities and Adaptations in Developing Countries. UNFCCC
LEARNING MEDIA	SOFTWARE Microsoft Power Point, Keynote, Microsoft Excel, Arc GIS, Gapura UB (SIADO and SIAM)

	HARDWARE.
	Laptop, LCD projector, laser pointer
TEAM TEACHING	1. Christia Meidiana (CM) 2. Dr. Imma Widya Agustin ST, MT. (IWA) 3. Ismu Rini Dwi Ari, MT, Ph.D. (IRDA) 4. Kartika Eka Sari, ST, MT (KES)
COURSE REQUIREMENTS	This course is an elective and there are no prerequisite courses.

Diagram of Relationship/percentage of ILO OBE/KKNI with CLOs



CLO Weight Mapping - ILO

CLO	ILO											TOTAL
	1	2	3	4	5	6	7	8	9	10	11	
1	1											1
2			0,2								0,8	1
3			1									1
4				1								1
5				1								1
6											1	1

ILO and CLO relationship and assessment

ILO and IK ILO charged in the Site Planning course				CLO			Media assessment and its contribution to MK competency scores			Week
ILO	ILO Statement	IK-ILO	IK- ILO Statement	CLO Statement	CLO Weight	Assessment Media	Tasks	Mid Exam	Final Exam	
1	Able to explain theoretical concepts and apply research methods in the field of urban and regional planning;	a	Explain theoretical concepts in the field of urban and regional planning	Understand, explain climate change adaptation and mitigation issues locally and globally. (CLO 1)	10	Exam Questions (Mid Exam)		10%		1
3	Able to apply participatory, comprehensive rational and strategic planning processes innovatively in the scope of urban settlement planning, villages, cities, regions, transportation or urban design.	a	Describe the process and methods of planning urban settlements, villages, cities, regions, transportation or urban design.	Understand and explain the impact of climate change (CLO 3)	33	Exam Questions (Mid Exam & Final Exam) Tasks (CBL)	9%	20%	4%	2, 3, 4, 14
4	Able to use the processes and methods of infrastructure planning and disaster mitigation; as well as environmental management,	b	Using Environmental Management processes and methods	Understand and use emission analysis and inventory methods (CLO 5)	25	Exam Questions (Mid Exam & Final Exam)	10%	5%	10%	7, 9, 13, 15

ILO and IK ILO charged in the Site Planning course				CLO			Media assessment and its contribution to MK competency scores			Week
ILO	ILO Statement	IK-ILO	IK- ILO Statement	CLO Statement	CLO Weight	Assessment Media	Tasks	Mid Exam	Final Exam	
	information systems, urban management, and public policy appropriately and systematically.					Tasks (CBL)				
		f	Using Disaster Mitigation Planning processes and methods	Understand and explain climate change mitigation and adaptation efforts (CLO 4)	10	Exam Question (Mid Exam) Tasks (CBL)	5%	5%		5, 6
11	Apply a responsible attitude to work in their field of expertise independently or in a team and develop organizational and entrepreneurial skills, in accordance with laws, values, norms, and ethics.	a	Apply a responsible attitude in the tasks that are their responsibility	Apply what has been understood from the analytic cognitive aspect in the affective domain in everyday life to always protect the environment (CLO 6)	12	Exam Question (Final Exam) Tasks (CBL)		6%	6%	10, 11
		b	Use knowledge in the field of urban and regional planning to manage and lead in a team or organization.	Understand and explain the meaning of climate change from the physical environment and policy aspects (CLO 2)	10	Exam Question (Final Exam) Tasks (CBL)		5%	5%	12

Recapitulation of Percentage Relationship between CLO and Assessment

Recapitulation of Percentage Relationship between CLO and Assessment					
CLO	DESCRIPTION	Tasks	Mid Exam *	Final Exam	
CLO 1	Understand, explain climate change adaptation and mitigation issues locally and globally.		10		10
CLO 2	Understand and explain the meaning of climate change from the physical environment and policy aspects.		5	5	10
CLO 3	Understand and explain the impacts of climate change	9	20	4	33
CLO 4	Understand and explain climate change mitigation and adaptation efforts	5	5		10
CLO 5	Understand and use emission analysis and inventory methods	10	5	10	25
CLO 6	Apply what has been understood from the cognitive aspect of analytics in the affective domain in everyday life to always protect the environment.		6	6	12
	Final Score =	24%	51%	25%	100%

**Case Based Learning*

Percentage Recapitulation of ILO and CLO Relationship

	ILO 1	ILO 3	ILO 4	ILO 11
CPMK 1	10			
CPMK 2				10
CPMK 3		33		
CPMK 4			10	
CPMK 5			25	
CPMK 6				12
Weight	10	33	35	22

Week	Lecturer	Expected End Capability (CLO)	Subject matter	Indicator	Criteria & form of Assessment (Indicator)	Learning Methods	Time (duration)	Learning Material / Study Material [Literature]	Value Weight
(1)	(2)	(3)	(4)	(5)	(8)	(6)		(7)	(9)
1	CM	Able to identify types of renewable energy and the potential and challenges of renewable energy development in Indonesia [CLO 1].	Explain the general definition of renewable energy and recent developments in the world	Accuracy in explaining the definition and latest developments in RE utilization	Criteria: Clarity of description according to the explanation of lecture material and other related sources. Assessment: Test: Mid Exam essay questions Non Test:	• Lecture. Lecture • Discussion • Tasks: - •	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study: 60 minutes + 60 Minutes		5%
2	CM	Able to explain the development of renewable energy utilization from environmental, social, economic and technical aspects [CLO 3]	Explain the definition of biomass (waste) as renewable energy and the impact of utilization from 3 aspects	• Accuracy in explaining the limitations of biomass as ET • Accuracy in explaining the types and utilization of biomass for alternative energy	Criteria: Clarity of discussion and description according to the explanation of lecture material and other related sources. Assessment: Test: Non Test: CBL Assignment	• Lecture. Lecture • Discussion • Task 1: Literature study related to social & economic, technical aspects •	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study: 60 minutes + 60 Minutes		5%

Week	Lecturer	Expected End Capability (CLO)	Subject matter	Indicator	Criteria & form of Assessment (Indicator)	Learning Methods	Time (duration)	Learning Material / Study Material [Literature]	Value Weight
3	CM	Able to explain the development of renewable energy utilization from environmental, social, economic and technical aspects [CLO 3]	Explain the definition of RDF as renewable energy and the impact of utilization from 3 aspects	• Accuracy in explaining the definition of RDF • Accuracy in explaining the types and utilization of RDF for alternative energy.	Criteria: Accuracy in the use of analytical methods and clear sources, in accordance with the description of the lecture explanation. Assessment: Test: Non Test: CBL Tasks	• Lecture. Lecture • Discussion • Task 1: Literature study related to social & economic, technical aspects •	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study: 60 minutes + 60 Minutes		10%
4	CM	Able to explain the potential and utilization of renewable energy [CLO 2]	Able to explain the potential of biogas as renewable energy	• Accuracy in explaining the sources of biogas and its utilization in Indonesia • Accuracy in using the biogas potential calculation method	Criteria: Accuracy in the use of analytical methods and clear sources, in accordance with the description of the lecture explanation. Assessment: Test: Non Test: CBL Assignment	• Lecture. Lecture • Discussion • Task 2: Calculating biogas potential based on case studies	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study: 60 minutes + 60 Minutes		10%
5	SH	Able to explain the development of renewable energy utilization from environmental, social,	Explain the social & economic, technical aspects of	• Accuracy in explaining 3 aspects in the utilization of solar	Criteria: Accuracy in the use of analytical methods and clear sources, in accordance with the description of the lecture explanation.	• Lecture. Lecture • Discussion • Task 1:	Lecture: 2x 50 minutes Discussion: 50 minutes		5%

Week	Lecturer	Expected End Capability (CLO)	Subject matter	Indicator	Criteria & form of Assessment (Indicator)	Learning Methods	Time (duration)	Learning Material / Study Material [Literature]	Value Weight
		economic and technical aspects [CLO 3]	Solar power as RE	power and water as RE • Accuracy in explaining the calculation method of solar power potential	Assessment: Test: Mid Exam Essay Question Non Test:	Literature study related to social & economic, technical aspects •	Assignments and self-study: 60 minutes + 60 Minutes		
6	SH	Able to identify types of renewable energy and the potential and challenges of renewable energy development in Indonesia [CLO 1].	Explain the technical aspects of wind power as RE	• Accuracy in explaining 3 aspects in the utilization of hydropower as RE • Accuracy in using hydropower potential calculation methods	Criteria: Accuracy in the use of analytical methods and clear sources, in accordance with the description of the lecture explanation. Assessment: Test: Mid Exam Essay Question Non Test:	• Lecture. Lecture • Discussion • Task 2: Calculating wind power potential based on case studies •	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study: 60 minutes + 60 Minutes		5%
7	SH	Able to explain the potential and utilization of renewable energy [CLO 2]	Describe case studies of solar and wind power utilization as RE	• Appropriateness of case study selection (currentness and completeness of data)	Criteria: Accuracy in the use of analytical methods and clear sources, in accordance with the description of the lecture explanation. Assessment: Test: Mid Exam Essay Question	• Lecture. Lecture • Discussion • Task 3: Case Studies Case	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study: 60 minutes + 60 Minutes		10%

Week	Lecturer	Expected End Capability (CLO)	Subject matter	Indicator	Criteria & form of Assessment (Indicator)	Learning Methods	Time (duration)	Learning Material / Study Material [Literature]	Value Weight
				Accuracy in concluding case studies of solar and water power utilization in Indonesia and foreign countries.	Non Test:	studies of solar or wind power utilization as RE			
8	Mid Exam	Evaluation 1							
9	KES	Able to explain the potential and utilization of renewable energy [CLO 2]	Explain the social & economic, technical aspects of biomass (algae) as RE	- Accuracy in explaining 3 aspects of biomass utilization as RE - Accuracy in explaining the method of calculating biomass potential	Criteria: Accuracy in the use of analytical methods and clear sources, in accordance with the description of the lecture explanation. Assessment: Test: Non Test: CBL Tasks	- Lecture. - Lecture - Discussion - Task 1: - Literature study related to social & economic, technical aspects	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study: 60 minutes + 60 Minutes		5%
10	KES	Able to explain the potential and utilization of renewable energy [CLO 2]	Explain the social & economic, technical aspects of tidal power as RE	Appropriateness of case study selection (currentness and completeness of data)	Criteria: Completeness and clear sources according to the discussion and description of the lecture explanation. Assessment: Test:	- Lecture. - Lecture - Discussion - Task 3: Group assignment Case study	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study:		10%

Week	Lecturer	Expected End Capability (CLO)	Subject matter	Indicator	Criteria & form of Assessment (Indicator)	Learning Methods	Time (duration)	Learning Material / Study Material [Literature]	Value Weight
				Accuracy in concluding case studies of biomass utilization in Indonesia and foreign countries.	Non Test: CBL Tasks	of biomass utilization (algae) as RE 	60 minutes + 60 Minutes		
11	KES	Able to explain the potential and utilization of renewable energy [CLO 2]	Explain the social & economic, technical aspects of organic waste power as RE	- Accuracy in explaining 3 aspects in the utilization of organic waste energy as RE - Accuracy in explaining the method of calculating biomass potential	Criteria: Completeness and clear sources according to the discussion and description of the lecture explanation. Assessment: Test: Non Test: CBL Tasks	- Lecture. Lecture - Discussion - Task 1: - Literature study related to social & economic aspects, technical tidal power as RE	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study: 60 minutes + 60 Minutes		5%
12	KES	Able to explain the development of renewable energy utilization from environmental, social, economic and technical aspects [CLO 3]	Describe case studies of technical utilization of tidal power as RE	- Appropriateness of case study selection (currentness and completeness of data) - Accuracy in concluding case	Criteria: Accuracy in the use of analytical methods and clear sources, in accordance with the description of the lecture explanation. Assessment: Test: Non Test:	- Lecture. Lecture - Discussion - Task 3: - Group assignment Case study of	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study: 60 minutes + 60 Minutes		10%

Week	Lecturer	Expected End Capability (CLO)	Subject matter	Indicator	Criteria & form of Assessment (Indicator)	Learning Methods	Time (duration)	Learning Material / Study Material [Literature]	Value Weight
				studies of tidal power utilization in Indonesia and foreign countries.	CBL Tasks	technical utilization of tidal power as RE			
13	IRDA	Able to identify types of renewable energy and the potential and challenges of renewable energy development in Indonesia [CLO 1].	Explain the social & economic, technical aspects of geothermal as RE	• Accuracy in explaining 3 aspects in the utilization of tidal power as RE • Accuracy in explaining the method of calculating geothermal energy potential.	Criteria: Accuracy in the use of analytical methods and clear sources, in accordance with the description of the lecture explanation. Assessment: Test: Final Exam Essay Question Non Test:	• Lecture. Lecture • Discussion	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study: 60 minutes + 60 Minutes		5%
14	IRDA	Able to explain the potential and utilization of renewable energy [CLO 2]	Explain the social & economic, technical aspects of hydropower as RE	• Accuracy in explaining 3 aspects in the utilization of hydropower (hydro) as RE • Accuracy in explaining the method of calculating the	Criteria: Accuracy in the use of analytical methods and clear sources, in accordance with the description of the lecture explanation. Assessment: Test: Final Exam Essay Question Non Test:	• Lecture. Lecture • Discussion • Task 1: Literature study related to social & economic aspects, technical hydropower as RE	Lecture: 2x 50 minutes Discussion: 50 minutes Assignments and self-study: 60 minutes + 60 Minutes		5%

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FACULTY OF ENGINEERING
URP DEPARTMENT / UNDERGRADUATE URP STUDY PROGRAM

TASK PLAN 1

SUBJECT	RENEWABLE ENERGY MANAGEMENT				
CODE	TKW 4108	credits	3	SEMESTER	6
INSTRUCTOR	Christia Meidiana				
TASK FORM		TASK TIME			
Individual/Independent		50 minutes/week/semester			
CASED BASED LEARNING ASSIGNMENT TITLE					
Review of case studies of renewable energy utilization (Biomass and Biogas)					
TASK THEME					
Evaluate the potential utilization of renewable energy sources					
COURSE LEARNING TOPICS					
Explain the definition of biomass (waste) as renewable energy and the impact of utilization from 3 aspects					
Explain the definition of RDF as renewable energy and the impact of utilization from 3 aspects					
Able to explain the potential of biogas as renewable energy.					
TASK DESCRIPTION					
Students Case study of renewable energy utilization (Biomass and Biogas)					
ASSIGNMENT METHOD					
Individual: Case Study Literature review					
FORM AND FORMAT OF OUTPUT					
a. Object of Study: Case study					
b. Form of Output: Review report					
c. Output Format:					
1. Substance review:					
• Explanation of the definition of biomass, RDF and biogas					

• Potential utilization of renewable energy sources from 3 aspects	
2. Report format - Word/pdf format - Adding supporting references to the review from recent journals	
INDICATORS, CRITERIA AND ASSESSMENT WEIGHT	
1. Explanation of biomass definition from 3 aspects 2. Explanation of RDF definition from 3 aspects 3. Explanation of the potential of biogas as a renewable energy	
IMPLEMENTATION SCHEDULE	
Literature identification	Week 2 - 3
Review case study report	Week 4
Report Collection	Week 8

Assessment Rubric (CBL TASK 1)

Task Type : Review case study of renewable energy utilization (Biomass and Biogas)

Assessment type : Analytic/descriptive rubric and CBL perception rubric

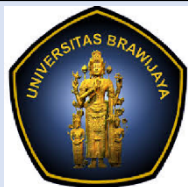
Assessment indicators : ILO 3 and ILO 4

1. Innovatively apply participatory planning processes and methods to Urban and Rural Settlement Planning.
2. Using Environmental Management processes and methods

Assessment criteria

Dimensions	Criteria	Maximum Value	Bad 0-55	Simply 56-69	Good 70-80	Very good 81-100
definition of biomass (waste) as renewable energy and the impact of utilization from 3 aspects	Explain the definition of biomass (waste) as renewable energy and the impact of utilization from 3 aspects	20	Unable to explain the definition of biomass (waste) as renewable energy and the impact of utilization from 3 aspects	Able to explain 30% definition of biomass (waste) as renewable energy and the impact of utilization from 3 aspects	Able to explain 60% of the definition of biomass (waste) as renewable energy and the impact of utilization from 3 aspects	Able to explain 90% of the definition of biomass (waste) as renewable energy and the impact of utilization from 3 aspects
definition of RDF as renewable energy and the impact of utilization from 3 aspects	Explain the definition of RDF as renewable energy and the impact of utilization from 3 aspects	20	Unable to explain the definition of RDF as renewable energy and the impact of utilization from 3 aspects	Able to explain 30% definition of RDF as renewable energy and the impact of utilization from 3 aspects	Able to explain 60% of the definition of RDF as renewable energy and the impact of utilization from 3 aspects	Able to explain 90% of the definition of RDF as renewable energy and the impact of utilization from 3 aspects

Dimensions	Criteria	Maximum Value	Bad 0-55	Simply 56-69	Good 70-80	Very good 81-100
potential of biogas as renewable energy	Explain the potential of biogas as renewable energy	20	Unable to explain the potential of biogas as renewable energy	Able to explain 30% of biogas potential as renewable energy	Able to explain 60% of biogas potential as renewable energy	Able to explain 90% of biogas potential as renewable energy
Report	Clarity of writing and novelty of supporting literature	40	Does not meet the overall requirements	Meets 30% of requirements	Meets 60% of requirements	Meets 90% of requirements



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TASK PLAN 2

SUBJECT	Renewable Energy Management				
CODE	TKW 4108	credits	3	SEMESTER	6
INSTRUCTOR	Kartika Eka Sari, ST, MT				
TASK FORM		TASK TIME			
Individual/Independent		50 minutes/week/semester			
CASED BASED LEARNING ASSIGNMENT TITLE					
Analysis of the suitability of developing renewable energy sources (Tidal Energy and Organic Waste)					
TASK THEME					
"Suitability of energy generation location with land conditions and potential energy raw materials"					
COURSE LEARNING TOPICS					
Students are able to evaluate land conditions and potential raw materials for renewable energy plant development sites (tidal and organic waste).					
TASK DESCRIPTION					
Students review evaluate land conditions and potential raw materials for renewable energy generation sites (tidal and organic waste).					
ASSIGNMENT METHOD					
Individuals: Literature review					
FORM AND FORMAT OF OUTPUT					
a. Object of Study: Case study of Tidal Power Plant Site and Organic Waste					
b. Form of Output: Review report					
c. Output Format:					
1. Substance review:					
• Evaluation of land/meteorological/oceanographic conditions					
• Evaluation of raw materials for renewable energy sources					
• Conclusion on the suitability of tidal power plant/organic waste development sites					

2. Report format - Word/pdf format maximum 10 pages - Using evaluation support literature from recent journals	
INDICATORS, CRITERIA AND ASSESSMENT WEIGHT	
1. Explanation of land/meteorological/oceanographic conditions 2. Explanation of the condition of raw materials for renewable energy sources 3. Explanation of the suitability of renewable energy power plant construction location 4. Report	
IMPLEMENTATION SCHEDULE	
Literature identification	Week 9 - 10
Review case study report	Week 11 - 12
Report Collection	Week 16

Assessment Rubric (TASK)

Task Type : "Suitability of energy generation sites with land conditions and potential energy raw materials"

Assessment type : Analytic/descriptive rubric and CBL perception rubric

Assessment indicators : ILO 3 and 4

1. Innovatively apply participatory planning processes and methods to Urban and Rural Settlement Planning.
2. Using Environmental Management processes and methods

Assessment criteria

Dimensions	Criteria	Maximum Value	Bad 0-55	Simply 56-69	Good 70-80	Very good 81-100
Land conditions/meteorology/oceanography	Explain land/meteorological/oceanographic conditions	20	Unable to explain Land/meteorological/oceanographic conditions	Able to explain 30% Land conditions/meteorology/oceanography	Able to explain 60% Land conditions/meteorology/oceanography	Able to explain 90% Land conditions/meteorology/oceanography
Renewable energy source raw material conditions	Describe the condition of raw materials for renewable energy sources	20	Unable to explain the condition of raw materials for renewable energy sources	Able to explain 30% condition of raw materials for renewable energy sources	Able to explain 60% of raw material conditions for renewable energy sources	Able to explain 90% of raw material conditions for renewable energy sources
Suitability of renewable energy power plant construction location	Explain the suitability of renewable energy power plant construction sites	20	Unable to explain the suitability of renewable energy power plant construction sites	Able to explain 30% The suitability of renewable energy power plant construction sites	Able to explain 60% The suitability of renewable energy power plant construction sites	Able to explain 90% The suitability of renewable energy power plant construction sites

Dimensions	Criteria	Maximum Value	Bad 0-55	Simply 56-69	Good 70-80	Very good 81-100
Report	Completeness and additional references used to review the case study	40	Does not meet the overall requirements: • PDF maximum 10 pages • Number of additional references	Meets 30% of the requirements: • PDF maximum 10 pages • Number of additional references	Meet 60% of the requirements: • PDF maximum 10 pages • Number of additional references	Meets 90% of the requirements: • PDF maximum 10 pages • Number of additional references



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ESSAY QUESTION PLAN

SUBJECT	Renewable Energy Management				
CODE	TKW 4108	credits	3	SEMESTER	6
INSTRUCTOR	1. Ismu Rini Dwi Ari, MT, Ph.D. (IRDA) 2. Dr. Septiana Hariyani ST., MT. (SH)				
TEST FORM		TASK TIME			
Essay		60 minutes			
TOPIC DISCUSSION					
• Social, economic and technical aspects (Solar, wind, water and geothermal energy) • Explain the utilization of solar, wind, water and geothermal energy					
COURSE LEARNING TOPICS					
• Social, economic and technical aspects of solar power as RE • Social, economic and technical aspects of wind power as RE • Social, economic and technical aspects of hydropower as RE • Social, economic and technical aspects of geothermal power as RE • Explain case studies of the utilization of solar, wind, water and geothermal power as RE					
FORM OF TEST					
a. Implementation: Offline (according to the UTS and UAS schedule) b. Form: Essay c. Topic: • Solar renewable energy sources • Wind power renewable energy sources					

- Hydropower renewable energy sources
- Renewable energy source geothermal power

INDICATORS, CRITERIA AND ASSESSMENT WEIGHT

1. Accuracy in explaining 3 aspects in the utilization of solar, wind, water and geothermal power as RE
2. Accuracy in explaining the calculation method of solar, wind, water and geothermal potentials
3. Accuracy in concluding case studies on the utilization of solar, wind, water and geothermal power

IMPLEMENTATION SCHEDULE

Mid Exam	On schedule
Final Exam	On schedule

Assessment Rubric (ESSAY)

Test Type : Essay

Assessment type : Mid Exam and Final Exam Essay

Assessment indicators : 1LO 1, 1LO 3 and ILO 4

1. Apply research and methods in the field of urban and regional planning
2. Innovatively apply participatory planning processes and methods to Urban and Rural Settlement Planning.
3. Using Environmental Management processes and methods

Assessment criteria

Dimensions	Criteria	Maximum Value	Bad 0-55	Simply 56-69	Good 70-80	Very good 81-100
Accuracy in explaining 3 aspects in the utilization of solar, wind, water and geothermal power as RE	Explain 3 aspects in the utilization of solar, wind, water and geothermal power as RE	30	Unable to explain 3 aspects in the utilization of solar, wind, water and geothermal power as RE	Able to explain 30% 3 aspects in the utilization of solar, wind, water and geothermal power as RE	Able to explain 60% 3 aspects in the utilization of solar, wind, water and geothermal power as RE	Able to explain 3 aspects in the utilization of solar, wind, water and geothermal power as RE
Accuracy in explaining the calculation method of solar, wind, water and	Explain the calculation methods of solar, wind, water and	20	Unable to explain the calculation method of solar, wind, water and geothermal	Able to explain 30% of solar, wind, water and geothermal potential calculation	Able to explain 60% of solar, wind, water and geothermal potential calculation	Able to explain 90% of the calculation methods of solar, wind, water and geothermal

Dimensions	Criteria	Maximum Value	Bad 0-55	Simply 56-69	Good 70-80	Very good 81-100
geothermal potentials	geothermal potentials		potential based on ecosystem services	methods based on ecosystem services	methods based on ecosystem services	potential based on ecosystem services
Accuracy in concluding case studies on the utilization of solar, wind, water and geothermal power	Explain the conclusions of case studies on the utilization of solar, wind, water and geothermal power	50	Unable to explain the conclusion of case studies on the utilization of solar, wind, water and geothermal power	Able to explain 30% of case study conclusions on the utilization of solar, wind, water and geothermal power	Able to explain 60% of the conclusions of case studies on the utilization of solar, wind, water and geothermal power	Able to explain 90% of the conclusions of case studies on the utilization of solar, wind, water and geothermal power