MODUL
ENVIRONMENTAL GIS

MASTER PROGRAM OF ENVIRONMENTAL SCIENCE
SCHOOL OF POSTGRADUATED STUDIES
DIPONEGORO UNIVERSITY

Modul Description :

Modul design	Environmental GIS
Modul level, if applicable	
Code, if applicable	P-CIL-8-214
Subtitles, if any	
Course, if applicable	
Semester(s) in which the Modul is taught	semester 2
Modul responsible*	
Teaching Lecturer	1. Dr. Eng. Maryono, ST, MT 2. Prof. Dr. Denny Nugroho Sugianto, ST, M.Sc 3. Dr. Muhammad Helmi, S.Si., M.Si"
Language	*Indonesian and English*
Relationship with curriculum	
Type of teaching, hours of contact	*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* *Total work for 1 semester = 100 hours = 4 ECTS*
Workload	*(Estimated) workload, divided into contact hours (lectures, exercises, laboratory sessions, etc.) and personal study, including test preparation, specified in hours,[1]and overall.*
credit points	*2 credits / 4 ECTS*
Requirements according to the exam regulations	*Lecture attendance of at least 75%*
Recommended prerequisites	*For example, competence in…*

*Advanced lecture material conducted by the main supervisor, co-supervisors and students refers to the research topic.

Modul the desired learning objectives/outcomes	Students are able to know the benefits of GIS-based software in answering environmental problems and are also able to operate GIS-based software to answer environmental problems.
Fill	In this course students will study one of the main goals of geographic information systems, namely the use of computer-based systems to manage geographic data. The theoretical foundation of geographic information systems, components, data formats and spatial data processing methods will be provided so that students have knowledge of how to compile, process, analyze, and interpret spatial data in geographic information systems. In order to understand and gain experience in compiling spatial data, students will be given the task of compiling simple spatial data which is organized as attribute data in spatial data. The process of converting spatial data used in geographic information systems will also be given in this course.
Study and examexam requirements and forms	• *Open the book and close the book* • *Multiple choice, case studies, interviews, practicals*
Media used	*Powerpoint, youtube, website*
Reference	1. Adil Ahmat. 2017. Geographic Information System. ANDI Publisher. Yogyakarta 2. Irwansyah Eddy. 2013. Basic Principles and GIS Application Development. Digibook Printing and Publishing. Yogyakarta 3. Wahana Computer.2015.GIS Modeling for Disaster Mitigation. PT. Elex Media Komputindo. Jakarta

SEMESTER STUDY PLAN

Study program: Master of Environmental Science				**Faculty: School Of Postgraduated Studies**			
Subject:	**GIS Environment**	**Code: P-CIL-8-214**		**Credit:2 (4 ECTS)**		**Smt:2**	
Supporting lecturer:	**Dr. Eng. Maryono, ST, MT** Prof. Dr. Denny Nugroho Sugianto, ST, M.Si Dr. Muhammad Helmi, S.Si., M.Si						
Learning Outcomes Subject:	◦ Able to recognize the benefits of GIS-based software in responding to environmental problems. ◦ Able to operate GIS-based software to answer environmental problems.						
Short Description of Courses:	In this course, students will learn one of the main objectives of geographic information systems, namely the use of computer-based systems to manage geographic data. The theoretical basis of geographic information systems, components, data formats and methods of processing spatial data will be provided so that students will have knowledge of how to compile, process, analyze, and interpret spatial data in geographic information systems. To understand and gain experience in compiling spatial data, students will be given the task of compiling simple spatial data compiled as attribute data in spatial data. The process of converting spatial data used in geographic information systems will also be given in this course.						

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	Able to explain what is GIS	Introduction to Lectures	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) ◦ *Lecture = 1x 120 minutes* ◦ *Q&A = 1 x 20 minutes* ◦ *Discussion = 1 x 20 minutes*	Students listen to the lecturer's explanation and answer the lecturer's	Presence and Activeness in Understanding Discussion	5

				◦ ***Presentation = 1 x 20 minutes*** *Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)*	questions, as well as discuss		
2	Able to understand the challenges and complexities of infrastructure development	Challenges and complexities of infrastructure development	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) ◦ *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	Presence and Activeness in Understanding Discussion	5
3	Able to understand infrastructure development and improve people's quality of life	Infrastructure development and improvement of people's quality of life	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) ◦ *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	Presence and Activeness in Understanding Discussion	5
4	Able to explain GIS-based development in the digital era	GIS-based development in the digital era	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) ◦ *Lecture = 1x 120 minutes* ◦ *Q&A = 1 x 20 minutes* ◦ *Discussion = 1 x 20*	Students listen to the lecturer's explanation and answer the lecturer's	Presence and Activeness in Understanding Discussion	5

				minutes ◦ ***Presentation = 1 x 20 minutes*** *Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)*	questions, as well as discuss		
5	Able to understand the use of GIS in infrastructure development	Utilization of GIS in infrastructure development	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) ◦ *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	Presence and Activeness in Understanding Discussion	5
6	Able to understand the basics of spatial analysis	Basics of spatial analysis	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) ◦ *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	Presence and Activeness in Understanding Discussion	5
7	Able to do basic mapping practice	Basic mapping tutorials and practices	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) ◦ *Lecture = 1x 120 minutes* ◦ *Q&A = 1 x 20 minutes*	Students listen to the lecturer's explanation and answer the lecturer's	Presence and Activeness in Understanding Discussion	5

				◦ *Discussion = 1 x 20 minutes* ◦ ***Presentation = 1 x 20 minutes*** *Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)*	questions, as well as discuss		
8	Mid Term Examination	**Meeting Material 1-7**	**Written test**	**216 minutes of processing time or the equivalent of 0.25 ECTS**	**Students working on UTS questions**	**Meeting Material 1-7**	15
9	Able to understand the role of GIS in unraveling environmental utilization regulatory issues	The role of GIS in unraveling the problems of environmental utilization regulation	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) ◦ *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	Presence and Activeness in Understanding Discussion	5
10	Able to monitor disaster areas using GIS	Monitoring disaster areas using GIS	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) ◦ *Lecture = 1x 120 minutes* ◦ *Q&A = 1 x 20 minutes* ◦ *Discussion = 1 x 20 minutes* ◦ ***Presentation = 1 x 20 minutes***	Students listen to the lecturer's explanation and answer the lecturer's questions, as well as discuss	Presence and Activeness in Understanding Discussion	5

				Individual Tasks (Self Work) = 1 x 36 minutes/day (16 weeks)			
11	Able to understand the use of GIS in disaster mitigation	Discussion of case studies on the use of GIS in disaster mitigation	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) • *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	Presence and Activeness in Understanding Discussion	5
12	Able to understand the use of GIS in infrastructure asset management	Utilization of GIS in infrastructure asset management	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) • *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	Presence and Activeness in Understanding Discussion	5

13	Able to understand the use of GIS in infrastructure asset management	Utilization of GIS in green infrastructure development	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) • *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	Presence and Activeness in Understanding Discussion	5
14	Able to understand the use of GIS in infrastructure asset management	Utilization of GIS in collaborative infrastructure planning	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) • *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	Presence and Activeness in Understanding Discussion	5
15	Able to understand the use of GIS in environmental research	Utilization of GIS in environmental research	Lectures, questions and answers, and discussions	216 minutes (0.25 ECTS) • *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	Presence and Activeness in Understanding Discussion	5

16	Final Examination	**Meeting Materials 1-15 (resume material)**	**Written test**	**216 minutes of processing time or the equivalent of 0.25 ECTS**	**Students working on UAS questions**	**Completeness and correctness of explanation and accuracy of understanding**	15
8. Reference List:		1. Adil Ahmat.2017. Geographic Information System. ANDI Publisher. Yogyakarta 2. Irwansyah Edy. 2013. Basic Principles and Development of GIS Applications. Digibook Printing and Publishing. Yogyakarta 3. Computer Vehicles. 2015. GIS Modeling for Disaster Mitigation. PT. Elex Media Komputindo. Jakarta					