



SEMESTER STUDY PLAN

Study program: Master of Environmental Science

Faculty: Graduate School

Subject:	Philosophy of Science and Research Methodology	Code: CIL-8-101	Credit:3 (6 ECTS)	Sem:1
Supporting lecturer:	1. Prof. Drs. Sudharto Prawata Hadi, MES, Ph.D. 2. Prof. Dr. Ir. Purwanto, DEA			
Learning Outcomes Subject:	<ul style="list-style-type: none"> • Have the ability to explore, integrate and construct various sources of knowledge in the reality of life into the scope of science • Have the ability to select and build linkages between; the uniqueness of various local knowledge for scientific development according to the rules of science • Able to describe the relationship between knowledge, philosophy and philosophy of science in terms of ontology, epistemology, and axiology. 			
Short Description of Courses:	The Philosophy of Science course discusses; the position of knowledge, habits, beliefs of a person or group of people in science, knowledge of sources of knowledge, scientific methods, scientific results, scientific attitudes, sources of truth and limitations of science, as well as the role of science and technology in the development of human civilization. This course trains students to think logically, critically, comprehensively, and contemplatively so that they can understand the linkage of various sources of knowledge in the past with the present and the future in the development of science and technology which relies on the integration of ontology, sestimology and axiology in building artifacts as scientific products. .			

1	2	3	4	5	6	7	
Week	Final Ability of each learning stage	Study Materials/ Subjects	Learning methods	Time	Student Learning Experience	Evaluation	
						Criteria & Indicators	Weight (%)
1.	Able to understand the position of knowledge in the scope of knowledge and the sources of knowledge as a whole in group activities	Introduction, concepts and philosophy of science, community group activities and scientific discovery inference	Lectures and discussions	330 minutes (0.375 ECTS) Consist of: <ul style="list-style-type: none"> • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30</i> 	Understanding the activities and beliefs of community groups as part of the source of knowledge	Students are able to understand the position of knowledge, study of knowledge and scientific perspectives and philosophy of science through	5

				<i>minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i>		lectures and discussion activities	
2.	Able to describe the relationship between the uniqueness of people's lives, the uniqueness of local knowledge in the geographical geological uniqueness unit on the development of philosophy and philosophy of science in terms of ontology, epistemology, and axiology.	Source of Knowledge Truth Understanding Philosophy Understanding Science Understanding Philosophy of Science Benefits of Philosophy of Science	Lectures and discussions	330min (0.375 ECTS) Consist of: • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i>	Analyze and inference the uniqueness of geographical geological environment units and local knowledge of the community in a scientific perspective	Analyze and select community activities and knowledge that can be appointed as a source of knowledge	5
3.	Able to describe the relationship between knowledge, science, philosophy and philosophy of science in terms of ontology, epistemology, and axiology	The development of science / biology The development of philosophy The figures of philosophy and their thoughts Branches of philosophy The uniqueness and essence of various philosophical theories	Lectures and discussions	330min (0.375 ECTS) Consist of: • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i>	Identifying the development of science/biology and the development of philosophy in a certain period of time or era	Analyze and select community activities and knowledge that can be appointed as a source of knowledge	5
4.	Analyzing the basics of empiricism, idealism, and existentialism	Knowledge of Science Scientific Truth Limitations of knowledge	Lectures and discussions	330min (0.375 ECTS) Consist of: • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30</i>	Identifying the development of science/biology between the specifications of empiricism, idealism	The results of the analysis and selection of empiricism, idealism and existentialism	5

				<i>minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i>	and existentialism schools of thought	schools of thought in the development of science	
5.	Analyzing the basics of pragmatism in the history of the development of science	The development of science by era	Lectures and discussions	330min (0.375 ECTS) Consist of: • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i>	Identifying pragmatism throughout the history of the development of science according to its era	The results of the pragmatism analysis of the development of science	5
6.	Understanding and Mastering the scientific method, truth and sources of truth in natural science	Scientific Method Induction Deduction Logic Reasoning	Lectures, discussions and presentations	330min (0.375 ECTS) Consist of: • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i>	Understand the uniqueness of the scientific method and the sources of truth in natural science	Ability to analyze and select between thoughts of empiricism, idealism, existentialism and pragmatism of the development of science	5
7.	Understanding and Mastering ethics and scientific attitude	Ethics and Scientific attitude	Lectures, discussions and presentations	330min (0.375 ECTS) Consist of: • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i>	Understand ethics and scientific attitude	Ability to analyze the development of science based on ethics and scientific attitude	5

				<ul style="list-style-type: none"> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i> 			
8	UTS	Meeting Material 1-7	Independent Written Test	330 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
9.	Mastering the scientific method, truth and sources of truth in natural science	Syllogism Legal law deductive nomologican (DN) inductive statistical (IS)	Lectures, discussions and presentations	330min (0.375 ECTS) Consist of: <ul style="list-style-type: none"> • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i> 	Understanding the truth and the sources of truth in natural science	Ability to understand and integrate the ability to draw deductive inductive conclusions and vice versa	5
10.	Describe and interpret the functions of language, mathematics, and statistics as a means of scientific thinking	Mathematical Language, Probability Theory and Statistical Theory	Lectures, discussions and presentations	330min (0.375 ECTS) Consist of: <ul style="list-style-type: none"> • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i> 	Understanding and placing the functions of language, mathematics and statistics as a means of scientific thinking	Ability to understand and integrate mathematical language skills, statistical theory and probability theory in various cases in real life	5

11.	Understanding and using information technology as a means of scientific thinking	Information and communication technology Research support software	Lectures, discussions and assignments	330min (0.375 ECTS) Consist of: • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i>	Understand and use information technology as well as the use of research support software as a means of scientific thinking.	Ability to understand and use information technology and the ability to apply research support software	5
12.	Get to know the branches of natural science and its philosophical foundations	Branch of Science	Discussions and presentations	330min (0.375 ECTS) Consist of: • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i>	Knowing and understanding and the position of branches of science	Ability to integrate science into the realities of life	5
13.	Mastering the essence of scientific, positivistic and post-positivistic research	positivistic and post-positivistic philosophy	Lectures, discussions and presentations	330min (0.375 ECTS) Consist of: • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i>	Knowing and understanding the essence of positivistic and post-positivistic logic	Ability to understand the positivistic and post-positivistic logic that underlies a research	5

14.	Mastering the essence of quantitative and qualitative research, as well as scientific work	Exploratory Research Qualitative and qualitative research philosophy	Lectures, discussions and presentations	330min (0.375 ECTS) Consist of: • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i>	Knowing and understanding the specifications of exploratory research and quantitative and qualitative research	Model of qualitative and quantitative problem-solving ability integration	5
15.	Identify environmental problems and develop independent research	Background of the problem, objectives and research methods	Discussions and assignments	330min (0.375 ECTS) Consist of: • <i>Lecture:180 minutes</i> • <i>Q&A: 30 minutes</i> • <i>Discussion : 30 minutes</i> • <i>Presentation : 30 minutes</i> • <i>Individual tasks: 60 minutes/day (16 weeks)</i>	Identify environmental problems, understand causes and develop research	The ability to identify environmental problems, the ability to analyze the background of the problem and the suitability between research objectives and methods	5
16	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. Team of Lecturers of Philosophy of Science, Faculty of Philosophy, UGM. 2002. Philosophy of Science as the basis for the development of science. Yogyakarta: Liberty Publishers. 2. Noeng Muhajir. 2011. Philosophy of Science: ontology, epistemology, axiology. Yogyakarta: Rake Sarasin. 3. Jujun Suria sumantri. 1995. Science in Perspective: A collection of essays on the nature of science. Indonesian Torch Foundation. 4. Bronowski, Jacob. 1973. The Accent of Man. Boston: Little Brown, Company 5. Kant, Immanuel. 2004. Critique of Practical Reason. Mineola, NY.: Dover Publications, Inc. 					

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