| | | Document Code |
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| ![UNESA logo] | **Universitas Negeri Surabaya**<br>**Faculty of Mathematics and Natural Sciences**<br>**Undergraduate Chemistry Study Program** | |

## SEMESTER LEARNING PLAN

| Courses | CODE | Course Family | Credit Weight | | | | SEMESTER | Compilation Date |
|---|---|---|---|---|---|---|---|---|
| **Science Philosophy** | 4720102024 | | **T=2** | **P=0** | **ECTS=3.18** | | 4 | July 18, 2024 |

| AUTHORIZATION | SP Developer | Course Cluster Coordinator | Study Program Coordinator |
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| | ...................................... | ...................................... | Dr. Amaria, M.Si. |

| Learning model | Case Studies |
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| Program Learning Outcomes (PLO) | PLO study program that is charged to the course |
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| | **Program Objectives (PO)** |
| | **PLO-PO Matrix** |
| | P.O |
| | **PO Matrix at the end of each learning stage (Sub-PO)** |

| P.O | Week | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

| Short Course Description | Study of schools of thought in science, scientific philosophical questions (ontology, epistemology, and axiology), the role of tools of science, and scientific components (scientific products, scientific methods, and scientific attitudes) in the field of natural science (natural science, especially chemistry) and their implementation in religious life. This study was carried out through lectures, discussions, practices, presentations and chapter reports. |
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| References | Main : |
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1. McLelland, Christine V. 2006. The Nature of Science and The Scientific Method. USA: The Geological Society of America.
2. Dane, F.C. 2010. Evaluating Research: Methodology for People Who Need to Read Research (Chapter 2: The Scientific Approach). California: SAGE Publication, Inc.
3. Herron, J.D. et al. 1977. Problems Associated with Concept Analysis. Science Education 61(2). P. 185-199
4. Camarinha, L. M. & Matos. (tanpa tahun). Scientific Research, Methodologies and Techniques. cam@uninova.pt
5. The Scientific Approach in Education
6. Materi Dasar Pendidikan Program Akta Mengajar V. 1985. Buku IA Filsafat Ilmu. Jakarta: Departemen Pendidikan dan Kebudayaan, Universitas Terbuka.
7. Bunge, Mario. 2007. Philosophy of Science from Explanation to Justification. London: Transaction Publishers.

| | Supporters: |
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| Supporting lecturer | Prof. Dr. Harun Nasrudin, M.S.<br>Prof. Dr. Suyono, M.Pd.<br>Samik, S.Si., M.Si. |
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| Week- | Final abilities of each learning stage (Sub-PO) | Evaluation | | Help Learning, Learning methods, Student Assignments, [ Estimated time] | | Learning materials [ References ] | Assessment Weight (%) |
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| | | Indicator | Criteria & Form | Offline ( *offline* ) | Online ( *online* ) | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |

| 1 | Defines natural science comprehensively (in depth and broadly). A definition that answers 3 scientific questions (ontology, epistemology and axiology) complete with 3 scientific components (scientific products, scientific methods and scientific attitudes). | 1. Defines natural science which contains 3 answers to questions of ontology, epistemology and axiology.<br>2. Defines natural science which contains 3 scientific components (scientific products, scientific methods and scientific attitudes). | **Criteria:** Assessment is carried out on the following aspects: Participation during lectures is carried out through observation (weight 2) Sub-summative tests are carried out once assessing all relevant indicators through written examinations averaged and given a weight (2)) Assignments are given a weight (3) The final NA is ( Participation value x2) (Assignment value x 3) (UTS value x 2) UAS value (3) divided by 10 | Lectures and asking questions 2 X 50 | | | 0% |
| 2 | Classify which are facts, concepts, legal principles and theories. | 1. Define facts, concepts, legal principles and theories.<br>2. Identify examples of facts, concepts, legal principles and theories. | **Criteria:**<br>1. The assessment is carried out on the following aspects:<br>2. Participation during lectures is carried out through observation (weight 2) Sub-summative tests are carried out once assessing all relevant indicators through written examinations are averaged and given a weight (2)) Assignments are given a weight (3) The final NA is (participation value x2) (Value assignment x 3) (UTS score x 2) UAS score (3) divided by 10 | Reciprocal teaching reading strategy. 2 X 50 | | | 0% |
| 3 | Building (constructing) fact-based concepts. | 1. Collecting facts in the form of concept-building characteristics.<br>2. Defining collected fact-based concepts.<br>3. Make decisions about the status of certain objects based on formulated concepts. | **Criteria:**<br>1. The assessment is carried out on the following aspects:<br>2. Participation during lectures is carried out through observation (weight 2) Sub-summative tests are carried out once assessing all relevant indicators through written examinations are averaged and given a weight (2)) Assignments are given a weight (3) The final NA is (participation value x2) (Value assignment x 3) (UTS score x 2) UAS score (3) divided by 10 | Practice 2 X 50 | | | 0% |

| 4 | Distinguish between the 3 schools of thought most often used in science science (rationalism, empiricism and pragmatism) | 1. Provide examples of scientific products developed based on rationalism.<br>2. Provide examples of ideas developed based on empiricism.<br>3. Provide examples of scientific products developed based on pragmatism. | **Criteria:**<br>1. The assessment is carried out on the following aspects:<br>2. Participation during lectures is carried out through observation (weight 2) Sub-summative test is carried out once assessing all relevant indicators through written examinations averaged and given a weight (2)) Assignments are given a weight (3) The final NA is (participation value x2) (Value assignment x 3) (UTS score x 2) UAS score (3) divided by 10 | Lecture and giving examples 2 X 50 | | | 0% |
| 5 | Understand the scientific method comprehensively | 1. Classifying sources of knowledge.<br>2. Shows the difference between the scientific method (scientific approach) and other sources of knowledge.<br>3. Define each stage in the scientific method.<br>4. Write down the ways to fulfill each stage in the scientific method. | **Criteria:**<br>1. The assessment is carried out on the following aspects:<br>2. Participation during lectures is carried out through observation (weight 2) Sub-summative test is carried out once assessing all relevant indicators through written examinations averaged and given a weight (2)) Assignments are given a weight (3) The final NA is (participation value x2) (Value task x 3) | Library searchGroup discussion. 2 X 50 | | | 0% |
| 6 | Understand the scientific method comprehensively | 1. Classifying sources of knowledge.<br>2. Shows the difference between the scientific method (scientific approach) and other sources of knowledge.<br>3. Define each stage in the scientific method.<br>4. Write down the ways to fulfill each stage in the scientific method. | **Criteria:**<br>1. The assessment is carried out on the following aspects:<br>2. Participation during lectures is carried out through observation (weight 2) Sub-summative test is carried out once assessing all relevant indicators through written examinations averaged and given a weight (2)) Assignments are given a weight (3) The final NA is (participation value x2) (Value task x 3) | Library searchGroup discussion. 2 X 50 | | | 0% |

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| **7** | Understand the implementation of scientific methods in carrying out and writing scientific papers. | 1.Present the scientific method in a diagram. 2.Shows the position of deductive reasoning and inductive reasoning in the scientific method diagram. 3.Shows the role of tools of science in the scientific method diagram. | **Criteria:** 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2) Sub-summative test is carried out once assessing all relevant indicators through written examinations averaged and given a weight (2)) Assignments are given a weight (3) The final NA is (participation value x2) (Value task x 3) | Presentation by lecturer and response by students. Library search Group discussion. 2 X 50 | | | 0% |
| **8** | Answering UTS questions | Meeting indicators 1 to 7 | **Criteria:** 1.The assessment is carried out on the following aspects: 2.Participation during lectures, carried out through observation (weight 2) Sub-summative test, carried out once assessing all relevant indicators through a written test, averaged and given a weight (2)) Assignments given a weight (3) Final NA is (participation value x2 ) (Task value x 3) | Written exam 2 X 50 | | | 0% |
| **9** | Developing a syllogism | 1.Give an assessment in order to choose examples of correct and incorrect syllogisms. 2.Compile a series of syllogisms that fulfill the principles and laws of syllogism. 3.Compile a series of syllogisms that represent the occurrence of logical fallacies. 4.Compile a series of syllogisms that represent the occurrence of material error. | **Criteria:** 1.The assessment is carried out on the following aspects: 2.Participation during lectures, carried out through observation (weight 2) Sub-summative test, carried out once assessing all relevant indicators through a written test, averaged and given a weight (2)) Assignments given a weight (3) The final NA is (participation value x2 ) (Task value x 3) | Assignments, presentations, and group and class discussions. 2 X 50 | | | 0% |

| 10 | Developing a syllogism | 1. Give an assessment in order to choose examples of correct and incorrect syllogisms.<br>2. Compile a series of syllogisms that fulfill the principles and laws of syllogism.<br>3. Compile a series of syllogisms that represent the occurrence of logical fallacies.<br>4. Compile a series of syllogisms that represent the occurrence of material error. | **Criteria:**<br>1. The assessment is carried out on the following aspects:<br>2. Participation during lectures, carried out through observation (weight 2) Sub-summative test, carried out once assessing all relevant indicators through a written test, averaged and given a weight (2)) Assignments given a weight (3) Final NA is (participation value x2 ) (Task value x 3) | Assignments, presentations, and group and class discussions.<br>2 X 50 | | | 0% |
| 11 | Shows the role of language in the development of science (natural science). | 1. Compile the results of a chapter report about language as a tool of science without fatal errors.<br>2. Present the results of the chapter report directly and firmly in responding to the audience. | **Criteria:**<br>1. The assessment is carried out on the following aspects:<br>2. Participation during lectures, carried out through observation (weight 2) Sub-summative test, carried out once assessing all relevant indicators through a written test, averaged and given a weight (2)) Assignments given a weight (3) Final NA is (participation value x2 ) (Task value x 3) | Chapter Report<br>2 X 50 | | | 0% |
| 12 | Shows the role of logic in the development of science (natural science). | 1. Compile the results of a chapter report about logic as a tool of science without fatal errors.<br>2. Present the results of the chapter report directly and firmly in responding to the audience. | **Criteria:**<br>1. The assessment is carried out on the following aspects:<br>2. Participation during lectures, carried out through observation (weight 2) Sub-summative test, carried out once assessing all relevant indicators through a written test, averaged and given a weight (2)) Assignments given a weight (3) Final NA is (participation value x2 ) (Task value x 3) | Chapter Report<br>2 X 50 | | | 0% |

| 13 | Shows the role of mathematics in the development of science (natural science). | 1. Compile the results of a chapter report about mathematics as a tool of science without fatal errors. 2. Present the results of the chapter report directly and firmly in responding to the audience. | Criteria: 1. The assessment is carried out on the following aspects: 2. Participation during lectures, carried out through observation (weight 2) Sub-summative test, carried out once assessing all relevant indicators through a written test, averaged and given a weight (2)) Assignments given a weight (3) Final NA is (participation value x2 ) (Task value x 3) | Chapter Report 2 X 50 | | | 0% |
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| 14 | Shows the role of statistics in the development of science (natural science). | 1. Compile the results of a chapter report about statistics as a tool of science without fatal errors. 2. Present the results of the chapter report directly and firmly in responding to the audience. | Criteria: 1. The assessment is carried out on the following aspects: 2. Participation during lectures, carried out through observation (weight 2) Sub-summative test, carried out once assessing all relevant indicators through a written test, averaged and given a weight (2)) Assignments given a weight (3) Final NA is (participation value x2 ) (Task value x 3) | Chapter Report 2 X 50 | | | 0% |
| 15 | Realizing that science (natural science) has weaknesses and realizing the greatness and love of Allah for His creatures. | 1. Take an inventory of the weaknesses that apply to science, including natural sciences. 2. Behave in a non-arrogant manner. 3. Take an inventory of evidence of God's greatness and mercy towards humans and other creatures. 4. Behave that reflects a person who is grateful to Allah. | Criteria: 1. The assessment is carried out on the following aspects: 2. Participation during lectures, carried out through observation (weight 2) Sub-summative test, carried out once assessing all relevant indicators through a written test, averaged and given a weight (2)) Assignments given a weight (3) Final NA is (participation value x2 ) (Task value x 3) | 3 N (Niteni, Nyonto, and Ngembangke). The examples created and presented by the lecturer must be stunning. 2 X 50 | | | 0% |

| 16 | Answering UAS questions | Meeting indicators 1 to 15 | **Criteria:** 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2) Sub-summative test, carried out once assessing all relevant indicators through a written test, averaged and given a weight (2)) Assignments are given a weight (3) The final NA is (participation value x2) (Assignment value x 3) | Written exam 2 X 50 | | | 0% |
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**Evaluation Percentage Recap: Case Study**

| No | Evaluation | Percentage |
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| | | 0% |

**Notes**

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.