

### The Philosophy of Science

Module designation	The Philosophy of Science
Semester(s) in which the module is taught	1 <sup>st</sup> semester (odd semester)
Person responsible for the module	Dr. Lukman El Hakim, M.Pd. Tian Abdul Aziz, Ph.D.
Language	Indonesia
Relation to curriculum	This course is a compulsory course and offered in the 1st semester.
Teaching methods	Teaching methods used in this course are: <ul style="list-style-type: none"> <li>● Lecture (i.e., small group discussions and project-based learning)</li> <li>● Structured assignments (i.e., project development and presentations)</li> </ul>
Workload (incl. contact hours, self-study hours)	For this course, students required to meet a minimum of 154,66 hours in one semester, which consist of 26,66 hours for lecture 64 hours for structured assignments 64 hours for private study
Credit points	2 CP / 5,2 ECTS
Required and recommended prerequisites for joining the module	No prerequisites required.
Module objectives/intended learning outcomes	Students are able to : <ol style="list-style-type: none"> <li>1. Understand the nature of philosophy, the nature of science, and the steps of scientific thinking.</li> <li>2. Understand the role of language in knowledge development.</li> <li>3. Understand the philosophy of mathematics and the philosophy of Mathematics Education .</li> <li>4. Understand the relationship between science and cultural development.</li> </ol>

Content	<p><b>Students will learn about:</b></p> <ol style="list-style-type: none"> <li>1. Philosophy and the nature of philosophical thought.</li> <li>2. The basics of knowledge according to philosophy.</li> <li>3. Ontology, epistemology, and axiology.</li> <li>4. The sources of knowledge, how to acquire knowledge and the structure of knowledge.</li> <li>5. The characteristics and differences of natural sciences and social sciences.</li> <li>6. Be able to explain the role of natural sciences and social sciences in society.</li> <li>7. Criticism of the absolute philosophy of mathematics.</li> <li>8. The concept of philosophy of mathematics education.</li> <li>9. social constructivism as a philosophy of mathematics education.</li> <li>10. Mathematics education goals.</li> <li>11. Mathematics education ideology.</li> <li>12. Changes in social ideology.</li> <li>13. The development of the national curriculum.</li> <li>14. The hierarchy of mathematics, learning, and abilities.</li> <li>15. Mathematics and Values.</li> <li>16. Investigation, problem solving, and pedagogy.</li> </ol>
Examination forms	Assessment of the learning process follows the following components: Presentation 20%, Project Paper 60%, dan Discussion dan Reflection Paper 20%
Study and examination requirements	<p>Study and examination requirements:</p> <ol style="list-style-type: none"> <li>1. Students must attend 15 minutes before the class starts.</li> <li>2. Students must switch off all electronic devices.</li> <li>3. Students must inform the lecturer if they will not attend the class due to sickness, etc.</li> <li>4. Students must submit all class assignments before the deadline.</li> <li>5. Students must submit all class assignments to get a final grade.</li> </ol>
Reading list	<ol style="list-style-type: none"> <li>1. Paul Ernest, The philosophy of mathematics education.</li> <li>2. Stewart Shapiro, Thinking about mathematics.</li> <li>3. Jujun S. Sumantri, Filsafat Ilmu sebuah Pengantar Populer.</li> <li>4. Conny Semiawan dkk, Panorama Filsafat Ilmu.</li> <li>5. The Liang Gie, Filsafat Matematika.</li> <li>6. Jujun S. Sumantri, Ilmu dalam Perspektif.</li> <li>7. Hendro Darmojo, Filsafat IPA.</li> </ol>