SEMESTER LEARNING ACTIVITY PLANS
(SLAP)
SEMESTER EVEN 2022/2023

Special Topics in Theoretical and Mathematical Physics

MFF5002 / 3 Credits

Lecturer Coordinator:

Dr.rer.nat. Muhammad Farchani Rosyid, M.Si.

UNIVERSITAS GADJAH MADA
FACULTY OF MATHEMATICS AND NATURAL SCIENCE
2022

Universitas Gadjah Mada
Faculty of Mathematics and Natural Science
Physics Department / Study Program Master Physics
Semester Even 2022/2023

SEMESTER LEARNING ACTIVITY PLANS (SLAP)

Code	Course Name	Credits (credits)	Semester	Status	Prerequisite
MFF5002	*Special Topics in Theoretical and Mathematical Physics*	*3*	*Even*	*Elective*	*None*

Short Description

Special Topics in Theoretical and Mathematical Physics course is Elective course 3 credits (Theory) in the 2022 Curriculum Master Physics Study Program, Faculty of Mathematics and Natural Science UGM.

The syllabus of this course is as follows:
It consists of specialized topics in particle physics, astrophysics, cosmology, econophysics, mathematical physics, gravity, etc.

The courses are held in class for 14 weeks, each week's session last for 3 x 50 minutes. Four weeks of course period is used for Midterm Exam and Final Exam, each held for two weeks as scheduled.

Student evaluation for course assessments is performed summative and formative. The summative evaluation is implemented as written exams, both Midterm and Final Exam, which take a maximum of 120 minutes. The formative evaluation is implemented as individual assignments for each student in the form of completing an assignment individually. Monitoring is carried out by observing student activities during the course, such as attendance, Q&A and discussion about the material presented, and student performance in completing individual assignments.

Program Learning Outcomes (PLO) Imposed on the Course

PLO 3	Mastering further knowledge of classical and modern physics theory, and its relationship with other disciplines, and has mastered an advanced field of physics specialization that allows him to keep up with the latest international research developments.
PLO 4	Mastering various mathematical disciplines related to an advanced field of physics, and able to develop physical models using various mathematical and computational tools with an inter or multidisciplinary approach to solving problems related to an advanced field of physics.
PLO 6	Able to apply knowledge to analyze, synthesize, formulate problems and solve problems comprehensively in one of advanced field of physics, through experimental or theoretical research, then be able to classify and draw conclusions about their findings for the development of science and technology.

Upon completion of this course, students should be able to:

Course Outcomes (CO)	***CO1***	Master the basic fields of physics, which include studies of Electrodynamics, Classical Mechanics, and Quantum Mechanics.		
	CO2	Master and apply one of the fields of Advanced Physics.		
	CO3	Master the ability to study a problem in a field of Physics through research.		
	CO4	Master various mathematical disciplines relevant to the field of Advanced Physics.		
	CO5	Master the basic fields of physics, which include studies of Electrodynamics, Classical Mechanics, and Quantum Mechanics.		
	CO6			
	CO7			
	CO8			
The Correlation of CO to Learning Materials and Methods, and Time Allocation		**Learning Materials**	**Learning Methods**	**Time Allocation**
	CO1	Special Topic 1	Lecture	3 x 50 minutes
	CO1	Special Topic 1	Lecture	3 x 50 minutes
	CO1	Special Topic 1	Lecture	3 x 50 minutes
	CO2	Special Topic 1	Lecture	3 x 50 minutes
	CO2	Special Topic 2	Lecture	3 x 50 minutes
	CO2	Special topic 2	Lecture	3 x 50 minutes
	CO2	Special topic 2	Lecture	3 x 50 minutes
	CO3	Special topic 3	Lecture	3 x 50 minutes
	CO3	Special topic 3	Lecture	3 x 50 minutes
	CO3	Special topic 3	Lecture	3 x 50 minutes
	CO4	Special topic 3	Lecture	3 x 50 minutes
	CO4	Special topic 4	Lecture	3 x 50 minutes
	CO4	Special topic 4	Lecture	3 x 50 minutes
	CO4	Special topic 4	Lecture	3 x 50 minutes
	Final Exam/ Project Task Results/ Case Analysis Results			
Learning Methods	Lecture			
Student Learning Experience	Learn to analyze and review: Special Topic 1, Special Topic 1, Special Topic 1, Special Topic 1, Special Topic 2, Special topic 2, Special topic 2, Special topic 3, Special topic 3, Special topic 3, Special topic 3, Special topic 4, Special topic 4, Special topic 4.			

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<tr><td>Access to Learning Media/ LMS and Offline and Online Percentage</td><td>Sync (google meet), Asynchronous (google classroom, video)</td></tr>
<tr><td>Assessment Methods and Synchronization with CO</td><td>
<table>
<tr><th>Assessment Methods</th><th>Assessment Percentage</th><th>Criteria/Indicators</th><th>CO1</th><th>CO2</th><th>CO3</th><th>CO4</th></tr>
<tr><td>Participatory Activity*</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Project Results/ Case Study Results/ PBL Results*</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="7">Cognitive</td></tr>
<tr><td>Assignment</td><td>30%</td><td></td><td>7,5%</td><td>7,5%</td><td>7,5%</td><td>7,5%</td></tr>
<tr><td>Quiz</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Midterm Exam</td><td>35%</td><td></td><td>17,5%</td><td>17,5%</td><td></td><td></td></tr>
<tr><td>Final Exam</td><td>35%</td><td></td><td></td><td></td><td>17,5%</td><td>17,5%</td></tr>
<tr><td colspan="7">*) can also be obtained from the Midterm or Final Exam as the result of participatory activities or project/ case study results. According to IKU 7, the percentage of project results/ case study/ PBL results is at least 50%.</td></tr>
</table>
</td></tr>
<tr><td>References</td><td>Main references:
Depends on the topic.</td></tr>
<tr><td>Lecturers (Team Teaching)</td><td>1. Dr.rer.nat. Muhammad Farchani Rosyid, M.Si.
2. Mirza Satriawan, S.Si., M.Si., Ph.D.
3. Romy Hanang Setya Budhi, S.Si., M,Sc., Ph.D.
4. Dr. Dwi Satya Palupi, S.Si., M.Si.</td></tr>
<tr><td>Authorization</td><td>
<table>
<tr><th>Date of Drafting</th><th>Lecturer Coordinator</th><th>Head of Curriculum Committee</th><th>Head of Study Program</th></tr>
<tr><td></td><td>Dr.rer.nat. Muhammad Farchani Rosyid, M.Si.</td><td>Dr.Ing. Ari Setiawan</td><td>Mirza Satriawan, M.Si., Ph.D</td></tr>
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