SEMESTER LEARNING ACTIVITY PLANS (SLAP)

SEMESTER ODD 2022/2023

Physics Undergraduate Study Program

Physics Department

Calculus I

MMM 1101/ 3 Credits

Lecturer Coordinator:

Atok Zulijanto, S.Si., M.Sc., Ph.D.; Prof. Dr. Christiana Rini Indrati, M.Sc.; Dewi Kartika Sari, S.Si., M.Sc., Ph.D.; Dr. Dwi Ertiningsih, S.Si., M.Sc.; Hadrian Andradi, S.Si., M.Sc., Ph.D.; Prof. Imam Solekhudin, S.Si., M.Sc. Ph.D.; Dr. Indarsih, S.Si., M.Sc.; Dr.rer.nat. Lina Aryati, MS; Made Benny Prasetya Wiranata, S.Si. M.Sc.; Made Tantrawan, S.Si., M.Sc., Ph.D.; Prof. Dr. Salmah, M.Sc.; Dr. Solikhatun, S.Si., M.Sc.; Dr. Sumardi, M.Sc.; Prof. Dr. Supama, M.Sc.; Uha Isnaini, S.Si., M.Sc., Ph.D.; Umi Mahnuna Hanung, S.Si., M.Sc.; Dr. Zenith Purisha, S.Si., M.Sc.

UNIVERSITAS GADJAH MADA

FACULTY OF MATHEMATICS AND NATURAL SCIENCE

2022

	Universitas Gadjah Mada Faculty of Mathematics and Natural Science Physics Department / Physics Undergraduate Study Program Semester ODD 2022/2023	**Document Number :** ……

SEMESTER LEARNING ACTIVITY PLANS (SLAP)

Code	Course Name	Credits (Credits)		Semester	Status	Prerequisite
MMM 1101	*Calculus I*	*T: 3*	*P: …*	*ODD*	*Compulsory*	*None*

Short Description		
Program Learning Outcomes (PLO) Imposed on the Course	***PLO 2***	Knowledge. Able to explain theoretical concepts and principles of classical and modern physics and able to apply basic concepts of physics and related mathematical methods in finding solutions to physical problems.
Course Outcomes (CO)	**After completing this course, students are expected to be able to:**	
	CO1	Students are able to solve problems related to the properties of real numbers and functions.
	CO2	Students are able to solve problems of limits, continuity, derivatives, and interpretation of geometric derivatives.
	CO3	Students are able to use derivatives to solve problems related to limits, extreme values, and to draw graphs of functions.
	CO4	Students are able to determine Taylor and Maclaurin series of a function and its application.

The Correlation of CO to Learning Materials and Methods, and Time Allocation		**Learning Materials**	**Learning Methods**	**Time Allocation**
	CO 1	Real number	TCL - SCL mixed	***3X50 minutes***
	CO 1	Functions and graphics	TCL - SCL mixed	***3X50 minutes***
	CO 2	Function Limit	TCL - SCL mixed	***3X50 minutes***
	CO 2	Continuity	TCL - SCL mixed	***3X50 minutes***
	CO 2	Derivatives	TCL - SCL mixed	***3X50 minutes***
	CO 2	Interpretation of geometric derivatives	TCL - SCL mixed	***3X50 minutes***
	CO 3	High-order derivatives	TCL - SCL mixed	***3X50 minutes***
	Midterm exam/Project Task Results/Case Analysis Results			
	CO 3	Middle value theorem	TCL - SCL mixed	***3X50 minutes***
	CO 3	L'Hopitals rule theorem	TCL - SCL mixed	***3X50 minutes***
	CO 3	Extreme value problem	TCL - SCL mixed	***3X50 minutes***
	CO 3	Application of extreme value problems	TCL - SCL mixed	***3X50 minutes***
	CO 3	Up and Down function	TCL - SCL mixed	***3X50 minutes***
	CO 3	Concavity inflection point, drawing function graph	TCL - SCL mixed	***3X50 minutes***
	CO 4	Taylor and Maclaurin series	TCL - SCL mixed	***3X50 minutes***

<table>
<tr><td></td><td colspan="9">Final exams/ Project Task Results/Case Analysis Results</td></tr>
<tr><td>Learning Methods</td><td colspan="9">TCL- SCL mixed</td></tr>
<tr><td>Student Learning Experience</td><td colspan="9">Listening to the lecturer's explanation and discussion</td></tr>
<tr><td>Access to Learning Media/ LMS and Offline and Online Percentage</td><td colspan="9">Whiteboard, LCD projector, Laptop</td></tr>
<tr><td rowspan="11">Assessment Methods and Synchronization with CO</td><td>Assessment Methods</td><td>Assessment Percentage</td><td>Criteria/ Indicators</td><td>CO1</td><td>CO2</td><td>CO3</td><td>CO4</td><td>CO5</td><td>CO6</td></tr>
<tr><td>Participatory Activity*</td><td></td><td></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><td></td><td></td></tr>
<tr><td colspan="9">Cognitive</td></tr>
<tr><td>Assignment</td><td>20</td><td></td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>Quiz</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Midterm Exam</td><td>40</td><td></td><td>√</td><td>√</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Final Exam</td><td>40</td><td></td><td></td><td></td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>Total</td><td>100</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="9">*) 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>
<tr><td>References</td><td colspan="9">Main References;
1. Abe Mizrahi and Michael Sullivan, 1990, Calculus and Analytic Geometry, Wadsworth.
2. James Stewart, 2014, Calculus: Early Transcendentals, 8th edition, Cengage Learning.
3. Robert A. Adam and Christopher Essex, 2010, Calculus, A Complete Course, Pearson.
4. Tim Pengajar Kalkulus, 2003, Diktat Kuliah Kalkulus I, FMIPA UGM.
5. Christopher Heil, Joel Hass, Maurice D. Weir, George B. Thomas, Jr., 2018, Thomas’Calculus: Early Transcendentals, fourteenth edition, Pearson.</td></tr>
<tr><td>Lecturers (Team Teaching)</td><td colspan="9">1. Atok Zulijanto, S.Si.,M.Si.,Ph.D.
2. Prof. Dr. Christiana Rini Indrati, M.Si.
3. Dewi Kartika Sari, S.Si., M.Sc., Ph.D.
4. Dr. Dwi Ertiningsih, S.Si., M.Si.
5. Hadrian Andradi, S.Si., M.Sc., Ph.D.</td></tr>
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<tr><td></td><td colspan="4">6. Prof. Imam Solekhudin, S.Si., M.Si. Ph.D.
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<tr><td rowspan="2">Authorization</td><td>Date of Drafting</td><td>Lecturer Coordinator</td><td>Head of Curriculum Committee</td><td>Head of Study Program</td></tr>
<tr><td></td><td></td><td></td><td>Dr. Eng. Ahmad Kusumaatmaja, S.Si., M.Sc.</td></tr>
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