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



Physics Undergraduate Study Program Physics Department Mathematical Physics I MFF 1020/ 3 Credits

Lecturer Coordinator:

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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 :

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SEMESTER LEARNING ACTIVITY PLANS (SLAP)										
Code	Course Name	Credits (Credits))	Semester	Status	Pr	erequisite			
MFF 1020	Mathematical Physics I	<i>T: 3</i>	<i>P</i> :	ODD	Compulsory		None			
Short Description	Mathemati at Gadjah Mada of study with th take the Calculu courses, Calculu make it easier to and III) as an in various Physics	atical Physics I course is a compulsory subject for the Bachelor of Physics study program da University. This course can be taken by students in the even semester of their first year the approval of the instructor. Before taking this course, students are strongly advised to ilus course. This is because, in Mathematical Physics I (and Mathematical II and III) ulus is used as a foundation to understand Mathematics (for) Physics better so that it will to understand Physics and Advanced Physics. By studying Mathematical Physics I (II instrument, students are expected to understand better the theoretical foundations of cs and Advanced Physics phenomena.								
Program LearningPLO 2Knowledge. Able to explain theoretical concepts and principles of modern physics and able to apply basic concepts of physics and mathematical methods in finding solutions to physical problems							f classical and related			
(PLO) Imposed on the Course	PLO 4	Special Skills. Able to design and carry out experiments/theoretical reviews, able to identify a physical problem based on the results of observations and experiments, and able to operate related technologies.								
	After completing this course, students are expected to be able to:									
	<i>C01</i>	Explain the concepts of Complex Algebra, Complex Roots, Powers of Complex Numbers, and Trigonometric Functions and their hyperbolic functions.								
	<i>CO2</i>	Explain Harmonic Series and Complex Series.								
	СОЗ	Explain Partial Derivative, Total Derivative, and Height/Extremum Value Derivation.								
Course	<i>CO4</i>	Explaining two-dimensional (parabola, ellipse, and hyperbola) and three-dimensional (paraboloid, ellipsoidal, and hyperboloidal) Geometry analytics.								
Outcomes (CO)	<i>CO5</i>	Explains Vector algebra, dot product, and cross product.								
	<i>CO6</i>	Explains vector calculus, vector derivation, and integration.								
	<i>C07</i>	Explaining vector, gradient, divergence, and rotation operators and cylindrical and spherical coordinates.								
	<i>CO</i> 8	Explain the integration of lines, planes, and volumes.								
	СО9	Explain gradient integration, divergence, and rotation as well as Stokes' theorem and Gauss' theorem.								
		Lear	ning I	Materials	Learning M	lethods	Time Allocation			
The Correlation of CO to Learning Materials and Methods, and Time Allocation	he Correlation 1. Introduction (Lecture TCL-SCL mixed 'CO to rules, exams, and assessments). laterials and CO 1 2. Complex numbers 3. lethods, and numbers, complex number algebra, complex 3.						3X50 minutes			

CO 1 de Moivre's theorem, complex roots, polynomial equations, logarithms, and powers of complex numbers TCL-SCL mixed CO 1 de Moivre's theorem, complex numbers TCL-SCL mixed CO 1 hyperbolic trigonometric functions, hyperbolic identities, hyperbolic equations, inverse hyperbolic functions, calculus of hyperbolic functions, calculus of hyperbolic functions, aclaculus of hyperbolic functions, definitions of partial derivatives, total and differential derivatives, total and differential surfaces, parametric, implicit, and explicit equations. TCL-SCL mixed 3X50 minutes CO 4 Conic sections (parabola, hyperbola, ellipsoi, three- dimensional shapes (parabola, hyperbola, ellipsoid, spheroid). TCL-SCL mixed 3X50 minutes CO 5 components, magnitude of a subtraction, multiplication by scalars, basis vectors and vector corres, evector addition and subtraction, multiplication by scalars, basis vectors movel, equation of line, equation of plane, surface of a sphere, determining distance to vector, reverse vector), ector acleus (vector derivative concerning a parameter, curves, and surfaces in space, vector fields and scalar fields, isoscalar surfaces, coordinate systems, TCL-SCL mixed 3X50 minutes CO 6 Vector orealous (vector derivative int				
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