

**PROGRAM PLAN AND
SEMESTER LEARNING
ACTIVITIES
(RPKPS)
SCHOOL YEAR 2021/2022**



Physical
Geophysics
Basic Physics II
MFG 1012/ 3 credits

Mentoring Team:
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**GADJAH MADA UNIVERSITY
FACULTY OF MATHEMATICS
AND NATURAL SCIENCES
2021**



Gadjah Mada University
 Faculty of Mathematics and Natural Sciences
 Department of Physics / S1 Geophysics Study
 Program Academic Year 2021/2022


Document Code:

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SEMESTER LEARNING PROGRAM AND ACTIVITY PLAN (RPKPS)

Course Code	Course Name	Weight (credit)		Semester	Course Status	Prerequisite Courses						
MFF 1012	Basic Physics I	T : 3	P:	Complete	Mandatory	-						
Course Brief Description	Basic Physics II is a physics subject that examines electrical, magnetic, optical and modern physics phenomena. This subject is a continuation of basic physics material I which includes mechanics, oscillations, mechanical waves and thermodynamics. By studying this course, students are expected to have a complete understanding of the basics of physics and its applications, both in advanced courses, and to understand a number of scientific phenomena in various daily lives.											
Graduate Learning Outcomes (CPL) Charged n in MK	CPL2	Knowledge Aspect. 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 a physical problem.										
Course Learning Outcomes (CPMK)	After completing the learning of this course, students are expected to be able to:											
	CPMK-1	Students have the ability to explain various scientific phenomena in nature and in everyday life related to topics about electricity, magnetism, and electricity. [CPL-2]										
	CPMK-2	Students have the ability to explain electromagnetic waves, optics and modern physics [CPL-2]										
CPL Mapping with CPMK	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>CPMK1</th> <th>CPMK2</th> </tr> </thead> <tbody> <tr> <td>CPL-2</td> <td></td> <td></td> </tr> </tbody> </table>							CPMK1	CPMK2	CPL-2		
	CPMK1	CPMK2										
CPL-2												
CPM K link with Material and Form of Learning, as well as Time Allocation	Learning Materials				Forms of Learning	Time Allocat						
	CPMK-1	Electrostatics I (Electric Charge and Coulomb's Law, Electric Field, Gauss's Law, Conductor)			TCL - SCL mixed	2 Hours						
	CPMK-1	Electrostatics II (Potential Electricity, Electric Potential Energy, Capacitance and Dielectric)			TCL - SCL mixed	2 Hours						
	CPMK-1	Dynamic electricity (Electric current, Electrical resistance, Electric power, Electric measuring instruments, Kirchoff's law, RC circuits)			TCL - SCL mixed	2 Hours						

	CPMK-1	Magnetism I (Magnetic field, Magnetic Force, Biot-Savart Law, Ampere's Law, Gauss's Law in Magnetism, Magnetism in Matter)	TCL - SCL mixed	2 Hours
	CPMK-1	Magnetism II (Faraday's Law, Lenz's Law, Induction and inductance, RL and RLC Circuits, Energy in Magnetic Fields, AC Current, Power in AC Circuits)	TCL - SCL mixed	2 Hours
	CPMK-1	Maxwell's Equations (Current Shift, Maxwell's Equations in Vacuum and Matter)	TCL - SCL mixed	2 Hours
	CPMK-1	Electromagnetic Waves (Field Electromagnetic Waves, Electromagnetic Wave Spectrum)	TCL - SCL mixed	2 Hours
UTS/Project Task Results/Case Analysis				
	CPMK-2	Light and Optical Rays (Properties of Light, Speed of Light, Huygens Principle, Dispersion)	TCL - SCL mixed	2 Hours
	CPMK-2	Geometric Optics (Snell's Law, Shadow formation by reflection, Shadow formation by refraction, Optical Tools)	TCL - SCL mixed	2 Hours
	CPMK-2	Physical Optics (Light as wave, Light interference, Light diffraction)	TCL - SCL mixed	2 Hours
	CPMK-2	Modern Physics I (Galileo Relativity, Michelson-Morley Experiment, Einstein's Postulates, Lorentz Transformation, Relativistic Momentum and Energy, Mass and Energy)	TCL - SCL mixed	2 Hours
	CPMK-2	Modern Physics II (Blackbody Radiation, Planck's Quantum Theory, Photoelectric Effect, Compton Effect, Uncertainty Principle, Atomic Models, Lasers, Atomic Nuclei, Radioactivity, Nuclear		
	CPMK-2	Modern Physics III (Astrophysics and Cosmology)	TCL - SCL mixed	2 Hours
	CPMK-2	14. Modern Physics IV (Electrical properties of solids, Semiconductors, Diodes and Transistors, Superconductors)	TCL - SCL mixed	2 Hours
UAS/ Project Task Results/ Case Analysis				
Learning Methods	TCL - SCL mixed			
Student Learning Experience	Listen to dose explanations and discussions			
Access to Learning Media an/ LMS	Slides and reference books			

and Offline & Online Percentage					
Assessment Methods and Alignment with CPMK	Assessment Techniques	Assessment Percentage	Criteria/ Indicators	CPMK-1	CPMK-2
	Participatory Activities[*]				
	Project Results / Case Study / PBL Results[*]				
	Cognitive				
	Assignment	15	Task Grades	√	√
	Quiz	15	Quiz Value	√	√
	UTS	35	UTS scores	√	
	UAS	35	UAS value		√
	Total	100			
	*) can also be obtained from UTS or UAS which is the result of participatory activities or <i>project</i> / case study results. In accordance with IKU 7, the percentage of participatory activities and project results/case studies/PBL results is at least 50%.				
Reference List	<ol style="list-style-type: none"> Halliday, D., Resnick, R and Walker, J., 2014, Fundamentals of Physics, Fundamental of Physics Extended, Tenth Edition, John Wiley & Sons, Inc, USA. Tipler, P.A., 2008, Physics for Scientists and Engineers, Sixth edition, W. H. Freeman and Company, New York, USA. Raymond A. Serway, dan John Jewett, 2014, Physics for Scientists and Engineers, Brooks/Cole Cengage Learning, Singapore. 				
Name of Lecturer (Team Teaching)	Dr. Rinto Anugraha NQZ et al.				
Authorization	Drafting Date	Course Coordinator		Coordinator of Expertise (if applicable)	Head of Study Program
	<i>September 2022</i>	Dr. Rinto Anugraha NQZ et al.			 Dr.. Sudarmaji,MSi