

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



Physical  
Geophysics  
Basic Physics 1  
MFF 1011 / 3 credits

Mentoring Team:  
Basic Physics Subject Supervisory Team 1

**UNIVERSITAS GADJAH MADA  
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 1011	Basic Physics 1	T: 3	P: -	1	Mandatory	-


<b>Course Brief Description</b>	<p>Basic Physics 1 is a compulsory course of 3 credits in the 2021 Curriculum of the S1 Physics Study Program, FMIPA UGM. The general purpose of organizing this MK is to provide mastery of basic concepts to students regarding the phenomenon of motion of objects, fluids, waves and heat. In the 2021 curriculum, the MK Physics Study Program is associated with competencies in aspects of Knowledge (CPL 2) and aspects of Long life learning / self-development (CPL 5)</p> <p>The learning objectives of the Basic Physics 1 course can be seen from the desired learning outcomes, namely that:</p> <ol style="list-style-type: none"> <li>1. Students are able to explain concepts and solve cases in the motion of objects.</li> <li>2. Students are able to explain concepts and solve cases in fluids, waves and heat.</li> </ol> <p>Learning is carried out based on a face-to-face schedule in class for 14 weeks, with each week meetings held for 300 minutes. Four weeks during the lecture period are used for the Midterm Examination (UTS) and Final Semester Examination (UAS), each of which is held on a scheduled basis for 2 weeks by the Academic Section of FMIPA UGM.</p> <p>Evaluation for students for course assessment is carried out summatively and formatively. Summatively manifested in the form of written exams, both UTS and UAS, which take a maximum of 120 minutes. The formative evaluation is realized in the form of independent assignments for each student. The form of independent activity is in the form of completing an assignment / homework given to students to be completed independently at home. The monitoring process is carried out by looking at student activities during the lecture process, such as: attendance in lectures, questions and answers and discussions on the material being presented and student <i>performance</i> in doing independent assignments in the form of homework given.</p>
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<b>Graduate Learning Outcomes (CPL) Charged to MK</b>	<b>CPL2</b>	<b>Knowledge Aspect.</b> 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.
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<b>Course Learning Outcomes (CPMK)</b>	<b>After completing the learning of this course, students are expected to be able to:</b>	
	<b>CPMK1</b>	Students are able to explain concepts and solve cases in the motion of objects. [CPL-2]
	<b>CPMK2</b>	Students are able to explain concepts and solve cases in fluid, wave and heat. [CPL-2]

<b>CPL mapping with CPMK</b>		<b>CPMK1</b>	<b>CPMK2</b>
	CPL-2		

<b>The Relationship of CPMK with Learning Materials and Forms, as well as Time Allocation</b>		<b>Learning Materials</b>	<b>Forms of Learning</b>	<b>Allocation Time</b>	
	<i>CPMK1</i>	Explanation of RPKPS, physical quantities, dimensions, units and Vector	SCL with CBL	3 hours tuition	
	<i>CPMK1</i>	Linear Motion	SCL with CBL	3 hours tuition	
	<i>CPMK1</i>	Newton's Forces and Laws	SCL with CBL	3 hours tuition	
	<i>CPMK1</i>	Effort, Power and Power	SCL with CBL	3 hours tuition	
	<i>CPMK1</i>	Linear momentum and angular momentum	SCL with CBL	3 hours tuition	
	<i>CPMK1</i>	Rotational Dynamics of Rigid Bodies	SCL with CBL	3 hours tuition	
	<i>CPMK1</i>	Equilibrium and Elasticity	SCL with CBL	3 hours tuition	
	<b>UTS/Project Task Results/Case Analysis Results</b>				
	<i>CPMK2</i>	Gravitation	SCL with CBL	3 hours tuition	
	<i>CPMK2</i>	Fluid	SCL with CBL	3 hours tuition	
	<i>CPMK2</i>	Vibration	SCL with CBL	3 hours tuition	
	<i>CPMK2</i>	Wave	SCL with CBL	3 hours tuition	
	<i>CPMK2</i>	Sound	SCL with CBL	3 hours tuition	
	<i>CPMK2</i>	Heat 1: Temperature, temperature, and the first law of thermodynamics	SCL with CBL	3 hours tuition	
	<i>CPMK2</i>	Heat 2: Kinetic Theory of Gases	SCL with CBL	3 hours tuition	
<b>UAS/ Project Task Results/ Case Analysis Results</b>					
<b>Learning Methods</b>	SCL with CBL				
<b>Student Learning Experience</b>	Learn to study and study: physical quantities and their units, the concept of linear motion of objects, the concept of force and Newton's laws, the concept of work, power and power, the concept of linear momentum and angular momentum, the concept of rotational dynamics of rigid bodies, the concept of equilibrium and elasticity of an object, the concept of gravity, the phenomenon of fluids, the concept of object vibration, the concept of waves, the concept of sound, the concept of temperature, and the first law of thermodynamics, The kinetic concept of gases.				
<b>Access Learning Media / LMS and Offline &amp; Online Percentage</b>	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet				
<b>Assessment Methods and Alignment with CPMK</b>	<b>Technique Valuation</b>	<b>Percentage Valuation</b>	<b>Criterion/ Indicators</b>	<b>CPMK 1</b>	<b>CPMK 2</b>
	<b>Participatory Activities<sup>*)</sup></b>				
	<b>Project Results/Case Study Results/PBL Results<sup>*)</sup></b>				

	<b>Cognitive</b>			
	<b>Assignment</b>	<b>30</b>	<b>Task Grades</b>	√
	<b>Quiz</b>			
	<b>UTS</b>	<b>35</b>	<b>UTS scores</b>	√
	<b>UAS</b>	<b>35</b>	<b>UAS value</b>	√
	<b>Total</b>			
	*) 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, <b>the percentage of</b> participatory activities and project results/case studies/PBL results is at least 50%.			
<b>Reference List</b>	<b>Main:</b> <ol style="list-style-type: none"> <li>Halliday, D. Resnick, R and Walker, J., 2018, Fundamentals of Physics: Extended, tenth edition, John Wiley &amp; Sons, Inc. USA.</li> <li>Tipler, P.A. Mosca, G., 2008, Physics for Scientists and Engineers, sixth edition, W. H. Freeman and Company, New York, USA.</li> <li>Serway, R.S. dan Jewett, 2014, Physics for Scientists and Engineers, ninth edition, Brooks/Cole Cengage Learning, Singapore.</li> </ol>			
<b>Lecturer Name Supervisor (Team Teaching)</b>	<ol style="list-style-type: none"> <li>Dr.. Moh. Ali Joko</li> <li>Dr. Eko Sulistya, M.Si.</li> <li>Dr. Mirza S.</li> <li>Dr. Ari DN</li> <li>Prof. Dr. Sismanto</li> <li>Dr.. Eddy Hartantyo</li> <li>Prof. Dr. Gede Bayu S</li> <li>Dr. Idham</li> <li>Dr. Rinto A</li> <li>Dr. Chotimah</li> <li>Dr. Juliasih</li> <li>Dr. Muh. Arifin</li> <li>Dr. Iman S</li> <li>Dr. Mitrayana</li> <li>Dr. Romy HSB</li> <li>Imam Suyanto, M.Si.</li> <li>Dr. Wahyudi</li> <li>Dr. Herlan</li> <li>Dr. Sudarmaji</li> <li>Dr. DS Palupi</li> <li>Dr. Bambang ME</li> <li>Dr. Arief H</li> <li>Dr. Fahrudin N</li> <li>Drs. Sunarta, M.S.</li> <li>Elida LI, M.Si.</li> </ol>			
<b>Authorization</b>	<b>Drafting Date</b>	<b>Course Coordinator</b>	<b>Coordinator of Expertise (if any)</b>	<b>Head of Study Program</b>
	September 2022	(Signature) Dr. Mitrayana		 Dr. Sudarmaji, MSi.

## Weekly Learning Activity Plan (RKPM)

Week To-	Sub-CPMK (Final Planned Capability)	Assessment Methods			Study Materials (Learning Materials)	Learning Methods n	Learning Time Load n	Student Learning Experience n	Learning Media n	External Libraries and Learning Resources
		Indicators	Component	Bobot (%)						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Students are able to explain concepts and solve cases related to dimensions, units and vectors.	-	-	-	Introduction: RPKPS Explanation, physical quantities, dimensions, units and vectors	SCL with CBL	2 x 50 minutes 1 x 50 minutes	Learn to study and study physical quantities and their units	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
2	Students are able to explain concepts and solve cases related to linear motion of objects	Problem Solving on Assignment	Task 1	3,33	Linear Motion: Motion 1 D, GLB, GLBB, Free fall motion	SCL with CBL	2 x 50 minutes 1 x 50 minutes	Learn to study and study the concept of linear motion thing	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
3	Students are able to explain consequences and solve cases related to Newton's forces and laws	-	-	-	Force and Hk Newton: The concept of force, Newton's Laws	SCL with CBL	2 x 50 minutes 1 x 50 minutes	Learn to study and study the concepts of force and Newton's laws.	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
4	Students are able to explain consequences and solve Related cases	-	-	-	Effort, Power and Power	SCL with CBL	2 x 50 minutes 1 x 50 m3nit	Learn to study and study	LCD, Whiteboard, Laptop, Zoom	Library 1, 2, 3

	effort, power and manpower							Concept Business, power and power	Meeting and Google meet	
5	Students are able to explain concepts and solve cases related to linear momentum and angular momentum	Problem Solving on Assignment	Task 2	3,33	Linear momentum and angular momentum	SCL with CBL	2 x 50 minutes 1 x 50 m3nit	Learn to study and study the concepts of linear momentum and angular momentum .	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
6	Students are able to explain concepts and solve cases related to the dynamics of rotation of rigid bodies	-	-	-	Rotational Dynamics of Rigid Bodies	SCL with CBL	2 x 50 minutes 1 x 50 m3nit	Learn to study and study the concept of the dynamics of rotation of objects Toughness	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
7	Students are able to explain concepts and solve cases related to the equilibrium and elasticity of objects	Completing Questions on Assignments	Task 3	3,33	Equilibrium and Elasticity	SCL with CBL	2 x 50 minutes 1 x 50 m3nit	Learn to study and study the concept of equilibrium and elasticity of an object	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
8	Evaluate students' understanding thoroughly.: CPMK 1,	-	-	-	Midterm Exam (UTS)	-	-	-	-	-

9	Evaluate students' understanding thoroughly.: CPMK 1,	Problem Solving.	UTS	50	Midterm Exam (UTS)	-	-	-	-	-
10	Students are able to explain consequences and solve gravity-related cases	-	-	-	Gravitation	SCL with CBL	2 x 50 minutes 1 x 50 m3nit	Learn to study and study the concept of gravity	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
11	Students are able to explain the consequences and solve cases related to Fluid	Completing Questions on Assignments	Task 4	3,33	Fluid	SCL with CBL	2 x 50 minutes 1 x 50 m3nit	Learn to study and study fluid phenomena	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
12	Students are able to explain concepts and solve cases related to Object Vibration	-	-	-	Vibration	SCL with CBL	2 x 50 minutes 1 x 50 m3nit	Learn to study and study the concept of object vibration	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
13	Students are able to explain concepts and solve Wave-related cases				Wave	SCL with CBL	2 x 50 minutes 1 x 50 m3nit	Learn to study and study concepts wave	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
14	Students are able to explain concepts and solve cases related to the phenomenon of Sound	-	-	-	Sound	SCL with CBL	2 x 50 minutes 1 x 50 m3nit	Learn to study and study sound concepts	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3

15	Students are able to explain concepts and solve cases related to temperature, temperature, and the first law of thermodynamics	Completing Questions on Assignments	Task 5	3,33	Heat 1: Temperature, temperature, and the first law of thermodynamics	SCL with CBL	2 x 50 minutes 1 x 50 m3nit	Learn to study and study the concepts of temperature, temperature, and the first law of thermodynamics	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
16	Students are able to explain concepts and solve cases related to gas kinetics	Completing Questions on Assignments	Task 6	3,33	Heat 2: Kinetic Theory of Gases	SCL with CBL	2 x 50 minutes 1 x 50 m3nit	Learn to study and study the kinetic concept of gases.	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet	Library 1, 2, 3
17	Evaluate students' understanding thoroughly.: CPMK 1,	-	-	-	Final Semester Exam (UAS)	-	-	-	-	-
18	Evaluate students' understanding thoroughly.: CPMK 2	Problem Solving on Assignment	<b>UAS</b>	50	Final Semester Exam (UAS)	-	-	-	-	-