

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



Geophysical

Physical

Mechanics I

MFF 1401 / 2 credits

Supervisory

Team: Dr.

Mitrayana

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Dr. Yosef Robertus Utomo,

**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

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SEMESTER LEARNING PROGRAM AND ACTIVITY PLAN (RPKPS)

Course Code	Course Name	Weight (credit)		Semester	Course Status	Prerequisite Courses
MFF 1401	Mechanics I	T: 2	P: -	Complete	Mandatory	MFF 1011, MMM 1101

Course Brief Description

Mechanics 1 is a compulsory subject of the Physics Study Program and Geophysics Study Program, Department of Physics, FMIPA UGM. Courses are given in every semester 2 (Even) with a weight of 2 credits of theory. This RPKPS is prepared based on the syllabus set by the Physics Study Program and Geophysics Study Program, Department of Physics, FMIPA UGM. Because there are quite a lot of students who take part in this lecture every semester with more than 120 people, so the lectures are divided into two classes for physics study programs, by separating even and odd from student numbers. With such a large number of students, of course, this will slightly limit the variety of types of methods in learning. The learning methods of the Mechanics course used are: Lecture method (*Quantum learning*), class discussion (*Cooperative learning*) and providing examples of problem solving (problem based learning) based on the student center learning (*SCL*) paradigm.

The learning objectives of the Mechanics 1 course can be seen from the desired learning outcomes, namely that:


1. Students are able to explain and solve cases of motion dynamics of single objects.
2. Students are able to explain and solve cases of motion dynamics of many objects and rigid objects.

Learning is carried out based on a face-to-face schedule in class for 14 weeks, with each week consisting of one meeting for 100 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.

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. As for formative evaluation is

	<p>realized in the form of independent assignments for each student. The form of independent activity is in the form of completing a task given to students to be discussed <i>in groups</i> and then completed independently at home in the form of a written report for each of these tasks. 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 <i>student performance</i> in doing independent assignments in the form of homework given.</p>									
Graduate Learning Outcomes (CPL) Charged in MK	CPL-2	Mastery of general knowledge: Graduates are able to apply basic science (mathematics, physics, chemistry, biology, geology), and geophysics in general and their relationship with other sciences such as geology, geodesy, geochemistry, geography, computing and information technology.								
Course Learning Outcomes (CPMK)	After completing the learning of this course, students are expected to be able to:									
	CPMK-1	Students are able to explain and solve cases of motion dynamics of single objects. [CPL 2]								
	CPMK-2	Students are able to explain and solve cases of motion dynamics of many objects and rigid objects. [CPL 2]								
CPL Mapping with CPMK	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>CPMK-1</td> <td>CPMK-2</td> </tr> <tr> <td>CPL-2</td> <td></td> <td></td> </tr> </table>					CPMK-1	CPMK-2	CPL-2		
	CPMK-1	CPMK-2								
CPL-2										
CPM K link with Material and Form of Learning, as well as Time Allocation		Learning Materials	Forms of Learning	Time Allocation						
	CPMK-1	Basic Concepts and Vectors	SCL and Discussion	2 Hours						
	CPMK-1	Newtonian Mechanics and Straight Motion of Particles	SCL and Discussion	2 Hours						
	CPMK-1	Frictional force	SCL and Discussion	2 hours						
	CPMK-1	Oscillation	SCL and Discussion	2 Hours						
	CPMK-2	General Motion of Particles	SCL and Discussion	4 Hours						

		in Three Dimensions			
	<i>CPMK-1</i>	Noninertial Reference	SCL and Discussion	2 Hours	
UTS/ Project Task Results/ Case Analysis Results					
	<i>CPMK-2</i>	Gravity and Center Force	SCL and Discussion	6 Hours	
	<i>CPMK-2</i>	Dynamics of Particle Systems	SCL and Discussion	2 Hours	
	<i>CPMK-1</i>	Rigid Body Mechanics	SCL and Discussion	2 Hours	
	<i>CPMK-2</i>	Rigid Motion in Three Dimensions	SCL and Discussion	4 Hours	
UAS/ Project Task Results/ Case Analysis Results					
Learning Method	SCL and Discussion				
Student Learning Experience	Listen to explanations, presentations, discussions, and questions and answers.				
Access Media Learning ran/ LMS and Offline &; Online Percentage	LCD, Whiteboard, paper, google classroom/ internet				
Assessment Method and Harmony n with CPMK	Assessment Techniques	Assessment Percentage	Criteria/ Indicators	CPMK 1	CPMK2
	Participatory Activities^{*)}				
	Project Results/Case Study Results/PBL Results^{*)}				

	Assignment	15	Task results	5	10
	Quiz	15	Quiz Results	5	10
	UTS	35	UTS Results	20	15
	UAS	35	UAS results	10	25
	Total	100		40	60
	*) can also be obtained from UTS or UAS which is the result of participatory activities or <i>project / case study</i> 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"> 1. Fowles & Cassiday (1993), Issue 7; Analytical Mechanics. 2. David Morin (2004); Introductory Classical Mechanics 3. Qiang Yuan-qi et al. (1994); Problems and Solutions on Mechanics; Major American Qualifying Questions and Solution 				
Name of Lecturer (Team Teaching)	<ol style="list-style-type: none"> 1. Dr. Mitrayana 2. Drs. Imam Suyanto, M.Si. 3. Dr. Yosef Robertus Utomo, S.U. 4. Ibn Jihad, S.Si. M.Sc. 				
Authorization	Drafting Date	Course Coordinator	Coordinator of Expertise (if any)	Head of Study Program	
	2020	(Signature)		 Dr. Sudarmaji, MSi.	