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

Geophysics of Heat and Mass Transfer
MFG4623/ 2 credits

Mentoring Team:

Heat and Mass Transfer Assistance Team

UNIVERSITAS GADJAH MADA FACULTY OF MATHEMATICS AND NATURAL SCIENCES
2022

	Gadjah Mada University Faculty of Mathematics and Natural Sciences Department of Physics / S1 Geophysics Study Program Odd Semester 2022/2023	**Document Code:** .....

SEMESTER LEARNING PROGRAM AND ACTIVITY PLAN (RPKPS)

Course Code	Course Name	Weight (credit)		Semester	Course Status	Prerequisite Courses
MFG4623	*Heat and Mass Transfer*	*T: 2*	*P: -*	*Odd*	*Choice*	-

Course Brief Description	The Heat and Mass Transfer course is held to provide an understanding of the physical processes of heat and mass transfer, Fourier's law for heat conductivity, heat transfer by conduction, the computational basis of heat conductivity in steady state, conservation of mass, mass momentum and energy.	
Graduate Learning Outcomes (CPL) Charged to MK	***CPL-2***	**Mastery of 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
	CPL-3	**Operational and comprehensive skills**: Graduates are able to apply all geophysical methods (seismic, gravitational, magnetic, electrical, electromagnetic, and thermic methods) for energy exploration (e.g. oil and gas, coal, geothermal), mining materials (eg: iron, copper, gold, silver, tin) as well as groundwater and disaster mitigation.
Course Learning Outcomes (CPMK)	**After completing the learning of this course, students are expected to be able to:**	
	CPMK-1	Students are able to understand the concepts of heat and mass transfer, their use, Fourier's law for heat conductivity, heat transfer by conduction, the computational basis of heat conductivity, and the 1D and 2D heat conductivity equations under steady state conditions.
	CPMK-2	Students are able to understand the physical equations of conservation of mass, mass momentum, and energy, and the Reynolds transfer equation.

CPL mapping with CPMK

	CPMK1	CPMK2
CPL-2		
CPL-3		

The Relationship of CPMK with Learning Materials and Forms, as well as Time Allocation		Learning Materials	Forms of Learning	Time Allocation
	CPMK1	The concept of heat transfer	presentation	2
	CPMK1	Heat transfer applications	presentation	2
	CPMK1	Fourier's law for heat conductivity	presentation	2 Hour
	CPMK1	Computing basis on heat conductivity	presentation	2 Hour

	CPMK1	1D heat conductivity equation steady state conditions	presentation	2 Hour
	CPMK1	Thermal conductivity equation of unsteady state conditions	presentation	2 Hour
	UTS/Project Task Results/Case Analysis			
	CPMK2	Conservation of mass	presentation	2
	CPMK2	Reynolds transport	Drones and equipment	2
	CPMK2	Conservation of mass momentum I	presentation	2
	CPMK2	Conservation of mass momentum II	presentation	2
	CPMK2	Conservation of energy I	presentation	2
	CPMK2	Conservation of energy II	presentation	4
	UAS/ Project Task Results/ Case Analysis			

Learning Methods	**Blended Learning and Student Based Learning**
Student Learning Experience	Lectures in class and discussions.
Access Learning Media / LMS and Offline &; Online Percentage	LCD, Whiteboard, Laptop, Zoom Meeting and Google meet

Assessment Methods and Alignment with CPMK

Assessment Techniques	Assessment Percentage	Criteria/ Indicators	CPMK-1	CPMK-2	
Participatory Activities*)					
***Project Results*/Case Study Results/PBL Results*)**					
Cognitive					
Assignment					
Quiz					
UTS	**50**	**UTS scores**		✓	
UAS	**50**	**UAS value**			
Total	**100**				

*) can also be obtained from UTS or UAS which is the result of participatory activities or *project* / 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

1. Lecturer notebook
2. Rajput, Er. R. K. 2012. Heat and Mass Transfer. S. Chand &; Company LtD.
3. Lienhard, J. H. 2020. A heat transfer text book. Phlogiston press.

Name of Lecturer (*Team Teaching*)	1. Dr. Budi Eka Nurcahya, M.Si. 2. Dr. rer. Nat. Herlan Darmawan, M.Sc			
Authorization	**Drafting Date**	**Course Coordinator**	**Coordinator of Expertise (if applicable)**	**Head of Study Program**
	August 10 2022	 *Dr.Budi Eka urcahya, M.Si.*	Dr. rer.nat. Ade Anggraini, M.T.	 Dr. Sudarmaji, MSi