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

Physical

Geophysics

Mathematical Physics II

MFG 1021/ 3 credits

Mentoring Team:

Prof. Dr. Kusminarto, Prof.Dr. Agung B S Utomo, Dr. Ing. Ari Setiawan, M.Si., Dr. Rinto Anugroho, NQZ, M.Si.

GADJAH MADA UNIVERSITY
FACULTY OF MATHEMATICS
AND NATURAL SCIENCES
2021

<table>
<tr><td rowspan="3"><img> Gadjah Mada University logo</td><td colspan="4">Gadjah Mada University
Faculty of Mathematics and Natural Sciences
Department of Physics / S1 Geophysics Study
Program Academic Year 2021/2022</td><td>Document Code:</td></tr>
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	Gadjah Mada University Faculty of Mathematics and Natural Sciences Department of Physics / S1 Geophysics Study Program Academic Year 2021/2022				**Document Code:** ....

SEMESTER LEARNING PROGRAM AND ACTIVITY PLAN (RPKPS)					
Course Code	**Course Name**	**Weight (credit)**	**Semester**	**Course Status**	**Prerequisite Courses**
MFG 1021	*Mathematics FIsika II*	*T: 3* *P:*	*Complete*	*Mandatory*	-

Course Brief Description	After attending the course, students are expected to have basic knowledge of Geophysical data processing techniques, both data in the area of time, space, frequency and wave numbers.	
Graduate Learning Outcomes (CPL) Charged n in MK	**CPL-1**	**Good Attitude**: Graduates are honest, disciplined, curious, critical, confident, independent, emotionally mature, cooperative, and trustworthy. Uphold norms, values, morals, religion, general ethics and professional ethics, and actively play a role in the global movement of sustainable development and behave professionally
	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	Can explain the concepts of matrix concepts, determinants, special matrices, vectors and self-values of a matrix, base change, diagonalization of matrices, systems of linear equations and vector spaces. [CPL-1, CPL-2]
	CPMK-2	Can describe and use Fourier series, fourier transforms and Laplace transforms. [CPL-1, CPL-2]
	CPMK-3	Can explain ordinary differential equations (equations of degree one, equations of degree two, answers with sequences: ordinary and singular points, alignment around ordiner points, alignment around singular points), and press. Legendre, press. Hermite, press. Bessel, etc [CPL-1, CPL-2]
	CPMK-4	Can explain partial differential equations (boundary conditions, variable separation, Fourier analysis, diffusion equations, heat propagation, and waves.
	CPMK-5	Can explain Integral Equations. [CPL-1, CPL-2]

CPL Mapping with CPMK						
		CPMK1	**CPMK2**	**CPMK3**	**CPMK4**	**CPMK5**
	CPL-1					
	CPL-2					

CPMK link with Material and Form of Learning as well as Time		**Learning Materials**	**Forms of Learning**	**Time Allocat**
	CPMK-1	1. Introduction 2. Matrices, determinants and vector spaces (vector spaces, vector subspaces, linear and linear-free hooks, bases, operators	TCL - SCL mixed	2 Hours

Allocation		linear and its properties, linear operators and matrices, addition of matrices, multiplication of matrices by scalars, multiplication of matrices, transposes, complex conjugates and conjugates of Hermite, track a matrix, determinants and their properties, inverse of matrices, degree of a matrix, special matrices, swavectors and self-values of a matrix, base change, diagonal of a matrix, system of linear equations)		
	CPMK-1	(Continued) Matrices, determinants and vector spaces (vector spaces, vector subspaces, linear and linear-free hooks, bases, linear operators and their properties, linear operators and matrices, matrix summation, matrix multiplication by scalars, matrix multiplication, transpose, complex conjugates and Hermite conjugates, track a matrix, determinants and their properties, matrix inverses, degrees of a matrix, special matrices, swavectors and self-values of a matrix, change of base, diagonal of a matrix, system of linear equations)	TCL - SCL mixed	2 Hours
	CPMK-2	Fourier series and Fourier transform (Dirichlet condition, Fourier coefficient of tangibility, noncontinuous function, unperiodic function of complex Fourier series, Parleval theorem, Fourier transform and its properties, uncertainty principle, Dirac delta	TCL - SCL mixed	2 Hours
	CPMK-2	(Continued) Fourier series and Fourier transform (Dirichlet terms, Fourier coefficients, tangibility, noncontinuous functions, nonperiodic functions, complex Fourier series, Parverseval's theorem, Fourier transform and its properties, uncertainty principle, Dirac delta	TCL - SCL mixed	2 Hours
	CPMK-2	Function Series for Gas and Even Functions Convolution and Deconvolution	TCL - SCL mixed	2 Hours
	CPMK-2	Fourier transform for high dimensions	TCL - SCL mixed	2 Hours
	CPMK-2	Laplace transform (Laplace transform for derivatives and integrals, properties of Laplace transform	TCL - SCL mixed	2 Hours
	UTS/Project Task Results/Case Analysis Results			
	CPMK-2	(Continued) Laplace transform,	TCL - SCL mixed	2 Hours

		Laplace transformation for derivatives and integrals, properties of Laplace transformations		
	CPMK-3	Ordinary differential equations (equations of degree one: general form of answer, equations with separate variables, exact equations, inexact equations, homogeneous equations, equations of degree two: linear equations with fixed coefficients linear equations with indefinite coefficients, answers with sequences: ordinary and singular points, alignment around ordiner points, alignment around circular points,	TCL - SCL mixed	2 Hours
	CPMK-3	(Continued) Ordinary differential equations (equations of degree one: general form of answer, equations with separate variables, exact equations of inexact equations, homogeneous equations, equations of degree two: linear equations with fixed coefficients, linear equations with indefinite coefficients, answers with deseries: ordinary and singular points, alignment around ordiner points, alignment around singular points,	TCL - SCL mixed	2 Hours
	CPMK-3	press. Legendre, press. Hermite, press. Bessel, etc	TCL - SCL mixed	2 Hours
	CPMK-4	Introduction to partial differential equations (boundary terms, variable separation, Fourier analysis, heat diffusion and propagation equations, wave equations,		
	CPMK-4	(Continued) Introduction to partial differential equations (boundary terms, variable separation, Fourier analysis, heat diffusion and propagation equations, wave equations,	TCL - SCL mixed	2 Hours
	CPMK-5	Integral Equations	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 and Percentage	Slides and reference books			

Offline &;								
Assessment Methods and Alignment with CPMK	**Assessment Techniques**	**Assessment Percentage**	**K rit eri a/ In di ka to r**	**CPMK-1**	**CPMK-2**	**CPMK-3**	**CPMK-4**	**CPMK-5**
	Participatory Activities*)							
	Project **Results / Case Study / PBL Results** *)							
	Cognitive							
	Assignment	**20**						
	Quiz							
	UTS	**40**						
	UAS	**40**						
	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	Main: 1. F. Riley, M. P. Hobson and S. J. Bence, 2006, Mathematical methods for physics and engineering, third edition, Cambridge Press. 2. Tom M. Apostol, Calculus, vol. I, issue II, John Wiley & Sons, 1967 3. Tom M. Apostol, Calculus, vol. II, issue II, John Wiley & Sons, 1967. Suggestion 1. Boas, M.L., 1983, Mathematical Methods in the Physical Sciences, 2nd ed., John Willey & Sons, NY. 2. Thomas G.B. dan Finney R.L., 1995, Calculus and Analytic Geometry, Addison Wesley.							
Name of Lecturer (*Team Teaching*)	Prof. Dr. Kusminarto, Prof.Dr. Agung B S Utomo, Dr. Ing. Ari Setiawan, M.Si., Dr. Rinto Anugroho, NQZ, M.Si.							

Authorization	Drafting Date	Course Coordinator	Coordinator of Expertise (if applicable)	Head of Study Program
	2022			Dr.. Sudarmaji,MSi