

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



Geophysics Computational
Methods Practicum
MFG-1103/ 1 SKS

Supervisory
Team: Wiwit
Suryanto

**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	
MFG-1103	Computational Methods Practicum	T:-	P:1	Odd	Mandatory	MFG 1102 (Computational Methods)	
Course Brief Description	After attending and graduating from this lecture, students are expected to be able to make simple application programs to solve physics and geophysical problems, and be able to process and analyze geophysical data using computer programs.						
Graduate Learning Outcomes (CPL) Charged to 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					
	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	Explain basic terms in computing, programming languages, and algorithms. [CPL-2]					
	CPMK-2	Demonstrate Python and/or Matlab to solve geophysical problems. [CPL-3]					
CPL mapping with CPMK		CPMK1	CPMK2				
	CPL-1						
	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	
	CPMK-1	Introduction to the Python Integrated development environment, and data types		TCL - SCL mixed		1 Hour	
	CPMK-1	Python modules		TCL - SCL mixed		1	
	CPMK-1	Logic, terms and loops		TCL - SCL mixed		1	
	CPMK-1	Functions, errors, and handling		TCL - SCL mixed		1	
	CPMK-2	Time series data analysis		TCL - SCL mixed		1	
	UTS/Project Task Results/Case Analysis						
	CPMK-1	Concurrency and parallelization		TCL - SCL mixed		1	

	CPMK-2	Geostatistical calculations, data analysis within the region frequency-space	TCL - SCL mixed	1 Hour																																			
	CPMK-2	Interpolation and extrapolation calculations	TCL - SCL mixed	1 Hour																																			
	CPMK-2	Numerical integration	TCL - SCL mixed	1																																			
	CPMK-2	Geophysical data visualization	TCL - SCL mixed	1																																			
UAS/ Project Task Results/ Case Analysis																																							
Learning Methods	Student centered Learning, Presentations, discussions																																						
Student Learning Experience	Discuss, download and study practicum materials. Work on assignments and compile practicum reports.																																						
Access Learning Media / LMS and Offline & Online Percentage	LCD, paper, Simaster and ELok (e-learning), presentation impressions.																																						
Assessment Methods and Alignment with CPMK	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Assessment Techniques</th> <th style="width: 25%;">Assessment Percentage</th> <th style="width: 25%;">Criteria/Indicators</th> <th style="width: 25%;">CPMK1</th> <th style="width: 25%;">CPMK2</th> </tr> </thead> <tbody> <tr> <td>Participatory Activities*)</td> <td style="text-align: center;">10</td> <td>Participation Rubric</td> <td></td> <td></td> </tr> <tr> <td>Project Results/ Case Study Results/ PBL Results*)</td> <td style="text-align: center;">90</td> <td>Practicum report assessment rubric</td> <td></td> <td></td> </tr> <tr> <td colspan="5">Cognitive</td> </tr> <tr> <td>UTS</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td>UAS</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td style="text-align: center;">100</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>*) 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%.</p>				Assessment Techniques	Assessment Percentage	Criteria/Indicators	CPMK1	CPMK2	Participatory Activities*)	10	Participation Rubric			Project Results/ Case Study Results/ PBL Results*)	90	Practicum report assessment rubric			Cognitive					UTS	-	-			UAS	-	-			Total	100			
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Reference List	<ol style="list-style-type: none"> Landau, R. H., & Páez, M. J. (2018). Computational Problems for Physics: With Guided Solutions Using Python. CRC Press. Matthes, E. (2019). Python crash course: A hands-on, project-based introduction to programming. No starch press. Press, W. H., Teukolsky, S. A., Vetterling, W. T., & Flannery, B. P. (2007). Numerical recipes 3rd edition: The art of scientific computing. Cambridge university press. 																																						
Name of Lecturer (Team Teaching)	<ol style="list-style-type: none"> Wiwit Suryanto Theodosius Marwan Irnaka 																																						
Authorization	Drafting Date	Course Coordinator	Coordinator of Expertise (if any)	Head of Study Program																																			
	Aug 18, 2022	Dr.rer.nat. Wiwit Suryanto M.Si.	Dr. rer.nat. Ade Angraini, M.T.	 Dr. Sudarmaji, MSi.																																			