DEPARTMENT OF GEOMATICS ENGINEERING
UNDERGRADUATE PROGRAM IN GEOMATICS ENGINEERING
COURSE SYLLABUS

COURSE	Name	Spatial Data Computation and Programming
	Code	RM184304
	Credits	3 (three)
	Semester	III (three)

COURSE DESCRIPTION

In this course, students will learn basic programming using Matlab and R programming languages which are widely used to carry out numerical and mathematical computational analysis, including to process and present spatial data.

EXPECTED LEARNING OUTCOME

C	Able to identify, formulate, analyze and solve problems in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, and cadastral
D	Able to perform spatial data acquisition using modern measurement methods, geospatial data processing, using industry standard software, and making standard designs and analyzes in the fields of geodesy, surveying, hydrography, remote sensing, photogrammetry, and cadastral.
E	Able to apply information & communication technology and the latest technological developments in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, geographic information systems, and cadastral.
F	Able to compile scientific reports and provide solutions based on leadership, creativity and communication skills as well as being responsible for the work done.

COURSE LEARNING OUTCOME

1	Students use the concepts and principles of natural science, as well as mathematical applications to make calculations based on spatial data.
2	Students are able to use the Matlab or R programming language to do data processing and analysis in order to solve simple problems related to spatial.
3	Students are able to solve simple problems that use technology in the fields of geodesy, surveying, hydrography, remote sensing, photogrammetry, geographic information systems, and cadastre also applying and analyzing in the Matlab or R programming language
4	Students are able to prepare reports and present the results of data processing and analysis responsibly

COURSE MATERIALS

1	Basic syntax
2	Matrix Operations
3	Chart
4	Dynamic input and output
5	Control
6	Data analysis
7	Function analysis
8	File Interaction
9	Calculations in statistics, teristris mapping and coordinate transformation
10	Spatial data exploration in Graphical User Interface (GUI)

PREREQUISITE

Basic Mathematics 1 minimum C

REFERENCES

A.	Main References
1	Tjolleng, A. 2017. Pengantar Pemrograman MATLAB, Elex Media Komputindo. Jakarta
2	Sianipar, R.H. 2013. Pemrograman MATLAB Dalam Contoh Dan Penerapan. Informatika
3	Sianipar, R.H. 2017. Matlab Untuk Mahasiswa, Belajar Dari Berbagai Studi Kasus. Andipublisher. Yogyakarta.
4	Lansley, G. and Cheshire, J. 2016. An Introduction to Spatial Data Analysis and Visualisation in R. University College London, London.
5	Hijmans, R.J. 2019. Introduction to R. The Geospatial and Farming Systems Research Consortium (GFC). University of California, Davis.
B.	Additional References

1 https://www.tutorialspoint.com/matlab/
2 https://rspatial.org/intr/index.html