DEPARTMENT OF GEOMATICS ENGINEERING
UNDERGRADUATE PROGRAM IN GEOMATICS ENGINEERING

COURSE SYLLABUS

COURSE	Name	Geodynamics and Deformation
	Code	RM184936
	Credits	3 (three)
	Semester	Elective Course

COURSE DESCRIPTION

This course studies the science and concepts of geodynamics related to the structure and dynamics of the Earth, such as volcanic phenomena, plate movements (landslides and earthquakes). Students can also learn about deformation studies such as the phenomenon of land subsidence, geodetic aspects in deformation studies, and knowledge of geodetic science applications and methods in deformation surveys. After studying geodynamics and deformation studies, it is expected to open students' insights into disaster mitigation knowledge.

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,
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	Able to explain the Earth's geodynamic phenomena related to the structure of the Earth and plate tectonic theory
2	Able to identify various types of the Earth's geodynamic phenomena
3	Able to identify geodetic technology that can be used to carry out geodynamic observations of the Earth
4	Able to perform observations and analyze the Earth's geodynamics using geodetic methods
5	Able to explain the geodetic aspects in deformation studies
6	Able to perform studies and analysis of deformation using geodetic observation data
7	Able to use the results of geodynamic and deformation analysis for disaster mitigation

COURSE MATERIALS

1	Introduction to Geodynamics and Deformation
2	Earth's structures: layers of the Earth, Earth's core, Earth's characteristics
3	Plate Tectonics: plate tectonics theories, continental drift, and geological studies
4	Geodynamics phenomena: volcano, earthquake, fault activities, landslide, land subsidence
5	Methods of geodynamics survey: geodynamics studies using SLR, VLBI, GNSS, and InSAR
6	Geodynamics studies: global and regional crustal deformation
7	Deformation studies: geodetic aspects in deformation study, deformation analysis methods, deformation surveys, deformation survey networks, case studies
8	Disaster mitigation

PREREQUISITE

Advanced Terrestrial Mapping, Global Navigation Satellite System Survey

REFERENCES

A.	Main References
1	Turcotte, D. L and G. Schubert. 2002. Geodynamics (2nd Ed). Cambridge University Press, Cambridge.
2	Caspary, W.F. 1998. Concepts of Network and Deformation Analysis. Monograph 11, School of Surveying. The University of New South Wales.
3	Smith, D. E and D.L. Turcotte. 2013. Contribution of Space Geodesy to Geodynamics. Published by the American Geophysical.
4	Segall, Paul. 2010. Earthquake and Volcano Deformation. Princenton University Press. Pricenton. New Jersey.
5	Mal, A.K. and S.J. Singh. 1991. Deformation of Elastic Solids. Prentince Hall, Inc., New Jersey.
B.	Additional References
1	E-learning Geodynamics and Deformation (share.its.ac.id)

2	Related Journals, such as: Journal of Geodesy 2. Journal of Geodynamics 3. Geophysical Journal International 4. Geophysical Reseach Letters 5. Nature.	1.