MINISTRY OF EDUCATION AND CULTURE
UNIVERSITAS NEGERI SURABAYA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF PHYSICS
Ketintang Campus, Jalan Ketintang, C3 Building, Surabaya 60231
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Module Name :	*Metode Pengukuran Geofisika* Geophysical Measurement Methods
Module level :	Bachelor degree/Undergraduate Programme
Course Code :	4520102142
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	8/Fourth Year
Module coordinator(s)	Tjipto Prastowo, Ph.D
Lecturer(s):	Tjipto Prastowo, Ph.D
Language:	*Bahasa Indonesia*
Classification within the curriculum:	~~Compulsory~~/ Elective
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or sks*)
Workload :	a. Lecture: 1 x 50 minutes lectures, 1 x 60 minutes structured activity, 1 x 60 minutes individual activity, 14 weeks per semester, 39.67 total hours of lecture per semester ~ 1.59 ECTS b. Lab activity: 1x170 minutes lab activity, 14 weeks per semester 39.67 total hours of lab activity per semester ~ 1.59 ECTS Total of lecture and lab activity= 79.33 total hours per semester ~ 3.18 ECTS**
Credit Point:	2 sks (3.18 ECTS)
Requirements:	Basic Physics I Basic Physics II

Learning goals/competencies:	1. Demonstrating independent, creative and honest characters in doing student assignments, mid and final exams. 2. Understanding a systematic study on various methods commonly used in geophysical surveys for examination of sub-surface structures near and beneath the surface including measurements of physical anomalies in a local site. 3. Applying a geophysical method selected to identify characteristics of sub-surface structures near and beneath the surface 4. Understanding differences in geophysical data collection and processing techniques between common geophysical methods
Content	Geophysical Methods examine the solid Earth as a complex, physical system with a layered structure having different characteristics between rock layers constituting the structure of the Earth that can possibly be determined during field surveys by data collection, acquisition, and processing. These involve the applications of geophyiscal methods and measurement techniques, using either a single or a combined method, to accurately detect the presence of a physical anomaly under investigation. In this context, the roles of both 2D and 3D modeling for sub-surface structure determination (located near and below the surface at depth) are vital in identifying and characterising a physical system examined. The methods discussed include gravity, seismic (reflection, refraction, tomography), magnetic, geoelectric, electromagnetic induction approaches.
Attribute Soft skill:	Scientific report, public speaking, and team work
Study/exam achievements:	Students are considered to complete the course and pass if they obtain at least 40% of maximum final grade. The final grade (NA) is calculated based on the following ratio:

Assessment Components	**Percentage of contribution**
Participation	20%
Assignment	30%
Mid-semester test	20%

	Final semester test: 30%
Learning Methods :	1. Student-centered approach, 2. Lecture and discussion, 3. Laboratorium activity 4. Presentations
Form of Media:	*Power Point* slides, e-book file, and multimedia.
Literature (primary references):	1. Telford, M. W., Geldart, L. P., Sheriff, R. E. and Keys, D. A. 1990. Applied Geophysics. 2nd Edition. New York: Cambridge University Press, US. p.1-744. 2. Blakely, R. J. 1995. Potential Theory in Gravity and Magnetic Applications. Cambridge: Cambridge University Press, UK. pp.1-512. 3. Hinze, W. J., von Frese, R. R. B. and Saad, A. H. 2013. Gravity and Magnetic Explorations: principles, practices, and applications. University Printing House: Cambridge University Press, UK. pp.1-512. 4. Reynolds, J. M. 1997. An Introduction to Applied and Environmental Geophysics. Chichester: John Wiley and Sons Ltd., UK. pp.1-711. 5. Glatzmaier, G. A. 2001. Convection in the core and the generation of the Earth's magnetic field. An American Museum of Natural History Book. The New Press, New York: US. pp.62-67. 6. Stein, S. and Wysession, M. 2003. An Introduction to Seismology, Earthquake, and Earth Structure. Malden, MA: Blackwell Publishing, US. pp.1-498. 7. Everett, M. E. 2013. Near-surface Applied Geophysics. 2nd Edition. New York: Cambridge University Press, US. pp.1-422.
Notes:	1. *1 sks in learning process = three periods consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, 2. Technology, and Higher Education No. 50 Year 2018.

	**1 sks = 1,59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/Un38/Hk/Ak/2019