

Module Handbook

Module Name:	Electromagnetic Methods
Module Level:	Bachelor
Abbreviation, if applicable:	FI4161
Sub-heading, if applicable:	
Courses included in the module, if applicable:	
Semester/term:	fourth year
Module coordinator(s):	
Lecturer(s):	
Language:	Bahasa Indonesia
Classification within the curriculum:	General Studies / Major Subject / Elective Studies
Teaching format / class hours per week during the semester:	2 hours lectures
Workload:	2 hours lectures, 4 hours individual study per week, 16 weeks per semester, and total 96 hours a semester
Credit Points:	2
Requirements:	FI2202 Electricity and Magnetism, FI2101 Mathematical Physics I, FI2201 Mathematical Physics II
Learning goals/competencies:	<p>Knowledge:</p> <ul style="list-style-type: none"> – Demonstrate understanding of basic principal and concept in electromagnetic methods and its application. <p>Skills:</p> <ul style="list-style-type: none"> – Ability to apply the EM methods for exploration and earth studies. <p>Competence:</p> <ul style="list-style-type: none"> – Ability to keep up with the new development in EM technology for exploration and earth studies.
Content:	<p>Review of the electromagnetic field (EM) theory: Maxwell equations, diffusion equations and electromagnetic waves, skin effect, transmission and reflection of EM fields. EM field sources: natural sources, electric dipole, magnetic dipole. Response function of the earth: the impedance tensor, tipper, apparent resistivity and impedance phase. EM methods: the method of magnetotelluric (MT), CSAMT, transient EM (TEM), Very Low Frequency (VLF) method, Ground Penetrating Radar (GPR), measurement techniques, processing and analysis of data, the EM data interpretation, application methods EM for the exploration and study of Earth.</p>
Study/exam achievements:	Students are considered to be competent and pass if at least get 50% of maximum mark of the exams, homework, and quiz.
Forms of Media:	Slides and LCD projectors, blackboards, lab.
Literature:	<ol style="list-style-type: none"> 1. Telford W.F. & Godart, Applied Geophysics, Cambridge Univ. Press., 1985 2. Nabighian (ed), Electromagnetic Method in Applied Geophysics - Theory, SEG, 1989 3. Nabighian (ed), Electromagnetic Method in Applied Geophysics - Applications, SEG, 1991 4. Vozoff (ed), Magnetotelluric Methods, SEG, 1989. 5. Zonge K., Controlled Source Audio MT, Zonge Inc. 1989. 6. Kaufman, A. A. and Keller, G. V., Frequency and transient sounding, Elsevier. 1983
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