



MODULE HANDBOOK DESCRIPTION

Module designation	<i>Geo-Electromagnetic Data and Signal Processing</i>	
Code	<i>FBC0011</i>	
Semester(s) in which the module is taught	<i>7/fourth year</i>	
Person responsible for the module	<i>Bulkis Kanata, ST., MT.</i>	
Language	<i>Indonesian</i>	
Relation to curriculum	<i>Free Elective for Telecommunication Engineering</i>	
Teaching methods	<i>Lectures, small group discussion, Presentation, case base method.</i>	
Workload (incl. contact hours, self-study hours)	<p>Contact minutes every week, each week of the 16 weeks/semester:</p> <ul style="list-style-type: none"> • Lectures: 2 x 50 minutes • Exercises and Assignments: 2 x 60 minutes • Private study: 2 x 60 minutes. <p>total study hours = 5 hours 40 minutes/week</p>	
Credit points	<i>2 SKS (~ 3.2 ECTS)</i>	
Required and recommended prerequisites for joining the module	-	
Module objectives/intended learning outcomes	<p><i>1. Students are able to explain: Definition of Geo-Electromagnetic and Signal Processing, Elements of Geomagnetic Field, Source of world geomagnetic and seismic data, Geomagnetic signal processing methods for earthquake mitigation:</i></p> <ul style="list-style-type: none"> - <i>Differentiation</i> - <i>Polarization</i> - <i>Detrended</i> - <i>Fractal</i> - <i>Correlation Analysis</i> - <i>Time-Frequency Analysis</i> 	<i>PLO3 50%</i>
	<p><i>2. Students are able to design of programs to apply Polarization, Detrended, Fractal, Time-Frequency domain signal and filter</i></p>	<i>PLO4 30%</i>

	3. <i>Students are able to conduct experiment on Detrended, Fractal, Time-Frequency Analysis</i>	PLO5 20%
Content	<p><i>Definition of Geo-Electromagnetic and Signal Processing, Signal Filtering, Source of world geomagnetic and seismic data, Elements of Geomagnetic Field, Geomagnetic signal processing methods for earthquake mitigation:</i></p> <ul style="list-style-type: none"> - <i>Differentiation</i> - <i>Polarization</i> - <i>Detrended</i> - <i>Fractal</i> - <i>Correlation Analysis</i> - <i>Time-Frequency Analysis</i> 	
Examination forms	<ul style="list-style-type: none"> - <i>Written case study</i> - <i>Create program</i> - <i>Presentation case study</i> - <i>Midterm and final test</i> 	
Study and examination requirements	<p><i>The final grade in the module is composed of:</i></p> <ul style="list-style-type: none"> a. <i>Attendance: 10%</i> b. <i>Case I assessment: 15%</i> c. <i>Case II assessment: 15%</i> d. <i>Midterm assessment: 30%</i> e. <i>Final assessment: 30%</i> 	
Reading list	<ol style="list-style-type: none"> 1. <i>Harsh K. Gupta. Encyclopedia of Solid earth Geophysics. (Springer, 2011).</i> 2. <i>Tamer becherrawy. Electromagnetism, Maxwell Equation, Wave propagation and Emission. (Wiley, 2012).</i> 3. <i>William Lowrie. Fundamentals of Geophysics. (Cambridge University press, 2007).</i> 4. https://www.mathworks.com/support/learn-with-matlab-tutorials.html 5. https://ds.iris.edu/gmap/#network=GSN 6. https://earthquake.usgs.gov/data/ 7. http://wdc.kugi.kyoto-u.ac.jp/ 	