



BUKU PEDOMAN MATA KULIAH
COURSE MODULE HANDBOOK

PEMODELAN GAYA BERAT BUMI
EARTH GRAVITY MODELLING

DEPARTEMEN TEKNIK GEOMATIKA
Fakultas Teknik Sipil, Perencanaan, dan Kebumihan

DEPARTMENT OF GEOMATICS ENGINEERING
Faculty of Civil Engineering, Planning, and Geo Engineering

INSTITUT TEKNOLOGI SEPULUH NOPEMBER

MATA KULIAH PILIHAN (ELECTIVE COURSE)

Pemodelan Gayaberat Bumi / *Earth Gravity Modelling*

Nama modul <i>Module name</i>	Pemodelan Gayaberat Bumi <i>Earth Gravity Modelling</i>
Tingkatan <i>Module level</i>	Pasca Sarjana (S2) <i>Master Degree</i>
Kode <i>Code</i>	RM185905
Mata kuliah <i>Course</i>	Pemodelan Gayaberat Bumi <i>Earth Gravity Modelling</i>
Semester <i>Semester</i>	III (tiga) atau IV (empat) <i>III (three) or IV (four)</i>
Penanggung jawab mata kuliah <i>Person responsible for the module</i>	Ira Mutiara Anjasmara
Dosen <i>Lecturer</i>	Ira Mutiara Anjasmara
Bahasa <i>Language</i>	Bahasa Indonesia dan Bahasa Inggris <i>Indonesian and English</i>
Relasi pada kurikulum <i>Relation to curriculum</i>	Mata kuliah wajib untuk Program Master Teknik Geomatika <i>Compulsory Courses for Master of Geomatics Engineering</i>
Tipe pertemuan, jam tatap muka <i>Type of teaching, contact hours</i>	Kuliah, 1.67 jam x 16 minggu per semester <i>Lecture, 1.67 hours x 16 weeks per semester</i>
Beban belajar <i>Workload</i>	Kuliah: 1.67 jam x 14 minggu = 23.38 jam Penugasan terstruktur: 4 jam x 14 minggu = 56 jam Kegiatan mandiri: 4 jam x 14 minggu = 56 jam Ujian: 1.67 jam x 2 kali = 3.34 jam Total = 138.72 jam <i>Lecture: 1.67 hours x 14 weeks = 23.38 hours</i> <i>Structured exercises and assignments: 4 hours x 14 weeks = 56 hours</i> <i>Independent activities: 4 hours x 14 weeks = 56 hours</i> <i>Exam: 1.67 hours x 2 time = 3.34 hours</i> <i>Total = 138.72 hours</i>
Kredit <i>Credits</i>	2 SKS <i>2 credits</i>
Persyaratan sesuai dengan peraturan ujian <i>Requirements according to</i>	Minimum 80% kehadiran untuk mengikuti ujian tertulis <i>Minimum 80% attendance in this course in order to take</i>

<i>the examination regulations</i>	<i>the exams</i>																																																				
Deskripsi Mata Kuliah <i>Description of Course</i>	Matakuliah ini mempelajari pemodelan bentuk dan ukuran Bumi (Geoid) menggunakan data gayaberasat dengan berbagai metode. <i>This course studies the modeling of the shape and size of the Earth (Geoid) using gravity data with various methods.</i>																																																				
Capaian Pembelajaran / Course Learning Outcomes <i>Module objectives/ Course learning outcomes</i>	<ol style="list-style-type: none"> 1. Mampu menjelaskan konsep dasar berbagai metode pemodelan geoid. 2. Mampu membuat model geoid gravimetrik menggunakan berbagai metode dari data gayaberasat yang didapatkan dari pengukuran. 3. Mampu melakukan analisis dan validasi terhadap model geoid yang dihasilkan. <ol style="list-style-type: none"> 1. <i>Able to explain the basic concepts of various geoid modeling methods.</i> 2. <i>Able to create gravimetric geoid models using various methods from gravity data obtained from measurements.</i> 3. <i>Able to perform analysis and validation of the resulting geoid model.</i> 																																																				
CPL Prodi yang dibebankan <i>Learning outcomes and their corresponding to PLOs</i>	<table border="1"> <thead> <tr> <th></th> <th>PLO.1</th> <th>PLO.2</th> <th>PLO.3</th> <th>PLO.4</th> <th>PLO.5</th> <th>PLO.6</th> <th>PLO.7</th> <th>PLO.8</th> <th>PLO.9</th> <th>PLO.10</th> <th>PLO.11</th> <th>PLO.12</th> </tr> </thead> <tbody> <tr> <td>CLO.1</td> <td></td> <td></td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CLO.2</td> <td></td> <td></td> <td></td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CLO.3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		PLO.1	PLO.2	PLO.3	PLO.4	PLO.5	PLO.6	PLO.7	PLO.8	PLO.9	PLO.10	PLO.11	PLO.12	CLO.1			✓										CLO.2				✓									CLO.3								✓				
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Mata kuliah wajib prasyarat <i>Mandatory prerequisites</i>	-																																																				
Pokok Bahasan <i>Content</i>	<ol style="list-style-type: none"> 1. Teori dasar gayaberasat Bumi 2. Pengukuran dan reduksi anomali gayaberasat Bumi 3. Model Gayaberasat Bumi Global 4. Solusi Integral Stokes <ul style="list-style-type: none"> - Direct Numerical Integration - FFT - LSC 5. Pemodelan Geoid Gravimetrik 6. Pemodelan Geoid menggunakan Gravsoft <ol style="list-style-type: none"> 1. <i>The basic theory of Earth's gravity</i> 																																																				

	<ol style="list-style-type: none"> 2. <i>Measurement and reduction of the Earth's gravity anomaly</i> 3. <i>Global Earth Gravity Model</i> 4. <i>Stokes Integral Solution</i> 5. <i>Gravimetric Geoid Modelling</i> <ul style="list-style-type: none"> - <i>Direct Numerical Intregation</i> - <i>FFT</i> - <i>LSC</i> 6. <i>Geoid Modeling using Gravsoft</i> 														
<p>Pembelajaran dan Persyaratan Ujian <i>Study and examination requirements and forms of examination</i></p>	<table border="1" data-bbox="711 584 1428 1055"> <thead> <tr> <th data-bbox="711 584 1313 651">Rencana Evaluasi</th> <th data-bbox="1313 584 1428 651">Bobot Weight</th> </tr> </thead> <tbody> <tr> <td data-bbox="711 651 1313 719">Tugas 1: Data gayaberat <i>Assign 1: Gravity Data</i></td> <td data-bbox="1313 651 1428 719">10%</td> </tr> <tr> <td data-bbox="711 719 1313 786">Tugas 2: Studi Literatur (Geoid Model) <i>Assign 2: Literature study (Geoid Model)</i></td> <td data-bbox="1313 719 1428 786">10%</td> </tr> <tr> <td data-bbox="711 786 1313 853">Presentasi 1 <i>Presentation 1</i></td> <td data-bbox="1313 786 1428 853">10%</td> </tr> <tr> <td data-bbox="711 853 1313 920">Tugas 3: Geoid Gravimetrik sederhana <i>Assign 3: Simple Gravimetric Geoid</i></td> <td data-bbox="1313 853 1428 920">20%</td> </tr> <tr> <td data-bbox="711 920 1313 987">Tugas 4: Pemodelan Geoid <i>Assign 4: Geoid Modelling</i></td> <td data-bbox="1313 920 1428 987">35%</td> </tr> <tr> <td data-bbox="711 987 1313 1055">Presentasi 2 <i>Presentation 2</i></td> <td data-bbox="1313 987 1428 1055">15%</td> </tr> </tbody> </table>	Rencana Evaluasi	Bobot Weight	Tugas 1: Data gayaberat <i>Assign 1: Gravity Data</i>	10%	Tugas 2: Studi Literatur (Geoid Model) <i>Assign 2: Literature study (Geoid Model)</i>	10%	Presentasi 1 <i>Presentation 1</i>	10%	Tugas 3: Geoid Gravimetrik sederhana <i>Assign 3: Simple Gravimetric Geoid</i>	20%	Tugas 4: Pemodelan Geoid <i>Assign 4: Geoid Modelling</i>	35%	Presentasi 2 <i>Presentation 2</i>	15%
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<p>Media yang digunakan <i>Media employed</i></p>	<p>Media pengajaran secara klasik dengan papan tulis dan presentasi power point <i>Classical teaching tools with white board and power point presentation</i></p>														
<p>Daftar Pustaka <i>Reading list</i></p>	<ol style="list-style-type: none"> 1. Hofmann-Wellenhof, B. and H. Moritz. 2005. <i>Physical Geodesy</i>. Vienna: Springer. 2. Bomford, G. 1980. <i>Geodesy</i>, Oxford University Press, Oxford 3. Torge, W. 2001. <i>Geodesy</i>. de Gruyter, Berlin. 4. Vaníček, P. and E.J. Krakiwsky.1986. <i>Geodesy: the Concepts</i>. 2nd ed. Amsterdam: Elsevier 5. Torge, W. 1989. <i>Gravimetry</i>. de Gruyter, Berlin. 6. Blakely, R.J. 1994. <i>Potential Theory in Gravity and Magnetic Applications</i>, Cambridge University Press, Cambridge. 7. Chuji Tsuboi. 1979. <i>Gravity</i>, Allen & Unwin, London. 														