



BUKU PEDOMAN MATA KULIAH COURSES MODULE HANDBOOK

PEMETAAN BAWAH TANAH
UNDERGROUND SURVEY

DEPARTEMEN TEKNIK GEOMATIKA
Fakultas Teknik Sipil, Perencanaan, dan Kebumian

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

INSTITUT TEKNOLOGI SEPULUH NOPEMBER

13. Pemetaan Bawah Tanah / *Underground Survey*

Nama modul <i>Module name</i>	Pemetaan Bawah Tanah <i>Underground Survey</i>
Tingkatan <i>Module level</i>	Pasca Sarjana (S2) <i>Master Degree</i>
Kode <i>Code</i>	CM235606
Mata kuliah <i>Course</i>	Pemetaan Bawah Tanah <i>Underground Survey</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>	Prof. Mokhamad Nur Cahyadi, S.T., M.Sc., Ph.D.
Dosen <i>Lecturer</i>	Prof. Mokhamad Nur Cahyadi, S.T., M.Sc., Ph.D.
Bahasa <i>Language</i>	Bahasa Indonesia dan Bahasa Inggris <i>Indonesian and English</i>
Relasi pada kurikulum <i>Relation to curriculum</i>	Mata kuliah pilihan untuk Program Master Teknik Geomatika <i>Elective 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: 2 jam x 14 minggu= 28 jam Kegiatan mandiri: 2 jam x 14 minggu = 28 jam Ujian: 1.67 jam x 2 kali = 3.34 jam Total = 82.72 jam <i>Lecture: 1.67 hours x 14 weeks = 23.38 hours</i> <i>Structured exercises and assignments: 4 hours x 14 weeks = 28 hours</i> <i>Independent activities: 4 hours x 14 weeks = 28 hours</i> <i>Exam: 1.67 hours x 2 time = 3.34 hours</i> <i>Total = 82.72 hours</i>
Kredit <i>Credits</i>	2 SKS <i>2 credits</i>
Persyaratan sesuai dengan peraturan ujian <i>Requirements according to the examination regulations</i>	Minimum 80% kehadiran untuk mengikuti ujian tertulis <i>Minimum 80% attendance in this course in order to take the exams</i>
Deskripsi Mata Kuliah <i>Description of Course</i>	

Capaian Pembelajaran / Course Learning Outcomes	<ol style="list-style-type: none"> 1. Mahasiswa mampu menganalisa pemetaan bawah tanah dengan peralatan terestrial 2. Mahasiswa mampu menganalisa pemetaan bawah tanah dengan metode fotogrametri 3. Mahasiswa mampu menganalisa pemetaan bawah tanah dengan metode pengikatan dan survey dengan drone bawah tanah 																																								
<i>Module objectives / Course learning outcomes</i>	<ol style="list-style-type: none"> 1. <i>Students are able to analyze underground mapping with terrestrial equipment</i> 2. <i>Students are able to analyze underground mapping using photogrammetric methods</i> 3. <i>Students are able to analyze underground mapping using the binding method and survey with underground drones</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> </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> </tr> <tr> <td>CLO.2</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> </tr> </tbody> </table>		PLO.1	PLO.2	PLO.3	PLO.4	PLO.5	PLO.6	PLO.7	PLO.8	PLO.9	CLO.1				✓						CLO.2					✓					CLO.3						✓			
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Mata kuliah wajib prasyarat <i>Mandatory prerequisites</i>	-																																								
Pokok Bahasan	<ol style="list-style-type: none"> 1. Metode terestris dalam survey bawah tanah 2. Jenis - jenis infrastruktur underground survey yang ada di Indonesia 3. Strategi dan analisa metode terestris untuk pemetaan bawah tanah khususnya dengan analisa peningkatan dan uitzet 4. Dasar-dasar dan analisa fotogrametri untuk pemetaan bawah tanah 5. Fotogrametri dalam maintainance infrastruktur pemetaan bawah tanah 6. Close range fotogrametri untuk merencanakan dan mengevaluasi struktur bangunan underground survey 7. Laser scanner dan backpack lidar 8. Waterpass untuk studi deformasi underground survey dan fotogrametri 																																								

Content	<ol style="list-style-type: none"> 1. <i>Terrestrial methods for underground surveying</i> 2. <i>Types of underground survey infrastructure in Indonesia</i> 3. <i>Strategy and analysis of terrestrial methods for underground mapping, especially with improvement and uitzet analysis</i> 4. <i>Basics and analysis of photogrammetry for underground mapping</i> 5. <i>Photogrammetry in underground mapping infrastructure maintenance</i> 6. <i>Close range photogrammetry to plan and evaluate underground survey building structures</i> 7. <i>Laser scanners and backpack lidar for underground survey</i> 8. <i>Waterpass for underground survey and photogrammetry</i> 										
Pembelajaran dan Persyaratan Ujian <i>Study and examination requirements and forms of examination</i>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Rencana Evaluasi</th> <th style="text-align: center;">Bobot Weight</th> </tr> </thead> <tbody> <tr> <td>Tugas 1 <i>Assignment 1</i></td> <td style="text-align: center;">25%</td> </tr> <tr> <td>Evaluasi Tengah Semester <i>Mid Semester Exam</i></td> <td style="text-align: center;">25%</td> </tr> <tr> <td>Tugas 2 <i>Assignment 2</i></td> <td style="text-align: center;">25%</td> </tr> <tr> <td>Evaluasi Akhir Semester <i>Final Semester Exam</i></td> <td style="text-align: center;">25%</td> </tr> </tbody> </table>	Rencana Evaluasi	Bobot Weight	Tugas 1 <i>Assignment 1</i>	25%	Evaluasi Tengah Semester <i>Mid Semester Exam</i>	25%	Tugas 2 <i>Assignment 2</i>	25%	Evaluasi Akhir Semester <i>Final Semester Exam</i>	25%
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Media yang digunakan <i>Media employed</i>	Classical teaching tools with whiteboard and powerpoint presentation										
Daftar Pustaka <i>Reading list</i>											