



BUKU PEDOMAN MATA KULIAH
COURSE MODULE HANDBOOK

SISTEM INFORMASI GEOGRAFI LANJUT
ADVANCED GEOGRAPHIC INFORMATION
SYSTEMS

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 WAJIB
(COMPULSORY COURSE)**

Sistem Informasi Geografi Lanjut / *Advanced Geographic Information Systems*

Nama modul <i>Module name</i>	Sistem Informasi Geografi Lanjut <i>Advanced Geographic Information Systems</i>
Tingkatan <i>Module level</i>	Pasca Sarjana (S2) <i>Master Degree</i>
Kode <i>Code</i>	RM185202
Mata kuliah <i>Course</i>	Sistem Informasi Geografi Lanjut <i>Advanced Geographic Information Systems</i>
Semester <i>Semester</i>	II (dua) <i>II (two)</i>
Penanggung jawab mata kuliah <i>Person responsible for the module</i>	Hepi Hapsari Handayani
Dosen <i>Lecturer</i>	Hepi Hapsari Handayani Lalu Muhamad Jaelani
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: 2.5 jam x 14 minggu = 35 jam Penugasan terstruktur: 5 jam x 14 minggu = 70 jam Kegiatan mandiri: 6 jam x 14 minggu = 84 jam Ujian: 2.5 jam x 2 kali = 5 jam Total = 194 jam <i>Lecture: 2.5 hours x 14 weeks = 35 hours</i> <i>Structured exercises and assignments: 5 hours x 14 weeks = 70 hours</i> <i>Independent activities: 6 hours x 14 weeks = 84 hours</i> <i>Exam: 2.5 hours x 2 time = 5 hours</i> <i>Total = 194 hours</i>
Kredit <i>Credits</i>	3 SKS <i>3 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>

<p>Capaian Pembelajaran / Course Learning Outcomes</p>	<ol style="list-style-type: none"> 1. Mahasiswa mampu menerapkan konsep analisa statistika dan spasial dalam Sistem Informasi Geografis sehingga mampu berfikir secara kritis tentang pemanfaatan teknologi SIG untuk beberapa studi kasus berdasarkan pemahaman tentang prinsip, proses, aplikasi dan pengembangan SIG, serta mengungkapkan ide atau gagasan mereka secara lisan dan tertulis dalam bentuk makalah seminar dan jurnal. 2. Mahasiswa mampu mengembangkan dan menerapkan metode dalam spasial modelling baik menggunakan konsep prediksi maupun normative secara sederhana berdasarkan data SIG baik berbasis vector maupun raster berdasarkan berbagai aspek dapat meliputi aspek fisik, sosial, ekonomi, dll. 3. Mahasiswa mampu menerapkan metode MCDA berbasis SIG serta menyusun parameter-parameter yang terlibat dalam penyelesaian studi kasus berdasarkan teknik pembobotan yang tepat seperti rangking, rating atau machine learning, sehingga dapat menganalisis metode yang tepat untuk terapan dalam bidang seperti perencanaan, lingkungan, kebencanaan, ekonomi, pembangunan infrastruktur, dll. 4. Mahasiswa mampu merepresentasikan hasil dan analisa yang dilakukan pada bidang terapan sebagai studi kasus dalam sistem berbasis web (WeBGIS) dengan memanfaatkan platform opensource GIS. 5. Mahasiswa mampu melakukan analisa untuk uji kontrol kualitas terhadap seluruh proses yang dilakukan dalam penerapan atau pengembangan SIG dalam terapan untuk studi kasus.
<p><i>Module objectives/ Course learning outcomes</i></p>	<ol style="list-style-type: none"> 1. <i>Students are able to apply statistical and spatial analysis methods in GIS therefore they are able to think critically about the use of GIS technology for several case studies based on an understanding of the principles, processes, applications, and development of GIS, then present the proposed idea by verbal or written in the article of seminar and journal.</i> 2. <i>Students are able to develop and apply methods in spatial modeling using both predictive and normative concepts simply based on GIS data, both vector-based and raster-based on various aspects including physical, social, economic, etc.</i> 3. <i>Students are able to apply the GIS-based MCDA method and compile the parameters involved for</i>

	<p><i>accomplishment case studies based on appropriate weighting techniques such as ranking, rating, or machine learning, thus, they can analyze using the suitable method for application in various areas such as planning, environment, disaster, economics, infrastructure development, etc.</i></p> <p>4. <i>Students are able to present the results and analyses carried out in the applied subjects as case studies by utilizing a web-based system and the open-source GIS platform.</i></p> <p>5. <i>Students are able to perform the analysis for quality control tests on each process carried out in the development of the GIS application.</i></p>																																																																	
<p>CPMK dan hubungan dengan CPL Prodi <i>Learning outcomes and their corresponding to PLOs</i></p>	<table border="1" data-bbox="695 741 1441 969"> <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> <tr> <td>CLO.4</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													CLO.4						✓	✓					
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<p>Mata kuliah wajib prasyarat <i>Mandatory prerequisites</i></p>	<p>-</p>																																																																	
<p>Pokok Bahasan <i>Content</i></p>	<p>Komponen SIG, Data Konversi SIG, Topologi data, Sistem Basis Data Spasial dan non spasial, analisa spasial dan non spasial SIG, pengembangan SIG dan aplikasinya.</p> <p><i>GIS Components, GIS Conversion Data, Data Topology, Spatial and nonspatial Database System, Spatial and nonspatial analysis of GIS, GIS development and application.</i></p>																																																																	
<p>Pembelajaran dan Persyaratan Ujian <i>Study and examination requirements and forms of examination</i></p>	<table border="1" data-bbox="711 1496 1433 1832"> <thead> <tr> <th>Rencana Evaluasi</th> <th>Bobot Weight</th> </tr> </thead> <tbody> <tr> <td>Evaluasi Tengah Semester <i>Midterm Exam</i></td> <td>25%</td> </tr> <tr> <td>Hasil Proyek <i>Team based project</i></td> <td>30%</td> </tr> <tr> <td>Studi Kasus <i>Case Method</i></td> <td>25%</td> </tr> <tr> <td>Kuis <i>Cognitive Quiz</i></td> <td>20%</td> </tr> </tbody> </table>	Rencana Evaluasi	Bobot Weight	Evaluasi Tengah Semester <i>Midterm Exam</i>	25%	Hasil Proyek <i>Team based project</i>	30%	Studi Kasus <i>Case Method</i>	25%	Kuis <i>Cognitive Quiz</i>	20%																																																							
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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. Villanueva, K.J. 1984. <i>Kartografi</i>. Jurusan Teknik Geodesi FTSP ITB. Bandung.2. Wolf, Paul, R. 1974. <i>Elementary of Photogrammetry</i>3. Kraak, MJ., Omerling, J. 1996. <i>Cartography Petzation of spatial data</i>. Prentice-Hall. LondonYuwono, 2009. <i>Kartografi</i>. Prodi teknik Geomatika ITS. 2009. Surabaya
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