

PROGRAM STUDI MAGISTER TEKNIK GEOMATIKA
MASTER OF GEOMATICS ENGINEERING



BUKU PEDOMAN MATA KULIAH *COURSES MODULE HANDBOOK*

SISTEM INFORMASI GEOGRAFIS 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

14. Sistem Informasi Geografis 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>	CM235701
Mata kuliah <i>Course</i>	Sistem Informasi Geografi Lanjut <i>Advanced Geographic Information Systems</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>	Dr. Ing. Ir. Teguh Hariyanto, M.Sc.
Dosen <i>Lecturer</i>	Dr. Ing. Ir. Teguh Hariyanto, M.Sc. Hepi Hapsari Handayani, 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>	Matakuliah Pilihan Wajib Bidang Minat untuk Program Master Teknik Geomatika <i>Elective Course (Mandatory for the Chosen Area of Specialist) for Master of Geomatics Engineering</i>
Tipe pertemuan, jam tatap muka <i>Type of teaching, contact hours</i>	Kuliah, 2.5 jam x 16 minggu per semester <i>Lecture, 2.5 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 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>

<p><i>Module objectives/ Course learning outcomes</i></p>	<p>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.</p> <ol style="list-style-type: none"> 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 ranking, rating atau machine learning, sehingga dapat menganalisis metode yang tepat untuk terapan dalam bidang seperti perencanaan, lingkungan, kebencanaan, ekonomi, pembangunan infrastruktur, dll. <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 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>CPMK dan hubungan dengan CPL Prodi <i>Learning outcomes and their corresponding to PLOs</i></p>	<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					✓	✓			
	PLO.1	PLO.2	PLO.3	PLO.4	PLO.5	PLO.6	PLO.7	PLO.8	PLO.9																																
CLO.1					✓	✓																																			
CLO.2					✓	✓																																			
CLO.3					✓	✓																																			
<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"> <thead> <tr> <th>Rencana Evaluasi</th> <th>Bobot Weight</th> </tr> </thead> <tbody> <tr> <td>Studi kasus <i>Case Metod</i></td> <td>20%</td> </tr> <tr> <td>Kognitif - Tugas <i>Cognitive Assignment</i></td> <td>30%</td> </tr> <tr> <td>Hasil Project <i>Team based Project</i></td> <td>20%</td> </tr> <tr> <td>Evaluasi Akhir Semester <i>Final Semester Exam</i></td> <td>30%</td> </tr> </tbody> </table>	Rencana Evaluasi	Bobot Weight	Studi kasus <i>Case Metod</i>	20%	Kognitif - Tugas <i>Cognitive Assignment</i>	30%	Hasil Project <i>Team based Project</i>	20%	Evaluasi Akhir Semester <i>Final Semester Exam</i>	30%																														
Rencana Evaluasi	Bobot Weight																																								
Studi kasus <i>Case Metod</i>	20%																																								
Kognitif - Tugas <i>Cognitive Assignment</i>	30%																																								
Hasil Project <i>Team based Project</i>	20%																																								
Evaluasi Akhir Semester <i>Final Semester Exam</i>	30%																																								
<p>Media yang digunakan <i>Media employed</i></p>	<p>Classical teaching tools with white board and power point presentation</p>																																								
<p>Daftar Pustaka <i>Reading list</i></p>	<ol style="list-style-type: none"> 1. Wolf, Paul, R. 1974. <i>Elementary of Photogrammetry</i> 2. Kraak, MJ., Omerling, J. 1996. <i>Cartography Petzation of spatial data</i>. Prentice-Hall. London 3. Yuwono, 2009. <i>Kartografi</i>. Prodi teknik Geomatika ITS. 2009. Surabaya 3. Wolf, Paul, R. 1974. <i>Elementary of Photogrammetry</i> 4. Kraak, MJ., Omerling, J. 1996. <i>Cartography Petzation of spatial data</i>. Prentice Hall. London 5. Green D. and T. Bossomaier, Online GIS and spatial metadata. Taylor & Francis, 2002 6. Aronoff S., Geographic information systems: a management perspective. WDL Publications, 1989. 7. Kang-Tsung Chang, Introduction to Geogpahic Information Systems, Fourth Edition. Singapore. Mc Graw Hill. 2008 																																								