

# MODUL HANDBOOK ENVIRONMENTAL GEOGRAPHIC INFORMATION SYSTEM (GIS)



MASTER PROGRAM OF ENVIRONMENTAL SCIENCE  
SCHOOL OF POSTGRADUATED STUDIES  
DIPONEGORO UNIVERSITY

**Modul Description :**

Module designation	Environmental Geographic Information System (GIS)
Semester(s) in which the module is taught	2 <sup>nd</sup> Semester
Person responsible for the module	Prof. Dr. Denny Nugroho Sugianto, S.T., M.Si. Dr. Muhammad Helmi, S.Si., M.Si. Dr.Eng. Maryono, S.T., M.T.
Language	Indonesian and English
Relation to curriculum	Elective
Teaching methods	Mix Method or Blended Learning by incorporating Lecture Based-learning, Student Centred-Learning and Technological Learning <ul style="list-style-type: none"><li>• Lecture Based-Learning: teacher lead a lesson by using presentation, showing visual</li><li>• Student Centred-Learning: teacher promote individual learning so that student can exploring individual idea</li><li>• Technological Learning, teacher leads to use high technology in information such as by exploring, utilizing internet/searching engine and social media.</li></ul>
Workload (incl. Contact hours, self-study hours)	<ul style="list-style-type: none"><li>• Lecture, 2 hours per week</li><li>• Discussion and presentation (Q&amp;A), 1 hours per week</li><li>• Individual assignment, 3 hours per week</li><li>• Total workload for semester = 100 hours</li></ul>
Credit points	2 credits / 4 ECTS
Required and recommended prerequisites for joining the module	No required prerequisite
Module objectives/intended learning outcomes	<ul style="list-style-type: none"><li>• Able to analysis environmental conditions, issues by using Geographic Information System (GIS)</li><li>• Able to formulate environmental management by using Geographic information System</li><li>• Able to formulate and carry out scientific research to solve environmental problems by using Geographic Information System.</li><li>• Able to formulate rules, methods through of environmental management to improve the quality of life by using Geographic Information System (GIS)</li></ul>

Content	<p>GIS Environmental course will study one of the main goals of geographic information systems, namely the use of computer-based systems to manage geographic data, especially to support environmental management. The theoretical foundation of geographic information systems, components, data formats and spatial data processing methods will be provided so that students have knowledge of how to compile, process, analyze, and interpret spatial data in geographic information systems. In order to understand and gain experience in compiling spatial data, students will be given the task of compiling simple spatial data which is organized as attribute data in spatial data. The process of converting spatial data used in geographic information systems will also be given in this course.</p>
Examination forms	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Case studies</li> <li>• Practicals.</li> </ul>
Study and examination requirements	<p>Lecture attendance of at least 75%.</p>
Reading list	<ol style="list-style-type: none"> <li>1. Choi, Y., Baek, J., &amp; Park, S. (2020). Review of GIS-based applications for mining: Planning, operation, and environmental management. <i>Applied Sciences</i>, 10(7), 2266.</li> <li>2. Korchenko, O., Pohrebennyk, V., Kreta, D., Klymenko, V., &amp; Anpilova, Y. (2019). GIS and remote sensing as important tools for assessment of environmental pollution. <i>International Multidisciplinary Scientific GeoConference: SGEM</i>, 19(2.1), 297-304.</li> <li>3. Pourghasemi, H. R., &amp; Gokceoglu, C. (Eds.). (2019). <i>Spatial modeling in GIS and R for earth and environmental sciences</i>. Elsevier.</li> <li>4. Sánka, O. (2015). <i>Use of geographic information system in Environmental Science</i> (Doctoral dissertation, PhD thesis, Masarykova univerzita, Přírodovědecká fakulta).</li> <li>5. Kumar, S. S., Arivazhagan, S., &amp; Rangarajan, N. (2013). Remote sensing and GIS applications in <i>Environmental Sciences—A review</i>. <i>J. Environ. Nanotechnol</i>, 2(2), 92-101.</li> <li>6. Nyerges, T., McMaster, R. B., &amp; Couclelis, H. (2011). <i>The SAGE handbook of GIS and society</i>. The SAGE</li> </ol>

	<p>Handbook of GIS and Society, 1-576.</p> <ol style="list-style-type: none"><li data-bbox="694 224 1452 347">7. Wong, W. S. D., &amp; Lee, J. (2005). Statistical analysis of geographic information with ArcView GIS and ArcGIS. Wiley.</li><li data-bbox="694 347 1452 470">8. Lovett, A. (2000). GIS and environmental management. Environmental science for environmental management, 267-285.</li></ol>
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