

<b>Course</b>	<b>Course Name</b>	Landuse Modelling
	<b>Course Code</b>	DK184727
	<b>Credit</b>	3
	<b>Semester</b>	7

<b>Expected Learning Outcomes</b>	
<b>Specific Knowledge</b>	Students are able to master the data analysis approach techniques in the problems of the area / city planning field
<b>Specific skills</b>	<ol style="list-style-type: none"> <li>1. Students are able to understand the concept of using Planning Information Systems and understand the methods of application in the Spatial Planning process.</li> <li>2. Students are able to provide information and display planning results into information systems for publication purposes.</li> <li>3. Students are able to draw up recommendations for space pattern recommendations using techniques in decision making using the GIS process.</li> </ol>
<b>General Skills</b>	Students are able to communicate small research visually, verbally and in writing based on ICT
<b>Course Learning Outcomes</b>	
<b>Specific Knowledge</b>	<ol style="list-style-type: none"> <li>1. Mastering the techniques and processes of regional and urban planning qualitatively, quantitatively, spatial modeling (geographic information systems) and presentation techniques</li> <li>2. Mastering spatial / aspatial planning methods in decision making.</li> </ol>
<b>Specific skills</b>	<ol style="list-style-type: none"> <li>1. Able to formulate the concept of planning and direction of the plan through the study of strategic problems in the context of cities, regions, coastal areas by understanding planning problems through observing and utilizing physical / spatial, social, economic and environmental data.</li> <li>2. Able to utilize ICT in data management to produce information that is easily understood by the public and decision makers.</li> <li>3. Able to describe the spatial characteristics of cities, regions, coastal areas through analysis of the relationship between aspatial and spatial aspects so that information is available as a basis for developing</li> </ol>

	<p>planning models</p> <p>4. Able to arrange spatial / spatial model alternatives through qualitative and quantitative approaches in the form of scenarios for setting spatial patterns and the structure of cities, regions, coastal areas and proposing solutions according to context.</p>
<b>General skills</b>	<p>1. Able to demonstrate independent, quality and measurable performance.</p> <p>2. Being able to make decisions appropriately in the context of problem solving in his area of expertise, based on the results of analysis of information and data</p> <p>3. Able to carry out a self-evaluation process on work groups that are under their responsibility, and able to manage learning independently</p> <p>4. Able to document, store, secure and rediscover data to ensure validity and prevent plagiarism</p>
<b>Subject</b>	
<ol style="list-style-type: none"> <li>1. Introduction to the Landuse Modeling lecture and explanation of the lecture contract</li> <li>2. Introduction to Cellular Automata and Introduction to LanduseSim as a spatial planning analysis tool</li> <li>3. Review Cellular Automata and GIS for landuse modeling</li> <li>4. Introduction of the LanduseSim user-interface and data type</li> <li>5. Simple land use practice</li> <li>6. Case study: Trend and Target / Scenario-based modeling</li> <li>7. Modeling scheme: Neighborhood Filter, Time-Step</li> <li>8. Explanation of the Features of Zoning, Land Elasticity, and Land Hierarchy</li> <li>9. Simulation Practice from Beginning to End</li> <li>10. Validation, Calculation of Accuracy and Model Calibration</li> <li>11. Governance of land use in relation to land requirements (UrbanFootprint)</li> <li>12. Practice Developing land use / impact assumptions</li> <li>13. Development of planning scenarios with Landuse Modeling</li> <li>14. Spatial Rapid Assessment based on scenarios and assessments</li> <li>15. Small research related to Landuse Management</li> </ol>	
<b>Study Material</b>	
<ol style="list-style-type: none"> <li>1. Data Concept</li> <li>2. Quantitative analysis technique approach</li> <li>3. Qualitative analysis technique and approach</li> </ol>	
<b>References</b>	
<ol style="list-style-type: none"> <li>1. Pratomoatmojo, N. A. (2014) LanduseSim sebagai aplikasi pemodelan</li> </ol>	

- dan simulasi spasial perubahan penggunaan lahan berbasis Sistem Informasi Geografis dalam konteks perencanaan wilayah dan kota. Seminar Nasional Cities, 69–80.
2. Pratomoatmojo, N. A. (2016) LanduseSim Practice: spatial modeling of settlement and industrial growth by means of cellular automata and Geographic Information System. Urban and Regional Planning Department, Sepuluh Nopember Institute of Technology, Surabaya. Download at: <http://www.landusesim.com/>
  3. Pratomoatmojo, N. A. (2018) LanduseSim Algorithm: Land use change modelling by means of Cellular Automata and Geographic Information System. IOP Conf. Series: Earth and Environmental Science 202 012020. DOI:10.1088/1755-1315/202/1/012020
  4. Pratomoatmojo, N. A. (2018) LanduseSim Methods: Land use class hierarchy for simulations of multiple land use growth. IOP Conf. Series: Earth and Environmental Science 202 012023. DOI:10.1088/1755-1315/202/1/012023
  5. Pratomoatmojo, N.A. (2012) Land use change modelling under tidal flood scenario by means of Markov-cellular automata in Pekalongan municipal. Universitas Gadjah Mada, Yogyakarta.
  6. Sadewo, M. N. dan Buchori, I. (2018) Simulasi Perubahan Penggunaan Lahan Akibat Pembangunan Kawasan Industri Kendal (KIK) Berbasis Cellular Automata. Majalah Geografi Indonesia, Vol. 32.
  7. Yazid Al-Darwish, Hany Ayad Dina Taha, Dina Saadallah (2018) Predicting the future urban growth and it's impacts on the surrounding environment using urban simulation models: Case study of Ibb city – Yemen. Alexandria Engineering Journal. Volume 57, Issue 4, December 2018, Pages 2887-2895. <https://doi.org/10.1016/j.aej.2017.10.009>
  8. Santiago Linares and Natasha Picone (2018) Modelización de la expansión urbana y su impacto en el paisaje natural mediante Sistemas de Información Geográfica y Automatas Celulares. Caso de estudio: Tandil, Argentina
  9. Santiago Linares and Natasha Picone (2018) Application of Remote Sensing and Cellular Automata Model to Analyze and Simulate Urban Density Changes. Book of Urban and Remote Sensing. Taylor & Francis.
  10. (book) Modelling Urban Development with Geographical Information Systems and Cellular Automata