

3. System Analysis and Environmental Modelling

Module designation	System Analysis and Environmental Modelling
Module level, if applicable	
Code, if applicable	PCIL 9133
Subtitle, if applicable	
Courses, if applicable	
Semester(s) in which the module is taught	1 st Semester
Person responsible for the module	Prof. Dr. Ir. Purwanto, DEA
Lecturer	1. Prof. Dr. Ir. Purwanto, DEA 2. Prof. Dr. Sutrisno Anggoro, M.S.
Language	<i>Indonesian and English</i>
Relation to curriculum	Compulsory
Type of teaching, contact hours	<ul style="list-style-type: none"> • Regular meeting with Lecturer 16 times (40 hours with total contact hour per teaching is 2.5 hours weekly for 16 weeks). This activity consists of Lecture: 80 minutes; Q&A: 20 minutes; Discussion: 30 minutes; Presentation: 20 minutes) • Independent work on reading materials and literature review (48 hours, 3 hours weekly for 16 weeks) • Preparing paper and final personal assignment (96 hours, 6 hours weekly for 16 weeks) • Peer group discussion (24 hours, 1.4 hour weekly for 16 weeks) • Personal work on reflecting the course's gained knowledge to the student's research topic (± 17 hours, 1.1 hours weekly for 16 weeks) <p>Total contact hours in 1 semester = 225 hours</p>
Student Workload for One ECTS	<ul style="list-style-type: none"> • Face-to-face lecturers in class (4.44 hours) • Independent work (reading books, materials, papers, literature review, etc : 5.33 hours) • Preparing paper and structured assignments (doing homework or assignments given by lecturers : 10.67 hours) • Peer group discussion (2.67 hours) • Personal work on reflecting the course's gained knowledge to the student's research topic (1.89 hours) <p>Total workload for one ECTS = 25 hours</p>
Laboratory Work	Students taking this course have the chance to utilize the computer laboratory within the Diponegoro University to

	practice the environmental modelling and simulation
Credit points	3 SKS which equivalent to 9 ECTS
Requirements according to the examination regulations	Minimum attendance of lectures 75%
Recommended prerequisites	
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> • Able to identify, formulate and analyze complex engineering problems on integrated systems based on analytical, computational or experimental approaches. • Mastering the principles and techniques of integrated system design with an environmental systems approach. • Able to research and investigate complex engineering problems on integrated systems using basic engineering principles and by carrying out research, analysis, data interpretation and information synthesis to provide solutions.
Content	<ul style="list-style-type: none"> • This course studies systems and system modeling, especially systems in the environment • This course studies the process/steps of mathematical modeling for problems in environmental systems • The process of model verification and validation, to finding solutions or model analysis.
Study and examination requirements and forms of examination	<ul style="list-style-type: none"> • Open book and close book • Multiple choice, case study, interview, practice
Media employed	Power point, YouTube, website
Reading Materials	<p>Lee, G. Y., Hickie, I. B., Occhipinti, J. A., Song, Y. J. C., Skinner, A., Camacho, S., ... & Freebairn, L. (2022). Presenting a comprehensive multi-scale evaluation framework for participatory modelling programs: A scoping review. <i>PloS one</i>, 17(4), e0266125.</p> <p>Rahmati, O., Kornejady, A., Samadi, M., Deo, R. C., Conoscenti, C., Lombardo, L., ... & Bui, D. T. (2019). PMT: New analytical framework for automated evaluation of geo-environmental modelling approaches. <i>Science of the total environment</i>, 664, 296-311.</p> <p>Refsgaard, J. C., van der Sluijs, J. P., Højberg, A. L., & Vanrolleghem, P. A. (2007). Uncertainty in the environmental modelling process—a framework and guidance. <i>Environmental modelling & software</i>, 22(11), 1543-1556.</p> <p>Skidmore, A. (2017). <i>Environmental modelling with GIS and remote sensing</i>. CRC Press.</p>