

MODUL HANDBOOK COMPUTER APPLICATIONS AND ENVIRONMENTAL MODELING



MASTER PROGRAM OF ENVIRONMENTAL SCIENCE
SCHOOL OF POSTGRADUATE STUDIES
DIPONEGORO UNIVERSITY

Modul Description:

Module designation	Computer Applications and Environmental Modeling
Semester(s) in which the module is taught	1 st semester
Person responsible for the module	Prof. Dr. Ir. Purwanto, DEA Dr. Dwi P Sasongko, M.Si Dr. Istadi, S.T., M.T.
Language	Indonesian and English
Relation to curriculum	Compulsory
Teaching methods	Mix Method or Blended Learning by incorporating Lecture Based-Learning, Student Centred-Learning and Technological Learning • Lecture Based-Learning: teacher lead a lesson by using presentation, showing visual • Student Centred-Learning: teacher promote individual learning so that student can exploring individual idea • Technological Learning, teacher leads to use high technology in information such as by exploring, utilizing internet/searching engine and social media.
Workload (incl. contact hours, self-study hours)	• Lecture, 3 hours per week • Discussion and presentation (Q&A), 1,5 hours per week • Individual assignment, 5 hours per week • Total workload for semester = 150 hours
Credit points	3 Credits / 6 ECTS
Required and recommended prerequisites for joining the module	No required prerequisite
Module objectives/intended learning outcomes	• Able to formulate and carry out scientific research to solve environmental problems, especially by using quantitative and computation approach • Able to formulate rules, methods through of environmental management to improve the quality of life, especially by using quantitative and computation approach

Content	This course discusses the history of systems and models in environmental management. Concepts and approaches, definitions and clarifications, various systems and models and their applications in environmental management, model construction, input-output models, system-model relationships, simulations, and case studies. This course also study information retrieval, environmental information systems, classification of environmental information, theoretical data and its relationship with environmental information, data processing using computers. Spreadsheet application (Excel), visual basic (Programming), Access (Database), SPSS (Statistics), word processing (Word), Presentation (Power Point).
Examination forms	• Closed book or Open book • Essay, • Individual and group assignments
Study and examination requirements	Lecture attendance of at least 75%.
Reading list	1. Parnis, J. M., & Mackay, D. (2020). Multimedia environmental models: the fugacity approach. CRC press. 2. Abdel-Magid, IM 2019. Computer Modeling Applications for Environmental Engineers. CRC Press. 3. Beven, K. (2018). Environmental modelling: an uncertain future?. CRC press. 4. Bastin, L., Cornford, D., Jones, R., Heuvelink, G. B., Pebesma, E., Stasch, C., ... & Williams, M. (2013). Managing uncertainty in integrated environmental modelling: The UncertWeb framework. Environmental Modelling & Software, 39, 116-134. 5. Holzbecher, E. 2012. Environment Modeling: Using MATLAB. Jumper 6. Villa, F., Athanasiadis, I. N., & Rizzoli, A. E. (2009). Modelling with knowledge: A review of emerging semantic approaches to environmental modelling. Environmental Modelling & Software, 24(5), 577-587. 7. 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. Environmental modelling & software, 22(11), 1543-1556.