

MODUL HANDBOOK HYDROCLIMATOLOGY



MASTER PROGRAM OF ENVIRONMENTAL SCIENCE
SCHOOL OF POSTGRADUATED STUDIES
DIPONEGORO UNIVERSITY

Modul Description :

Modul designation	Hydroclimatology
Semester(s) in which the module is taught	2 nd Semester
Person responsible for the module	Prof. Dr. Ir. Sutrisno Anggoro, M.S. Ferry Hermawan, S.T., M.T., Ph.D. Dr. Muhammad Helmi, S.Si., M.Si. Prof.Dr.Ir. Sri Puryono KS., M.P.
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">• 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)	<ul style="list-style-type: none">• Lecture, 2 hours per week• Discussion and presentation (Q&A), 1 hours per week• Individual assignment, 3 hours per week• Total workload for semester = 100 hours
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">• Able to formulate environmental management theory based on the perspective from Hydroclimatology• Able to formulate and carry out scientific research to solve environmental problems base on the perspective of Hydroclimatology• Able to formulate environmental management policies according to the perspective from Hydroclimatology• Able to solve environmental problems with a technical

	engineering approach from the perspective of Hydroclimatology
Content	Hydroclimatology course provides students with a thorough background of the basic processes that govern the climatic and hydrological systems, and the relationships between them. It first examines fundamental atmospheric and hydrological processes and traces the flow of energy and water between the Earth's surface and the atmosphere. Then the physical processes that control the water cycle are examined, including evapotranspiration, precipitation, runoff and storage of water in natural reservoirs (including soil and groundwater, lakes and wetlands). Finally, students will learn about the role of water in climate in Earth's major biomes.
Examination forms	<ul style="list-style-type: none"> • Essay • Case studies
Study and examination requirements	Lecture attendance of at least 75%.
Reading list	<ol style="list-style-type: none"> 1. Hao, Z., Singh, V. P., & Hao, F. (2018). Compound extremes in hydroclimatology: a review. <i>Water</i>, 10(6), 718. 2. Syarifudin. 2017. <i>Applied Hydrology</i>. ANDI Publisher. Yogyakarta 3. Duan, W., He, B., Takara, K., Luo, P., Nover, D., & Hu, M. (2017). Impacts of climate change on the hydroclimatology of the upper Ishikari river basin, Japan. <i>Environmental Earth Sciences</i>, 76, 1-16. 4. Garner, G., Van Loon, A. F., Prudhomme, C., & Hannah, D. M. (2015). Hydroclimatology of extreme river flows. <i>Freshwater Biology</i>, 60(12), 2461-2476. 5. Shelton, M. L. (2009). <i>Hydroclimatology: perspectives and applications</i>. Cambridge University Press. 6. Stationarity, B. (2009). Future hydroclimatology and the research challenges of a post-stationary world. <i>Journal of Contemporary Water Research & Education</i>, (142), 4-9. 7. Tjasyono Bayong. 2008. <i>Applied Climatology</i>. ITB Press. Bandung

	8. Mather, J. R. (1991). A history of hydroclimatology. <i>Physical Geography</i> , 12(3), 260-273.
--	---