

Hydroclimatology



**MASTER PROGRAM OF ENVIRONMENTAL SCIENCE
SCHOOL OF POSTGRADUATE STUDIES
DIPONEGORO UNIVERSITY**



A Module Handbook or collection of module descriptions that is also available for students to consult should contain the following information about the individual modules:

Module design	Hydroclimatology
Module level, if applicable	
Code, if applicable	CIL-2-2-730
Subtitles, if applicable	
Courses, if applicable	
Semester(s) in which the module is taught	2 nd Semester
Person responsible for the module	Prof. Dr. Ir. Sutrisno Anggoro, MS
Lecturer	1. Dr. Muhammad Helmi, SSi, MSi 2. Ferry Hermawan, ST., MT., PhD.
Language	<i>Indonesian and English</i>
Relations to curriculum	
Type of teaching, contact hours	<i>Lecture: 60 minutes Q&A: 10 minutes Discussion: 10 minutes Presentation: 10 minutes</i>
Workload	<i>(Estimated) workload, divided into contact hours (lecture, exercise, laboratory session, etc.) and private study, including examination preparation, specified in hours,¹ and in total.</i>
Credit points	<i>2 credits</i>
Requirements according to the examination regulations	<i>Minimum attendance of lectures 75%</i>
Recommended prerequisites	<i>eg existing competences in...</i>

¹ When calculating contact time, each contact hour is counted as a full hour because of the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Module objectives/intended learning outcomes	• Be able to describe the underlying relationship between climate variability and water resources; • Able to describe and explain natural hydro climatological variability at various spatial scales; • Be able to explain the methods used to reconstruct records of past hydro climatological changes; • Able to explain basic concepts and methods used in both climate science and hydrology; • Able to demonstrate knowledge of cutting-edge technology and instrumentation including weather radar and satellites for real-time measurement of meteorological and climate parameters; • Able to demonstrate an understanding of cause and effect of atmospheric and ocean circulation; • Able to discuss interactions between ocean/atmosphere circulation and hydrological processes such as precipitation, evaporation, interception, soil moisture, snow, river flow, etc.; • Able to explain climate change and climate variability; • Able to demonstrate an understanding of climate indicators, hydroclimatic models, and sources of global climate data; • Able to discuss 'contemporary' challenges in hydro climatology due to the increasing human impact on processes in the hydrologic cycle.
Content	This course provides students with a thorough background of the basic processes that govern the climate and hydrological systems, and the relationships between them. It first examines underlying 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 water storage 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.

Study and examination requirements and forms of examination	• <i>Open book and close book</i> • <i>Multiple choice, case study, interview, practice</i>
Media employed	<i>Powerpoint, youtube, website</i>
Reading list	1. Chow, Ven Te., 1985, Hidrologi Saluran Terbuka, Penerbit Erlangga, Jakarta. 2. Daldjoeni. 1986. Pokok-Pokok Klimatologi. Bandung: Penerbit Alumni. 3. Handoko. 1995. Klimatologi Dasar. Jakarta: PT Dunia Pustaka Jaya. 4. Tjasyono, Bayong. 1999. Klimatologi Umum. Bandung: ITB.