

Module Name	Water Quality (Practicum)
Code, if applicable	GEL 0206
Semester(s) in which the module	Third (3 rd) Semester
Person responsible for the module	Tommy Andryan Tivianton, M.Sc.
Lecturer	Tommy Andryan Tivianton, M.Sc.
Language	Bahasa Indonesia
Relation to curriculum	elective courses
Type of teaching	STAR, field and laboratory study accompanied by lecturers and assistants
Workload	Field visit = 4 session x 50 minutes = 200 minutes In laboratories 4 days x 6 session x 50 minutes = 1200 minutes Report finalization 1 x 2 x 50 minutes = 100 minutes Final exam = 100 minutes
Credit points	1 SKS
Requirements according to the examination regulations	Maximum 2 hours in each days
Recommended prerequisites	Water Quality(took in the same semester)
Module objectives/intended learning outcomes	This practicum performed several exercises that are divided into three major groups as follows: <ol style="list-style-type: none"> 1. Sampling Includes techniques and parameters to be measured related to water quality analysis 2. Laboratory analysis Includes the introduction of tools as well as analysis of physical and chemical properties of water, COD, and BOD 3. Data analysis and presentation of reports Includes analysis of data from the results of laboratory analysis, and presentation of analytical results in the form of research reports.
Content	<ol style="list-style-type: none"> 1. Techniques of water sampling 2. Principles of laboratory tools and how to use them 3. Aspects of health, safety and environment (hse) in the laboratory 4. Analyze the value of acidity, ph, electrical conductivity (ec), and the turbidity of water samples with volumetric and potentiometer 5. Analyze the content of the elements ca, mg, caco3, and cl in water samples by titration method 6. Analyze the content of iron, ammonia and phosphate in water samples by spectrophotometry method 7. Analyze the content of nitrate and nitrite in water samples by spectrophotometric method 8. Analyze the content of na and k in water samples by flame photometric method and the content of sulfate in water samples with turbidimeter method

	<p>9. The levels of suspension in the water sample with gravimetric method</p> <p>10. Were able to analyze the levels of chemical oxygen demand (cod), dissolved oxygen (do), biochemical oxygen demand (bod) in water samples</p> <p>11. Able to present and analyze the results of the water quality of water samples</p>
Study and examination requirements and forms of examination	<p>Pre-test: 10%</p> <p>Individual Assignment: 10%</p> <p>Practicum report: 40%</p> <p>Final Exam: 40%</p>
Media employed	<ul style="list-style-type: none"> - Laboratory and tools for Water quality Measuresment - titration method - spectrophotometry method - flame photometric method - gravimetric method - LCD, checklist
Reading list	<p>Alaerts G. Dan Sri Sumetri. S. 1987, Metode Penelitian Air, Usaha nasional, Surabaya.</p> <p>Bartram J and Balance R Water Quality Monitoring A Practical Guide to the Design and Implementtation of Fresh Water Quality Programme, Chapman & Hall London, 1996.</p> <p>Chapman Deborah, Water Quality Assessment – A Pracical Guide To Use Biota, Sediment and Water in Environmental Monitoring- Second Edition WHO/UNESCO/UNEP 1996.</p> <p>Dudin Darsa Dudin, 1975, Pencemaran Air dan Syarat Kimia Air Minum, Dinas Laboratorium dan Dokumentasi Berita Direktorat Geologi, Bandung.</p> <p>Hem, J.D., 1970, Study and Interpretation of The Chemical Characteristik of Natural water, United State Goverment Printing Office, Wasingthon.</p> <p>Karmono dan Joko Cahyono, 1978, Pengantar penentuan Kualitas Air, Laboratorium Hodrologi, Fakultas Geografi, Universitas Gadjah Mada, Serayu Valley Project, NUFFIC-UGM, Yogyakarta.</p> <p>Manual, Analysis of Water Sample, Hydrology Laboratory Serayu Valley Project, Fakultas Geografi UGM, Yogyakarta.</p> <p>Planning of Water Quality Monitoring Systems, WMO (World Meterorological Organization) No. XXX-UNEP (United Nation Environmental Program) Global Environmental System/Water (GEMS/Water), 2008.</p>

	<p>Rain Water and Tracher, 1960, Method of Collection and Analysis of Water Sample, Unite State Printing Office, Washington.</p> <p>SNI (Standar Nasional Indonesia) 6989.57:2008 Air dan Limbah Bagian 57: Metode Pengambilan Contoh Air Permukaan.</p> <p>Todd, D.K., 1959, Groundwater Hydrology, John Welley and Sons, Inc. New York London</p> <p>Vladimir Novotny, Water Quality Diffuse Pollution and Watershed Management, Second Edition, John Wiley & Sons Inc. , 2003.</p>
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