

Module Name	Geohydrology
Module level, if applicable	Advance
Code, if applicable	GEL 2206
Semester(s) in which the module	4 <sup>th</sup>
Person responsible for the module	Dr. Tjahyo Nugroho Adji, M.Sc.Tech.
Lecturer	1. Prof. Dr. Setyawan Purnama, M.Si. 2. Dr. Tjahyo Nugroho Adji, M.Sc.Tech. 3. Ahmad Cahyadi, S.Si., M.Sc.
Language	Bahasa Indonesia
Relation to curriculum	<p>Geohydrology Course is one of the elective courses in Environmental Geography Study Program, Faculty of Geography. Geohydrology courses can be taken by students in the fourth semester. Geohydrology courses are advanced courses of basic hydrology courses. Geohydrology courses cover the study of groundwater hydrological conditions and methods of evaluation of groundwater potentials of a region.</p> <p>The topics selected in the eyes of this quality include the characteristics of aquifers, springs, groundwater quality and quantity analysis, groundwater management, groundwater potential investigations, and even some topics on sustainable groundwater management models. This will certainly contribute positively to society and country as they pass and working into the real world.</p>
Type of teaching, contact hours	STAR ( <i>Student Teacher Aesthetic Role-Sharing</i> ) is an optimal combination between SCL ( <i>Student Centered Learning</i> ) and TCL ( <i>Teacher Centered Learning</i> ).
Workload	<p>Lecturer, including homework and discussion : 14 meetings x 100 minutes each</p> <p>Mid Semester Examination: 100 minutes</p> <p>Final Semester Examination: 100 minutes</p> <p>Total workload = 1600 minutes</p>
Credit points	2 Credits
Requirements according to the examination regulations	Minimum attendance requirement 70% from total lecture
Recommended prerequisites	Basic Hydrology
Module objectives/intended learning outcomes	<p>After following this course students are expected to be able to evaluate the potential of groundwater in different places on the surface of the Earth including its influence factors. Students are able to choose a method and make a framework of problem investigation and groundwater potential, and able to arrange and make groundwater model in a region.</p>

	Through this course design, students are expected to think critically to save groundwater, to evaluate groundwater conditions in a region, including to analyze and dare to express ideas and ideas with confidence. The ability of this softskills will be useful when students shine, discuss with mentors while undergoing the final task and when working into the world of work.
Content	<ol style="list-style-type: none"> <li>1. Introduction and general explanation about concept of groundwater and Geohydrology</li> <li>2. Groundwater Vertical Zonation</li> <li>3. Water table fluctuation and aquifer</li> <li>4. Characteristics of aquifer</li> <li>5. Methods to aquifer characteristics analysis</li> <li>6. Spring and Seepage</li> <li>7. Analysis and estimation of safe yield</li> <li>8. Grounwater Potency</li> <li>9. Pumping test methods</li> <li>10. Aplication of GIS, remote sensing and geophysic on groundwater resources investigation</li> <li>11. Groundwater used model</li> <li>12. Groundwater hydrogeochemistry</li> <li>13. Sea water intrusion</li> </ol>
Study and examination requirements and forms of examination	<ol style="list-style-type: none"> <li>1. Individual assignment – written</li> <li>2. Midterm exam – written</li> <li>3. Attendance – summary from presence list</li> <li>4. Final exam – written and/or oral</li> </ol>
Media employed	<ol style="list-style-type: none"> <li>1. Online sources</li> <li>2. Computers</li> <li>3. Interactive video</li> <li>4. LCD projector</li> </ol>
Reading list	<p>Brown, A.G. 1995. <i>Geomorphology and Groundwater</i>, Chichester: John Wiley and Sons.</p> <p>Fetter, C.W. 1988. <i>Applied Hydrogeology</i>. New York: Mac Millan Publishing.</p> <p>Freeze, R.A. and Cherry, J.A. 1979. <i>Groundwater</i>. New Jersey: Englewood Cliff, Prentice Hall Inc.</p> <p>Gilli, E.; Mangan, C. and Mudry, J. 2012. <i>Hydrogeology: Objectives, Methods, Applications</i>. Boca Raton: CRC Press.</p> <p>Hem, J.D. 1970. <i>Study and Interpretation of the Chemical Characteristic of Natural Water</i>. Washington D.C.: United State Government Printing Office.</p> <p>Hiscock, K.M. 2005. <i>Hydrogeology: Principles and Practice</i>. Oxford: Blackwell Publishing.</p>

	<p>Kruseman and de Ridder, 1990. <i>Analysis and Interpretation of Pumping Test Data</i>. ILRI, Wagenigen, the Netherlands</p> <p>Margat, J. and van der Gun, J. 2013. <i>Groundwater Around the World</i>. Boca Raton: CRC Press.</p> <p>Moore, J.E. 2002. <i>Field Hydrogeology: A Guide for Site Investigations and Report Preparation</i>. Boca raton: CRC Press.</p> <p>Nonner, J.C. 2003, <i>Introduction to Hydrogeology</i>. Deflt: A,A, Balkema Publisher.</p> <p>Sen, Z. 2015. <i>Practical and Applied Hydrogeology</i>. Waltham, UK: Elsevier.</p> <p>Tanuguchi, M. and Holman, I.P. 2010. <i>Groundwater Response to Changing Climate</i>. Boca Raton: CRC Press.</p> <p>Todd, D.K. and Mays. 2005. <i>Groundwater Hydrology</i>. New York, John Wiley and Sons</p> <p>Walton, W.C. 1970. <i>Groundwater Resources Evaluation</i>. Tokyo, Mc Graw Hill Book Company</p> <p>Weight, W.D. 2008. <i>Hydrogeology Field Manual, Second Edition</i>. New York: The McGRaw-Hill Companie, Inc.</p> <p>Younger, P.L. 2007. <i>Groundwater in the Environment</i>. Oxford, United Kingdom: Blackwell Publishing.</p>
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