


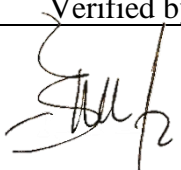
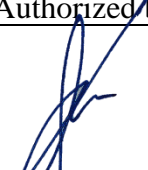


Faculty of Natural Sciences and Mathematics  
Chemistry Department  
Chemistry Education Study Program

Module name		Drinking Water Technology		
Module level, if applicable		4 <sup>th</sup> year		
Code, if applicable		SPK-775		
Semester(s) in which the module is taught		7 <sup>th</sup> semester		
Person responsible for the module		Prof. Riyanto, Ph.D		
Lecturer		Prof. Riyanto, Ph.D Beta Wulan Febriana, M.Pd		
Language		Bahasa Indonesia		
Relation to curriculum		<i>Elective</i>		
Teaching methods	Class size	Forms of active participation	Workload: 91 hours	
Theory and Practice	50-60	Discussion	Lecture: 100 (min) x 16 (meeting)	27 hours
			Lab work (structured and or making product): 120 (min) x 16 (week) + 120 (min) x 16 (week)	64 hours
ECTS credit		3.25		
Credit points		2 SCU		
Requirements according to the examination regulations		Minimum attendance at lectures is 75% (according to UII regulation)		
Recommended prerequisites		N/A		
Related course		N/A		
Module objectives/intended learning outcomes		On successful completion of the course students should be able to: 1. Explain the Quality Control (QC) of bottled raw materials. 2. Describe the techniques of making and managing bottled drinking water. a. Explain the stages of pre-filtration and purification in the process of making bottled drinking water.		

	b. Explain the process of pH regulation, filtering and coagulation in the process of making bottled drinking water. c. Explain the removal of heavy metals, organic impurities in water accurately. d. Describe the stages of the process of filtering, disinfecting in various ways such as ozonation and RO in the process of making bottled water properly 3. Explain the testing and packaging of bottled drinking water in accordance with the regulations of the Minister of Health. a. Analyze of quality parameters of bottled water products including chemistry and physics b. Analyze of quality parameters of bottled water products including biology and radioactivity 4. Explain the bottled water marketing process correctly.		
Content	<ul style="list-style-type: none"> <li>• Definition of bottled water technology (BWT),</li> <li>• BWT quality standard requirements according to Indonesian National Standard,</li> <li>• Types of BWT manufacturing process technology,</li> <li>• BWT manufacturing process steps,</li> <li>• QC and QA in the BWT manufacturing process, BWT quality analysis.</li> </ul>		
Study and examination requirements and forms of examination	Final score (NA) is calculated as follows:		
	Intended learning outcomes	Weight (%)	Technique of assessment
	1	20	Written test (midterm)
	2	30	Non test: project assessment
	3	30	Non test: project assessment
	4	20	Written test (final examination)
Media employed	Power point slide presentation, video, Google classroom		
Reading list	Spellman, F.S., and Drinan, J.E., 2012, The Drinking Water Handbook, 2nd ed., Second Edition, CRC Press.  American Water Works Association, Edzwald, J., 2010, <i>Water Quality &amp; Treatment: A Handbook on Drinking Water (Water Resources and</i>		

	<p><i>Environmental Engineering Series</i>), 6th ed., McGraw-Hill Professional.</p> <p>Ingram, C., 2012, <i>The Drinking Water Book: How to Eliminate Harmful Toxins from Your Water</i>, 2nd ed., Celestial Arts.</p> <p>Rakness, K., 2005, <i>Ozone in Drinking Water Treatment: Process Design, Operation, and Optimization</i>, 1st ed., American Waterworks Association.</p> <p>MWH, Crittenden, J.C., Trussell, R.R., Hand, D.W., Howe, K., and Tchobanoglous, G., 2012, <i>Principles of Water Treatment</i>, 1st ed., Wiley.</p> <p>Peter M. Huck, Marek M. Sozanski, 2011, <i>Designing and Optimizing Drinking Water Treatment Processes: A Guide to Conducting Investigations</i>, IWA Publishing.</p> <p>Chittaranjan Ray, Ravi Jain, 2011, <i>Drinking Water Treatment: Focusing on Appropriate Technology and Sustainability (Strategies for Sustainability)</i>, Springer; 1st Edition.</p>
--	--

Prepared by:	Verified by:	Authorized by:
		
Person responsible for the module	Student representative	Coordinator Program