		Faculty of Natural Sciences and Mathematics Chemistry Department Chemistry Education Study Program			
Module Name		Electrochemistry			
Module level, if applicable		4st year			
Code, if applicable		SPK-753			
Semester (s) in which the module is taught		7st semester			
Person responsible for the module		Prof. Riyanto, M.Si., Ph.D			
Lecturer(s)		Muhaimin, M.Sc. M. Miqdam Musawwa, M.Sc.			
Language		English- Indonesia			
Relation to curriculum		Compulsory			
Types of teaching and learning	Class size	Forms of active participation	Workload: 91 hours		
Lecture and discussion	50 – 60	Discussion	Lecture: 100 (min) x 16 (meeting)	27 hours	
			Assignment: 120 (min) x 16 (week)	32 hours	
			Independent study: 120 (min) x 16 (week)	32 hours	
ECTS credit		3.25			
Credit points		2 SCU			
Requirements according to examination regulations		Minimum attendance at lectures is 75% (according to UII regulation)			
Recommended prerequisites		N/A			
Related course		Instrumental Chemistry			
Module objectives/intended learning		On successful completion of the course students should be able to: 1. Explain the theoretical concepts of electrochemistry definitions and their applications, the principles of redox reactions, types of reactions in electrochemistry and Nernst's law 2. Explain the theoretical concepts of electrochemical cell types, components in galvanic cells and electrolysis 3. Explain the theoretical concepts of galvanic cell applications (batteries, batteries, fuel cells) 4. Explain the application of electrolysis cells in daily life, industrial fields of inorganic and organic compounds, and waste treatment 5. Explain the application of electrolysis cells in the field of analysis (sensors and biosensors)		
Content		The importance of studying electrochemistry, redox reactions,			

<table>
<tr><td></td><td colspan="3">spontaneous and nonspontaneous reactions, Nersnt's law, electrolysis cells and voltaic cells, voltaic cell applications: batteries, batteries and fuel cells, electrolysis cell applications: Faraday's law, electroplating, electrodeposition, nanomaterials, Na industry, gases chlorine, Au, Al, and Zn, applications of electrolysis in the fields of analysis: potentiometry, electrogravimetry, electrophoresis, polarography, voltammetry, cyclic voltammetry, anodic and cathodic stripping voltammetry, applications of electrolysis in the field of electrosynthesis: organic and inorganic synthesis.</td></tr>
<tr><td rowspan="8">Study and examination requirements and forms of examination</td><td colspan="3">Final score (NA) is calculated as follows:</td></tr>
<tr><td>Intended learning outcomes</td><td>Weight (%)</td><td>Technique of assessment</td></tr>
<tr><td>1</td><td>20</td><td>Written test: assignment</td></tr>
<tr><td>2</td><td>20</td><td>Written test: assignment</td></tr>
<tr><td>3</td><td>20</td><td>Written test: midterm</td></tr>
<tr><td>4</td><td>20</td><td>Written test: assignment</td></tr>
<tr><td>5</td><td>20</td><td>Written test: final examination</td></tr>
<tr><td>6</td><td>20</td><td>Written test: assignment</td></tr>
<tr><td>Media employed</td><td colspan="3">Powerpoint slide presentation, video, Google classroom</td></tr>
<tr><td>Reading lists</td><td colspan="3">1. Hamann, C.H., Hamnett, A., and Vielstich, W., 2007, Electrochemistry, John Wiley and Sons, New York.
2. Bagotsky, V.S., 2006, Fundamentals of electrochemistry, John Wiley and Sons Inc., New Jersey.
3. Bockris, J.O., and Reddy, A.K.N., 2002, Modern Electrochemistry, Second Edition, Vol. 1, Kluwer Academic Publisher, New York.
4. Kissinger, P.T., and Heineman, W.R. 1996. Laboratory techniques in electroanalytical chemistry. Second edition. New York: Marcel Dekker. Inc.
5. Lund, H. & Hammerich, O. 2001. Organic electrochemistry. Fourth Edition, Revised and Expanded., New York: Marcel Dekker, Inc.</td></tr>
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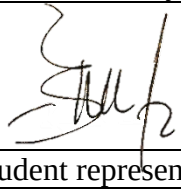
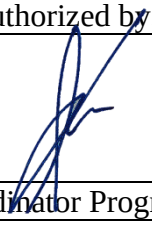
Prepared by:	Verified by:	Authorized by:
		
Person responsible for the module	Student representative	Coordinator Program