



**SEMESTER LEARNING PLAN (RPS)**  
**MASTER STUDY PROGRAM (S-2) CHEMISTRY**  
**FACULTY OF MATHEMATICS AND NATURAL SCIENCES**  
**UNIVERSITY OF BENGKULU**

Identity of Course		Identity of Lecturer	
Code	: MIK-352	Name	: Dr. Charles Banon, M.Si
Subject Name Lecture	: Electrochemistry	Field	: Chemistry
Course Weight (credits)	: 2 (2-0)		
Semester	: 1		
Prerequisite Course	: -		
Graduate Learning Outcomes (CPL) CPL			
Code		Elements of CPL	
S-9	:	Demonstrate a responsible attitude towards work in their field of expertise independently	
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Scientific Study Materials	:	This lecture will discuss: <ol style="list-style-type: none"> <li>1. Chemistry and Electricity,</li> <li>2. Electrochemical Cells,</li> <li>3. Predictions and the Importance of Cell Potential,</li> <li>4. Nernst's Equation,</li> <li>5. Batteries and <i>Fuels Cells</i>.</li> <li>6. Electrochemical Corrosion.</li> <li>7. Sell Electrolytic</li> </ol>	
CP Course (CPMK)	:	<ol style="list-style-type: none"> <li>1) Have adequate knowledge of Electrochemistry.</li> <li>2) Mastering the concepts, principles and reactions in electrochemistry.</li> <li>3) Have and understand the concept of electrochemical applications in everyday life.</li> </ol>	
Learning Experience	:	Students are given knowledge about electrochemistry, reactions in electrochemistry, application of electrochemical principles, fuel cells and electrochemical corrosion.	
References List	:	<ol style="list-style-type: none"> <li>1. Lower, SK, 2006, <i>Electrochemistry: Chemical reactions at an electrode, galvanic and electrolytic cells</i>, Simon Fraser Univ. <a href="http://www.chem1.com/acad/pdf/elchem.pdf">http://www.chem1.com/acad/pdf/elchem.pdf</a>.</li> <li>2. Swayer, DT, Sobkowiak, A., and Roberts, JL, Jr., 1995, <i>Electrochemistry for Chemists</i>, 2<sup>nd</sup> edition, A Wiley-Interscience Publication., NY.</li> </ol>	



Stage	Final Ability	Subject Material	Reference	Learning Method	Time (minutes)	Assessment*	
						Indicator/ CPL code	Assessment technique /weight
1	2	3	4	5		6	7
1	Applying lecture rules and assessment components for courses	1. Lecture Contract 2. Lecture regulations 3. Assessment components 4. References/ literature/ reference books	Ref No : -	Lecture Discussion	2x50	Knowing the components of assessment and references	
2	Able to understand Chemistry and Electricity	<ul style="list-style-type: none"> <li>Electroneutrality</li> <li>Electroneutrality</li> <li>Potential Differences at Interfaces</li> </ul>	Ref No : 1,2	Lectures Discussion	2x50	Understand the basic concepts of Electrochemistry	Test/7%
3-4	Understand about electrochemical cells and reactions taking place in it	<ul style="list-style-type: none"> <li>Drawing of an electrochemical cell</li> <li>Charge transport Inside the Cell.</li> <li>Rules for Drawing</li> <li>Electrodes and Electrode Reactions</li> <li>Standard Half-Cell Potentials</li> </ul>	Ref No : 1,2	Lecture Discussion	4x50	Understanding the electrochemical cell and the reactions in it	Test/13%
5	Understanding the meaning of Prediction and the Importance of Cell	<ul style="list-style-type: none"> <li>Potential Cell Potential and the Electromotive Series</li> <li>Cell Potential And Free Energy</li> </ul>	Ref No : 1,2	Group discussion Task	2x50	Understanding the importance of cell potential in daily applications	Test/7%
6-7	Understanding Nernst Equation	<ul style="list-style-type: none"> <li>Importance of Nernst Equation</li> <li>Cell concentration</li> <li>Thermodynamic of Galvanic Cell</li> <li>Analytical application of Nernst Equation</li> <li>Membrane Potential</li> </ul>	Ref No : 1, 2	Lectures Class Discussion	4x50	Understand the importance of the Nernst equation and its application	Test/13%
8	Mid-Semester Evaluation	MIDDLE SEMESTER EXAM			2x50		Test/7%

9-10	Understand the various forms, models and functions of Ideal Batteries and <i>Fuel Cells</i>	<ul style="list-style-type: none"> <li>• Ideal and the Reality</li> <li>• Primary and Secondary of Batteries</li> <li>• History of Batteries Development</li> <li>• <i>Fuel Cell</i></li> </ul>	Ref No: 1,2	Lecture Class Discussion	4x50	Can explain various shapes, models and functions of B Battery and <i>Fuel Cell</i>	Test/13%
11-12	Students can understand and provide various alternatives to overcome Electrochemical	<ul style="list-style-type: none"> <li>• Corrosion Corrosion due to electrochemical processes</li> <li>• Controlling corrosion with active metal coating</li> <li>• Controlling corrosion with cathodic protection</li> </ul>	Ref No : 1,2	Lecture Class discussion	4x50	Can analyze the situation materials corrode and provide various alternative solutions	Test/13%
13-14	Students can understand about Electrolytic Sell Electrolytic	<ul style="list-style-type: none"> <li>• Introductory of Electronic Cells</li> <li>• Electrolysis In Aqueous Solution</li> <li>• Faraday's Law For Electrolysis</li> <li>• Industrial Electrolytic Process</li> </ul>	Ref No : 1,2	Lecture Class discussion	4x50	Able to explain about Electrolytic Cell	Test /13%
15	Students can review lecture materials from 9-14 meetings	Lecture materials from 9-14 meetings	Ref No: 1,2	Lecture Class Discussion	2x50	Students prepare for Final Exam (UAS)	Tests/7%
16	Final Semester Evaluation	FINAL EXAM SEMESTER			2x50		Test/ 7%

FINAL SCORE = 45% UTS + 45% UAS + 10% TASK/QUIZ

## Appendix 1. Learning Outcomes of Graduates

### Appropriate Attachment of Permenristekdikti No. 44 of 2015 concerning the National Standards for Higher Education

#### A. The Attitude formulation

Attitudes that must be possessed by every graduate of academic, vocational and professional education programs are as follows,

CPL Code	Attitude Formulation
S-1	Believe in God and be able to demonstrate a religious attitude
S-2	Upholding humanity values in carrying out tasks based on religion, morals, and ethics
S-3	To contribute on improving the quality of life in society, nation, state, and progress of civilization based on Pancasila

S-4	Becoming a citizen who proud and love the nation, has nationalism and responsibility to the country and nation.
S-5	respects cultural diversity, views, religion, and beliefs, as well as other people's original opinions or findings
S-6	works together and has social sensitivity and concern for society and the environment
S-7	obeys the law and disciplined in life as a part of society and state
S-8	internalizes academic values, norms, and academic ethics
S-9	demonstrates a responsible attitude towards work in their field of expertise independently
S-10	internalizes the spirit of independence, struggle, and entrepreneurship

## **B. General Skills Formula**

### **B1. Undergraduate Program**

<b>CPL Code</b>	<b>General Skills Formula</b>
KU-1	Able to apply logical, critical, systematic and innovative thinking in the context of developing or implementing science and technology that pays attention to and applies humanities values in accordance with their field of expertise.
KU-2	Able to demonstrate independent, quality and measurable performance.
KU-3	Able to study the implications of the development or implementation of science and technology that pays attention to and applies humanities values according to their expertise based on scientific principles, procedures and ethics in order to produce solutions, ideas, designs or art criticism, compose a scientific description of the results of the study in the form of a thesis or final project report, and upload it on the college website.
KU-4	Compile a scientific description of the results of the study above in the form of a thesis or final project report and upload it on the university's website
KU-5	Able to make appropriate decisions in the context of solving problems in their field of expertise based on the results of information and data analysis.
KU-6	Able to maintain and develop a network with supervisors, colleagues, colleagues both inside and outside the institution.
KU-7	Able to be responsible for the achievement of group work results and supervise and evaluate the completion of work assigned to workers under their responsibility.
KU-8	Able to carry out the evaluation process of work groups under their responsibility and able to manage learning independently
KU-9	Able to document, store, secure and rediscover data to ensure validity and prevent plagiarism.

### **B2. Diploma Three Program**

<b>CPL Code</b>	<b>General Skills Formula</b>
KU-1	Able to complete wide-ranging work and analyze data with various appropriate methods, both those that have not been or have been standardized
KU-2	Able to demonstrate quality and measurable performance
KU-3	Able to solve work problems with the nature and nature of context that is in accordance with the field of applied expertise based on logical thinking, innovative, and responsible for the results independently
KU-4	Able to compile reports on results and work processes accurately and accurately and communicate them effectively to other parties who need
KU-5	Able to work together, communicate and be innovative in their work
KU-6	Able to be responsible for the achievement of group work results and supervise and evaluate the completion of work assigned to workers under their responsibility
KU-7	Able to carry out a self-evaluation process for work groups under their responsibility and able to groan ola work competency development independently

KU-8	Able to document, store, secure and retrieve data to ensure validity and prevent plagiarism
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