



**Universitas Negeri Surabaya**  
**Faculty of Mathematics and Natural Sciences**  
**Undergraduate Chemistry Education Study Program**

Document Code

**SEMESTER LEARNING PLAN**

Courses		CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																									
Inorganic Chemistry Practical		8420401247	Compulsory Study Program Subjects	T=1	P=0	ECTS=1.59	7	June 20, 2022																																									
AUTHORIZATION		SP Developer		Course Cluster Coordinator			Study Program Coordinator																																										
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Learning model	Project Based Learning																																																
Program Learning Outcomes (PLO)	PLO study program which is charged to the course																																																
	Program Objectives (PO)																																																
	PLO-PO Matrix																																																
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 100px; height: 20px;">P.O</td> </tr> </table>							P.O																																								
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PO Matrix at the end of each learning stage (Sub-PO)																																																	
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2" style="width: 30px; height: 20px;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 20px; height: 20px;">1</td> <td style="width: 20px; height: 20px;">2</td> <td style="width: 20px; height: 20px;">3</td> <td style="width: 20px; height: 20px;">4</td> <td style="width: 20px; height: 20px;">5</td> <td style="width: 20px; height: 20px;">6</td> <td style="width: 20px; height: 20px;">7</td> <td style="width: 20px; height: 20px;">8</td> <td style="width: 20px; height: 20px;">9</td> <td style="width: 20px; height: 20px;">10</td> <td style="width: 20px; height: 20px;">11</td> <td style="width: 20px; height: 20px;">12</td> <td style="width: 20px; height: 20px;">13</td> <td style="width: 20px; height: 20px;">14</td> <td style="width: 20px; height: 20px;">15</td> <td style="width: 20px; height: 20px;">16</td> </tr> </table>																P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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Short Course Description	Inorganic Practicum is to develop experimental skills and develop thinking and scientific work skills on how to identify, understand the physical and chemical properties of elements, compounds and laboratory manufacture of main group and transition group elements.																																																
References	Main :																																																
	<ol style="list-style-type: none"> <li>1. Lee, J.D. 1991. Concise Inorganic Chemistry . Four Edition. London: Chapman &amp; Hall.</li> <li>2. Madan, R.D. 1997. Modern Inorganic Chemistry . New Delhi: S. Chand and Company LDT.</li> <li>3. Manku, G.S. 1980. Inorganic Chemistry. India: Tata Mc Graw Hill Book Co.</li> <li>4. Sugiarto, B. dkk. 1997. Kimia Anorganik . Surabaya: Unipress IKIP Surabaya</li> </ol>																																																
	Supporters:																																																
Supporting lecturer	Prof. Dr. Achmad Lutfi, M.Pd. Dr. Amaria, M.Si. Prof. Dr. Sari Edi Cahyaningrum, M.Si. Dr. Muchlis, S.Pd., M.Pd. Dr. Kusumawati Dwiningsih, S.Pd., M.Pd. Rusly Hidayah, S.Si., M.Pd. Dr. Dina Kartika Maharani, S.Si., M.Sc. Amalia Putri Purnamasari, S.Si., M.Si.																																																
Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [ Estimated time]			Learning materials [ References ]	Assessment Weight (%)																																									
		Indicator	Criteria & Form	Offline ( offline )	Online ( online )																																												
(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)																																									

1	Understand the physico-chemical properties, laboratory preparation of main group elements and compounds (Hydrogen, Oxygen, Nitrogen and Ammonia, Sodium and Potassium, and Transition Elements)	<p>1.Explain the basics of practical elements and compounds of the main and transition groups (Hydrogen, Oxygen, Nitrogen and Ammonia, Sodium and Potassium and Transition Elements)</p> <p>2.Carrying out Pre-Laboratory work on main group elements and compounds (Hydrogen, Oxygen, Nitrogen and Ammonia, Sodium and Potassium, and Transition Elements)</p>	<p><b>Criteria:</b> Use the assessment format according to the Unesa guidebook</p>	Pre-laboratory and direction of practical material for main and transition groups (Hydrogen, Oxygen, Nitrogen and Ammonia, Sodium and Potassium, and Transition Elements) 1 X 50			0%
2	Understand, physico-chemical properties, laboratory preparation of main and transition group elements and compounds (Clor, Bromine, Iodine, Aluminium, Cis & Trans, Complex Salts, and Ligand Fields)	<p>1.Explains the basics of practical elements and compounds of the main and transition groups (Clor, Bromine, Iodine, Aluminium, Cis &amp; Trans, Complex Salts, and Ligand Fields).</p> <p>2.Carrying out Pre-Laboratory work on main and transition group elements and compounds (Clor, Bromine, Iodine, Aluminium, Cis &amp; Trans, Complex Salts, and Ligand Fields)</p>	<p><b>Criteria:</b> Use the assessment format according to the Unesa guidebook</p>	Pre-laboratory and direction of practical material for main and transition groups (Clor, Bromine, Iodine, Aluminium, Cis & Trans, Complex Salts, and Ligand Fields) 1 X 50			0%

3	Understand the position, physico-chemical properties, laboratory manufacture of Hydrogen compounds	<ol style="list-style-type: none"> <li>1. Know how to make hydrogen gas</li> <li>2. Know the properties of hydrogen gas and its compounds</li> <li>3. Identify hydrogen gas and its compounds</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1. Product Assessment Format, Practical Reports, and Journals with weights (3)</li> <li>2. Observation of activities in accordance with the Unesa guidebook with weights (2)</li> </ol>	Practical 1 X 50			0%
4	Understand the position, physico-chemical properties, laboratory production of oxygen elements and compounds	<ol style="list-style-type: none"> <li>1. Know how to make oxygen gas</li> <li>2. Knowing the presence of oxygen gas in a compound</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1. The product assessment report format is in accordance with the Unesa manual with weights (3)</li> <li>2. Observation of activities in accordance with the Unesa guidebook with weights (2)</li> </ol>	Practical 1 X 50			0%
5	Understand the position, physico-chemical properties, laboratory manufacture of Chlorine, Bromine and Iodine compounds	<ol style="list-style-type: none"> <li>1. Know the properties of chlorine, bromine and iodine and their compounds</li> <li>2. Know how to make chlorine, bromine and iodine gas and their compounds</li> <li>3. Identify chlorine, bromine, iodine and their compounds</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1. Product Assessment Format, Practical Reports, and Journals with weights (3)</li> <li>2. Observation of activities in accordance with the Unesa guidebook with weights (2)</li> </ol>	Practical 1 X 50			0%
6	Understand the position, physical-chemical properties, laboratory production of Nitrogen and Ammonia compounds	<ol style="list-style-type: none"> <li>1. Know the properties of nitrogen and its compounds</li> <li>2. Identify ammonium nitrogen gas and compounds</li> <li>3. Know how to make nitrogen and ammonium gas in the laboratory</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1. Product Assessment Format, Practical Reports, and Journals with weights (3)</li> <li>2. Observation of activities in accordance with the Unesa guidebook with weights (2)</li> </ol>	Practical 1 X 50			0%
7	Understand the position, physico-chemical properties, laboratory manufacture of Sodium and Potassium compounds	<ol style="list-style-type: none"> <li>1. Know the properties of sodium, potassium and their compounds</li> <li>2. Identify sodium and potassium compounds</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1. The product assessment report format is in accordance with the Unesa manual with weights (3)</li> <li>2. Observation of activities in accordance with the Unesa guidebook with weights (2)</li> </ol>	Practical 1 X 50			0%
8	Midterm exam	Mastering the Mid-Semester Exam material	<b>Criteria:</b> Mid-term exam, carried out via written exam, is given a weight of (2)	Midterm Exam 1 X 50			0%

9	Understand the physico-chemical properties, laboratory manufacture of Aluminum compounds	. Know the properties of Aluminum and its compounds	<b>Criteria:</b> 1.The product assessment report format is in accordance with the Unesa manual with weights (3) 2.Observation of activities in accordance with the Unesa guidebook with weights (2)	Practical 1 X 50			0%
10	Study and understand the characteristics of Cis-Trans	Know how to make cis-trans	<b>Criteria:</b> 1.The product assessment report format is in accordance with the Unesa manual with weights (3) 2.Observation of activities in accordance with the Unesa guidebook with weights (2)	Practical 1 X 50			0%
11	Study and understand the characteristics of Cis-Trans	Know how to make cis-trans	<b>Criteria:</b> 1.The product assessment report format is in accordance with the Unesa manual with weights (3) 2.Observation of activities in accordance with the Unesa guidebook with weights (2)	Practical 1 X 50			0%
12	Study the manufacture of complex salts and double salts	1.Know how to make cuprous ammonium sulfate double salt and copper (II) sulfate monohydrate tetraamine double salt 2.Studying the double salt of cupric ammonium sulfate and the double salt of tetraamine copper (II) sulfate monohydrate	<b>Criteria:</b> 1.The product assessment report format is in accordance with the Unesa manual with weights (3) 2.Observation of activities in accordance with the Unesa guidebook with weights (2)	Practical 1 X 50			0%

13	Learn how to make complex salts and double salts	1. Know how to make cuprous ammonium sulfate double salt and copper (II) sulfate monohydrate tetraamine double salt 2. Studying the double salt of cupric ammonium sulfate and the double salt of tetraamine copper (II) sulfate monohydrate	<b>Criteria:</b> 1. The product assessment report format is in accordance with the Unesa manual with weights (3) 2. Observation of activities in accordance with the Unesa guidebook with weights (2)	Practical 1 X 50			0%
14	Studying Ligand Field Strength	1. Study the difference in league field strength between ammonium and water ligands 2. Know how to find the wavelength at maximum absorbance 3. Get to know the variables that affect wavelength	<b>Criteria:</b> 1. The product assessment report format is in accordance with the Unesa manual with weights (3) 2. Observation of activities in accordance with the Unesa guidebook with weights (2)	Practical 1 X 50			0%
15	Study the reactions of transition metal ions	1. Study the reactions of transition metal salts 2. Get to know the formation of transition metal complex ions 3. Observe color changes due to changes in oxidation numbers and transition metal compounds	<b>Criteria:</b> 1. The product assessment report format is in accordance with the Unesa manual with weights (3) 2. Observation of activities in accordance with the Unesa guidebook with weights (2)	Practical 1 X 50			0%
16	According to final abilities at meetings 1 to 15	Carrying out Post Laboratory elements and compounds of main and transition groups	<b>Criteria:</b> Post Laboratory / Practicum as a UAS score, given a weight of (3)	Post Laboratory (Final Semester Exam) 1 X 50			0%

#### Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
		0%

#### Notes

- Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
- The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
- Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
- Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the

course.

5. **Indicators for assessing** ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.