



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

Document
Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date																																																																																																															
Monofunctional Organic Compounds	4720103195	Compulsory Study Program Subjects	T=3 P=0 ECTS=4.77	2	July 18, 2023																																																																																																															
AUTHORIZATION	SP Developer		Course Cluster Coordinator	Study Program Coordinator																																																																																																																
	Dr. First Ambar Wati, S.Si.		Prof. Dr. Suyatno, M.Si	Dr. Amaria, M.Si.																																																																																																																
Learning model	Case Studies																																																																																																																			
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																																																																																			
	Program Objectives (PO)																																																																																																																			
	PO - 1	Mastering theoretical concepts of the structure of monofunctional organic compounds, physical and chemical properties, synthesis reactions, and identification																																																																																																																		
	PO - 2	Able to apply conceptual understanding of monofunctional organic compounds to explain everyday phenomena through science process skills, critical thinking, creativity and problem solving																																																																																																																		
	PO - 3	Able to make the right decisions in order to solve problems based on the results of information and data analysis																																																																																																																		
	PO - 4	Demonstrate a responsible attitude towards work in his field of expertise independently																																																																																																																		
	PLO-PO Matrix																																																																																																																			
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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;"> <thead> <tr> <th rowspan="2">P.O</th> <th colspan="16">Week</th> </tr> <tr> <th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th> </tr> </thead> <tbody> <tr><td>PO-1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>PO-2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>PO-3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>PO-4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>															P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	PO-1																	PO-2																	PO-3																	PO-4																
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Short Course Description	This course discusses structure theory, alkanes, cycloalkanes, alkenes, alkynes, basic stereochemistry, alkyl halides, aromatic compounds, alcohol-ethers, aldehyde-ketones, carboxylic acids and their derivatives, and amines. Lectures are carried out using various methods, including case-based learning, presentations, questions and answers, and discussions.																																																																																																																			
References	Main :																																																																																																																			
	<ol style="list-style-type: none"> Fessenden, R.J. dan Fessenden, J.S. (1998). Kimia Organik. Jilid I dan 2. Penerjemah AH Pudjattmaka. Jakarta: Erlangga. Hart, H., Craine, L.E. & Hart, D.J. (2003). Kimia Organik. Suatu Kuliah Singkat. Edisi ke XI. Penerjemah: Achmadi, S.S., Jakarta: Erlangga Michael B. Smith and Jerry March, 2007, Advance Organic Chemistry Reactions, Mechanism and structure, 6th edition, Published by John Wiley & Sons, Inc., Hoboken, New Jersey Published simultaneously in Canada Solomon, T. W. G. & Fryhle, C. B. (2011). Organic Chemistry. New York: John Wiley & Sons, Inc 																																																																																																																			
	Supporters:																																																																																																																			

1. Robert V, Hoffman (2004). Organic Chemistry, an Intermediate Text, 2nd Ed, Canada: John Wiley and Sons, Inc.
2. Carey, F.A. (2000). Organic Chemistry. 4rd Ed. New York: McGraw-Hill Companies, Inc.
3. Artikel dalam jurnal ilmiah yang relevan

Supporting lecturer
 Prof. Dr. Suyatno, M.Si.
 Prof. Dr. Tukiran, M.Si.
 Dr. Ratih Dewi Saputri, S.Si., M.Si.
 Nurina Rizka Ramadhania, S.Si. M.Si.
 Dr. First Ambar Wati, S.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	Students understand the Organic Chemistry lecture system	1.Be able to explain the hybridization of carbon atoms 2.Be able to explain the difference between sigma and pi bonds in organic compounds 3.Able to explain electron delocalization 4.Able to explain the resonance structure of organic compounds	Criteria: Tests and non-tests (assignments) Form of Assessment : Participatory Activities	lectures, questions and answers, discussions, solving questions, and 3x50 assignments		Material: 1. Classical model 2. Bohr atomic model 3. Quantum mechanics of the atomic model 4. Orbital model 5. Physical properties of organic structures 6. Molecular orbital theory (MO) 7. Delocalization theory Bibliography: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes 1 and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i> Material: 1. Classical model 2. Bohr atomic model 3. Quantum mechanics of the atomic model 4. Orbital model 5. Physical properties of organic structures 6. Molecular orbital (MO) theory 7. Delocalization theory Bibliography: <i>Michael B. Smith and Jerry March , 2007, Advanced Organic Chemistry Reactions, Mechanism and structure , 6th edition, Published by John Wiley & Sons, Inc. ,Hoboken, New Jersey Published simultaneously in Canada</i>	4%

2	Understand the structure, nomenclature, isomers, as well as the properties and synthesis of alkane and cycloalkane compounds	<p>1. Be able to explain the structure of alkanes and cycloalkanes</p> <p>2. Able to explain the physical and chemical properties of alkanes and cycloalkanes</p> <p>3. Be able to explain the reactions and synthesis of alkanes and cycloalkanes</p>	<p>Criteria: Tests and non-tests (assignments)</p> <p>Form of Assessment : Participatory Activities, Portfolio Assessment</p>	Lectures, questions and answers, discussions, case studies, and problem solving 3 X 50		<p>Material: Alkanes and cycloalkanes: Structure, nomenclature, isomerization, properties and synthesis</p> <p>References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes 1 and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i></p> <hr/> <p>Material: Alkanes and cycloalkanes: Structure, nomenclature, isomerization, properties and synthesis</p> <p>References: <i>Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. XIth Edition. Translator: Achmadi, SS, Jakarta: Erlangga</i></p>	6%
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3	Understand the structure, nomenclature, isomers, as well as the properties and synthesis of alkane and cycloalkane compounds	<ol style="list-style-type: none"> 1. Be able to explain the structure of alkenes and alkynes 2. Be able to describe the physical and chemical properties of alkenes and alkynes 3. Be able to explain the reactions and synthesis of alkenes and alkynes 	<p>Criteria: Tests and non-tests (assignments)</p> <p>Form of Assessment : Participatory Activities, Portfolio Assessment</p>	Presentations, questions and answers, discussions, solving questions, case studies and 3 X 50 assignments		<p>Material: Alkenes and alkynes: Structure, nomenclature, isomerization, properties and synthesis</p> <p>References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes 1 and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i></p> <hr/> <p>Material: Alkenes and alkynes: Structure, nomenclature, isomerization, properties and synthesis</p> <p>References: <i>Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. X1th Edition. Translator: Achmadi, SS, Jakarta: Erlangga</i></p> <hr/> <p>Material: Alkenes and alkynes: Structure, nomenclature, isomerization, properties and synthesis</p> <p>Bibliography: <i>Robert V, Hoffman (2004). Organic Chemistry, an Intermediate Text, 2nd Ed, Canada: John Wiley and Sons, Inc.</i></p>	6%
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4	Understand geometric isomers, conformations, and optical isomers in organic compounds	<ol style="list-style-type: none"> 1. Able to explain the geometric isomers of alkenes and alicyclics 2. Able to explain the conformation of acyclic and cyclic compounds 3. Able to describe optical isomers in organic compounds 4. Able to determine the absolute configuration of chiral compounds 	<p>Criteria: Tests and non-tests (assignments)</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, questions and answers, discussions, and problem solving 3 X 50		<p>Material: Basic stereochemistry References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i></p> <hr/> <p>Material: Basic stereochemistry References: <i>Michael B. Smith and Jerry March, 2007, Advanced Organic Chemistry Reactions, Mechanism and structure, 6th edition, Published by John Wiley & Sons, Inc., Hoboken, New Jersey Published simultaneously in Canada</i></p> <hr/> <p>Material: Basic stereochemistry References: <i>Carey, FA (2000). Organic Chemistry. 4th Ed. New York: McGraw-Hill Companies, Inc.</i></p>	4%
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5	Understand geometric isomers, conformations, and optical isomers in organic compounds	<ol style="list-style-type: none"> 1. Able to explain the geometric isomers of alkenes and alicyclics 2. Able to explain the conformation of acyclic and cyclic compounds 3. Able to describe optical isomers in organic compounds 4. Able to determine the absolute configuration of chiral compounds 	<p>Criteria: Tests and non-tests (assignments)</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, questions and answers, discussions, and problem solving 3 X 50		<p>Material: Basic stereochemistry References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i></p> <hr/> <p>Material: Basic stereochemistry References: <i>Michael B. Smith and Jerry March, 2007, Advanced Organic Chemistry Reactions, Mechanism and structure, 6th edition, Published by John Wiley & Sons, Inc., Hoboken, New Jersey Published simultaneously in Canada</i></p> <hr/> <p>Material: Basic stereochemistry References: <i>Carey, FA (2000). Organic Chemistry. 4th Ed. New York: McGraw-Hill Companies, Inc.</i></p>	4%
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6	Understand the structure, nomenclature, properties and synthesis of alkyl halide compounds as well as the reaction mechanisms of SN-1 and SN-2	<ol style="list-style-type: none"> 1. Explain the structure of alkyl halide compounds 2. Able to describe the physical and chemical properties of alkyl halide compounds 3. Be able to explain the synthesis of alkyl halide compounds 4. Be able to explain the mechanism of SN-1 and SN-2 reactions in alkyl halides 5. Be able to explain the reaction mechanism of E-1 and E-2 in alkyl halides 	<p>Criteria: in accordance with the assessment guidelines applicable at Unesa</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, questions and answers, discussions, solving questions, and 3 X 50 assignments		<p>Material: Alkyl halides: structure, nomenclature, properties and synthesis of alkyl halide compounds and reaction mechanisms SN-1, SN-2, E-1 and E-2</p> <p>References: Fessenden, RJ and Fessenden, JS (1998). <i>Organic Chemistry. Volumes 1 and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i></p> <hr/> <p>Material: Alkyl halides: structure, nomenclature, properties and synthesis of alkyl halide compounds and reaction mechanisms SN-1, SN-2, E-1 and E-2</p> <p>References: Solomon, TWG & Fryhle, CB (2011). <i>Organic Chemistry . New York: John Wiley & Sons, Inc</i></p> <hr/> <p>Material: Alkyl halides: structure, nomenclature, properties and synthesis of alkyl halide compounds and reaction mechanisms SN-1, SN-2, E-1 and E-2</p> <p>Reference: Robert V, Hoffman (2004). <i>Organic Chemistry, an Intermediate Text, 2nd Ed, Canada: John Wiley and Sons, Inc.</i></p>	4%
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7	Understand the structure, nomenclature, properties and synthesis of alkyl halide compounds as well as the reaction mechanisms of SN-1 and SN-2	<ol style="list-style-type: none"> 1.Explain the structure of alkyl halide compounds 2.Able to describe the physical and chemical properties of alkyl halide compounds 3.Be able to explain the synthesis of alkyl halide compounds 4.Be able to explain the mechanism of SN-1 and SN-2 reactions in alkyl halides 5.Be able to explain the reaction mechanism of E-1 and E-2 in alkyl halides 	<p>Criteria: in accordance with the assessment guidelines applicable at Unesa</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, questions and answers, discussions, solving questions, and 3 X 50 assignments		<p>Material: Alkyl halides: structure, nomenclature, properties and synthesis of alkyl halide compounds and reaction mechanisms SN-1, SN-2, E-1 and E-2</p> <p>References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes 1 and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i></p> <hr/> <p>Material: Alkyl halides: structure, nomenclature, properties and synthesis of alkyl halide compounds and reaction mechanisms SN-1, SN-2, E-1 and E-2</p> <p>References: <i>Solomon, TWG & Fryhle, CB (2011). Organic Chemistry . New York: John Wiley & Sons, Inc</i></p> <hr/> <p>Material: Alkyl halides: structure, nomenclature, properties and synthesis of alkyl halide compounds and reaction mechanisms SN-1, SN-2, E-1 and E-2</p> <p>Reference: <i>Robert V, Hoffman (2004). Organic Chemistry, an Intermediate Text, 2nd Ed, Canada: John Wiley and Sons, Inc.</i></p>	4%
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8	complete UTS	able to explain and analyze the material given at meetings 1-7	<p>Criteria: In accordance with the assessment guidelines applicable at Unesa</p> <p>Form of Assessment : Test</p>	Midterm Exam 3 X 50		<p>Material: material 1-7</p> <p>References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i></p> <hr/> <p>Material: material 1-7</p> <p>References: <i>Solomon, TWG & Fryhle, CB (2011). Organic Chemistry. New York: John Wiley & Sons, Inc</i></p> <hr/> <p>Material: material 1-7</p> <p>References: <i>Robert V, Hoffman (2004). Organic Chemistry, an Intermediate Text, 2nd Ed, Canada: John Wiley and Sons, Inc.</i></p> <hr/> <p>Material: material 1-7</p> <p>References: <i>Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. XIth Edition. Translator: Achmadi, SS, Jakarta: Erlangga</i></p>	15%
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9	<p>Explain the structure, nomenclature and properties of aromatic hydrocarbons and be able to apply substitution reactions for the synthesis of aromatic compounds</p>	<p>1. Able to describe the molecular structure of aromatic compounds 2. Able to explain the relationship between aromatic molecular structure and resonance stability 3. Be able to explain substitution reactions for aromatic compounds 4. Be able to explain the synthesis reactions of aromatic compounds</p>	<p>Criteria: Non Test</p> <p>Form of Assessment : Participatory Activities</p>	<p>Lectures, questions and answers, discussions, and problem solving 3 X 50</p>		<p>Material: Aromatic hydrocarbons: Structure, nomenclature, properties and synthesis References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i></p> <hr/> <p>Material: Aromatic hydrocarbons: Structure, nomenclature, properties and synthesis References: <i>Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. XIth Edition. Translator: Achmadi, SS, Jakarta: Erlangga</i></p>	4%
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10	Understand the structure, nomenclature, classification of properties, differences and similarities as well as the synthesis of alcohol – phenol – ether compounds.	<ol style="list-style-type: none"> 1. Be able to explain the structure of alcohol-phenol and ether group compounds 2. Able to explain the physical and chemical properties of alcohol, phenol and ether group compounds 3. Be able to explain the reactions and synthesis of alcohol-phenol and ether group compounds 	<p>Criteria: Non Test</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, questions and answers, discussions, and problem solving 3 X 50		<p>Material: alcohol – phenol – ether: structure, nomenclature, isomers, property classification and synthesis References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i></p> <hr/> <p>Material: alcohol – phenol – ether: structure, nomenclature, isomers, property classification and synthesis References: <i>Michael B. Smith and Jerry March, 2007, Advanced Organic Chemistry Reactions, Mechanism and structure, 6th edition, Published by John Wiley & Sons, Inc. ,Hoboken, New Jersey Published simultaneously in Canada</i></p> <hr/> <p>Material: alcohol – phenol – ether: structure, nomenclature, isomers, property classification and synthesis References: <i>Articles in relevant scientific journals</i></p>	4%
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11	Understand the structure, nomenclature, classification of properties, differences and similarities as well as the synthesis of alcohol – phenol – ether compounds.	<ol style="list-style-type: none"> 1. Be able to explain the structure of alcohol-phenol and ether group compounds 2. Able to explain the physical and chemical properties of alcohol, phenol and ether group compounds 3. Be able to explain the reactions and synthesis of alcohol-phenol and ether group compounds 	Criteria: Non Test Form of Assessment : Participatory Activities	Lectures, questions and answers, discussions, and problem solving 3 X 50		Material: alcohol – phenol – ether: structure, nomenclature, isomers, property classification and synthesis References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i> <hr/> Material: alcohol – phenol – ether: structure, nomenclature, isomers, property classification and synthesis References: <i>Michael B. Smith and Jerry March, 2007, Advanced Organic Chemistry Reactions, Mechanism and structure, 6th edition, Published by John Wiley & Sons, Inc., Hoboken, New Jersey Published simultaneously in Canada</i> <hr/> Material: alcohol – phenol – ether: structure, nomenclature, isomers, property classification and synthesis References: <i>Articles in relevant scientific journals</i>	4%
12	Understand the structure, nomenclature, properties and be able to predict isomers and can synthesize carbonyl compounds	<ol style="list-style-type: none"> 1. Be able to explain the structure of aldehyde and ketone group compounds 2. Able to describe the physical and chemical properties of aldehyde and ketone group compounds 3. Be able to explain the reactions and synthesis of aldehyde and ketone group compounds 	Criteria: Non Test and Test Form of Assessment : Participatory Activities, Portfolio Assessment	Case-based learning (Case study), lectures, questions and answers, discussions, and problem solving 3 X 50		Material: Aldehyde and ketone material Reference: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volume 1. Jakarta: Erlangga</i> <hr/> Material: Aldehyde and ketone materials Reference: <i>Solomon, TWG & Fryhle, CB (2011). Organic Chemistry. New York: John Wiley & Sons, Inc</i>	6%

13	Understand the structure, nomenclature, properties and be able to predict isomers and can synthesize carbonyl compounds	<ol style="list-style-type: none"> 1. Be able to explain the structure of aldehyde and ketone group compounds 2. Able to describe the physical and chemical properties of aldehyde and ketone group compounds 3. Be able to explain the reactions and synthesis of aldehyde and ketone group compounds 	Criteria: Non Test and Test Form of Assessment : Participatory Activities, Portfolio Assessment	Case-based learning (Case study), lectures, questions and answers, discussions, and problem solving 3 X 50		Material: Aldehyde and ketone material Reference: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volume 1. Jakarta: Erlangga</i> <hr/> Material: Aldehyde and ketone materials Reference: <i>Solomon, TWG & Fryhle, CB (2011). Organic Chemistry. New York: John Wiley & Sons, Inc</i>	6%
14	Able to understand the structure, nomenclature, isomers, properties, especially acidity and synthesis of carboxylic acids and their derivatives	<ol style="list-style-type: none"> 1. Explain the structure of carboxylic acid group compounds and their derivatives 2. Describe the physical and chemical properties of carboxylic acid group compounds and their derivatives 3. Explain the synthesis reaction of carboxylic acid group compounds and their derivatives 	Criteria: 1. Non Test 2. Test Form of Assessment : Participatory Activities, Portfolio Assessment	Case-based learning (Case study), lectures, questions and answers, discussions, and problem solving 3 X 50		Material: Carboxylic acids and their derivatives: structure, nomenclature, properties and synthesis References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i> <hr/> Material: Carboxylic acids and their derivatives: structure, nomenclature, properties and synthesis References: <i>Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. XIth Edition. Translator: Achmadi, SS, Jakarta: Erlangga</i>	6%

15	Able to understand the structure, nomenclature, properties (especially basicity), classification and synthesis of amines	<ol style="list-style-type: none"> 1. Able to describe the structure of amine group compounds 2. Able to describe the physical and chemical properties of amine group compounds 3. Be able to explain the reactions and synthesis of amine group compounds 	<p>Criteria: Non Test</p> <p>Form of Assessment : Participatory Activities</p>	Presentations, questions and answers, discussions, solving questions, and assignments 3 X 50		<p>Material: Amine: Structure, classification, nomenclature, properties and synthesis</p> <p>References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i></p> <hr/> <p>Material: Amine: Structure, classification, nomenclature, properties and synthesis</p> <p>References: <i>Michael B. Smith and Jerry March, 2007, Advanced Organic Chemistry Reactions, Mechanism and structure , 6th edition, Published by John Wiley & Sons, Inc. ,Hoboken, New Jersey Published simultaneously in Canada</i></p>	4%
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16	Understand concepts, attitudes and skills in the Monofunctional Organic Compounds course	Understand concepts, attitudes and skills in the Monofunctional Organic Compounds course	<p>Criteria: In accordance with the assessment guidebook that applies at Unesa</p> <p>Form of Assessment : Test</p>	Final Exam Semester 2 X 50		<p>Material: material 9-15 References: <i>Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga.</i></p> <p>Material: material 9-15 References: <i>Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. Xlth Edition. Translator: Achmadi, SS, Jakarta: Erlangga</i></p> <p>Material: material 9-15 Bibliography: <i>Michael B. Smith and Jerry March, 2007, Advanced Organic Chemistry Reactions, Mechanism and structure, 6th edition, Published by John Wiley & Sons, Inc. ,Hoboken, New Jersey Published simultaneously in Canada</i></p> <p>Material: material 9-15 References: <i>Solomon, TWG & Fryhle, CB (2011). Organic Chemistry. New York: John Wiley & Sons, Inc</i></p> <p>Material: material 9-15 References: <i>Robert V, Hoffman (2004). Organic Chemistry, an Intermediate Text, 2nd Ed, Canada: John Wiley and Sons, Inc.</i></p>	19%
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Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	51%
2.	Portfolio Assessment	15%
3.	Test	34%
		100%

1. **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.
2. **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.
3. **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.
4. **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** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities 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.