

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

Document Code

SEMESTER LEARNING PLAN

Courses			CODE			Cou	se Fa	mily		Cr	redi	it Wei	ght	SEME	STER	Compilation Date
Monofunction Compounds	nal Organic		4720103195	5			pulsor ram S			T=	=3	P=0	ECTS=4.77	,	2	July 18, 2023
AUTHORIZAT	ΓΙΟΝ		SP Develop	ber		1 -			Cou	rse Cl	ust	er Co	ordinator	Study	Progran	n Coordinator
			Dr. First Am	bar V	Vati, S.S				Prof.	Dr. S	uya	tno, N	1.Si		Dr. Ama	ria, M.Si.
Learning model	Case Studies								l							
Program	PLO study pro	gram t	hat is charg	ged t	o the co	ourse										
Learning Outcomes	Program Object	tives ((PO)													
(PLO)	PO - 1		ring theoreti rties, synthes						of m	onofur	nctio	onal (organic con	npounds,	physica	I and chemical
	PO - 2	Able t throug	to apply con Jh science pr	ceptu ocess	ial unde s skills, c	rstandir ritical th	ig of inking	mono J, crea	ofuncti ativity	ional o and p	orga robl	anic c lem s	compounds olving	to explai	n everya	lay phenomena
	PO - 3	Able to	o make the ri	ght d	ecisions	in orde	r to so	lve p	roblen	ns bas	sed	on the	e results of i	nformatio	n and da	ta analysis
	PO - 4		nstrate a res	ponsi	ble attitu	de towa	ards w	ork ir	n his fi	ield of	exp	pertise	e independer	ntly		
	PLO-PO Matrix	[
			P.0													
			PO-1													
			PO-2													
			PO-3													
		PO-4														
	PO Matrix at th	e end	of each lea	rning	j stage	(Sub-P	0)									
			P.0								We	eek				
				1	2 3	3 4	5	6	7	8	9	10) 11 1	.2 13	14	15 16
		PC	0-1													
		PC)-2													
		PC)-3													
		PO)-4													
Short Course Description	This course disc compounds, alco various methods,	bhol-eth	ers, aldehyd	le-ket	ones, ca	arboxyli	c acid	ls an	d thei	ir deri	vati	ves, a	and amines	. Lecture		
References	Main :															
	Jakarta: 3. Michael	Craine Erlangg B. Smi d by Jo	e, L.E. & Ha ga ith and Jerry hn Wiley & S	rt, D. / Mar ions,	J. (2003 ch, 200 Inc. ,Hot). Kimia 7,Advar ooken, N	a Orga nce O New Je	anik. rgani ersey	Suatu c Che Publi	u Kulia emistry shed s	ah S y R simu	Singka eactic ultane	at. Edisi ke ons, Mechar ously in Car	XI. Pene nism and nada	rjemah:	ta: Erlangga. Achmadi, S.S., e , 6th edition,
	Supporters:															
			<u> </u>													

Support lecturer	Prof. Dr. Tukiran, Dr. Ratih Dewi S						
Week-	Dr. First Ambar V Final abilities of each learning stage	Vati, S.Si.	luation	Learni Student	o Learning, ing methods, : Assignments, imated time]	Learning materials	Assessmer Weight (%
	(Sub-PO)	Indicator	Criteria & Form	Offline(offline)	Online (<i>online</i>)	[References]	
(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: Fessenden, RJ and Fessenden, RJ and Sessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga. 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: 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	4%

2	Understand the structure, nomenclature, isomers, as well as the properties and synthesis of alkane and cycloalkane compounds	1.Be able to explain the structure of alkanes and cycloalkanes 2.Able to explain the physical and	Criteria: Tests and non- tests (assignments) Form of Assessment : Participatory Activities, Portfolio Assessment	Lectures, questions and answers, discussions, case studies, and problem solving 3 X 50	A c S n is s s	Material: Alkanes and cycloalkanes: Structure, iomenclature, somerization, oroperties and cynthesis References:	6%
		chemical properties of alkanes and cycloalkanes 3.Be able to explain the reactions and synthesis of alkanes and cycloalkanes			F a F (C V 2 F J J	Fessenden, RJ ind Fessenden, JS 1998). Organic Chemistry. /olumes I and P. Translator WH Pudjaatmaka. lakarta: Erlangga.	
					A c S n is s S F <i>H</i> <i>H</i> <i>H</i> <i>H</i> <i>H</i> <i>H</i> <i>H</i> <i>H</i> <i>H</i> <i>H</i>	Aaterial: Alkanes and hycloalkanes: Structure, somerization, properties and hynthesis References: fart, H., Traine, LE & Hart, DJ (2003).	
					C C S X T J J	Drganic Chemistry. A Short Lecture. (Ith Edition. Translator: Achmadi, SS, Iakarta: Erlangga	

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3	Understand the structure, nomenclature, isomers, as well as the properties and synthesis of alkane and cycloalkane compounds	 Be able to explain the structure of alkenes and alkynes Be able to describe the physical and chemical properties of alkenes and alkynes Be able to explain the reactions and synthesis of alkenes and alkynes 	Criteria: Tests and non- tests (assignments) Form of Assessment : Participatory Activities, Portfolio Assessment	Presentations, questions and answers, discussions, solving questions, case studies and 3 X 50 assignments		Material: Alkenes and alkynes: Structure, nomenclature, isomerization, properties and synthesis References: Fessenden, RJ and Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga. Material: Alkenes and alkynes: Structure, nomenclature, isomerization, properties and synthesis References: Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. XIth Edition. Translator: Achmadi, SS, Jakarta: Erlangga Material: Alkenes and alkynes: Structure, nomenclature, isomerization, properties and synthesis Bibliography: Robert V, Hoffman (2004). Organic Chemistry, an Intermediate Text, 2nd Ed, Canada: John Wiley and Sons, Inc.	6%

4	Understand geometric isomers, conformations, and optical isomers in organic compounds	1.Able to explain the geometric isomers of	Criteria: Tests and non- tests (assignments) Form of	Lectures, questions and answers, discussions, and problem	Material: B stereochem Reference: Fessenden and	nistry s:
	compounds	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	Assessment : Participatory Activities	and problem solving 3 X 50	Fessenden (1998). Org Chemistry. Volumes I a 2. Translate AH Pudjaatmal Jakarta: Erlangga. Material: B stereochem Reference: Michael B. Smith and J. March, 200 Advanced Organic Chemistry Reactions, Mechanism structure, 6 edition, Published I John Wiley Sons, Inc. ,Hobken, Jersey Published simultaneo	anic and or ka. asic istry s: Jerry 7, d and th py & New
					in Canada Material: B stereochem Reference: Carey, FA (2000). Org Chemistry. Ed. New Yo McGraw-HI Companies Inc.	nistry s: anic 4th rrk: II

		1		1	1	1	
5	Understand geometric isomers, conformations, and optical isomers in organic compounds	 Able to explain the geometric isomers of alkenes and alicyclics Able to explain the conformation of acyclic and cyclic compounds Able to describe optical isomers in organic compounds Able to determine the absolute configuration of chiral compounds 	Criteria: Tests and non- tests (assignments) Form of Assessment : Participatory Activities	Lectures, questions and answers, discussions, and problem solving 3 X 50		Material: Basic stereochemistry References: Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga. Material: Basic stereochemistry References: 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 stimulaneously in Canada Material: Basic stereochemistry References: Carey, FA (2000). Organic Chemistry. 4th Ed. New York: McGraw-Hill Companies, Inc.	4%

6	Understand the	1.Explain the	Criteria:	Lectures,	Material: Alkyl	4%
_	structure,	structure of	in accordance with	questions and	halides:	.,,,
	nomenclature,		the assessment	answers,	structure,	
	properties and	alkyl halide	guidelines	discussions,	nomenclature,	
	synthesis of alkyl	compounds	applicable at Unesa	solving	properties and	
	halide compounds as well as the	2.Able to		questions,	synthesis of	
	reaction	describe the	Form of	and	alkyl halide	
	mechanisms of SN-	physical and	Assessment :	3 X 50	compounds and	
	1 and SN-2	chemical	Participatory	assignments	reaction	
		properties of	Activities	Ū.	mechanisms	
		alkyl halide			SN-1, SN-2, E-	
		compounds			1 and E-2	
		Be able to			References:	
		explain the			Fessenden, RJ	
		synthesis of			and	
		alkyl halide			Fessenden, JS	
		compounds			(1998). Organic	
		4.Be able to			Chemistry.	
		explain the			Volumes I and	
		mechanism			2. Translator	
		of SN-1 and			AH	
		SN-2			Pudjaatmaka.	
		reactions in			Jakarta:	
		alkyl halides			Erlangga.	
		5.Be able to				
		explain the			Material: Alkyl	
		reaction			halides:	
					structure,	
		mechanism			nomenclature,	
		of E-1 and E-			properties and	
		2 in alkyl			synthesis of	
		halides			alkyl halide	
					compounds and	
					reaction	
					mechanisms	
					SN-1, SN-2, E-	
					1 and E-2	
					References:	
					Solomon, TWG	
					& Fryhle, CB	
					(2011). Organic	
					Chemistry .	
					New York: John	
					Wiley & Sons,	
					Inc	
					Material: Alkyl	
					halides:	
					structure,	
					nomenclature,	
					properties and	
					synthesis of	
					alkyl halide	
					compounds and	
					reaction	
					mechanisms	
					SN-1, SN-2, E-	
					1 and E-2 Reference:	
					Reference: Robert V,	
					Hoffman	
					(2004). Organic	
					(2004). Organic Chemistry, an	
					Intermediate	
					Text, 2nd Ed,	
					Canada: John	
					Wiley and	
					Sons, Inc.	
					30113, 1116.	
L						

7	Understand the	1.Explain the	Criteria:	Lectures,	Material: Alkyl	4%
	structure,	structure of	in accordance with	questions and	halides:	
	nomenclature,	alkyl halide	the assessment	answers,	structure,	
	properties and		guidelines	discussions,	nomenclature,	
	synthesis of alkyl halide compounds	compounds	applicable at Unesa	solving	properties and	
	as well as the	2.Able to	F	questions,	synthesis of	
	reaction	describe the	Form of	and	alkyl halide	
	mechanisms of SN-	physical and	Assessment	3 X 50	compounds and	
	1 and SN-2	chemical	Participatory	assignments	reaction	
		properties of	Activities		mechanisms	
		alkyl halide			SN-1, SN-2, E-	
		compounds			1 and E-2	
		Be able to			References:	
		explain the			Fessenden, RJ	
		synthesis of			and	
		alkyl halide			Fessenden, JS	
		compounds			(1998). Organic	
		4.Be able to			Chemistry.	
		explain the			Volumes I and	
		mechanism			2. Translator	
		of SN-1 and			AH	
		SN-2			Pudjaatmaka.	
					Jakarta:	
		reactions in			Erlangga.	
		alkyl halides				
		5.Be able to			Material: Alkyl	
		explain the			halides:	
		reaction			structure,	
		mechanism			nomenclature,	
		of E-1 and E-			properties and	
		2 in alkyl			synthesis of	
		halides			alkyl halide	
					compounds and	
					reaction	
					mechanisms	
					SN-1, SN-2, E-	
					1 and E-2	
					References:	
					Solomon, TWG	
					& Fryhle, CB	
					(2011). Organic	
					Chemistry .	
					New York: John	
					Wiley & Sons,	
					Inc	
					Material: Alkyl	
					halides:	
					structure,	
					nomenclature,	
					properties and	
					synthesis of	
					alkyl halide	
					compounds and	
					reaction	
					mechanisms	
					SN-1, SN-2, E-	
					1 and E-2	
					Reference:	
					Robert V.	
					Hoffman	
					(2004). Organic	
					Chemistry, an	
					Intermediate	
1 1						
					Text, 2nd Ed,	
					Text, 2nd Ed, Canada: John	
					Text, 2nd Ed,	

8	complete UTS	able to explain	Criteria:	Midterm	Material: 15%
		and analyze the material given at meetings 1-7	In accordance with the assessment guidelines applicable at Unesa Form of Assessment : Test	Exam 3 X 50	material 1-7 References: Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta:
					Erlangga. Material: material 1-7 References: Solomon, TWG & Fryhle, CB (2011). Organic Chemistry. New York: John Wiley & Sons, Inc
					Material: material 1-7 References: Robert V, Hoffman (2004). Organic Chemistry, an Intermediate Text, 2nd Ed, Canada: John Wiley and Sons, Inc.
					Material: material 1-7 References: Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. XIth Edition. Translator: Achmadi, SS, Jakarta: Erlangga

4.Be able to explain the synthesis hydrocarbons: Structure, nomenclature, properties and synthesis aromatic compounds References: Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. Xlth Edition.	aromatic Jakarta: compounds Aromatic A.Be able to Aromatic explain the Structure, synthesis reactions of aromatic Compounds A.Be able to Structure, explain the Structure, synthesis reactions of aromatic Craine, LE & compounds Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. Short Lecture. XIth Edition. Translator:	substitution Frlangga. reactions for aromatic compounds Aromatic 4.Be able to hydrocarbons: explain the synthesis reactions of aromatic aromatic References: compounds Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. XIth Edition.	4%
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10	Understand the	1.Be able to	Criteria:	Lectures,		Material:	4%
	structure,	explain the	Non Test	questions and		alcohol –	770
	nomenclature,	structure of		answers,		phenol – ether:	
	classification of	alcohol-	Form of	discussions,		structure,	
	properties, differences and		Assessment :	and problem		nomenclature,	
	similarities as well	phenol and	Participatory	solving		isomers,	
	as the synthesis of	ether group	Activities	3 X 50		property	
	alcohol – phenol –	compounds				classification	
	ether compounds.	2.Able to				and synthesis	
		explain the				References:	
		physical and				Fessenden, RJ	
		chemical				and	
		properties of				Fessenden, JS	
		alcohol,				(1998). Organic	
		phenol and				Chemistry.	
		ether group				Volumes I and	
		compounds				2. Translator	
		3.Be able to				AH	
		explain the				Pudjaatmaka.	
		•				Jakarta:	
		reactions and				Erlangga.	
		synthesis of					
		alcohol-				Material:	
		phenol and				alcohol –	
		ether group				phenol – ether:	
		compounds				structure,	
						nomenclature,	
						isomers,	
						property	
						classification	
						and synthesis	
						References:	
						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	
						III Callaud	
						Madavial	
						Material:	
						alcohol –	
						phenol – ether:	
						structure,	
						nomenclature,	
						isomers,	
						property	
						classification	
						and synthesis	
						References:	
						Articles in	
						relevant	
						scientific	
			1		1	journals	

	1						
	Understand the structure, nomenclature, classification of properties, differences and similarities as well as the synthesis of alcohol – phenol – ether compounds.	 Be able to explain the structure of alcohol- phenol and ether group compounds Able to explain the physical and chemical properties of alcohol, phenol and ether group compounds 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	alc phy stri nou iso pro- cla ani Re <i>Fei</i> <i>Ch</i> <i>Vo</i> <i>2</i> .7 <i>AH</i> <i>Pu</i> <i>Jai</i> <i>Erf</i> <i>Ma</i> alc phy stri noo iso pro- cla ani <i>Re</i> <i>Fei</i> <i>Ch</i> <i>Vo</i> <i>2</i> .7 <i>AH</i> <i>Pu</i> <i>Jai</i> <i>Erf</i> <i>Ma</i> alc phy stri noo iso pro- cla ani <i>Re</i> <i>Fei</i> <i>Ch</i> <i>Vo</i> <i>2</i> .7 <i>AH</i> <i>Pu</i> <i>Jai</i> <i>Erf</i> <i>Ma</i> alc phy stri noo iso pro- cla ani <i>Re</i> <i>Mi</i> <i>Sn</i> <i>Ma</i> <i>Ad</i> <i>On</i> <i>Ch</i> <i>Re</i> <i>Mi</i> <i>Sn</i> <i>Ma</i> <i>Ad</i> <i>On</i> <i>Ch</i> <i>Re</i> <i>Mi</i> <i>Sn</i> <i>Ma</i> <i>Ad</i> <i>On</i> <i>Ch</i> <i>Re</i> <i>Mi</i> <i>Sn</i> <i>Ma</i> <i>Ad</i> <i>On</i> <i>Ch</i> <i>Re</i> <i>Mi</i> <i>Sn</i> <i>Ma</i> <i>Ad</i> <i>On</i> <i>Ch</i> <i>Re</i> <i>Mi</i> <i>Sn</i> <i>Ad</i> <i>Ad</i> <i>On</i> <i>Ch</i> <i>Re</i> <i>Mi</i> <i>Sn</i> <i>Ad</i> <i>Ad</i> <i>On</i> <i>Ch</i> <i>Re</i> <i>Mi</i> <i>Sn</i> <i>Ad</i> <i>Ad</i> <i>On</i> <i>Ch</i> <i>Re</i> <i>Ad</i> <i>Ad</i> <i>Ch</i> <i>Re</i> <i>Ad</i> <i>Ad</i> <i>Ad</i> <i>Ch</i> <i>Re</i> <i>Ad</i> <i>Ad</i> <i>Ad</i> <i>Ch</i> <i>Re</i> <i>Ad</i> <i>Ad</i> <i>Ad</i> <i>Ad</i> <i>Ch</i> <i>Re</i> <i>Ad</i> <i>Ad</i> <i>Ad</i> <i>Ch</i> <i>Re</i> <i>Ad</i> <i>Ad</i> <i>Ad</i> <i>Ad</i> <i>Ad</i> <i>Ad</i> <i>Ad</i> <i>Ad</i>	essenden, JS 998). Organic nemistry. blumes I and Translator	4%
12	Understand the structure, nomenclature, properties and be able to predict isomers and can synthesize carbonyl compounds	 Be able to explain the structure of aldehyde and ketone group compounds Able to describe the physical and chemical properties of aldehyde and ketone group compounds 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	Alc ket Fe ann Fe (15) Ch Vo Jai Erl Ma Alc ket ma Re So & f (20) Ch	essenden, JS 998). Organic nemistry. Jolume 1. karta: langga aterial: dehyde and tone aterials eference: Jolomon, TWG Fryhle, CB 011).Organic nemistry. New prk: John iley& Sons,	6%

13	Understand the structure, nomenclature, properties and be able to predict isomers and can synthesize carbonyl compounds	 Be able to explain the structure of aldehyde and ketone group compounds Able to describe the physical and chemical properties of aldehyde and ketone group compounds 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: Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volume 1. Jakarta: Erlangga Material: Aldehyde and ketone materials Reference: Solomon, TWG & Fryhle, CB (2011). Organic Chemistry. New York: John Wiley& Sons, Inc	6%
14	Able to understand the structure, nomenclature, isomers, properties, especially acidity and synthesis of carboxylic acids and their derivatives	 Explain the structure of carboxylic acid group compounds and their derivatives Describe the physical and chemical properties of carboxylic acid group compounds and their derivatives 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: Fessenden, RJ and Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga. Material: Carboxylic acids and their derivatives: structure, nomenclature, properties and synthesis References: Hart, H., Craine, LE & Hart, DJ (2003). Organic Chemistry. A Short Lecture. XIth Edition. Translator: Achmadi, SS, Jakarta: Erlangga	6%

		_				
15	Able to understand the structure, nomenclature, properties (especially basicity), classification and synthesis of amines	 Able to describe the structure of amine group compounds Able to describe the physical and chemical properties of amine group compounds Be able to explain the reactions and synthesis of amine group compounds 	Criteria: Non Test Form of Assessment : Participatory Activities	Presentations, questions and answers, discussions, solving questions, and assignments 3 X 50	Material: Amine: Structure, classification, nomenclature, properties and synthesis References: Fessenden, JS (1998). Organic Chemistry. Volumes I and 2. Translator AH Pudjaatmaka. Jakarta: Erlangga. Material: Amine: Structure, classification, nomenclature, properties and synthesis References: 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	4%

	I		1				
16	Understand	Understand	Criteria:	Final Exam		Material:	19%
	concepts, attitudes and skills in the	concepts, attitudes and	In accordance with	Semester		material 9-15	
	Monofunctional	skills in the	the assessment guidebook that	2 X 50		References:	
	Organic	Monofunctional	applies at Unesa			Fessenden, RJ	
	Compounds course	Organic				and	
		Compounds course	Form of			Fessenden, JS (1998). Organic	
		course	Assessment :			Chemistry.	
			Test			Volumes I and	
						2. Translator	
						AH	
						Pudjaatmaka.	
						Jakarta:	
						Erlangga.	
						Material:	
						material 9-15	
						References:	
						Hart, H., Craine, LE &	
						Hart, DJ (2003).	
						Organic	
						Chemistry. A	
						Short Lecture.	
						XIth Edition.	
						Translator:	
						Achmadi, SS,	
						Jakarta:	
						Erlangga	
						Madaulal	
						Material: material 9-15	
						Bibliography:	
						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	
						Material:	
						material 9-15	
						References: Solomon, TWG	
						& Fryhle, CB	
						(2011). Organic	
						Chemistry. New	
						York: John	
						Wiley & Sons,	
						Inc	
						Material:	
						material 9-15	
						References:	
						Robert V,	
						Hoffman (2004) Organic	
						(2004). Organic Chemistry, an	
						Intermediate	
						Text, 2nd Ed,	
						Canada: John	
						Wiley and	
						Sons, Inc.	
L			1	1	I		

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.
- 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.