IPB UNIVERSITY
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
DEPARTEMEN KIMIA

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SEMESTER COURSE PLAN

KIM 1221
ORGANIC CHEMISTRY I
3(3-0)

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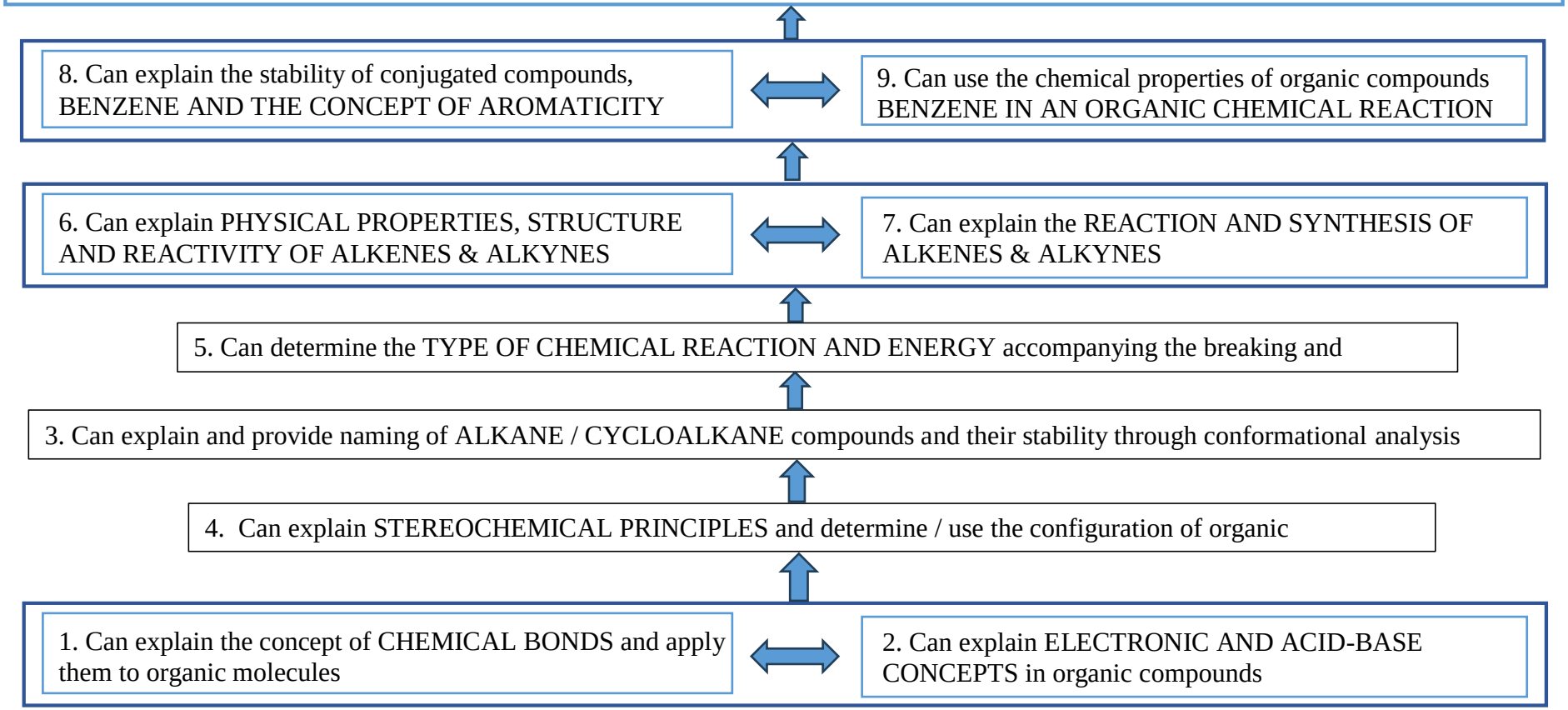
INSTRUCTIONAL ANALYSIS

Learning Outcomes:

1. Can describe structures based on functional groups and write nomenclature IUPAC
2. Can identify and compare the physical properties of organic compounds based on structure and functional groups
3. Mastering the basic theory of reactions and reaction mechanisms of organic compounds based on chemical properties and their reactivity
4. Skilled in analyzing a chemical synthesis reaction based on the basic principles of structure and reactivity of organic compounds



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Course Name	:	Organic Chemistry I
Code/Credit	:	KIM 1221/3(3-0)
Semester	:	Odd
Description	:	This Organic Chemistry I course is a compulsory course in the Department of Chemistry. This course is given to equip students with knowledge about the physical and chemical properties of organohalide compounds; alcohols and phenols, ethers and epoxides, as well as their analogous compounds sulfur; amines and heterocyclic compounds; carbonyl compounds: aldehydes and ketones, carboxylic acids and their derivatives including nitriles; with emphasis on structure, stereochemistry, synthesis, reactions and reaction mechanisms of nucleophilic substitution and addition, nucleophilic acyl substitution, α-carbonyl substitution and condensation reactions. The scope of the discussion and learning process is to use active learning through small group discussions, cooperative learning, and presentations. The language of instruction used in this lecture is Indonesian.
Prerequisites course	:	KIM 104 Kimia ST
Learning Outcomes	:	1. Able to describe structures based on functional groups and write nomenclature IUPAC 2. Able to identify and compare the physical properties of organic compounds based on structure and functional groups 3. Mastering the basic theory of reactions and reaction mechanisms of organic compounds based on chemical properties and their reactivity 4. Skillfully analyze a chemical synthesis reaction based on the basic principles of structure and reactivity of organic compounds.
Scope and Curriculum map of Royal Society of Chemistry Curriculum (RSC)[2)]	:	The uniqueness of the carbon atom, Stereochemistry, Functional groups in organic compounds, Functionality can be used to predict reactions, Types of organic reactions, reactions and structure of alkanes, alkenes and alkynes, reactions and structure of aromatic compounds (nucleophilic/electrophilic substitution, lithiation, ortho/para/meta directing), Organic synthesis
Division/Field	:	Organic Chemistry
Lecturers	:	1. Dr. Gustini Syahbirin, MS 2. Prof. Dr. Suminar S. Achmadi, M.Sc 3. Dr. Auliya Ilmiawati, S.Si., M.Si 4. Budi Arifin, S.Si., M.Si

[1)]Tutorial/practicum activities are expressed in credits, not in the number of hours

[2)]see Excel file Chemistry Curriculum Map from RSC

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Table 1. BLENDED LEARNING PLAN (12× Offline and 2× Online)

WEEK OF	LEARNING OUTCOMES	TOPIC	METHOD	DURATION	STUDY EXPERIENCE	PENILAIAN			REFERENCES
						CRITERION	INDICATOR	WEIGHT (%)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1-2	Can explain the concept of CHEMICAL BONDS and describe them on organic molecules	Chemical Bonding	**Face-to-face lectures, covering**: a. Lecture b. Class Interactive Discussion c. Review of Discussion Results d. Quizizz Task design Tables 2 and 3	6 × 50 min	1. Gain insight and explanation of CHEMICAL BONDS 2. Interact with students and: • Lecturers • Other students • Teaching materials 3. Gain conformity/ understanding, argue, and respect opinions for a joint decision between lecturers and students	**Hard Skills:** Completeness and correctness of explanations of the formation of covalent bonds (polar and nonpolar), hybridization, and describing compressed, complete, and line structures **Soft Skills:** 1. Activeness 2. Cooperation 3. Responsibility 4. Discipline accuracy and thoroughness in making questions and statements during interactive discussions	Scoring rubrics Table 4, 5, and 6		**1** **2, 3, 4**
2 - 3	Can explain ELECTRONIC AND ACID-BASE CONCEPTS in organic compounds.	Polar Covalent Bonds: Acids and Bases	***Asynchronous: Online via Zoom/WA/LMS***: a. Lecture b. Class Interactive Discussion	3 × 50 min	1. Gain insight and explanation of ELECTRONIC AND ACID-BASE CONCEPTS 2. Interact with students and: • Lecturers	***Hard skill:*** Completeness and correctness of explanations of the concepts of acid-base (Bronsted Lowry, Lewis), electrophilic-nucleophile,	Scoring rubrics Table 4, 5. and 6		**1** **2, 3, 4**

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			c. Review of Discussion Results d. Quizizz Task design Tables 2 and 3		• Other students • Teaching materials 3. Gain conformity/understanding, argue, and respect opinions for a joint decision between lecturers and students	resonance, intermolecular forces (Van der Waals, dipole interactions, hydrogen bonds) correctly **Soft Skills:** 1. Activeness 2. Cooperation 3. Responsibility 4. Discipline accuracy and thoroughness in making questions and statements during interactive discussions			
4	Can identify and describe the STEREOCHEMISTRY of organic compounds	Stereochemistry	**Face-to-face lectures, covering**: a. Lecture b. Class Interactive Discussion c. Review of Discussion Results d. Quizizz Task design Tables 2 and 3	3 × 50 min	1. Gain insight and explanation of STEREOCHEMISTRY 2. Interact with students and: • Lecturers • Other students • Teaching materials 3. Gain conformity/understanding, argue, and respect opinions for a joint decision between lecturers and students	***Hard skill:*** Completeness and correctness of the explanation of geometric isomers E-Z,/*cis-trans*, chiral carbon, R and S configurations, optically active isomers, enantiomers, diastereomers, and *meso* correctly **Soft Skills:** 1. Activeness 2. Cooperation 3. Responsibility 4. Discipline accuracy and	Scoring rubrics Table 4, 5, and 6		**1** **2, 3, 4**

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						thoroughness in making questions and statements during interactive discussions			
EXAM I								**25**	
5 and 6	Can explain and provide the naming of ALKANE/ CYCLOALKANE compounds and their stability through conformational analysis.	Organic Compounds: Alkanes, Cycloalkanes and Their Stereochemistry	**Face-to-face lectures, covering**: a. Lecture b. Class Interactive Discussion c. Review of Discussion Results d. Quizizz Task design Tables 2 and 3	4 × 50 min	1. Gain insight and explanation of ALKANE / CYCLOALKANE organic compounds 2. Interact with students and: • Lecturers • Other students • Teaching materials 3. Gain conformity/understanding, argue, and respect opinions for a joint decision between lecturers and students	***Hard skill:*** Completeness and correctness of explanations of nomenclature, physicochemical properties, isomers, conformations, correctly **Soft Skills:** 1. Activeness 2. Cooperation 3. Responsibility 4. Discipline accuracy and thoroughness in making questions and statements during interactive discussions	Scoring rubrics Table 4, 5, and 6		**1** **2, 3, 4**
7	Can name and explain the TYPES OF CHEMICAL AND ENERGY REACTIONS that accompany the breaking and formation of bonds	An Overview of Organic Reactions	**Face-to-face lectures, covering**: a. Lecture b. Class Interactive Discussion c. Review of Discussion Results d. Quizizz	5 × 50 min	1. Gain insight and explanation of the TYPES OF CHEMICAL REACTIONS AND THEIR ACCOMPANYING ENERGIES 2. Interact with students and:	***Hard skill:*** Completeness and correctness of explanations of types of organic reactions, energy diagrams, and overview of organic chemical reactions and their mechanisms correctly	Scoring rubrics Table 4, 5, and 6		**1** **2, 3, 4**

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			Task design Tables 2 and 3		• Lecturers • Other students • Teaching materials 3. Gain conformity/understanding, argue, and respect opinions for a joint decision between lecturers and students	**Soft Skills:** 1. Activeness 2. Cooperation 3. Responsibility 4. Discipline accuracy and thoroughness in making questions and statements during interactive discussions			
EXAM II/MIDTERM								**20**	
8-9	Can explain the PHYSICAL PROPERTIES, STRUCTURE, AND REACTIVITY OF ALKENES &; ALKYNES	Physical properties, structure, and reactivity of alkenes & alkynes	***Asynchronous: Online via Zoom/WA/LMS***: a. Lecture b. Class Interactive Discussion c. Review of Discussion Results d. Quizizz Task design Tables 2 and 3	6 × 50 min	1. Gain insight and explanation of the STRUCTURE AND REACTIVITY OF ALKENES & ALKYNES 2. Interact with students and: • Lecturers • Other students • Teaching materials 3. Gain conformity/understanding, argue, and respect opinions for a joint decision between lecturers and students	***Hard skill:*** Completeness and correctness of explanations of nomenclature, physicochemical properties, structure and reactivity, preparation, reactions, and mechanisms of electrophilic addition, addition of conjugation, and redox correctly **Soft Skills:** 1. Activeness 2. Cooperation 3. Responsibility 4. Discipline accuracy and thoroughness in making questions and statements	Scoring rubrics Table 4, 5, and 6		**1** **2, 3, 4**

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						during interactive discussions			
10-11	Can explain the REACTION AND SYNTHESIS OF ALKENES &; ALKYNES	Reactions and Synthesis of Alkenes &; Alkynes	**Face-to-face lectures, covering**: a. Lecture b. Class Interactive Discussion c. Review of Discussion Results d. Quizizz Task design Tables 2 and 3	3 × 50 min	1. Gain insight and explanation of the REACTION AND SYNTHESIS OF ALKENES &; ALKYNES 2. Interact with students and: • Lecturers • Other students • Teaching materials 3. Gain conformity/understanding, argue, and respect opinions for a joint decision between lecturers and students	***Hard skill:*** Completeness and correctness of explanations of reactions and mechanisms of electrophilic, redox, and simple synthesis correctly **Soft Skills:** 1. Activeness 2. Cooperation 3. Responsibility 4. Discipline accuracy and thoroughness in making questions and statements during interactive discussions	Scoring rubrics Table 4, 5, and 6		**1** **2, 3, 4**
EXAM III								**25**	
12	Can explain the stability of conjugated compounds, BENZENE AND THE CONCEPT OF AROMATICITY	Benzene and the concept of aromaticity	**Face-to-face lectures, covering**: a. Lecture b. Class Interactive Discussion c. Review of Discussion Results d. Quizizz Task design Tables 2 and 3	3 × 50 min	1. Gain insight and explanation of BENZENE AND THE CONCEPT OF AROMATICITY 2. Interact with students and: • Lecturers • Other students • Teaching materials 3. Gain conformity/understan	***Hard skill:*** Completeness and correctness of explanations of nomenclature, physicochemical properties of benzene, isomers of structure (o, p, m), activating groups and deactivators of benzene, Huckel's rule correctly	Scoring rubrics Table 4, 5, and 6		**1** **2, 3, 4**

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					ding, argue, and respect opinions for a joint decision between lecturers and students	**Soft Skills:** 1. Activeness 2. Cooperation 3. Responsibility 4. Discipline accuracy and thoroughness in making questions and statements during interactive discussions			
13 & 14	Can explain the CHEMISTRY of BENZENE in an organic chemical reaction.	Benzene chemistry: electrophilic and nucleophilic substitution reactions	**Face-to-face lectures, covering**: a. Lecture b. Class Interactive Discussion c. Review of Discussion Results d. Quizizz Task design Tables 2 and 3	6 × 50 min	1. Gain insight and explanation of BENZENE CHEMISTRY 2. Interact with students and: • Lecturers • Other students • Teaching materials 3. Gain conformity/understanding, argue, and respect opinions for a joint decision between lecturers and students	***Hard skill:*** Completeness and correctness of the explanation of Benzene Chemistry: preparation, electrophilic and nucleophilic substitution reactions, and simple synthesis correctly **Soft Skills:** 1. Activeness 2. Cooperation 3. Responsibility 4. Discipline accuracy and thoroughness in making questions and statements during interactive discussions	Scoring rubrics Table 4, 5. and 6		**1** **2, 3, 4**
EXAM IV/FINAL EXAM								**25**	

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Table 2. Assignment Design of Interactive Discussions in Class and Quiz

Week of	Material	Task Objectives	Task Description	Assessment Criteria
2	Meetings 1 to 4	Train students to achieve the final ability to meet subjects 1 and 2	The list of questions (problem sets) of the subjects of meetings 1 and 2 submitted via LMS/WA a week before the meeting, was done in groups	Accuracy, completeness, and clarity of individual answers
3		Train students to achieve the final ability to meet subjects 2 and 3	The list of questions (problem sets) of the subjects of meetings 2 and 3 submitted via LMS/WA a week before the meeting, was done in groups	
4		Train students to achieve the final ability of meeting subjects 3 and 4	The list of questions (problem sets) of the subjects of meetings 3 and 4 submitted via LMS/WA a week before the meeting, was done in groups	
Exercise I via LMS (Meeting material 1 to 4)				
EXAM 1 (Meeting materials 1 to 4)				
5	Meetings 5 to 7	Train students to achieve the final ability to meet subject 5	The list of questions (problem sets) of the subjects of meeting 5 submitted via LMS/WA a week before the meeting, was done in groups	Accuracy, completeness, and clarity of individual answers
6		Train students to achieve the final ability to meet subject 6	The list of questions (problem sets) of the subjects of meetings 6 submitted via LMS/WA a week before the meeting, was done in groups	
7		Train students to achieve the final ability to meet subject 7	The list of questions (problem sets) of the subjects of meeting 7 submitted via LMS/WA a week before the meeting, was done in groups	
Exercise II via LMS (Meeting material 5 to 7)				
EXAM 2/Midterm (Meeting material 5 to 7)				
8	Meetings 8 to 11	Train students to achieve the final ability to meet subject 8	The list of questions (problem sets) of the subjects of meeting 8 submitted via LMS/WA a week before the meeting, was done in groups	Accuracy, completeness, and clarity of individual answers
9		Train students to achieve the final ability to meet subject 9	The list of questions (problem sets) of the subjects of meeting 9 submitted via LMS/WA a week before the meeting, was done in groups	

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10		Train students to achieve the final ability to meet subject 10	The list of questions (problem sets) of the subjects of meeting 10 submitted via LMS/WA a week before the meeting, was done in groups	
11		Train students to achieve the final ability of meeting subject 11	The list of questions (problem sets) of the subjects of meeting 11 submitted via LMS/WA a week before the meeting, was done in groups	
Exercise III via LMS (Meeting material 8 to 11)				
EXAM 3 (Meeting materials 8 to 11)				
12	Meetings 12 to 14	Train students to achieve the final ability to meet subject 12	The list of questions (problem sets) of the subjects of meeting 12 submitted via LMS/WA a week before the meeting, was done in groups	Accuracy, completeness, and clarity of individual answers
13		Train students to achieve the final ability to meet Subject 13	The list of questions (problem sets) of the subjects of meeting 13 submitted via LMS/WA a week before the meeting, was done in groups	
14		Train students to achieve the final ability to meet subject 14	The list of questions (problem sets) of the subjects of meeting 14 submitted via LMS/WA a week before the meeting, was done in groups	
Exercise IV via LMS (Meeting material 12 to 14)				
EXAM 4/Final (Meeting materials 12 to 14)				

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Table 3. Comprehensive Training Task Plan via LMS (4×)

Week of	Comprehensive exercise of -	Task Objectives	Task Description	Assessment Criteria
1-4	I	Train students to achieve the final ability to meet subjects 1 to 4	List of questions (problem set) of the subject matter of meetings 1 to 4	Accuracy, completeness, and clarity of answers
5-7	II	Train students to achieve the final ability to meet subjects 5 to 7	List of questions (problem set) of the subject matter of meetings 5 to 7	Accuracy, completeness, and clarity of answers
8-11	III	Train students to achieve the final ability to meet subjects 8 to 11	List of questions (problem set) of the subject matter of meetings 8 to 11	Accuracy, completeness, and clarity of answers
12-14	IV	Train students to achieve the final ability of meeting subjects 12 to 14	List of questions (problem set) of the subject matter of meetings 12 to 14	Accuracy, completeness, and clarity of answers

Table 4. Assessment Design

Learning outcomes	Interactive Discussions, Quizizz and Comprehensive Exercises	Test			
		Exam I	Exam II	Exam III	Exam IV
Can describe structures based on functional groups and write nomenclature IUPAC	√	√	√	√	√
Can identify and compare the physical properties of organic compounds based on structure and functional groups	√	√	√	√	√
Mastering the basic theory of reactions and reaction mechanisms of organic compounds based on chemical properties and their reactivity	√	√	√	√	√
Skillfully analyze a chemical synthesis reaction based on the basic principles of structure and reactivity of organic compounds.	√	√	√	√	√

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Table 5. Assessment Weights:

Assessment Criteria	Score Range	Score Weight (%)	Information
Weekly Task Assessments, Quizizz, and Comprehensive Exercises Small group presentations: 1. Systematics and content of presentation; 2. Ability to respond to questions (whether or not appropriate); 3. Clarity of presentation (voice volume and intonation). Small group discussions and cooperative learning: 1. Communication Aspect: provides specific and easy-to-understand explanations; uses methods/tools (body movements, analogies, and concept maps) to help comprehension of messages by colleagues; uses constructive ways of expressing opinions and reasoning. 2. Discussion Aspect: not dominated in the discussion and actively contribute. 3. Openness aspect: ask for feedback on him/herself and value colleagues' opinions; use the knowledge and experience of other members in the group as a source of knowledge. **4.** Other aspects of Behavior: work together to develop a group work plan and conduct evaluations; willing to accept specific tasks/roles and share responsibilities.	55-100	15	Individual score
• Exam I • Exam II (Midterm) • Exam III • Exam IV (Final)	0-100 0-100 0-100 0-100	25 20 25 25	Individual score Individual score Individual score Individual score
Score of ORGANIC CHEMISTRY I (KIM 1221 3(3-0))		**110**	

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Table 6. Interactive Discussion Assessment Criteria

Score Range	Group Discussion Assessment Criteria
90-100	If students can provide specific and easy-to-understand explanations, use methods/tools (body movements, analogies, and concept maps) to help the understanding of messages by colleagues and use constructive ways in expressing opinions and reasoning. Students can contribute actively, respect the opinions of colleagues, work together, and conduct evaluations in groups.
80--<90	If students can provide specific and easy to understand explanations, use methods/tools (body movements, analogies, and concept maps) to help the understanding of messages by colleagues and use constructive ways in expressing opinions and reasoning. Students can contribute actively and value the opinions of colleagues in the group.
70--<80	If students can provide specific and easy to understand explanations, use ways/tools (body movements, analogies, and concept maps) to help understand messages by colleagues and use constructive ways in expressing opinions and reason. Students can contribute actively.
60--<70	If students can provide specific and easy to understand explanations, use methods/tools (body movements, analogies, and concept maps) to help to understand messages by colleagues and use constructive ways of expressing opinions and reason.
55--<60	If students can provide specific explanations but are less easy to understand, use methods/tools (body movements, analogies, and concept maps) to help the understanding of messages by colleagues and use constructive ways of expressing opinions and reason.
	Assessment Criteria on Presentation
90-100	If students can present material with good systematics, timeliness of delivery, good language use, ability to answer questions well / precisely, good and clear material delivery attitude

Recommended Reading Books Required and Supporting

1. **McMurry J. 2016. *Organic Chemistry*. 9th Ed. California (USA): Brooks/Cole. (Wajib)**
2. Clayden J, Greeves N, Warren S, Wothers P. 2012. *Organic Chemistry*. New York (USA). Oxford University Press.
3. Solomons TWG, Fryhle CB. 2016. *Organic Chemistry*. 12th Ed.. New Jersey (USA): John Wiley & Sons, Inc.
4. Brown WH, Foote C, Iverson BL, Anslyn EV, Novak BM. 2012. *Organic Chemistry*. 6th Ed. California (USA): Brooks/Cole.

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ONLINE LEARNING ACTIVITY PLAN

KIM 1221
ORGANIC CHEMISTRY I
3(3-0)

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1	Online Learning of	1 and 2
2	Course Name	Organic Chemistry I
3	Code/Credit	KIM 1221 / 3(3-0)
4	Developer Name	Dr. Auliya Ilmiawati, S.Si., M.Si
5	Learning Outcomes	1. Can describe structures based on functional groups and write nomenclature IUPAC 2. Can identify and compare the physical properties of organic compounds based on structure and functional groups 3. Mastering the basic theory of reactions and reaction mechanisms of organic compounds based on chemical properties and their reactivity 4. Skillfully analyze a chemical synthesis reaction based on the basic principles of structure and reactivity of organic
6	Expected Final Capabilities	**Online 1st in weeks 2 and 3:** Can explain ELECTRONIC AND ACID-BASE CONCEPTS in organic compounds **Online 2 at weeks 8 and 9:** Can explain the PHYSICAL PROPERTIES, STRUCTURE, AND REACTIVITY OF ALKENES &; ALKYNES

- Online Learning Materials of	**TOPICS COVERED**	**TEACHING MATERIALS AND ONLINE LEARNING ACTIVITIES**	**REFERENCES AND OTHER RESOURCES**
1 on Week	Polar Covalent Bonds: Acids and Bases	**1st Online Teaching Materials**: Lecture material on the topic of polar covalent bonds: acids and bases (.pdf file) uploaded on LMS	**1. McMurry J. 2016. *Organic Chemistry*. 9th Ed. California (USA): Brooks/Cole. (Required)**

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		1st Discussion Forum: At the 2nd meeting, Conduct discussions through WA group media or LMS between lecturers and students; and between students in a group to discuss the 1st Online Study Material. **1st task**: Interactive discussion about triggers that have been submitted 1 week in advance in the LMS. Students are required to upload answers to trigger questions from discussions with their groups in the assignment room at LMS. During the 3rd meeting, through ZOOM media each group explained their assignments to all students present and lecturers gave reviews. **1st Quiz (*Mini-Fast-Self):*** At the end of the 3rd meeting, students do questions related to Online Learning Material 1 in the form of multiple-choice questions and limited time in the form of electronic forms/QUIZIZZ	2. Clayden J, Greeves N, Warren S, Wothers P. 2012. *Organic Chemistry*. New York (USA). Oxford University Press. 3. Solomons TWG, Fryhle CB. 2016. *Organic Chemistry*. 12the Ed.. New Jersey (USA): John Wiley & Sons, Inc. 4. Brown WH, Foote C, Iverson BL, Anslyn EV, Novak BM. 2012. *Organic Chemistry*. 6th Ed. California (USA): Brooks/Cole.
2 at weeks 8 and 9	Physical properties, structure, and reactivity of alkenes & alkynes	**2nd Online Teaching Materials**: Course material on the topic of Physical Properties, Structure, and Reactivity of Alkenes & Alkynes (.pdf file) is uploaded in LMS **2nd Discussion Forum**: At the 8th meeting, conduct discussions through WA group media or LMS between lecturers and students; and between students in a group to discuss the 2nd Online Study Material. **2nd task**: Interactive discussion about triggers that have been submitted 1 week in advance in the LMS. Students are required to upload answers to trigger questions from discussions with their groups in the assignment room at LMS. During the 9th meeting, through ZOOM media each group explained their assignments to all students present and lecturers gave reviews. **2nd Quiz (*Mini-Fast-Self):*** At the end of the 9th meeting, students do questions related to Online Study Material 2 in the form of multiple-choice questions and limited time in the form of electronic forms/QUIZIZZ	1. **McMurry J. 2016. *Organic Chemistry*. 9th Ed. California (USA): Brooks/Cole. (Wajib)** 2. Clayden J, Greeves N, Warren S, Wothers P. 2012. *Organic Chemistry*. New York (USA). Oxford University Press. 3. Solomons TWG, Fryhle CB. 2016. *Organic Chemistry*. 12th Ed.. New Jersey (USA): John Wiley & Sons, Inc. 4. Brown WH, Foote C, Iverson BL, Anslyn EV, Novak BM. 2012. *Organic Chemistry*. 6th Ed. California (USA): Brooks/Cole.

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LEARNING UNIT

KIM 221
ORGANIC CHEMISTRY I
3(3-0)

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LEARNING UNIT

Course Name	:	Organic Chemistry I
Code/Credit	:	KIM 221 / 3(3-0)
Meeting of	:	1 – 2
Time Allocation	:	300 min
Learning Outcome	:	1. Can describe structures based on functional groups and write nomenclature IUPAC 2. Can identify and compare the physical properties of organic compounds based on structure and functional groups 3. Mastering the basic theory of reactions and reaction mechanisms of organic compounds based on chemical properties and their reactivity 4. Skillfully analyze a chemical synthesis reaction based on the basic principles of structure and reactivity of organic compounds.
Final Capabilities (Sub-LO)	:	Can explain CHEMICAL BONDING concepts and describe them in organic compounds
Study Material on the *Royal Society of Chemistry (RSC) Chemistry Curriculum Map*	:	The uniqueness of the carbon atom, Stereochemistry, Functional groups in organic compounds, Functionality can be used to predict reactions, Types of organic reactions, reactions and structure of alkanes, alkenes and alkynes, reactions and structure of aromatic compounds (nucleophilic/electrophilic substitution, lithiation, ortho/para/meta directing), Organic synthesis
Indicator	:	
I. Learning Objectives	:	Provide insight and explanation of CHEMICAL BONDS and *Soft Skills* of students to actively express opinions through discussion, cooperation / group work, be responsible for their duties, discipline and respect the opinions of others when arguing
II. Learning Materials	:	Chemical bonding
III. Learning Methods	:	Synchronous-Face-to-Face

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IV. Learning Steps

Phase	Teacher Activities	Student Activities	Softskill	Learning Tools/Materials/Resources
(1)	(2)	(3)	(4)	(5)
Initial Activities	• Open a meeting • Introduce him/herrself • Explain the course contract • Explain the LO of the course and each subject • Explain coursework	• Listening • Watching • Note-taking	Discipline	LCD Laptop Whiteboard Board marker
Main Activities	• Explain in general about the basic principles of chemical bond formation • Explains the formation of covalent bonds (polar and nonpolar) • Describe hybridization • Explain how compressed, complete, and line structures are depicted • Interactive discussion about triggers (students explain proposed answers)	• Listening • Watching • Note-taking • Explaining • Comment/answer • Ask questions (feedback)	Discipline	LCD Laptop Whiteboard Board marker
End Activities	• Summing up the material that has been delivered • Verifying the material that has been submitted with the LO of the subject matter • End a meeting • Provide a QUIZIZZ link as assign homework. Opening time 24 hours.	• Listening • Watching • Note-taking • Measuring self-ability	Discipline	LCD Laptop Whiteboard Board marker Link QUIZIZZ

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V. ASSESSMENT CRITERIA

1. Evaluate student achievement using established achievement indicators
2. Provide assignments (home work) for material that has been submitted via QUIZIZZ
3. Evaluate student discipline in attending lectures such as entering on time and not doing disruptive activities throughout the lecture

VI. REFERENCES

1. **McMurry J. 2016. *Organic Chemistry*. 9th Ed. California (USA): Brooks/Cole. (Wajib)**
2. Clayden J, Greeves N, Warren S, Wothers P. 2012. *Organic Chemistry*. New York (USA). Oxford University Press.
3. Solomons TWG, Fryhle CB. 2016. *Organic Chemistry*. 12th Ed. New Jersey (USA): John Wiley & Sons, Inc.
4. Brown WH, Foote C, Iverson BL, Anslyn EV, Novak BM. 2012. *Organic Chemistry*. 6th Ed.. California (USA): Brooks/Cole.