Module Description
MPK 1401 Fundamentals of Organic Chemistry

Module Name	**Fundamentals of Organic Chemistry**
Module level, if applicable	Undergraduate Programme
Code, if applicable	MPK 1401
Subtitle, if applicable	-
Course, if applicable	-
Semester(s) in which the module is taught	2nd Semester
Module coordinator(s):	Dr. Endah Sayekti, M.Si.
Lecturer	Dr. Endah Sayekti, M.Si. ; Dr. Ajuk Sapar, M.Si. ; Prof. Dr. Thamrin Usman, DEA. ; Rudiyansyah, M.Si., Ph.D. ; Dr. Andi Hairil Alimuddin, M.Si. ; Dra. Harlia, M.Si. ; Dr. M. Agus Wibowo, M.Si., Dr. Ari Widiyantoro, M.Si. ; Afghani Jayuska, S.Si., M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Courses for the undergraduate programme in Chemistry
Type of teaching, contact hours	Decide teaching/training components for each course outcome ● Theory /Face-to-face lecture (for understanding): 10 lecture meetings ● Practical (to develop skill): - ● Seminar (for communication skills): - ● Problems: 2 ● Assignments: 2 ● Project (small, group, etc): -
Workload	*(Estimated) Total workload: 2 x 2,83 hours = 5,66 hours.* *Contact hours (lecture): 2 x 0,83 hours = 1,66 hours.* *Private study including examination preparation, specified in hours: 2 x 2 hours = 4 hours* *2 x 50 minutes lectures,* *2 x 60 minutes structured activity,* *2 x 60 minutes individual activity,* *14 weeks per semester,* *79,33 total hours*

Credit points	2 (3.34 ECTS)
Requirements according to the examination regulations	Registered in this course Minimum 75% attendance in this course
Learning goals/competencies:	**Intended Learning Outcomes (ILO)** After taking this course, students will be able to: 1. LO1 2. LO3
Module objectives	1. Students are able to explain the concept and types of hybrid orbitals on carbon, oxygen, and nitrogen atoms in organic compounds 2. Students are able to explain and give examples of isomers and the nomenclature of Alkanes 3. Students are able to explain and give examples of isomers and nomenclature of Alkenes and Alkynes, and the physical properties 4. Students are able to explain the concept of aromaticity of Benzene, nomenclature of benzene and substituted benzene, and the physical properties 5. Students are able to explain the nomenclature and physical properties of Alkyl Halides 6. Students are able to explain the nomenclature and physical properties of Alcohols and Ethers 7. Students are able to explain the nomenclature and physical properties of Aldehydes and Ketones 8. Students are able to explain the nomenclature and physical properties of Carboxylic Acids and Carboxylic Acid Derivatives 9. Students are able to explain the nomenclature and physical properties of Amines 10. Students are able to explain the nomenclature and classification of Carbohydrates. 11. Students are able to explain the nomenclature and physical properties of Amino Acids and Proteins, 12. Students are able to explain the nomenclature of Lipids
Content:	1. Orbital and Their Role in Covalent Bonding a. Properties of Waves b. Bonding in Hydrogen

	c. Some General Features of Bonding and Antibonding Orbital d. Hybrid Orbital of Carbon e. Hybrid Orbitals of Nitrogen and Oxygen f. Conjugated Double Bond g. Resonance 2. Structural Isomerism, Nomenclature, and Alkane a. Survey of Organic Nomenclature b. Alkanes c. The Hydrocarbon Resources 3. Alkenes and Alkynes a. Bonding in Alkenes and Alkynes; Acidity of Alkynes b. Nomenclature of Alkene and Alkynes c. Physical Properties of Alkenes and Alkynes 4. Aromaticity: Benzene and Substituted Benzenes a. Nomenclature of Substituted Benzenes b. Physical Properties of Aromatic Hydrocarbons c. Stability of the Benzene Ring d. The Bonding in Benzene e. What is An Aromatic Compound? f. Requirements of Aromaticity 5. Alkyl Halide a. Bonding in Organohalogen Compounds b. Physical properties of Halogenated Alkanes c. Nomenclature and Classification of Alkyl Halides 6. Alcohol and Ether a. Bonding in Alcohols and Ethers b. Physical Properties of Alcohols and Ethers c. Nomenclature of Alcohols and Ethers 7. Aldehydes and Ketones a. Nomenclatures of Aldehydes and Ketones b. The Carbonyl Groups c. Physical properties of Aldehydes and Ketones 8. Carboxylic Acids and Derivatives of Carboxylic Acids a. Nomenclatures of Carboxylic Acids b. Physical Properties of Carboxylic Acids c. Acid Halides d. Anhydrides of Carboxylic Acids

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<tr><td></td><td>e. Ester of Carboxylic Acids
9. Amines
a. Classification and Nomenclature of Amines
b. Bonding in Amine
c. Physical Properties of Amines
10. Carbohydrates
a. Some Common Monosaccharides
b. Classification of the Monosaccharides
c. Disaccharides
d. Polysaccharides
11. Amino Acids and Proteins
a. The Structure of Amino Acids
b. Amino Acids and Dipolar Ions
c. Amphoterism of Amino Acids
d. Peptides
e. Bonding in Peptides
12. Lipids
a. Fats and Oils
b. Soap and Detergents</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, effort, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Recommended prerequisites</td><td>General Chemistry I, General Chemistry II</td></tr>
<tr><td>Study and examination requirements and forms of examination</td><td>Students are considered to be competent and pass if they get at least 50% of the maximum final grade. The final grade (NA) is calculated based on the following :

<table><tr><td>Assessment Components</td><td>Percentage Contribution</td></tr><tr><td>Participation</td><td>10%</td></tr><tr><td>Assignment</td><td>20% - 30%</td></tr><tr><td>Mid-semester test</td><td>30%</td></tr><tr><td>Final semester test</td><td>40%</td></tr><tr><td>Total</td><td>100%</td></tr></table>Mid and final semester tests are carried out as an essay exam.</td></tr>
<tr><td>Learning Methods</td><td>Case-Based Teaching Method</td></tr>
<tr><td>Media employed</td><td>white board; power point presentation; and e-learning system</td></tr>
</table>

Reading list	1. Fessenden, R. J., Fessenden, J. S., 1994, *Organic Chemistry*, 5th ed., Brooks Cole. 2. Morrison, R. T. Boyd, R. N., 1983, *Organic Chemistry*, 4th ed., Allyn & Bacon. 3. Solomons, T. W. G. and Fryhle, C. (2007) *Organic Chemistry*, John Wiley & Sons, New York. 4. Clayden J., Greeves N., Warren S., 2012, Organic Chemistry, Oxford University Press