



**Diponegoro University**  
**Faculty of Science and Mathematics**  
**Undergraduate Program Of Chemistry**

Module designation	<b>Organic Chemistry 2 (KO2)</b>
Semester(s) in which the module is taught	3
Person responsible for the module	Dra. Enny Fachriyah, M.Si.
Language	Indonesian
Relation to curriculum	Compulsory <del>/elective/</del> <del>specialisation</del>
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Face to face : 1 x (2 x 50 min); Structured study: 1 x (2 x 60 min); Self study: 1 x (2 x 60 min)
Credit points	2
Required and recommended prerequisites for joining the module	KO1
Module objectives/intended learning outcomes	Students can apply organic reaction mechanisms to predict the products that occur (C3)

Content	<ol style="list-style-type: none"><li>1. Aromaticity,: Benzene compounds, substituted benzene (Part-1)<ul style="list-style-type: none"><li>• Introduction (scope and review)</li><li>• Nomenclature and physical properties</li><li>• Stability and bonding of benzene</li></ul></li><li>2. Aromaticity,: Benzene compounds, substituted benzene (Part-2)<ul style="list-style-type: none"><li>• Substitution reactions: first, second and third of substituted benzene</li></ul></li><li>3. Aromaticity,: Benzene compounds, substituted benzene (Part-3)<ul style="list-style-type: none"><li>• Formation of benzenediazonium salts and their reactivity</li><li>• Halobenzenes and Nucleophilic Substitution Reactions in Aromatics</li></ul></li><li>4. Reactivity of alcohol and ether compounds (Part-1)<ul style="list-style-type: none"><li>• Nomenclature, structure &amp; physical properties of alcohol</li><li>• Alcohol production</li><li>• Alcohol reactivity: Rx substitution, elimination</li></ul></li><li>5. Reactivity of alcohol and ether compounds (Part-2)<ul style="list-style-type: none"><li>• Other reagents for converting alcohols to alkyl halides</li><li>• Rx oxidation of alcohol</li><li>• Rx esterification and inorganic esterification of alcohol</li><li>• Alcohol oxidation</li><li>• Ether generation</li><li>• Alkoxides and phenoxides</li><li>• Ether and epoxide substitution reactions and their use in synthesis</li></ul></li><li>6. Reactivity of amine compounds (Part-1)<ul style="list-style-type: none"><li>• Classification &amp; Nomenclature</li><li>• Amine Production</li></ul></li><li>7. Reactivity of amine compounds (Part-2)<ul style="list-style-type: none"><li>• Amine Reactions</li><li>• Use of Amines in Organic Synthesis</li></ul></li><li>8. Reactivity of aldehydes and ketones (part-1)<ul style="list-style-type: none"><li>• Introduction</li><li>• Nomenclature system</li><li>• Physical properties</li><li>• How to make aldehydes and ketones</li></ul></li><li>9. Reactivity of aldehydes and ketones (part-2)<ul style="list-style-type: none"><li>• Addition reactions that occur in aldehydes and ketones</li><li>• Addition-elimination reactions of aldehydes and ketones</li><li>• Oxidation of aldehydes and ketones</li><li>• Reduction of aldehydes and ketones</li></ul></li><li>10. Reactivity of aldehydes and ketones (part-1)<ul style="list-style-type: none"><li>• Reactivity of hydrogen alpha</li><li>• Tautomerization</li><li>• 1,4 addition to <math>\beta</math> unsaturated carbonyl compounds.</li><li>• Examples of using aldehydes and ketones in synthesis</li></ul></li><li>11. Carboxylic Acid Reactivity</li></ol>
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	<ul style="list-style-type: none"> <li>• Definition, nomenclature and physical properties</li> <li>• Manufacture of carboxylic acids</li> <li>• Effect of structure on acid strength</li> <li>• Reaction of carboxylic acids with bases</li> <li>• Esterification Reaction</li> <li>• Carboxylic acid reduction</li> <li>• Use of carboxylic acids in synthesis</li> </ul> <p>12. Reactivity of carboxylate derivatives</p> <ul style="list-style-type: none"> <li>• Overview of Reactivity of carboxylic acid derivatives</li> <li>• Acid halide reactivity</li> <li>• Reactivity of carboxylic acid anhydrides</li> <li>• Ester and carboxylic acid reactivity</li> <li>• Reactivity of lactone compounds</li> <li>• Amide compounds and their reactivity</li> <li>• Polyesters and polyamides</li> <li>• Nitrile compounds and their reactivity</li> <li>• Examples of using carboxylic acid derivatives in synthesis</li> </ul> <p>13. Enolates and Carbanions (Part-1)</p> <ul style="list-style-type: none"> <li>• Synthesis of Enolates and Carbanions</li> <li>• Aldol Condensation</li> </ul> <p>14. Enolate and Carbanion (Part-2)</p> <ul style="list-style-type: none"> <li>• Cannizaro . reaction</li> <li>• Esters Condensation</li> </ul>
Exams and assessment formats	Mid-Semester Exam and Final Exam
Study and examination requirements	Participatory Activities 20% Project Results 30% Task 10% Quiz 10% Mid-semester 15% Final exams 15%
Reading list	1. Fessenden, Ralph J. 1984, Kimia Organik, Erlangga : Jakarta