



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

Module designation	<b>Organic Chemistry 1 (KO1)</b>
Semester(s) in which the module is taught	2
Person responsible for the module	Dr. Bambang Cahyono
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	KD1
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. BK-1. Review of several study materials that form the basis of Organic Chemistry I<ul style="list-style-type: none"><li>• Why should organic chemistry be studied alone?</li><li>• Atomic orbitals, hybrid orbitals</li><li>• Lewis structure</li><li>• Covalent bond molecular orbitals and molecular formula.</li><li>• Molecular interactions and their impact on physical properties</li><li>• Structure and polarity of organic compounds</li><li>• Acid-base concept</li><li>• Induction and Resonance</li></ul></li><li>2. BK-2. The functional group as Active Center and Nomenclature<ul style="list-style-type: none"><li>• Functional groups</li><li>• IUPAC and Trivial Nomenclature</li></ul></li><li>3. BK-3. Stereochemistry of organic compounds<ul style="list-style-type: none"><li>• Geometrical Isomers in alkenes</li><li>• Geometric Isomers in Cyclic Compounds</li><li>• Straight chain conformation</li><li>• The conformation of a substituted cyclohexane</li><li>• Molecular Chirality Introduction</li><li>• Polarimeter</li><li>• Fischer projection,</li><li>• Configuration assignment (R) and (S)</li><li>• More than one chiral carbon atom</li></ul></li><li>4. BK-4. Substitution and Elimination Reactions in Alkyl Halide Compounds<ul style="list-style-type: none"><li>• Nomenclature of Alkyl Halides and their Physical properties</li><li>• SN-1 reaction</li><li>• SN-2 reaction</li><li>• E-1 reaction</li><li>• E-2 reaction</li><li>• Regioselectivity of elimination reactions</li><li>• Substitution and elimination competition</li></ul></li><li>5. BK-5. radical reaction<ul style="list-style-type: none"><li>• Radical reactions that occur in the chlorination of methane</li><li>• Other free radical reactions (initiators and inhibitors)</li><li>• Organometallic compounds (Gignard reaction)</li></ul></li><li>6. BK-6. Alkenes: Addition Reaction<ul style="list-style-type: none"><li>• Three-dimensional structure of alkenes and alkynes</li><li>• Nomenclature of the two groups</li><li>• Synthesis of alkenes and alkynes</li><li>• General mechanism of electrophilic addition</li><li>• Mechanism of reaction of hydrogen halide to double bond of an alkene<ul style="list-style-type: none"><li>• Regioselectivity of the addition of hydrogen halides to asymmetrical alkenes (Markovnikov's reasoning)</li><li>• The reaction mechanism for the addition of hydrogen halide radicals to alkenes, along with their regioselectivity</li></ul></li></ul></li></ol>
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	<ul style="list-style-type: none"> <li>• The reaction mechanism of H<sub>2</sub>SO<sub>4</sub> and H<sub>2</sub>O adsorption to alkenes, as well as the use of Mercuri acetate for the addition of alkenes</li> <li>• Reaction of borane to alkene addition,</li> <li>• Addition of halogens to alkenes,</li> <li>• Hydrogenation reactions in alkenes</li> <li>• Alkene oxidation reaction</li> <li>• 1,2, and 1,4 . addition reactions</li> <li>• Diels Alder reaction</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