



Diponegoro University
Faculty of Science and Mathematics
Undergraduate Program Of Chemistry

Module designation	Stereochemistry (STR)
Semester(s) in which the module is taught	3
Person responsible for the module	Dr. Parsaoran Siahaan, MS Dr. Dwi Hudyanti, MSc. Tri Windarti, M.Si
Language	Indonesian
Relation to curriculum	Compulsory / elective / specialisation
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	Graduate Learning Outcomes (GLO) 1. S9 Demonstrates an attitude of being responsible for work in his field of expertise independently. 2. KU1 Able to apply logical, critical, systematic, and innovative thinking in the development or implementation of science and technology that pays attention to and uses humanities values by their field of expertise. 3. KU2 Able to demonstrate independent, quality, and measurable performance. 4. KK1 Able to produce appropriate conclusions based on the identification, analysis, isolation, transformation, and synthesis of chemicals that have been carried out. 5. KK2 Able to solve science and technology problems in general and straightforward chemical fields such as identification, analysis, isolation, transformation, and synthesis of micro-molecules through the application of knowledge of structure, properties, kinetics, and energetics of molecules and chemical systems, with analytical methods and synthesis in specific chemical fields, as well as the application of relevant technologies. 6. KK3 Able to analyze several alternative solutions in identification, analysis, isolation, transformation, and synthesis of available chemicals and present analysis conclusions for appropriate decision making. 7. PP1 Mastering the theoretical concepts of structure, properties, changes, kinetics, and energetics of molecules and chemical systems, identification, separation, characterization, transformation, synthesis of micromolecular chemicals, and their application. Course Learning Outcomes (CLO) 1. M1 can explain the Role and Dynamics of Pesticides 2. M2 can explain the classification of pesticides based on how the pesticide enters/works, based on the target organism, based on the level of toxicity 3. M3 can explain the analysis and handling of the dangers/impacts of using pesticides 4. M4 can describe the use and formulation of pesticides 5. M5 is capable of exploring and designing materials for pesticides 6. M6 can determine the qualitative and quantitative tests of pesticides 7. M7 Able to explain and describe Enantioselective reactions with Catalysts of Organic Compounds and Organo-metallic Compounds.
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Content	1. Structure of Organic Compounds. Introduction sp, sp^2 and sp^3 Hybrid Orbitals Sigma and phi bonds Structural isomers 2. Fisher's Projection: An Introduction. The basic principle of describing the structure of a molecule is with Fisher's projection. Fisher projection of monosaccharides and their derivatives. 3. Newmann's projection. Introduction The depiction of groups around the sigma bonds of ethane and butane compounds. Easel Formula. Form conformation and energy level. Transformation of Fischer projection to Newmann and vice versa. 4. Stereochemical Aspects: Structural Isomers Geometric Isomers (Cis and Trans). Molecular Chiral Conformation 5. Static Stereochemistry Molecular Chirality Cahn-Ingold-Prelog Rule Absolute Configuration 6. Number of Stereoisomers: Cyclic Chain Straight Chain 7. Identical Stereoisomer Relationship Meso Enantiomer Diastereoisomer 8. Dissymmetrical Compounds 9. Determination of the Absolute Configuration For Dissymmetric Compounds 10. Ring Compound Joined Ring Compound With Bridge 11. Dynamic Stereochemistry of SN_2, SN_1, SN_I substitution reactions, addition reactions: Alder diels, bromination, hydroxylation 12. Dynamic Stereochemistry of Elimination Reaction: Dehydration Hydrochlorination Rearrangement Reaction 13. Enantioselective Reaction with Organic Compound Catalyst 14. Enantioselective Reactions with Organo-metal Compound Catalysts
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. Juaristi, E., 1991, Introduction To Stereochemistry And Conformational Analysis, John Wiley and Sons, INC., New York. 2. Fessenden And Fessenden., ab Pudjaatmaka A.H., 1992, Kimia Organik, Jilid 1, Edisi Ke-3, Erlangga, Jakarta.