UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF CHEMISTRY
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Bachelor of Science in Chemistry **MODULE HANDBOOK**

Module name:	Organic Chemistry Synthesis
Module level, if applicable:	Undergraduate
Code:	KMA 6231
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	7th
Module coordinator:	C. Budimarwanti, M.Si
Lecturer(s):	C. Budimarwanti, M.Si
Language:	Bahasa Indonesia and English
Classification within the curriculum:	Elective Subject
Teaching format / class hours per week during the semester:	100 minutes lectures, 120 structured activities and 120 individual study per week
Workload:	Total workload is 90,67 hours per semester which consists of 100 minutes lectures, 120 structured activities and 120 individual study per week for 16 weeks
Credit points:	2 SKS (3 ECTS)
Prerequisites course(s):	-
Course Outcomes	After taking this course, the students are expected to be able to: CO1: Understanding aspects of the synthesis of organic compounds in chemical research CO2: designing the synthesis of an organic compound through the disconnection approach, determining the starting material used, the steps of the reaction and the route of reaction taken, and the reagents used CO3: presenting the results of the synthesis design and mentioned the chemical research innovations that can be done
Content:	This lecture contains a discussion of concepts about: the principles of the disconnection approach; basic principles of aromatic compound synthesis; sequence of steps in the synthesis of organic compounds; disconnection of one C-X group: derivative of RCO carbonyl compounds. X derivatives of carboxylic acids, alcoholic compounds, alkyl halides, sulfides, ethers; chemoselectivity; disconnection of two C-X groups: 1,1-difunctional compound, 1,2-difunctional compound, 1,3-difunctional compound; amine synthesis, protective group. Nucleophilic addition to the double bond. • Aspects / Principles of the discounting approach • The basic principles of synthesis of aromatic compounds

<table>
<tr><td></td><td>

The sequence of steps in the synthesis of aromatic compound
Termination of 1 C-X Cluster
Chemoselectivity
Termination of 2 C-X Clusters
Synthesis of Amines
Protective Clusters

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<tr><td>Study / exam achievements:</td><td>Attitude assessment is carried out at each meeting by observation and/or self-assessment techniques using the assumption that basically every student has a good attitude. The student is marked very good or not good attitude if they show it significantly compared to other students in general. The result of attitude assessment is not taken into account in the final grades, but as one of the requirements to pass the course. Students will pass from this course if at least have a good attitude. The final mark will be weight as follow:
<table>
<tr><th>No</th><th>CO</th><th>Assessment Object</th><th>Assessment Technique</th><th>Weight</th></tr>
<tr><td>1</td><td>CO1,
CO2,
CO3,</td><td>a. Assignments
b. Activity
c. Final Exam
d. Midterm Exam</td><td>Presentation / written test</td><td>20%
20%
30%
30%</td></tr>
<tr><td colspan="3"></td><td>Total</td><td>100%</td></tr>
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</td></tr>
<tr><td>Forms of media:</td><td>Handout, Board, LCD Projector, Laptop/Computer, Module</td></tr>
<tr><td>References:</td><td>

Michael Pirrung, 2017, Handbook of Synthetic Organic Chemistry, 2nd Ed, United Kingdom: Elsevier Inc.
Seb Caille, Sheng Cui, Margaret M. Faul, Steven M. Mennen, Jason S. Tedrow, and Shawn D. Walker, 2019, Molecular Complexity as a Driver for Chemical Process Innovation in the Pharmaceutical Industry. The Journal of Organic Chemistry, 84, 8, 4583-4603.
Florian W. Friese and Armido Studer, 2019, New avenues for C–B bond formation via radical intermediates. Chem. Sci., 10, 8503-8518.
McMurry, John., Organic Chemistry, ninth edition, Cengage Learning, 2016
Bruice, P.Y., Organic Chemistry, fifth edition, Pearson Prentice Hall, 2007

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PLO and CO mapping

	PLO									
	Attitude	General Skill		Knowledge				Specific Skill		
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1					√					
CO2							√			
CO3									√	