

SYLLABUS:

Date / Revision	23 May 2015 / 02 May 2017 / PP
Faculty	Life Sciences (LS)
Study Programs	Biomedical Engineering (BME), Chemical Engineering (CHE), Food Technology (FTE)

SUBJECT: Organic Chemistry

1 Basic Information

1.01	Subject Name	Organic Chemistry
1.02	Semester	2
1.03	Level	1
1.04	SKS	3
1.05	Mandatory / Curriculum	D-02
1.06	Subject Code	ORCH
1.07	Subject Code	BME-FTE-CHE-D-LS-117
1.08	Year	2017 (7)
1.09	Quality Control	Final Test, OFSE, see evaluation
1.10	Limitations	Min 12 and Max 32 students in one class
1.11	Combined with	All Faculty of Life Sciences Students
1.12	Pre-requisite	Chemistry
1.13	Responsible	Dr. Tutun Nugraha
1.14	Revision	15-05-2017/pp

2 Description of Subject

This course will provide students with an understanding of the properties, structure, nomenclature, conformation, and reaction of organic compounds. The connectivity between structures and reactivity will be exemplified.

3 Objectives

The Organic Chemistry course will complement and deepen the knowledge of students in the field of chemistry specifically that which is related to organic compounds. Throughout the course, the properties, structures and reactivity organic compounds are discussed. The course will be further strengthened by organic chemistry laboratory work which will add to the skills of the students in practical chemistry.

4 Competency

After having the course, students are expected to:

- Understand and be able to explain the structures, properties and reactions of many different types organic compounds.
- Use critical thinking and logic in the solution of problems
- Apply learned organic chemistry skills to new situations
- Demonstrate an understanding of chemistry

5 Learning Approach / Methodology

- Lectures/ Class contact (time-tabled) supplemented with interactive questions and answers to build the projects;
- Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing;
- Student Study Effort: homework/assignment; preparation for test/quizzes/ examination.
- Writing assignments/presentations

6 Evaluation

5.1	Absence maximum	25%
5.2	Participation in Discussion	-
5.3	Homework / Classwork/Report	10
5.4	Presentation /Simulation	-
5.5	Daily Quiz	30
5.6	Final Examination	60 Points
	Total	100 Points

7 Text Book and Reference

1	<p>Main Text Book: Organic Chemistry, 11th Edition International Student Version T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder, Wiley ISBN: 978-1-118-32379-3</p>
2	<p>Supplemental Textbooks: Organic Chemistry, L. G. Wade JR, 8th Edition, ISBN-10: 0-321-81139-9, Pearson, 2013 Chemistry, 6th Edition, International Student dan Lecture Version James E. Brady, Neil D. Jespersen, Alison Hyslop, John Wiley & Sons</p>

8 Content / Topics of Lecture

Week	Content/ Topics of Lecturing	Text Book Chapter	Remark
1	Introduction <ul style="list-style-type: none"> Structure and properties of organic molecules Reactivity and functional groups 	Lecture, Group discussion, tutorial for exercise	3 × 50 min
2,3,4	Hydrocarbon Compound; nomenclature, structure, properties, conformation, reaction and uses and sources <ul style="list-style-type: none"> Introduction Nomenclature of Alkane, Alkene, Alkyne Physical properties of Alkane, Alkene, Alkyne Conformation of Alkane Synthesis of Alkene, Alkyne Reaction of Alkane, Alkene, Alkyne Uses and sources of Alkane, Alkene, Alkyne 	Lecture, Group discussion, tutorial for exercise	3 x 3 × 50 min
5,6	Stereochemistry, Fisher Projection, Haworth, Absolute and Relative Configuration <ul style="list-style-type: none"> Stereochemistry Fisher Projection, Haworth Absolute and Relative Configuration 	Lecture, Group discussion, tutorial for exercise	2 x 3 × 50 min
7	Alcohol, ether, aldehyde, ketone, Aromatic compound, carboxylic acid and its derivatives (part 1) <ul style="list-style-type: none"> Introduction Nomenclature of Alcohol and Ether Structure and Synthesis of Alcohol Reaction of Alcohol and Ether Nomenclature of Aldehyde and Ketone Structure and Synthesis of Aldehyde and Ketone Reaction of Aldehyde and Ketone Nomenclature of Carboxylic Acid Structure Synthesis of Carboxylic Acid and Esther Derivatives of Carboxylic Acid 	Lecture, Group discussion, tutorial for exercise	1 x 3 × 50 min
8	Midterm Break		
9,10	Alcohol, ether, aldehyde, ketone, Aromatic compound, carboxylic acid and its derivatives (part 2) <ul style="list-style-type: none"> Introduction Nomenclature of Alcohol and Ether Structure and Synthesis of Alcohol Reaction of Alcohol and Ether Nomenclature of Aldehyde and Ketone Structure and Synthesis of Aldehyde and Ketone Reaction of Aldehyde and Ketone Nomenclature of Carboxylic Acid Structure Synthesis of Carboxylic Acid and Esther Derivatives of Carboxylic Acid 	Lecture, Group discussion, tutorial for exercise	2 x 3 × 50 min

11, 12	<p>Carbohydrate and Nucleic Acid:</p> <ul style="list-style-type: none"> • Introduction • Carbohydrate Classification • Structure and properties of Carbohydrate • Reaction of Carbohydrate • Nucleic Acid; structure of RNA and DNA, additional function of nucleotides 	Lecture, Group discussion, tutorial for exercise	2 x 3 x 50 min
13, 14	<p>Amino Acid, Peptides, Protein:</p> <p>Introduction Structure and Synthesis Properties of Amino acid Reaction of Amino acid Structure and nomenclature of peptides and protein Classification of Protein Levels of protein structure</p>	Lecture, Group discussion, tutorial for exercise	2 x 3 x 50 min
15	<p>Lipid</p> <p>Introduction Classification Structure, nomenclature and properties</p>	Lecture, Group discussion, tutorial for exercise	3 x 50 min
16, 17	Final Examination		