

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 Laboratory

1 Basic Information

1.01	Subject Name	Organic Chemistry Laboratory
1.02	Semester	3
1.03	Level	1
1.04	SKS	1
1.05	Mandatory / Curriculum	D-02
1.06	Subject Code	ORCL
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, Chemistry Laboratory, Organic Chemistry
1.13	Responsible	Dr. Tutun Nugraha
1.14	Revision	15-05-2017/pp

2 Description of Subject

This course will provide students opportunity to further strengthen and deepen their knowledge in organic chemistry while adding to their skill in chemistry laboratory practice and equipments. The focus will be similar to the material given in class including materials on the properties, structures, nomenclatures, conformation, and reaction of organic compounds.

3 Objectives

The Organic Chemistry Laboratory course will complement and deepen the knowledge of students in the field of organic chemistry. In the lab they will be introduced to various methods and techniques as well as equipment typical to the field of organic chemistry. This will provide further foundations for the higher level lab courses as well as prepare students for their research work in the lab in the future.

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	30
5.4	Presentation /Simulation	-
5.5	Daily Quiz	10
5.6	Final Examination	60 Points
	Total	100 Points

7 Text Book and Reference

1	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
2	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

8 Content / Topics of Lecture

Week	Content/ Topics of Lecturing	Text Book Chapter	Remark
1	General experiment rules in Laboratory <ul style="list-style-type: none"> • Introduction • Safety procedure in organic chemistry laboratory, material safety data sheet, personal protective equipment, experiment schedule • Discussion on flammability, fire safety, flash point, autoignition point, toxicity • Briefing on prelab and postlab 	Lecture, Group discussion, tutorial for exercise	3 × 50 min
2,3	Software in organic chemistry <ul style="list-style-type: none"> • Application of ACD/chemsketch • Drawing of simple and complex molecular structures and functional group using appropriate software, naming compounds in accordance with convention • Predicting the mechanisms of reactions in organic compounds based on structural information and drawing these mechanisms of reactions using the software 	Lecture, Group discussion, tutorial for exercise, lab work	2 x 3 × 50 min
4,5	Recrystallization organic compounds <ul style="list-style-type: none"> • Introduction to recrystallization phenomena which typically is used in the industry. • The observation include its dissolution and recrystallization process, its separation, observation of the acquired crystal by using a microscope, and observe the melting point of purified compound and compare its melting point with the standard 	Lecture, Group discussion, tutorial for exercise, lab work	2 x 3 × 50 min
6,7	Identification of alcohol <ul style="list-style-type: none"> • Introduction of primary alcohol, secondary alcohol, and tertiary alcohol • Introduction Solubility and Lucas reagent to difference primary alcohol, secondary alcohol, and tertiary alcohol • Introduction Iodoform reaction 	Lecture, Group discussion, tutorial for exercise, lab work	2 x 3 × 50 min

8	Midterm break		
9, 10	Simple distillation and boiling point determination Introduction of simple distillation of organic compound solution and its boiling point determination	Lecture, Group discussion, tutorial for exercise, lab work	2 x 3 x 50 min
11, 12	Lipid, oils, and soaps Introduction to process involving lipids, oil, soap, and reflux technique (reactive reflux Process in saponification process) The lipid will be utilized in the making of soap for lab scale	Lecture, Group discussion, tutorial for exercise, lab work	2 x 3 x 50 min
13, 14	Extraction of essential oil from orange peel This will be the more applied part of the module relevant to practices in flavour and fragrance industries, the work involve the extraction of essential oil from natural sources using appropriate solvent. The source of the essential oil is orange peel. The experiments also include extraction technique for organic compound and simple characterization of the yielded results	Lecture, Group discussion, tutorial for exercise, lab work	2 x 3 x 50 min
15	Review/Evaluation		1 x 3 x 50 min
16, 17	Final Examination		