	Universitas Negeri Surabaya Faculty of Mathematics and Natural Sciences Undergraduate Chemistry Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Organic Chemistry Practicum	4720102158	Compulsory Study Program Subjects	T=2	P=0	ECTS=3.18	3	July 18, 2023

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Dr. First Ambar Wati, S.Si.	Prof. Dr. Suyatno, M.Si	Dr. Amaria, M.Si.

Learning model	**Project Based Learning**	
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**	
	Program Objectives (PO)	
	PO - 1	Skilled in carrying out purification, identifying functional groups, determining physical properties, synthesizing simple organic compounds, and isolating biological organic compounds
	PO - 2	Mastering the basic concepts of purification, identification of functional groups, determination of physical properties, synthesis of simple organic compounds, and isolation of biological organic compounds
	PO - 3	Make decisions based on the results of the purification process, identification of functional groups, determination of physical properties, synthesis of simple organic compounds, and isolation of biological organic compounds
	PO - 4	Have a responsible attitude in identifying, synthesizing and isolating organic compounds

PLO-PO Matrix

P.O
PO-1
PO-2
PO-3
PO-4

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PO-1																
PO-2																
PO-3																
PO-4																✔

Short Course Description	Providing skills regarding purification, identification of functional groups, determination of physical properties, synthesis of simple organic compounds, and isolation of biological organic compounds. Lectures are carried out using practicum, discussion, presentation and project methods.
References	**Main :**

1. Anwar, C., Purnomo, B., Pranowo, H.D., Wahyuningsih, T.D. (1996).Pengantar Praktikum Kimia Organik.Jakarta: Direktorat Jenderal Pendidikan Tinggi
2. Carey, F.A. (2000).Organic Chemistry.4rd Ed. New York: McGraw-Hill Companies, Inc.
3. Casey, M, Leonard, J, Lygo, B, 1990.Advanced Practical Organic Chemistry.New York: Chapman and Hall.
4. Fessenden,R.J. dan Fessenden, J.S. (1998).KimiaOrganik. Jilid 1. Penerjemah AH Pudjaatmaka. Jakarta: Erlangga
5. Fessenden,R.J. dan Fessenden, J.S. (1998).KimiaOrganik. Jilid 2. Penerjemah AH Pudjaatmaka. Jakarta: Erlangga
6. Furnis, B.S., Hannaford, A.J., Smith, P.W.G., Tatchell,A.R.. 1989.Vogel 19sTextbook of Practical Organic Chemistry.5th ed. New York:Longman Scientific & Technical
7. Hart,H., Craine, L.E. & Hart, D.J. (2003).Kimia Organik. SuatuKuliah Singkat. Edisi keXI. Penerjemah: Achmadi, S.S., Jakarta:Erlangga
8. Solomon, T.W.G. & Fryhle, C.B. (2011).Organic Chemistry.New York: John Wiley& Sons, Inc.
9. Tim Kimia Organik, 2021.Buku Petunjuk Praktikum Kimia Organik, tim Prak Kimia Organik

Supporters:

1. Stéphane Caron (2020).Practical Synthetic Organic Chemistry.New York: John Wiley& Sons, Inc.
2. JOHN LEONARD, BARRY LYGO,GARRY PROCTER (2013). AdvAnced PrActicAl OrgAnic chemistry. CRC Press. Taylor and Francis

Supporting lecturer

Prof. Dr. Suyatno, M.Si.
Prof. Dr. Tukiran, M.Si.
Dr. Mitarlis, S.Pd., M.Si.
Dr.Hj. Rinaningsih, S.Pd., M.Pd.
Dr. Ratih Dewi Saputri, S.Si., M.Si.
Dr. Andika Pramudya Wardana, S.Si., M.Si.
Nurina Rizka Ramadhania, S.Si. M.Si.
Dr. First Ambar Wati, S.Si.

Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)
		Indicator	Criteria & Form	Offline (*offline*)	Online (*online*)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	1. Understand the Organic Chemistry Practical lecture system 2. Understand experimental techniques and design an experiment	1. Explain the RPS, lecture system, assessment system, determination of graduation, and organic chemistry practicum lecture rules 2. Have basic skills in working in a laboratory	**Criteria:** 1. Participation is assessed during lectures and practicums, carried out through observations 2. Structured assignment assessments and practicum reports are averaged, then given weights **Form of Assessment** : Participatory Activities	6x50 presentations, discussions and demonstrations	6x50 presentations, discussions and demonstrations	**Material:** 1. Basic principles of distillation, sublimation and solvent extraction 2. Basic skills for working in the laboratory **Reference:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Handbook, Organic Chemistry Practical Team* **Material:** Basic principles of distillation, sublimation and solvent extraction 2. Basic skills for working in a laboratory **References:** *JOHN LEONARD, BARRY LYGO, GARRY PROCTER (2013). AdvAnced PrActicAl OrgAnic chemistry. CRC Press. Taylor and Francis*	2%

2	Able to compile and discuss the results of an experimental design that will be carried out based on the organic chemistry practical manual	Explain the results of the design of an experiment that will be carried out based on the organic chemistry practical manual	**Criteria:** 1. Participation is assessed during lectures and practicums, carried out through observations 2. Structured assignment assessments and practical reports are averaged **Form of Assessment** : Participatory Activities, Portfolio Assessment	Presentation, discussion, questions and answers 6 X 50		**Material:** recrystallization and determination of melting point **References:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Handbook, Organic Chemistry Practical Team* **Material:** Recrystallization method and determination of melting point **References:** *Stéphane Caron (2020). Practical Synthetic Organic Chemistry. New York: John Wiley& Sons, Inc.*	3%
3	Able to compile and discuss the results of an experimental design that will be carried out based on the organic chemistry practical manual	Explain the results of the design of an experiment that will be carried out based on the organic chemistry practical manual	**Criteria:** 1. Participation is assessed during lectures and practicums, carried out through observations 2. Structured assignment assessments and practical reports are averaged **Form of Assessment** : Participatory Activities, Portfolio Assessment	Presentation, discussion, questions and answers 6 X 50		**Material:** recrystallization and determination of melting point **References:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Handbook, Organic Chemistry Practical Team* **Material:** Recrystallization method and determination of melting point **References:** *Stéphane Caron (2020). Practical Synthetic Organic Chemistry. New York: John Wiley& Sons, Inc.*	3%
4	Able to identify alcohol, phenol and carboxylic acid compounds	Skilled in identifying alcohol and phenolic compounds and carboxylic acids	**Criteria:** 1. Participation is assessed during lectures and practicums, carried out through observations 2. Structured assignment assessments and practicum reports are averaged, then given weights **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment, Practical Assessment	Practicum, questions and answers, discussions, preparation of 6 X 50 practical reports		**Material:** Identification of alcohol and phenol compounds **References:** *Carey, FA (2000).Organic Chemistry.4rd Ed. New York: McGraw-Hill Companies, Inc.* **Material:** Identification of alcohol, phenol and carboxylic acid compounds. **Reference:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Handbook, Organic Chemistry Practical Team*	5%

5	Able to identify aldehyde and ketone compounds	Skilled in identifying aldehyde and ketone compounds	**Criteria:** 1. Participation is assessed during lectures and practicums, carried out through observations 2. Structured assignment assessments and practicum reports are averaged, then given weights **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment, Practical Assessment	Practicum, discussion, question and answer, and assignment for making a 6 X 50 practicum report		**Material:** Identification of aldehydes and ketones **Reference:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Handbook, Organic Chemistry Practical Team* **Material:** Identification of aldehydes and ketones **References:** *JOHN LEONARD, BARRY LYGO, GARRY PROCTER (2013). AdvAnced PrActicAl OrgAnic chemistry. CRC Press. Taylor and Francis*	5%
6	Able to isolate ginger oil	Skilled in isolating ginger oil using Soxhlet	**Criteria:** 1. Participation is assessed during lectures and practicums, carried out through observations 2. Structured assignment assessments and practical reports are averaged **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment, Practical Assessment	Practicum, discussion, question and answer, and assignment for making a 6 X 50 report		**Material:** identifying types of carbohydrates **Reference:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Handbook, Organic Chemistry Practical Team* **Material:** identifying types of carbohydrates **References:** *JOHN LEONARD, BARRY LYGO, GARRY PROCTER (2013). AdvAnced PrActicAl OrgAnic chemistry. CRC Press. Taylor and Francis*	5%

7	Able to identify fats and make soap	Skilled in identifying fats and making soap	**Criteria:** 1. Participation is assessed during lectures and practicums, carried out through observations 2. Structured assignment assessments and practical reports are averaged **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment, Practical Assessment	Practicum, discussion, question and answer and assignment for making a 6 X 50 report		**Material:** fat identification and soap making **Reference:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Manual, Organic Chemistry Practical Team* **Material:** principles of lipids and soap **References:** *JOHN LEONARD, BARRY LYGO, GARRY PROCTER (2013). AdvAnced PrActicAl OrgAnic chemistry. CRC Press. Taylor and Francis*	5%
8	Mid-semester exam to measure final ability achievement of TM 1 to 7	Mid-term exam to measure achievement of TM 1 to 7 indicators	**Criteria:** Attached to the UTS question assessment rubric **Form of Assessment** : Test	Midterm Exam 6 X 50			9%
9	1. Able to synthesize n-butyl acetate 2. Able to synthesize aspirin 3. Capable of recrystallization	1. Skilled in synthesizing n-butyl acetate using reflux 2. Skilled in synthesizing aspirin 3. Skilled in recrystallizing synthetic products	**Criteria:** 1. Participation is assessed during lectures and practicums, carried out through observations 2. Structured assignment assessments and practical reports are averaged **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment, Practical Assessment	Practicum, discussion, question and answer and assignment for making a 6 X 50 report		**Material:** butyl acetate synthesis **Library:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Handbook, Organic Chemistry Practical Team* **Material:** butyl acetate synthesis **Bibliography:** *Stéphane Caron (2020).Practical Synthetic Organic Chemistry. New York: John Wiley& Sons, Inc.*	5%
10	able to identify types of carbohydrates	Skilled in identifying types of carbohydrates	**Criteria:** 1. Participation is assessed during lectures and practicums, carried out through observations 2. Structured assignment assessments and practical reports are averaged **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Practical Assessment	Practicum, discussion, question and answer, and assignment for making a 6 X 50 report		**Material:** aspirin synthesis **Reference:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Handbook, Organic Chemistry Practical Team* **Material:** aspirin synthesis **Bibliography:** *Stéphane Caron (2020).Practical Synthetic Organic Chemistry. New York: John Wiley& Sons, Inc.*	5%

11	Able to identify proteins	Skilled at identifying proteins	**Criteria:** 1. Participation is assessed during lectures and practicums, carried out through observations 2. Structured assignment assessments and practical reports are averaged **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Practical Assessment	Practicum, discussion, question and answer, and assignment for making a 6 X 50 report		**Material:** protein analysis **Reference:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Handbook, Organic Chemistry Practical Team*	5%
12	Able to do a project on making herbal drinks	Skilled in making herbal drinks	**Criteria:** Participation is assessed during lectures and practicums, carried out through observations **Form of Assessment** : Project Results Assessment / Product Assessment	project based learning 6 X 50		**Material:** ginger oil isolation **Reference:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Manual, Organic Chemistry Practical Team* **Material:** ginger oil isolation **References:** *JOHN LEONARD, BARRY LYGO, GARRY PROCTER (2013). AdvAnced PrActicAl OrgAnic chemistry. CRC Press. Taylor and Francis*	9%
13	Able to do a project on making herbal drinks	Skilled in making herbal drinks	**Criteria:** Participation is assessed during lectures and practicums, carried out through observations **Form of Assessment** : Project Results Assessment / Product Assessment	project based learning 6 X 50		**Material:** ginger oil isolation **Reference:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Manual, Organic Chemistry Practical Team* **Material:** ginger oil isolation **References:** *JOHN LEONARD, BARRY LYGO, GARRY PROCTER (2013). AdvAnced PrActicAl OrgAnic chemistry. CRC Press. Taylor and Francis*	9%

14	Able to do a project on making herbal drinks	Skilled in making herbal drinks	**Criteria:** Participation is assessed during lectures and practicums, carried out through observations **Form of Assessment** : Project Results Assessment / Product Assessment	project based learning 6 X 50		**Material:** ginger oil isolation **Reference:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Manual, Organic Chemistry Practical Team* **Material:** ginger oil isolation **References:** *JOHN LEONARD, BARRY LYGO, GARRY PROCTER (2013). AdvAnced PrActicAl OrgAnic chemistry. CRC Press. Taylor and Francis*	10%
15	Able to report practical results	Skilled in presenting practicum results reports	**Criteria:** 1. Participation is assessed during lectures and practicums, carried out through observations 2. Structured assignment assessments and practicum reports are averaged, then given weights **Form of Assessment** : Project Results Assessment / Product Assessment	presentation, and questions and answers 6 X 50		**Material:** practicum results report **Library:** *Organic Chemistry Team, 2021. Organic Chemistry Practical Handbook, Organic Chemistry Practical Team* **Material:** practicum report. **References:** *Solomon, TWG & Fryhle, CB (2011). Organic Chemistry. New York: John Wiley & Sons, Inc.* **Material:** practicum results report **References:** *JOHN LEONARD, BARRY LYGO, GARRY PROCTER (2013). AdvAnced PrActicAl OrgAnic chemistry. CRC Press. Taylor and Francis*	5%

16	The final semester exam is to measure the achievement of students' final abilities in carrying out organic chemistry practicum	The final semester exam is to measure the achievement of indicators of students' ability to carry out organic chemistry practicum	**Criteria:** Attached to the rubric is an observation sheet for organic chemistry practicum performance **Form of Assessment** : Project Results Assessment / Product Assessment, Test	Organic chemistry practical exam 2 X 50		**Material:** organic chemistry practical material. **Reference:** *Carey, FA (2000). Organic Chemistry. 4th Ed. New York: McGraw-Hill Companies, Inc.* **Material:** organic chemistry practical material. **Reference:** *Solomon, TWG & Fryhle, CB (2011). Organic Chemistry. New York: John Wiley & Sons, Inc.* **Material:** organic chemistry practical material **Reader:** *Stéphane Caron (2020). Practical Synthetic Organic Chemistry. New York: John Wiley& Sons, Inc.* **Material:** organic chemistry practical material **References:** *JOHN LEONARD, BARRY LYGO, GARRY PROCTER (2013). AdvAnced PrActicAl OrgAnic chemistry. CRC Press. Taylor and Francis*	15%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	14.59%
2.	Project Results Assessment / Product Assessment	50.09%
3.	Portfolio Assessment	9.25%
4.	Practical Assessment	9.59%
5.	Test	16.5%
		100%

Notes

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased.

Criteria can be quantitative or qualitative.

7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.