

COURSE PORTFOLIO

Determination of molecular structure

Academic Year – 2020/2021

- PLO 1 Able to apply religious attitudes, demonstrate an internalizing academic and human values
- PLO 2 Able to demonstrate excellence, honesty, competitiveness, leadership, and possessing social sensitivity to society and the environment
- PLO 3 Able to demonstrate performance independently or as part of a team professionally and measurably by applying interdisciplinary knowledge and skill, critical, and creative thinking in the context of being a lifelong learner
- PLO 4 Able to communicate ideas, scientific research results clearly in oral or written format to scientists and the wider community
- PLO 5 Able to Integrating mathematical and basic concepts of science to solve problems in chemistry
- PLO 6 Able to master the knowledge of chemistry (organic chemistry, inorganic, analytical, physical, and biochemical)
- PLO 7 Able to understand concepts and applications in the field of biosciences and materials chemistry to solve problems in the field of chemistry and its applications
- PLO 8 Able to understand operational knowledge about functions, how to operate chemical instruments, and analysis of data and information from these instruments
- PLO 9 Able to understand work safety, ethics, environmental issues, and policies related to the chemical field
- PLO 10 Able to carry out laboratory and research work by paying attention to the safety and security of laboratory work and applying responsible scientific behavior.
- PLO 11 Able to obtain, process, interpret, and evaluate scientific data and produce conclusions by considering scientific and technological aspects and scientific ethics.
- PLO 12 Able to solve science and technology problems in chemistry independently based on relevant scientific methodologies and present it as a scientific work.

Course Outcome (CO):

CO 1.	Identify the types of functional groups by organic molecules.
CO 2.	Identify the molecular weight and molecular fragments of organic compounds.
CO 3.	Identify and determine the position of the hydrogen atom (proton) and its environment in the molecule.
CO 4.	Identify and determine the position of the carbon atom and its environment in the molecule.
CO 5.	Identify the position and correlation of hydrogen and carbon atoms in a molecule.

CO 6.	Determine the molecular structure of organic compounds.
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Lecturers:**1. Team of Organic Chemistry Lecturers****Mapping Course Learning Outcome (CO) and Program Learning Outcome (PLO)**

Program Learning Outcome Course Outcome	PLO 6. Able to master the knowledge of chemistry (organic chemistry, inorganic, analytical, physical, and biochemical)	PLO 8. Able to understand operational knowledge about functions, how to operate chemical instruments, and analysis of data and information from these instruments	PLO 11. Able to obtain, process, interpret, and evaluate scientific data and produce conclusions by considering scientific and technological aspects and scientific ethics
CO 1. Identify the types of functional groups by organic molecules.	• (Assignment)		
CO 2. Identify the molecular weight and molecular fragments of organic compounds.	• (Assignment)		
CO 3. Identify and determine the position of the hydrogen atom (proton) and its environment in the molecule.	• (Assignment)		
CO 4. Identify and determine the position of the carbon atom and its environment in the molecule.		• (Midterm Exam)	• (Midterm Exam)
CO 5. Identify the position and correlation of hydrogen and carbon atoms in a molecule.	• (Assignment)		
CO 6. Determine the molecular structure of organic compounds.			• (Final Exam)

Forms of Assessment

Group/Individuals Assignment	= 20%
Midterm examination	= 40%
Final examination	= 40%
Total	= 100%

	PLO 6	PLO 8	PLO 11
Group/Individuals Assignment	10%	80%	10%
Midterm examination	15%	70%	15%
Final examination	15%	70%	15%

Outcomes Assessment

No	Name	Assignment	Midterm Exam	Final Exam	Final Grade and Score	
1	A	78	76	80	77,60	B+
2	B	82	75	80	78,80	B+
3	C	82	80	80	80,80	B+
4	D	76	78	78	77,20	B+
5	E	86	82	84	84,00	A-
6	F	70	78	74	74,00	B
7	G	86	74	78	79,60	B+
8	H	88	86	86	86,80	A
9	I	84	78	80	80,80	B+
10	J	78	74	76	76,00	B+
11	K	84	82	84	83,20	A-

12	L	88	86	86	86,80	A
13	M	78	88	84	83,20	A-
14	N	86	86	88	86,40	A
15	O	82	84	86	83,60	A-
16	P	78	86	80	81,60	A-
17	Q	78	78	75	77,40	B+
18	R	76	82	78	78,80	B+
19	S	81	87	8	68,80	B-
20	T	87	90	86	88,00	A
21	U	81	85	82	82,80	A-
22	V	78	86	82	82,00	A-
23	W	77	86	82	81,60	A-
24	X	78	78	75	77,40	B+
25	Y	78	76	75	76,60	B+
26	Z	76	84	78	79,60	B+
27	AA	72	76	78	74,80	B
28	AB	71	78	76	74,80	B
29	AC	74	75	77	75,00	B
30	AD	86	80	82	82,80	A-
31	AF	82	84	82	82,80	A-

Calculation of Weight per PLO

Form of Assessment	Weight	Weight per PLO			Total	Total Weight		
		PLO 6	PLO 8	PLO 11		PLO 6	PLO 8	PLO 11
Assignment	0,40	0,10	0,80	0,10	1,00	0,04	0,32	0,04
Midterm Exam	0,40	0,15	0,70	0,15	1,00	0,06	0,28	0,06
Final Exam	0,20	0,15	0,70	0,15	1,00	0,03	0,14	0,03

Total	1,00	0,25	1,50	0,25	1,00	0,13	0,74	0,13
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Example of PLO Calculation

No	Name	Assignment	Midterm Exam	Final Exam	Final Score and Grade
1	A	78	76	80	77,60 B+

No	Name	PLO 6	PLO 8	PLO 11
1	A	$((78*0.04) + (76*0.06) + (80*0.03)) / 0.13 = 77.54$	$((78*0.32) + (76*0.28) + (80*0.14)) / 0.74 = 77,62$	$((78*0.04) + (76*0.06) + (80*0.03)) / 0.13 = 77.5$

PLO Assessment Rubric

PLO	Performance Criteria	Excellent (E)	Good (G)	Satisfy (S)	Fail (F)
6	Master the knowledge of chemistry (organic chemistry, inorganic, analytical, physical, and biochemical)	Students are able to master the knowledge of chemistry (organic chemistry, inorganic, analytical, physical, and biochemical, at with a score of at least 80.	Students are able to master the knowledge of chemistry (organic chemistry, inorganic, analytical, physical, and biochemical with a score of at least 70 and less than 80..	Students are able to master the knowledge of chemistry (organic chemistry, inorganic, analytical, physical, and biochemical with a score of at least 70 and less than 80.	Students are able to master the knowledge of chemistry (organic chemistry, inorganic, analytical, physical, and biochemical with a score of less than 60.
8	Understand operational knowledge about functions, how to operate chemical instruments, and analysis of	Students are able to understand operational knowledge about functions, how to operate chemical instruments, and analysis of data and	Students are able to understand operational knowledge about functions, how to operate chemical instruments, and analysis of data and	Students are able to understand operational knowledge about functions, how to operate chemical instruments, and analysis of data and	Students are able to understand operational knowledge about functions, how to operate chemical instruments, and analysis of data and

	data and information from these instruments	information from these instruments at with a score of at least 80.	information from these instruments with a score of at least 70 and less than 80.	information from these instruments with a score of at least 70 and less than 80.	information from these instruments with a score of less than 60.
11	Obtain, process, interpret, and evaluate scientific data and produce conclusions by considering scientific and technological aspects and scientific ethics	Students are able to understand operational obtain, process, interpret, and evaluate scientific data and produce conclusions by considering scientific and technological aspects and scientific ethics at with a score of at least 80.	Students are able to obtain, process, interpret, and evaluate scientific data and produce conclusions by considering scientific and technological aspects and scientific ethics with a score of at least 70 and less than 80.	Students are able to obtain, process, interpret, and evaluate scientific data and produce conclusions by considering scientific and technological aspects and scientific ethics with a score of at least 70 and less than 80.	Students are able obtain, process, interpret, and evaluate scientific data and produce conclusions by considering scientific and technological aspects and scientific ethics with a score of less than 60.

Example of PLO Predicates for Each Student

No	Name	PLO 6	PLO 8	PLO 11
1	A	77.54 Good	77.62 Good	77.54 Good

PLO Predicates for All Students

No.	Name	Midterm Exam	Final Exam	Assignment	Final Grade and Score	PLO 6	PLO 8	PLO 11	PLO 6	PLO 8	PLO 11
1	A	78	76	80	77,60 B+	77,54	77,62	77,54	G	G	G
2	B	82	75	80	78,80 B+	78,31	78,97	78,31	G	G	G
3	C	82	80	80	80,80 B+	80,62	80,86	80,62	E	E	E
4	D	76	78	78	77,20 B+	77,38	77,14	77,38	G	G	G
5	E	86	82	84	84,00 A-	83,69	84,11	83,69	E	E	E

6	F	70	78	74	74,00	B	74,62	73,78	74,62	G	G	G
7	G	86	74	78	79,60	B+	78,62	79,95	78,62	G	G	G
8	H	88	86	86	86,80	A	86,62	86,86	86,62	E	E	E
9	I	84	78	80	80,80	B+	80,31	80,97	80,31	E	E	E
10	J	78	74	76	76,00	B+	75,69	76,11	75,69	G	G	G
11	K	84	82	84	83,20	A-	83,08	83,24	83,08	E	E	E
12	L	88	86	86	86,80	A	86,62	86,86	86,62	E	E	E
13	M	78	88	84	83,20	A-	84,00	82,92	84,00	E	E	E
14	N	86	86	88	86,40	A	86,46	86,38	86,46	E	E	E
15	O	82	84	86	83,60	A-	83,85	83,51	83,85	E	E	E
16	P	78	86	80	81,60	A-	82,15	81,41	82,15	E	E	E
17	Q	78	78	75	77,40	B+	77,31	77,43	77,31	G	G	G
18	R	76	82	78	78,80	B+	79,23	78,65	79,23	G	G	G
19	S	81	87	8	68,80	B-	66,92	69,46	66,92	S	S	S
20	T	87	90	86	88,00	A	88,15	87,95	88,15	E	E	E
21	U	81	85	82	82,80	A-	83,08	82,70	83,08	E	E	E
22	V	78	86	82	82,00	A-	82,62	81,78	82,62	E	E	E
23	W	77	86	82	81,60	A-	82,31	81,35	82,31	E	E	E
24	X	78	78	75	77,40	B+	77,31	77,43	77,31	G	G	G
25	Y	78	76	75	76,60	B+	76,38	76,68	76,38	G	G	G
26	Z	76	84	78	79,60	B+	80,15	79,41	80,15	E	G	E
27	AA	72	76	78	74,80	B	75,23	74,65	75,23	G	G	G
28	AB	71	78	76	74,80	B	75,38	74,59	75,38	G	G	G
29	AC	74	75	77	75,00	B	75,15	74,95	75,15	G	G	G
30	AD	86	80	82	82,80	A-	82,31	82,97	82,31	E	E	E
31	AF	82	84	82	82,80	A-	82,92	82,76	82,92	E	E	E

Distribution of PLO Achievements

		PLO 6	PLO 8	PLO 11
%	E	54,83870968%	51,6129%	54,8387%
%	G	41,93548387%	45,1613%	41,9355%
%	S	3,225806452%	3,22581%	3,22581%
%	F	0%	0%	0%
		100%	100%	100%

Achievement Percentage of PLO



