



Course Specification of Pharmaceutical Organic Chemistry II

I. Course Identification and General Information:

1	Course Title	Pharmaceutical Organic Chemistry II				
2	Course Number & Code:	Ph533				
3	Credit hours:	C.H				Total
		Th.	Pr.	Tr.	Seminar.	
		2	2			3
4	Study level/ semester at which this course is offered:	2 nd Level /1 st semester				
5	Pre –requisite (if any):	General Pharmaceutical Chemistry & Pharmaceutical Organic Chemistry I				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmacy				
8	Language of teaching the course:	English				
9	The department in which the course is offered:	Department of Medicinal Chemistry, Pharmaceutical Organic and Analytical Chemistry				
10	Location of teaching the course:	Faculty of Pharmacy-Sana`a University				
11	Prepared by:	Dr. Mokhtar A. Al-Ghorafy				
12	Date of approval:					

II. Course description:

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إ.د. القاسم محمد عباس

رئيس القسم عميد الكلية عميدة مركز التطوير وضمان الجودة
إ.م.د. توفيق العبيدي د. خالد الشوية إ.م.د. هدى العماد

الموصف نائب العميد لشؤون الجودة
إ.د. محمود البريهي الغرافي



This course provides students with the fundamental knowledge of stereochemistry and aromatic compounds including the nomenclatures, properties, synthesis, chemical reactions and the pharmaceutical application of these compounds. The practical part includes the preparation of some aromatic compounds.

III. Intended learning outcomes (ILOs) of the course:

At the end of this course the students should be able to:

1. Define the concepts of aromaticity and the differences between benzenoid and non benzenoid compounds.
2. Recognize the nomenclatures of aromatic and polynuclear compounds.
3. Identify the functional groups in organic compounds and their use in some synthetic procedures of drugs 4. Understand some chemical and physical concepts and their effect on drug molecule characters 5. Outline the synthesis and chemical reactions of aromatic and polynuclear organic compounds.
6. Detect the difference between aromatic and non aromatic compounds using chemical reactions
7. Correlate the structure of organic molecules with their effect on the biological activity.
8. Suggest the suitable methods for synthesizing aromatic and polynuclear compounds of pharmaceutical interest.
9. Use laboratory reagents adequately and safely
10. Synthesize and Purify some aromatic compounds as starting material for synthesis of some drugs.
11. Synthesize and Purify some polynuclear compounds as starting material for synthesis of some drugs.
12. Collaborate effectively in groups to solve some problems encountered in pharmaceutical organic chemistry.
13. Search and evaluate the literature from different sources including the library, internet ...etc
14. Manage and organize the time effectively and implement writing and presentation skills to explore the importance of aromatic compounds in pharmaceutical industry

IV. Intended learning outcomes (ILOs) of the course:

(A) Knowledge and Understanding:

Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **Knowledge and Understanding.**

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Program Intended Learning Outcomes (Sub-PIOs) in: Knowledge and Understanding		Course Intended Learning Outcomes (CILOs) in: Knowledge and Understanding	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
A1-	Recognize the principles of physical, chemical, clinical, social, behavioral, health and pharmaceutical sciences.	a1-	Define the concepts of aromaticity and the differences between benzenoid and non benzenoid compounds.
		a2-	Recognize the nomenclatures of aromatic and
A2-	Recognize the physicochemical properties, preparation, structure activity relationship (SAR), toxicity and the modern methods of analysis of various substances of chemical and natural products of therapeutic potential as well as the basic principle of drug discovery, design and development.		polynuclear compounds.
		a3-	Identify the functional groups in organic compounds and their use in some synthetic procedures of drugs
		a4-	Understand some chemical and physical concepts and their effect on drug molecule characters
		a5-	Outline the synthesis and chemical reactions of aromatic and polynuclear organic compounds.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Knowledge and Understanding After participating in the course, students would be able to:		Teaching strategies/methods to be used	Methods of assessment
a1-	Define the concepts of aromaticity and the differences between benzenoid and non benzenoid compounds.	Lecture method , Computer based teaching and learning, group discussion and tutorial	Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam.
a2-	Recognize the nomenclatures of aromatic and polynuclear compounds.		



a3-	Identify the functional groups in organic compounds and their use in some synthetic procedures of drugs	
a4-	Understand some chemical and physical concepts and their effect on drug molecule characters	
a5-	Outline the synthesis and chemical reactions of aromatic and polynuclear organic compounds.	

(B) Intellectual Skills:			
Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Intellectual skills			
Program Intended Learning Outcomes (Sub-PILOs) in Intellectual skills		Course Intended Learning Outcomes (CILOs) of Intellectual Skills	
After completing this program, students would be able to		After participating in the course, students would be able to:	
B1-	Consolidate the chemical, biochemical and physiological principles to construct the pharmacophores of the structure and their effect on the stability, pharmacokinetic and pharmacodynamic profiles of the drug.	b1-	Detect the difference between aromatic and non aromatic compounds using chemical reactions
		b2-	Correlate the structure of organic molecules with their effect on the biological activity.
B2-	Categorize the synthetic and natural drugs according to their mechanism of action, systemic effect, therapeutic uses, contraindication and toxicity.	b3-	Suggest the suitable methods for synthesizing aromatic and polynuclear compounds of pharmaceutical interest
Teaching And Assessment Methods For Achieving Learning Outcomes:			
Alignment Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:			
Course Intended Learning Outcomes (CILOs) in Intellectual Skills.		Teaching strategies/methods to be used.	Methods of assessment
After participating in the course, students would be able to:			

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Professional and Practical Skills strategies/methods to be assessment used After participating in the course, students would be able to:

- c1- Use laboratory reagents adequately and safely Lecture method, Practical Practical works,
sessions and group homework, practical
- c2- Synthesize and Purify some aromatic compounds as discussion exam and practical starting material for
synthesis of some drugs.. reports.
- c3- Synthesize and Purify some polynuclear compounds as starting material for synthesis of some drugs

(D) General / Transferable Skills:

Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **General and Transferable skills**

Program Intended Learning Outcomes (PILOs) in Course Intended Learning Outcomes (CILOs)
General / Transferable skills in General / Transferable skills

After completing this program, students would be able to: After participating in the course, students would be able to:

- D3- Develop financial, market management, writing, d1- Collaborate effectively in groups to solve some presentation and time management skills as well as problems encountered in pharmaceutical creativity, critical thinking, problem solving and decision organic chemistry.

	making abilities.		
D5-	Apply information and communication technology and working effectively in a team.	d2-	Search and evaluate the literature from different sources including the library, internetetc
		d3-	Manage and organize the time effectively and implement writing and presentation skills to explore the importance of aromatic compounds in pharmaceutical industry

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods.

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Course Intended Learning Outcomes (CILOs) in General and Transferable Skills		Teaching strategies/methods to be used.	Methods of assessment
After participating in the course, students would be able to:			
d1-	Collaborate effectively in groups to solve some problems encountered in pharmaceutical organic chemistry.	Small group discussions, Tutorials and Practical sessions.	Homework, and reports.
d2-	Search and evaluate the literature from different sources including the library, internetetc		
d3-	Manage and organize the time effectively and implement writing and presentation skills to explore the importance of aromatic compounds in pharmaceutical industry		

V. Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1.	Introduction of aromatic chemistry	a 1, b1-3, d1-3	- Definition of aromatic compounds, aromaticity. Huckl' rule and properties of aromatic compounds. - Nomenclature of aromatic	2	4
			-The effect of aromaticity on stability and chemical properties of drugs		



2.	Reaction of aromatic compounds - Effect of substituent	a2-5, b1-3, d1-3	-Halogenations -Nitration -sulphonation -Friedel-Craft alkylation and acylation Donating and withdrawing mechanism and their effect on the chemical properties of drugs	2	4
3.	Aryl halide	a2-5, b1-3, d1-3	-Nomenclature -Properties -Synthesis -Reactions -The structure activity of halide and their effect on the physical and chemical characters of drugs	1	2
4.	Phenols	a2-5, b1-3, d1-3	Structure, acidity character .nomenclature, preparation ,reactions and uses -The structure activity of phenol in drugs	1	2
5.	-Aromatic Aldehydes and ketones	a2-5, b1-3, d1-3	Structure, reactivity .nomenclature, preparation and reaction and their application in drug development	2	4
6.	Mid Exam	a1-5, b1-3		1	2
7.	- Aromatic Carboxylic acids	a2-5, b1-3, d1-3	-Acidity -Nomenclature -synthesis -Reactions the structure activity of carboxylic acid in the physical and chemical characters of drugs	2	4



8.	Aromatic Amines	a2-5, b1-3, d1-3	-structure ,nomenclature ,synthesis reaction, diazonium salt ,basicity and uses the structure activity of amine in the physical and chemical properties of drugs	2	4
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9.	Polynuclear Aromatic Compounds	a2-5, b1-3, d1-3	-Naphthalene, anthracene Phenanthrene Pharmaceutical importance of polynuclear compounds	2	4
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10.	Final Exam	a1-5, b1-3		1	2
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Number of Weeks /and Units Per Semester

16 32

b - Practical Aspect

Order	Tasks/ Experiments	CILOs (symbols)	Number of Weeks	Contact Hours
1.	Synthesis of aspirin	c1, c2,d1-3	1	2
2.	Preparation of salicylamide	c1, c2,d1-3	1	2
3.	Preparation of acetanilide	c1, c2,d1-3	1	2
4.	Nitration of acetanilide	c1, c2,d1-3	1	2
5.	Preparation of p-nitroaniline	c1, c2,d1-3	1	2
6.	Preparation of sulfanilic acid	c1, c2,d1-3	1	2
7.	Mid-Exam	c1-2	1	2
8.	Preparation of benzoic acid oxidation of benzyl alcohol	c1, c2,d1-3	1	2
9.	Preparation of α -nitronaphthalene	c1, c3,d1-3	1	2

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10.	Preparation of naphthalene picrate	c1, c3,d1-3	1	2
11.	Preparation of Anthracene picrate	c1, c3,d1-3	1	2
12.	Acylation of β -naphthol and Crystallization of 2naphthylacetate	c1, c3,d1-3	2	4
13.	Final Exam	c1-3	1	2
Number of Weeks /and Units Per Semester			16	32

VII. a-Teaching strategies of the course:

Lecture method, computer based teaching and learning group discussion, brainstorming and Problem solving sessions, tutorial, Practical sessions and group discussion

b- Assessment Methods:

Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam Practical works, practical exam and practical reports.

VII. Assignments:

No.	Assignments	Aligned CILOs (symbols)	Week Due	Mark
	Homework Assignments	a2, a3, a5, b2, b3, d1-3	Sporadic through the semester	10
	Reports	c2-4, d1-3		

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1	Attendance, Participation, reports and quizzes	All Weeks	10	7%	a1,a4,a5, b1,b3, d1-3



	Oral Tests and Homework assignments	Sporadic through the semester	10	7%	a2, a3, a5, b2, b3, d1-3
2	Attendance, Practical Reports and Practical mid-semester exam	7 th	30	20%	c1-3
3	Theoretical mid-semester exam	9 th	30	20%	a1-5, b1- b3
5	Final Exam (theoretical)	16 th	50	33%	a1-5, b1-3
6	Final Exam (practical)	16 th	20	20%	c1-3
	Total		150	100%	

IX. Students' Support:

Office Hours/week	Other Procedures (if any)
Two contact hours per week	None

X. Learning Resources:

1- Required Textbook(s) (maximum two).

- 1- R. T. Morrison and R. N. Boyd. 2002. Organic Chemistry, 6th edition, Pearson Prentice Hall of India Pvt. Ltd, New Delhi.
- 2- Francis A. Carey and Richard J. Sundberg. 2001. Advanced Organic Chemistry; Part B: Reactions and Synthesis, 4th edition, Wiley and Sons., Inc. New York.
- 3- Michael Heidelberger. 1923. Advanced Laboratory Manual of Organic Chemistry, The chemical catalog company, inc. New York.

2- Recommended Books and Reference Materials.

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1.	L. Finar., ,1963. Organic Chemistry: The Fundamental Principles, 4 th edition, longman green and company ltd. London.
2.	John McMurry. 2011, " Fundamentals of Organic Chemistry " Seventh Edition, Brooks/Cole 20 Davis Drive, Belmont.
3.	Jerry March.,. 2007,. Advanced Organic Chemistry ; reaction, mechanism and structure, 6 th edition, John Wiley & Sons, Inc., Hoboken, New Jersey
4.	Janice Gorzynski Smith. 2011,." Organic Chemistry", Third Edition, McGraw-Hill, a business unit of The McGraw-Hill Companies, New York.
5.	K.-H. Hellwich · C. D. Siebert, "Stereochemistry Workbook" 2006, Springer-Verlag Berlin Heidelberg , Berlin.
6.	Lectures Notes and Practical Manual.

3- Electronic Materials and Web Sites etc.

- 1- <http://www.chemaxon/marvin> 2-
www.orgsyn.org.
3-

XI. Facilities Required:

1 - Accommodation:	<ul style="list-style-type: none"> - Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc. - Well-equipped laboratories with all required equipment and reagents.
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2 - Computing resources:	- Computer laboratory with internet facilities.
XII. Course Improvement Processes:	
1- Strategies for obtaining student feedback on effectiveness of teaching	
	<ul style="list-style-type: none"> ▪ Student-based assessment of the effectiveness of teaching using a questionnaire designed by the Quality Assurance Unit at the end of the semester. ▪ Meeting with students and faculty (once per semester).
2- Other strategies for evaluation of teaching by the instructor or by the department.	
	<ul style="list-style-type: none"> ▪ Assessment of the course syllabus and contents by the teachers using a questionnaire designed by the Quality Assurance Unit of the university at the end of the semester. ▪ Regular meeting and discussion of the course content between the Head of Department and the teaching staff of the course (for theory and practice).
3- Processes for improvement of teaching.	
	<ul style="list-style-type: none"> ▪ Revision of the course specification and its teaching strategies every three academic years after consideration of all issues raised by the teachers and/or students during regular meetings and discussions. ▪ Exploring any possible defects in the course that might be encountered by the teaching staff and their mitigation in subsequent improved versions of course specification.
4- Processes for verifying standards of students' achievement	
	<ul style="list-style-type: none"> ▪ Checking of a sample of students' work by an independent faculty member. ▪ Periodic exchange and check marking of a sample of students' assignments with a faculty member from another institution. ▪ Adoption of scoring rubrics to assess the students' achievement (both for ongoing or summative assessments). ▪ Regular follow-up of laboratory logbooks to assess the practical achievement of students.
5- Procedures for periodically reviewing of course effectiveness and planning for improvement	
	<ul style="list-style-type: none"> ▪ Student rating and feedback



	<ul style="list-style-type: none"> Peer rating and feedback Regular meeting of the Curriculum Committee of the faculty.
6- Course development plans	
	<ul style="list-style-type: none"> Conducting regular workshops for the staff for improving their course specification skills. Regular revision of course specification and syllabus items.

XIII. Course Policies: (including plagiarism, academic honesty, attendance etc)	
The University Regulations on academic misconduct will be strictly enforced. Please refer to -----	
1	Class Attendance: <ul style="list-style-type: none"> Attendance of all lectures and practical sessions is required. Unexcused absence exceeding 25% of the lectures or practical sessions will disqualify the student from entering the final exam.
2	Tardy: <p>- Roll will be called in the very beginning of each lecture and practical class. Retardation for more than three weeks without a reasonable excursion, the student involved shall not be allowed to attend the class any longer and consequently shall be considered to be absent.</p>
3	Exam Attendance/Punctuality: <ul style="list-style-type: none"> Exam attendance is obligatory unless being excused by the department and faculty. Absence from assignments or exams will be dealt with according to the general policy of the university.
4	Assignments & Projects: <ul style="list-style-type: none"> Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ▪ Projects: Not applicable.
5	Cheating: <ul style="list-style-type: none"> Punishment of cheating will be according to the general policy of the university in this respect.



6	<p>Plagiarism:</p> <ul style="list-style-type: none"> Plagiarism in written essays, reports, etc. is not accepted, and students who plagiarize the works of others will be punished according to the general policy of the university.
7	<p>Other policies:</p> <ul style="list-style-type: none"> General policies of the Students' Affairs of the University and the Quality Assurance Unit.

Course Plan of Pharmaceutical Organic Chemistry II

I- Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Dr. Mokhtar A. Al-Ghorafy	Office Hours					
Location & Telephone No.	770010749	SAT	SUN	MON	TUE	WED	THU
E-mail	Alghorafi2030@yahoo.com	2h					

II- Course Identification and General Information:					
1-	Course Title:	Pharmaceutical Organic Chemistry II			
2-	Course Number & Code:	Ph533			
3-	Credit hours:	C.H			C.H Th.
		Th.	Seminar	Pr.	
		2		2	2
4-	Study level/year at which this course is offered:	2 nd Level /2 nd semester			
5-	Pre –requisite (if any):	General Pharmaceutical Chemistry & Pharmaceutical Organic Chemistry I			
6-	Co –requisite (if any):	-			
7-	Program (s) in which the course is offered	Bachelor of pharmacy			



8-	Language of teaching the course:	English
9-	System of Study:	Semesters
10-	Mode of delivery:	Regular
11-	Location of teaching the course:	Faculty of Pharmacy- Sana`a university

III- Course description:

This course provides students with the fundamental knowledge of stereochemistry and aromatic compounds including the nomenclatures, properties, synthesis, chemical reactions and the pharmaceutical application of these compounds. The practical part includes the preparation of some aromatic compounds.

IV- Intended learning outcomes (ILOs) of the course:

At the end of this course the students should be able to:

1. Define the concepts of aromaticity and the differences between benzenoid and non benzenoid compounds.
2. Recognize the nomenclatures of aromatic and polynuclear compounds.
3. Identify the functional groups in organic compounds and their use in some synthetic procedures of drugs
4. Understand some chemical and physical concepts and their effect on drug molecule characters
5. Outline the synthesis and chemical reactions of aromatic and polynuclear organic compounds.
6. Detect the difference between aromatic and non aromatic compounds using chemical reactions
7. Correlate the structure of organic molecules with their effect on the biological activity.
8. Suggest the suitable methods for synthesizing aromatic and polynuclear compounds of pharmaceutical interest.
9. Use laboratory reagents adequately and safely
10. Synthesize and Purify some aromatic compounds as starting material for synthesis of some drugs.
11. Synthesize and Purify some polynuclear compounds as starting material for synthesis of some drugs.
12. Collaborate effectively in groups to solve some problems encountered in pharmaceutical organic chemistry.
13. Search and evaluate the literature from different sources including the library, internetetc
14. Manage, organize the time effectively and implement writing and presentation skills to explore the importance of aromatic compounds in pharmaceutical industry



V- Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Week Due	Contact hours
1)	Introduction of aromatic chemistry	a 1, b1-3, d1-3	- Definition of aromatic compounds, aromaticity. Huckl rule and properties of	1,2	4

			aromatic compounds. - Nomenclature of aromatic -The effect of aromaticity on stability and chemical properties of drugs		
2)	Reaction of aromatic compounds - Effect of substituent	a2-5, b1-3, d1-3	-Halogenations -Nitration -sulphonation -Friedel-Craft alkylation and acylation Donating and withdrawing mechanism and their effect on the chemical properties of drugs	3,4	4
3)	Aryl halide	a2-5, b1-3, d1-3	-Nomenclature -Properties -Synthesis -Reactions -The structure activity of halide and their effect on the physical and chemical characters of drugs	5	2



4)	Phenols	a2-5, b1-3, d1-3	Structure, acidity character .nomenclature, preparation ,reactions and uses -The structure activity of phenol in drugs	6	2
	-Aromatic Aldehydes and ketones	a2-5, b1-3, d1-3	Structure, reactivity .nomenclature, preparation and reaction and their application in drug development	7,8	4
	6Mid Exam	a1-5, b1-3		9	2
	- Aromatic Carboxylic acids	a2-5, b1-3, d1-3	-Acidity -Nomenclature -synthesis -Reactions the structure activity of carboxylic acid in the physical and chemical characters of drugs	10,11	4

	Aromatic Amines	a2-5, b1-3, d1-3	-structure ,nomenclature ,synthesis reaction, diazonium salt ,basicity and uses the structure activity of amine in the physical and chemical properties of drugs	12,13	4
	Polynuclear Aromatic Compounds	a2-5, b1-3, d1-3	-Naphthalene, anthracene Phenanthrene Pharmaceutical importance of polynuclear compounds	14,15	4
	Final Exam	a1-5, b1-3		16	2
Number of Weeks /and Units Per Semester				16	32

b - Practical Aspect

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Order	Tasks/ Experiments	CILOs (symbols)	Week Due	Contact Hours
	Synthesis of aspirin	c1, c2,d1-3	1	2
	Preparation of salicylamide	c1, c2,d1-3	2	2
	Preparation of acetanilide	c1, c2,d1-3	3	2
	Nitration of acetanilide	c1, c2,d1-3	4	2
	Preparation of p-nitroaniline	c1, c2,d1-3	5	2
	Preparation of sulfanilic acid	c1, c2,d1-3	6	2
	Mid-Exam	c1-2	7	2
	Preparation of benzoic acid oxidation of benzyl alcohol	c1, c2,d1-3	8	2
	Preparation of α -nitronaphthalene	c1, c3,d1-3	9	2
	Preparation of naphthalene picrate	c1, c3,d1-3	10	2
	Preparation of Anthracene picrate	c1, c3,d1-3	11,12	4
	Acylation of β -naphthol and Crystallization of 2naphthylacetate	c1, c3,d1-3	13,14	4
	Revision	c1-3,d1-3	15	2
	Final Exam	c1-3	16	2

Number of Weeks /and Units Per Semester	16	32
VIII. a-Teaching strategies of the course:		
Lecture method, computer based teaching and learning group discussion, brainstorming and Problem solving sessions, tutorial, Practical sessions and group discussion		

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b- Assessment Methods:

Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam Practical works, practical exam and practical reports.

VII. Assignments:

No.	Assignments	Aligned CILOs (symbols)	Week Due	Mark
	Homework Assignments	a2, a3, a5, b2, b3,d1-3	Sporadic through the semester	10
	Reports	c2-4, d1-3		

XIV. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1	Attendance, Participation, reports and quizzes	All Weeks	10	7%	a1,a4,a5, b1,b3, d1-3
	Oral Tests and Homework-assignments	Sporadic through the semester	10	7%	a2, a3, a5, b2, b3, d1-3
2	Attendance, Practical Reports and Practical mid-semester exam	7 th	30	20%	c1-3
3	Theoretical mid-semester exam	9 th	30	20%	a1-5, b1- b3
5	Final Exam (theoretical)	16 th	50	33%	a1-5, b1-3
6	Final Exam (practical)	16 th	20	20%	c1-3
Total			150	100%	

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إ.د. القاسم محمد عباس

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إ.م.د. هدى العماد د.خالد الشوية أ.م.د. توفيق العبيدي

الموصف نائب العميد لشؤون الجودة
إ.د. محمود البريهي الغرافي



XV. Students' Support:

Office Hours/week	Other Procedures (if any)
Two contact hours per week	None

XVI. Learning Resources:

1- Required Textbook(s) (maximum two).

- 4- R. T. Morrison and R. N. Boyd. 2002. Organic Chemistry, 6th edition, Pearson Prentice Hall of India Pvt. Ltd, New Delhi.
- 5- Francis A. Carey and Richard J. Sundberg. 2001. Advanced Organic Chemistry; Part B: Reactions and Synthesis, 4thedition, Wiley and Sons., Inc. New York.
- 6- Michael Heidelberger. 1923. Advanced Laboratory Manual of Organic Chemistry, The chemical catalog company, inc. New York.

2- Recommended Books and Reference Materials.

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|-----|---|
| 7. | L. Finar., ,1963. Organic Chemistry: The Fundamental Principles, 4 th edition, longman green and company ltd. London. |
| 8. | John McMurry. 2011, " Fundamentals of Organic Chemistry " Seventh Edition, Brooks/Cole 20 Davis Drive, Belmont. |
| 9. | Jerry March.,. 2007,. Advanced Organic Chemistry ; reaction, mechanism and structure, 6 th edition, John Wiley & Sons, Inc., Hoboken, New Jersey |
| 10. | Janice Gorzynski Smith. 2011,." Organic Chemistry", Third Edition, McGraw-Hill, a business unit of The |



11.	McGraw-Hill Companies, New York.
12.	K.-H. Hellwich · C. D. Lectures Notes and Practical Manual.
11. Siebert, "Stereochemistry Workbook" 2006, Springer-Verlag Berlin Heidelberg , Berlin.	
3- Electronic Materials and Web Sites etc.	
4- http://www.chemaxon/marvin 5- www.orgsyn.org .	
6-	

XVII. Facilities Required:	
1 - Accommodation:	- Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc. - Well-equipped laboratories with all required equipment and reagents.
3 - Computing resources:	- Computer laboratory with internet facilities.
XVIII. Course Improvement Processes:	
6- Strategies for obtaining student feedback on effectiveness of teaching	
	<ul style="list-style-type: none"> Student-based assessment of the effectiveness of teaching using a questionnaire designed by the Quality Assurance Unit at the end of the semester. Meeting with students and faculty (once per semester).
7 Other strategies for evaluation of teaching by the instructor or by the department.	



	<ul style="list-style-type: none"> Assessment of the course syllabus and contents by the teachers using a questionnaire designed by the Quality Assurance Unit of the university at the end of the semester. Regular meeting and discussion of the course content between the Head of Department and the teaching staff of the course (for theory and practice).
8- Processes for improvement of teaching.	
	<ul style="list-style-type: none"> Revision of the course specification and its teaching strategies every three academic years after consideration of all issues raised by the teachers and/or students during regular meetings and discussions. Exploring any possible defects in the course that might be encountered by the teaching staff and their mitigation in subsequent improved versions of course specification.
9- Processes for verifying standards of students' achievement	
	<ul style="list-style-type: none"> Checking of a sample of students' work by an independent faculty member. Periodic exchange and check marking of a sample of students' assignments with a faculty member from another institution. Adoption of scoring rubrics to assess the students' achievement (both for ongoing or summative assessments). Regular follow-up of laboratory logbooks to assess the practical achievement of students.
10- Procedures for periodically reviewing of course effectiveness and planning for improvement	
	<ul style="list-style-type: none"> Student rating and feedback Peer rating and feedback Regular meeting of the Curriculum Committee of the faculty.
6- Course development plans	
	<ul style="list-style-type: none"> Conducting regular workshops for the staff for improving their course specification skills. Regular revision of course specification and syllabus items.

XIX. Course Policies: (including plagiarism, academic honesty, attendance etc)

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إ.د. محمود البريهي

الموصف
الغرافي



The University Regulations on academic misconduct will be strictly enforced. Please refer to -----	
1	<p>Class Attendance:</p> <ul style="list-style-type: none"> Attendance of all lectures and practical sessions is required. Unexcused absence exceeding 25% of the lectures or practical sessions will disqualify the student from entering the final exam.
2	<p>Tardy:</p> <p>- Roll will be called in the very beginning of each lecture and practical class. Retardation for more than three weeks without a reasonable excursion, the student involved shall not be allowed to attend the class any longer and consequently shall be considered to be absent.</p>
3	<p>Exam Attendance/Punctuality:</p> <ul style="list-style-type: none"> Exam attendance is obligatory unless being excused by the department and faculty. Absence from assignments or exams will be dealt with according to the general policy of the university.
4	<p>Assignments & Projects:</p> <ul style="list-style-type: none"> Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ■ Projects: Not applicable.
5	<p>Cheating:</p> <ul style="list-style-type: none"> Punishment of cheating will be according to the general policy of the university in this respect.
6	<p>Plagiarism:</p> <ul style="list-style-type: none"> Plagiarism in written essays, reports, etc. is not accepted, and students who plagiarize the works of others will be punished according to the general policy of the university.
7	<p>Other policies:</p> <ul style="list-style-type: none"> General policies of the Students' Affairs of the University and the Quality Assurance Unit.