Course Specification Phytochemistry-II

I. Course Identification and General Information:							
1	Course Title:	Phytochemistry-II					
2	Course Number & Code:	*Ph*385					
3	Credit hours:	C.H				Total	
		Theoretical	Practical	Training	Seminar		
		2				2	
4	Study level/ semester at which this course is offered:	4th level /2nd semester					
5	Pre –requisite (if any):	Botany, pharmacognosy, phytochemistry I					
6	Co –requisite (if any):	None					
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 Pharmacognosy					
10	Location of teaching the course:	Faculty of Pharmacy					
11	Prepared by:	Dr. Bushra Moharam					
12	Date of approval:						

II. Course description:

This course provides information and discus of naturally occurring products from their chemical, pharmaceutical and therapeutic applications. It deals with their extraction, isolation, detection, pharmacological and toxicological effects. Phytochemical components in this course including; glycosides, volatile oils, tannins and phenylpropanoids.

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

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

1. Identify different phytochemicals of biologically active compounds of natural origin and their distribution in nature and classification.
2. Clarify physico-chemical properties of substances
3. Recognize the methods of extraction, separation and purification of the constituents of natural products
4. Describe the chemical structure of phytochemical substances of different alkaloids, steroids and terpens, their biological properties and contraindications of them.
5. Propose the possible leads to new drugs depending on natural product templates
6. Correlate the chemical structure of natural products with their pharmacological activity and predict of structural changes that modify the biological activity
7. Determine suitable methods for extraction; isolation of different compounds from natural origin
8. Perform suitable methods for extraction; isolation of alkaloids, terpenoids and steroids
9. Carry out different methods for quantitative determination of alkaloids, terpenoids and steroids in their origin or preparations
10. Identify different groups of glycosides, volatile oils, tannins and phenylpropanoids.
11. Collaborate in the write reports about the chemistry natural products such as alkaloids, terpenoids, steroids and their isolation and present them.
12. Collaborate effectively with other people, work in teamwork, team planning and manage times
13. Evaluate information from different sources, demonstrate critical thinking, problem solving and decision making abilities.

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

(A) Knowledge and Understanding:

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

Program Intended Learning Outcomes (Sub-PILOs) in: Knowledge and Understanding		Course Intended Learning Outcomes (CILOs) in: Knowledge and Understanding	
After completing this program, students will be able to:		**After completing this course, students will be able to:**	
A1-	Recognize the principles of physical, chemical, clinical, social, behavioral, health and pharmaceutical sciences.	**a1-**	Identify different phytochemicals of biologically active compounds of natural origin and their distribution in nature and classification.

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

A4-	Recognize the pharmaceutical dosage form design and the quality control of pharmaceutical formulations according to	**a2-**	Clarify physico-chemical properties of substances
		a3-	Recognize the methods of extraction, separation and purification of the constituents of natural products
	GMP and pharmacopeial requirements to support the pharmaceutical industries and research.	**a4-**	Describe the chemical structure of phytochemical substances of different glycosides, volatile oils, tannins and phenylpropanoids., their biological properties and contraindications of them.
		a5-	

Teaching And Assessment Methods For Achieving Learning Outcomes:

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

Course Intended Learning Outcomes (CILOs) in Knowledge and Understanding		Teaching strategies/methods to be used	Methods of assessment
completing this course, students will be able to:		Lectures tutorial and group discussion.	Written exam, Quizzes, homework and participation.
a1-	Identify different phytochemicals of biologically active compounds of natural origin and their distribution in nature and classification.		
a2-	Clarify physico-chemical properties of substances		
a3-	Recognize the methods of extraction, separation and purification of the constituents of natural products		
a4-	Describe the chemical structure of phytochemical substances, their biological properties and contraindications of them.		

(B) Intellectual Skills:

Alignment of 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 will be able to:		After completing this course, students will be able to:	
B3-	Design different types of safe and effective pharmaceutical dosage forms and develop novel methods of qualitative and quantitative analytical and biological analysis for pharmaceutical and biopharmaceutical products that support pharmaceutical research.	**b1-**	propose the possible leads to new drugs depending on natural product templates
B4-	Plan a modern system for administration of medical foundations and merge the ethics to business during the drug marketing .	**b2-**	Correlate the chemical structure of natural products with their pharmacological activity and predict of structural changes that modify the biological activity
		b3-	determine suitable methods for extraction; isolation of different compounds from natural origin

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of 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 completing this course, students will be able to:		Lectures, Solving Problem, Discussions, methods	Oral presentation, Written exam, Quizzes, and participation
b1-	propose the possible leads to new drugs depending on natural product templates		
b2-	Correlate the chemical structure of natural products with their pharmacological activity and predict of structural changes that modify the biological activity		
b3-	determine suitable methods for extraction; isolation of different compounds from natural origin		

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

(C) Professional and Practical Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Professional and Practical Skills

Program Intended Learning Outcomes (Sub-PILOs) in Professional and Practical Skills		Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills	
After completing this program, students will be able to:		**After completing this course, students will be able to:**	
C2-	Handle and dispose chemicals and pharmaceutical preparations safely and effectively.	**c1-**	Design different methods for determination of glycosides, volatile oils, tannins and phenylpropanoids in their origin or preparations
C3-	Extract, isolate, purify, identify and formulate the	**c2-**	Identify different groups of glycosides, volatile oils, tannins and phenylpropanoids.
	natural products and assure their rational use.		

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		Lectures ,Laboratory work, independent study.	Practical works and reports, presentations and homework.
c1-	Design different methods for determination of glycosides, volatile oils, tannins and phenylpropanoids in their origin or preparations		
c2-	Identify different groups of glycosides, volatile oils, tannins and phenylpropanoids.		

(D) General / Transferable Skills:

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

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

Program Intended Learning Outcomes (PILOs) in General / Transferable skills		Course Intended Learning Outcomes (CILOs) in General / Transferable skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
D1-	Practice independent learning needed for continuous professional development	d1-	Collaborate in the write reports about the chemistry natural products such as glycosides, volatile oils, tannins and phenylpropanoids and their isolation and present them.
D3	Develop financial, market management, writing, presentation and time management skills as well as creativity, critical thinking, problem solving and decision making abilities.	d2-	Collaborate effectively with other people, work in teamwork, team planning and manage times
		d3-	Evaluate information from different sources, demonstrate critical thinking, problem solving and decision making abilities.

Teaching And Assessment Methods For Achieving Learning Outcomes:

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

Course Intended Learning Outcomes (CILOs) in General and Transferable Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:			Reports, presentations and
		Lectures, small group discussions and practical classes	communication with the lecturer and his colleagues.
d1-	Collaborate in the write reports about the chemistry natural products such as glycosides, volatile oils, tannins and phenylpropanoids and their isolation and present them.		
d2-	Collaborate effectively with other people, work in teamwork, team planning and manage times		
d3-	Evaluate information from different sources, demonstrate critical thinking, problem solving and decision making abilities.		

IV. Course Content:

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	Glycosides	a1-4, b1-4, c1-2, d1-3	**Introduction**; Definition, distribution, properties, classification and nomenclature,	**1**	**2**
2	Glycosides	a1-4, b1-4, c1-2, d1-3	definition, classification, distribution, extraction, chemical and physical properties, characterization biological and pharmacological properties, drugs of Phenolic glycosides; **Simple phenolic glycosides (**arbutin, salicin, Coniferin) **Anthracene glycosides**; senna, rubarb, frangula, cascara, aloes, **Flavonoids glycosides** (a)Flavone (*b*)	**3**	**6**
			Flavonol,(*c*) Flavanone *d*) Chalcone (*e*) Isoflavonoid (*f*) Anthocyanidin **Coumarin** glycosides,		
3	Glycosides	a1-4, b1-4, c1-3, d1-3	definition, classification, distribution, extraction, chemical and physical properties, characterization biological and pharmacological of **Cardiac glycosides; digitalis , Strophanthus gly, Squill**	**1**	**2**

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

4	Glycosides	a1-4, b1-4, c1-2, d1-3	definition, classification, distribution, extraction, chemical and physical properties, characterization biological and pharmacological of **Cyanogenic glycosides;** Amygdalin, Linamarin **thioGLYCOSIDES; Sinigrin, sinalbin**	**1**	**2**
4	**Mid exam**	a1-4, b1-3		**1**	**2**
5	Volatile oils	a1-4, b1-4, c1-2, d1-3	Introduction: Definition, distribution, physical properties, method of isolation, chemical composition, Pharmacological properties,	**1**	**2**
6	Volatile oils	a1-4, b1-4, c1-2, d1-3	Drugs containing v.o. used as counter irritant agents, drug containing v.o. used as expectorants,	**1**	**2**
7	Volatile oils	a1-4, b1-4, c1-2, d1-3	Drugs containing v.o. used as diuretic, drug containing v.o. used as stomachic and carminative.	**1**	**2**
8	Tannins	a1-4, b1-4,	Definition**,** classification, structure, hydrolysable- and	**2**	**4**
		c1-2, d1-3	condensed-, complex and pseudo-tannins, distribution, biosynthesis, physico-chemical properties, extraction, characterization, biological properties, drug containing tannin		

9	Phenylpropanoids	a1-4, b1-4, c1-2, d1-3	definition**,** classification, , biosynthesis**, phenols and phenolic acids**: , structure, physico-chemical properties, characterization , extraction, biological properties, drug containing phenols and phenolic acids .	**1**	**2**
10	Phenylpropanoids	a1-4, b1-4, c1-2, d1-3	**Lignans**; definition**,** classification, biological properties, uses, drug containing lignans. **Lignin:** definition**,** structure, biological and pharmacological properties of some lignins	**1**	**2**
11	**Revision**	a1-4, b1-3		**1**	**2**
12	**Final exam**	a1-4, c1-2, b1-3		**1**	**2**
Number of Weeks /and Units Per Semester				**16**	**32**

V. Teaching strategies of the course:

Lectures, Practice session, Small group discussions, Tutorials and Practical classes

-

3-Assessment Methods:

Written and Oral exams, Quizzes, homework, participation, Reports , and Practical examination, practical reports, Practical works and presentations

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

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1	Present/Absent	1-16	10	10%	a1,a3, a4, b1-2
3	Class activities	1-16	10	10%	c1-2
6	Midterm written Exam	7th	20	20%	a1-4, c1-2, b1-3
	Final Exam (theoretical)	16th	60	60%	a1-4, c1-2, b1-3
	Total		**100**	**100%**	

VII. Students' Support:

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

VIII. Learning Resource (MLA style or APA style)S:

1- Required Textbook(s) (maximum two)

- Jarald E.E. and Jarald S. E., (2009); "Textbook of Pharmacognosy and Phytochemistry" CBS Publishers & Distributors, New Delhi
- Evans W.C., Evans D. & Trease E., Saunders "Trease and Evans(2009); 'Pharmacognosy" 16th ed. Elsevier, New York

2- Recommended Readings and Reference Materials

	1- Steven M. Colegate and Russell J. Molyneux. (2008); "Bioactive natural products : detection, isolation, and structural determination" 2nd ed,. 2- Cordell G.A. (2002); "The alkaloids: Chemistry and Biology" Volume 59, Elsevier, New York 3- Lectures Notes and Practical Manual.
3- Essential References	
4- Electronic Materials and Web Sites *etc*.	
	www.biomedcentral.com www.medscape.com http://www.sciencedirect.com/ http://www.ncbi.nlm.nih.gov/
5- Other Learning Material:	
	-

IX. 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.
2 - Computing resources:	- Computer laboratory with internet facilities.

X. Course Improvement Processes:

1- Strategies for obtaining student feedback on effectiveness of teaching

- 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.

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

	▪ 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.	
	▪ 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	
	▪ 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	
	▪ Student rating and feedback ▪ Peer rating and feedback ▪ Regular meeting of the Curriculum Committee of the faculty.
6- Course development plans	
	▪ Conducting regular workshops for the staff for improving their course specification skills. ▪ Regular revision of course specification and syllabus items.

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

VIII. Course Policies: (including plagiarism, academic honesty, attendance etc)	
The University Regulations on academic misconduct will be strictly enforced. Please refer to ----------	
1	**Class Attendance:** ▪ 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:** - 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.
3	**Exam Attendance/Punctuality:** ▪ 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:** ▪ Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ▪ Projects: Not applicable.
5	**Cheating:** ▪ Punishment of cheating will be according to the general policy of the university in this respect.
6	**Plagiarism:** ▪ 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	**Other policies:** ▪ General policies of the Students' Affairs of the University and the Quality Assurance Unit.

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

Course Plan of Phytochemistry-II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Bushra Moharam	Office Hours					
Location & Telephone No.	730010755	SAT	SUN	MON	TUE	WED	THU
E-mail	bushramoharam@yahoo.com.	1		1			

II. Course Identification and General Information:						
1-	Course Title:	Pharmacognosy I				
2-	Course Number & Code:	***Ph*385**				
3-	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2	-	-		2
4-	Study level/year at which this course is offered:	4^{th} level /2^{nd} semester				
5-	Pre –requisite (if any):	Botany, pharmacognosy				
6-	Co –requisite (if any):	None				
7-	Program (s) in which the course is offered	Bachelor of Pharmacy				
8-	Language of teaching the course:	English				

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

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 information and discus of naturally occurring products from their chemical, pharmaceutical and therapeutic applications. It deals with their extraction, isolation, detection, pharmacological and toxicological effects. Phytochemical components in this course including; glycosides, volatile oils, tannins and phenylpropanoids.

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

After completing this course, students will be able to:

1. Identify different phytochemicals of biologically active compounds of natural origin and their distribution in nature and classification.
2. Clarify physico-chemical properties of substances
3. Recognize the methods of extraction, separation and purification of the constituents of natural products
4. Describe the chemical structure of phytochemical substances of different alkaloids, steroids and terpens, their biological properties and contraindications of them.
5. Propose the possible leads to new drugs depending on natural product templates
6. Correlate the chemical structure of natural products with their pharmacological activity and predict of structural changes that modify the biological activity
7. Determine suitable methods for extraction; isolation of different compounds from natural origin
8. Perform suitable methods for extraction; isolation of alkaloids, terpenoids and steroids
9. Carry out different methods for quantitative determination of alkaloids, terpenoids and steroids in their origin or preparations
10. Identify different groups of glycosides, volatile oils, tannins and phenylpropanoids.
11. Collaborate in the write reports about the chemistry natural products such as alkaloids, terpenoids, steroids and their isolation and present them.
12. Collaborate effectively with other people, work in teamwork, team planning and manage times
13. Evaluate information from different sources, demonstrate critical thinking, problem solving and decision making abilities.

XI. Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Week Due	Contact hours
1	Glycosides	a1-4, b1-4, c1-2, d1-3	**Introduction**; Definition, distribution, properties, classification and nomenclature,	**1**	**2**
2	Glycosides	a1-4, b1-4, c1-2, d1-3	definition, classification, distribution, extraction, chemical and physical properties, characterization biological and pharmacological properties, drugs of Phenolic glycosides; **Simple phenolic glycosides (**arbutin, salicin, Coniferin) **Anthracene glycosides**; senna, rubarb, frangula, cascara, aloes, **Flavonoids glycosides** (a)Flavone (*b*) Flavonol,(*c*) Flavanone *d*) Chalcone (*e*) Isoflavonoid (*f*) Anthocyanidin **Coumarin** glycosides,	**2-4**	**6**
3	Glycosides	a1-4, b1-4, c1-3, d1-3	definition, classification, distribution, extraction, chemical and physical properties, characterization biological and pharmacological of **Cardiac glycosides; digitalis , Strophanthus gly, Squill**	**5**	**2**

4	Glycosides	a1-4, b1-4, c1-2, d1-3	definition, classification, distribution, extraction, chemical and physical properties, characterization biological and pharmacological of **Cyanogenic glycosides;** Amygdalin, Linamarin **thioGLYCOSIDES; Sinigrin, sinalbin**	**6**	**2**
4	**Mid exam**	a1-4, b1-3		**7**	**2**
5	Volatile oils	a1-4, b1-4, c1-2, d1-3	Introduction: Definition, distribution, physical properties, method of isolation, chemical composition, Pharmacological properties,	**8**	**2**
6	Volatile oils	a1-4, b1-4, c1-2, d1-3	Drugs containing v.o. used as counter irritant agents, drug containing v.o. used as expectorants,	**9**	**2**
7	Volatile oils	a1-4, b1-4, c1-2, d1-3	Drugs containing v.o. used as diuretic, drug containing v.o. used as stomachic and carminative.	**10**	**2**
8	Tannins	a1-4, b1-4, c1-2, d1-3	Definition**,** classification, structure, hydrolysable- and condensed-, complex and pseudo-tannins, distribution, biosynthesis, physico-chemical properties, extraction, characterization, biological properties, drug containing tannin	**11,12**	**4**

الموصف	نائب العميد لشؤون الجودة	رئيس القسم	عميد الكلية	عميدة مركز التطوير وضمان الجودة	رئيس الجامعة
ا.م.د.بشرى محرم	ا.د. محمود البريهي	د.سلوى راوح	د.خالد الشوبة	ا.م.د. هدى العماد	ا.د. القاسم محمد عباس

9	Phenylpropanoids	a1-4, b1-4, c1-2, d1-3	definition**,** classification, , biosynthesis**, phenols and phenolic acids**: , structure, physico-chemical properties, characterization	**13**	**2**
			, extraction, biological properties, drug containing phenols and phenolic acids .		
10	Phenylpropanoids	a1-4, b1-4, c1-2, d1-3	**Lignans**; definition**,** classification, biological properties, uses, drug containing lignans. **Lignin:** definition**,** structure, biological and pharmacological properties of some lignins	**14**	**2**
11	**Revision**	a1-4, b1-3		**15**	**2**
12	**Final exam**	a1-4, c1-2, b1-3		**16**	**2**
Number of Weeks /and Units Per Semester				**16**	**32**

V. Teaching strategies of the course:

Lectures, Practice session, Small group discussions, Tutorials and Practical classes

VI. Assessment Methods:

No.	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Present/Absent	All	10	10%
2	Class activities	All	10	10%
3	Midterm written Exam	7th	20	20%

4	Final Exam (theoretical)	16th	60	60%
5	**Total**		**100**	**100%**

VII. Learning Resources:

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

- Jarald E.E. and Jarald S. E., (2009); "Textbook of Pharmacognosy and Phytochemistry" CBS Publishers & Distributors, New Delhi
- Evans W.C., Evans D. & Trease E., Saunders "Trease and Evans(2009); 'Pharmacognosy" 16th ed. Elsevier, New York

2- Essential References.

3- Electronic Materials and Web Sites *etc.*

www.biomedcentral.com www.medscape.com
http://www.sciencedirect.com/ http://www.ncbi.nlm.nih.gov/

VIII. Course Policies:

The University Regulations on academic misconduct will be strictly enforced. Please refer to ----------

1 Class Attendance:

- 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:** - 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.
3	**Exam Attendance/Punctuality:** ▪ 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:** ▪ Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ▪ Projects: Not applicable.
5	**Cheating:** ▪ Punishment of cheating will be according to the general policy of the university in this respect.
6	**Plagiarism:** ▪ 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	**Other policies:** ▪ General policies of the Students' Affairs of the University and the Quality Assurance Unit.