



Course Specification of Pharmacology III

I. Course Identification and General Information:

1.	Course Title	Pharmacology III				
2.	Course Number & Code:	Ph479				
3.	Credit hours:	C.H				Total
		Th.	Pr.	Tr.	Seminar.	
		2	-			2
4.	Study level/ semester at which this course is offered:	4 th level /1 st semester				
5.	Pre –requisite (if any):	Anatomy and histology Physiology I &II General Pathology Pharmacology I & II				
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:	-				
10.	Location of teaching the course:	Faculty of Pharmacy- Sana`a university				
11.	Prepared by:	Associate Prof. Fahmy M. Al-Wasei				
12.	Date of approval:					

II. Course description:

The course also deals with the study of pharmacodynamics and pharmacokinetics of chemotherapeutic drugs for infections and cancer.



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

At the end of this course, the students will be able to:

1. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug physiology of chemotherapeutic drugs for infections and cancer.
2. Discuss drug limitations (side effects, contraindications, precautions, use in special patient categories and drug interactions) of chemotherapeutic drugs for infections and cancer.
3. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
4. Classify chemotherapeutic drugs for infections and cancer into various categories
5. Compare between therapeutically related drugs based on drug benefits (in particular efficacy and potency) and drug limitations.
6. Relate drug indications to MAO of drugs.
7. Predict drug limitations on the basis of Drug MOA.
8. Select an appropriate drug for patients based on drug benefits and limitation.
9. Calculate accurately drug's dosage, bioavailability, plasma half-life and volume of distribution in different patient populations.
10. Search efficiently for information using documented and electronic sources of information.
11. Prepare critical, scientific and referenced reports
12. Share successfully in team-work.
13. Show respect to life.
14. Demonstrate time management and self-learning during performing practical and professional works and assignments.



15. 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.**

Program Intended Learning Outcomes (Sub-PILOs) 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:	
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.	a1-	Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug physiology of chemotherapeutic drugs for infections and cancer.
A3-	Describe the general cellular, biochemical and physiological aspects of human body and recognize the pharmacokinetics, pharmacodynamics, disease pathophysiology, and pharmacogenetic of therapeutic agents to provide pharmaceutical care and facilitate management of patient's medication, rationalize drug use and overall health needs.	a2-	Discuss drug limitations (side effects, contraindications, precautions, use in special patient categories and drug interactions) of chemotherapeutic drugs for infections and cancer..
		a3-	Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.

Teaching And Assessment Methods For Achieving Learning Outcomes:

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إ.د. محمود البريهي إ.د. القاسم محمد عباس د. خالد الشويبة أ.م.د. هدى العماد



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-	Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug physiology of chemotherapeutic drugs for infections and cancer.	Lectures methods , Computer based teaching and learning, group discussion and tutorial	Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam.
a2-	Discuss drug limitations (side effects, contraindications, precautions, use in special patient categories and drug interactions) of chemotherapeutic drugs for infections and cancer..		
a3-	Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.		

(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:

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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-	Classify chemotherapeutic drugs for infections and cancer into various categories
		b2-	Compare between therapeutically related drugs based on drug benefits (in particular efficacy and potency) and drug limitations.
B2-	Categorize the synthetic and natural drugs according to their mechanism of action, systemic effect, therapeutic uses, contraindication and toxicity.	b3-	Relate drug indications to MAO of drugs.
		b4-	Predict drug limitations on the basis of Drug MOA.
B5-	Interpret the prescriptions, patient and clinical data, Analysis all the encountered pharmaceutical problems and plan the strategies for their solution, to develop the health care.	b5-	Select an appropriate drug for patients based on drug benefits and limitation.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:

<i>Course Intended Learning Outcomes (CILOs) in Intellectual Skills.</i>		Teaching strategies/methods to be used.	<i>Methods of assessment</i>
After participating in the course, students would be able to:			
b1-	Classify chemotherapeutic drugs for infections and cancer into various categories	Lectures methods, Group Discussion, Problem solving sessions, brainstorming and Computer based teaching and learning	Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam.
b2-	Compare between therapeutically related drugs based on drug benefits (in particular efficacy and potency) and drug limitations.		
b3-	Relate drug indications to MAO of drugs.		
b4-	Predict drug limitations on the basis of drug MOA.		

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b5-	Select an appropriate drug for patients based on drug benefits and limitation.		
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(C) Professional and Practical Skills.

Alignment 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 would be able to:		After participating in the course, students would be able to:	
C1-	Operate different pharmaceutical equipments and instruments and use emerging technologies in design, synthesis, pre-formulation, formulation, packaging, storage and analysis of pharmaceutical products according to GLP, GSP and cGMP guidelines.	c1-	Calculate accurately drug's dosage, bioavailability, plasma half-life and volume of distribution in different patient populations.
		c2-	Search efficiently for information using documented and electronic sources of information.
		c3-	Prepare critical, scientific and referenced reports
C2-	Handle and dispose chemicals and pharmaceutical preparations including radiopharmaceuticals safely and effectively.		
C5-	Conduct research studies and utilize the results in different pharmaceutical fields.		
Teaching And Assessment Methods For Achieving Learning Outcomes:			
Alignment Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:			

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Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills After participating in the course, students would be able to:		Teaching strategies/methods to be used	Methods of assessment
c1-	Calculate accurately drug's dosage, bioavailability, plasma half-life and volume of distribution in different patient populations.	Lectures methods, practical session, brainstorming and group discussion	Practical works, homework, practical exam and practical reports.
c2-	Search efficiently for information using documented and electronic sources of information.		
c3-	Prepare critical, scientific and referenced reports		

(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 General / Transferable skills		Course Intended Learning Outcomes (CILOs) in General / Transferable skills	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
D1-	Practice independent learning needed for continuous professional development	d1-	Share successfully in team-work.
D5-	Apply information and communication technology and working effectively in a team.	d2-	Show respect to life.
		d3-	Demonstrate time management and selflearning during performing practical and professional works and assignments.

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

Course Intended Learning Outcomes (CILOs) in General and Transferable Skills After participating in the course, students would be able to:		Teaching strategies/methods to be used.	Methods of assessment
d1-	Share successfully in team-work.	Small group discussions, Tutorials and Practical session	Homework and reports.
d2-	Show respect to life.		
d3-	Demonstrate time management and self-learning during performing practical and professional works and assignments.		

16. Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours

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1.	Chemotherapeutic drugs bacterial infections (Antibacterial)	a1, a2, a3, b1, b2, b3, b4, b5, c13, d2	Pharmacokinetics, Pharmacodynamics [drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of : Antibacterials <ul style="list-style-type: none"> • antibiotics: (β-lactams: penicillins, cephalosporins, penems, others), macrolides, aminoglycosides, tetracyclines, chloramphenicols, lincosamides, others • Synthetic Antibacterials: sulphonamides, fluroquinolones, nitrothiazoles (e.g. metronidazole) • Antituberculars and antileprotics • Antiseptics and disinfectants 	4	8
2.	Chemotherapeutic drugs for fungi and viruses infections (Antifungals& antivirals)	a1, a2, a3, b1, b2, b3, b4, b5, c12, d1, d3	Pharmacokinetics, Pharmacodynamics [drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :	3	6

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			<p>Antifungals (antimycotics)</p> <ul style="list-style-type: none"> • Polyene antibiotics : nystatin, amphotericin B, griseofulvin • antimetabolites : flucytosine <p>azoles : clotrimazole, miconazoles, etc</p> <p>Antivirals</p> <ul style="list-style-type: none"> • anti-herpes simplex • anti-influenza • anti-AIDS • immunomodulators e.g. interferone 		
3.	Midterm exam	a1-3, b1-5, c1-3		1	2

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4.	Chemotherapeutic drugs for parasitic infections	a1, a2, a3, b1, b2, b3, b4, b5, c13, d1-3	<p>Pharmacokinetics, Pharmacodynamics [drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</p> <p>Antiprotozoals</p> <ul style="list-style-type: none"> • Antamoebics and anti giardials • Anti-leishmanials and antitoxoplasmosis • Antimalarials <p>Anthelmintics</p> <ul style="list-style-type: none"> • For common worms infection • For tape worm : trematodes (taenia, H. 	3	6
			<p>nana) infections</p> <ul style="list-style-type: none"> • For schistosoma (Bilharzia)infections • For filarisis 		

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5.	Chemotherapeutic drugs for cancer (Anticancer ; antineoplastic)	a1, a2, a3, b1, b2, b3, b4, b5, c1, c3, d2	Pharmacokinetics, Pharmacodynamics [drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of : <ul style="list-style-type: none"> • Antimetabolites : methotrexate, 5-flurouracil. 6-mercaptopurine • Alkylating agents: nitrogen mustards, alkyl sulphonates, nitrosurea • Natural products: antibiotics, plant alkaloids, enzymes, interferons • Hormones and hormones anatogonists • Radioactive isotopes • Miscellaneous: cisplatin, mitotane , etc 	4	8
6.	Final Exam	a1-3, b1-5		1	2
Number of Weeks /and Units Per Semester				16	32

17. a-Teaching strategies of the course:

Lecture method, Group Discussion, Problem solving sessions and tutorials and brainstorming and.

b- Assessment Methods:

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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
1	Homework Assignments	a1-3, b1-5, d1-3	Sporadic through the semester	10
2	Reports	c1-3, d1-3		

I. 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, Quizzes and Homework-assignments	All Weeks	10	10%	a1-4,b1-4, d1-3
2.	Theoretical mid-semester exam	8 th	20	20%	a1, a2, a3, b1, b3
3.	Final Exam (theoretical)	16 th	70	70%	a1-4, b1-5
Total			100	100%	

II. Students' Support:

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

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III. Learning Resources:

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

- 1- Katzung–Basic and Clinical Pharmacology, (2007), McGraw-Hill
- 2- Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.

2- Recommended Books and Reference Materials.

1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.
2. Udaykumar. Text book of medical pharmacology
3. Lectures Notes and Practical Manual.

3- Electronic Materials and Web Sites *etc.*

www.en.wikipedia.org/

IV. 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.

V. 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.



	<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 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.



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

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.



Course Plan of Pharmacology III

I- Information about Faculty Member Responsible for the Course:

Name of Faculty Member	Fahmy M. Al-Wasei	Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail			2h				

II- Course Identification and General Information:

1-	Course Title:	Pharmacology III				
2-	Course Number & Code:	Ph479				
3-	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2	-	-		2
4-	Study level/year at which this course is offered:	3 rd level /2 nd semester				

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5-	Pre –requisite (if any):	Anatomy and histology Physiology I &II General Pathology Pharmacology I & II
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:

The course also deals with the study of pharmacodynamics and pharmacokinetics of chemotherapeutic drugs for infections and cancer.

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

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At the end of this course, the students will be able to:

1. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug physiology of chemotherapeutic drugs for infections and cancer.
2. Discuss drug limitations (side effects, contraindications, precautions, use in special patient categories and drug interactions) of chemotherapeutic drugs for infections and cancer.
3. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
4. Classify chemotherapeutic drugs for infections and cancer into various categories
5. Compare between therapeutically related drugs based on drug benefits (in particular efficacy and potency) and drug limitations.
6. Relate drug indications to MAO of drugs.
7. Predict drug limitations on the basis of Drug MOA.
8. Select an appropriate drug for patients based on drug benefits and limitation.
9. Calculate accurately drug's dosage, bioavailability, plasma half-life and volume of distribution in different patient populations.
10. Search efficiently for information using documented and electronic sources of information.
11. Prepare critical, scientific and referenced reports
12. Share successfully in team-work.
13. Show respect to life.
14. Demonstrate time management and self-learning during performing practical and professional works and assignments.

V- Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

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Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Week Due	Contact hours
7.	Chemotherapeutic drugs bacterial infections (Antibacterial)	a1, a2, a3, b1, b2, b3, b4, b5, c13, d2	Pharmacokinetics, Pharmacodynamics [drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of : Antibacterials <ul style="list-style-type: none"> antibiotics: (β-lactams: penicillins, cephalosporins, penems, others), macrolides, aminoglycosides, tetracyclines, chloramphenicols, lincosamides, others Synthetic Antibacterials: sulphonamides, fluroquinolones, nitrothiazoles (e.g. metronidazole) Antituberculars and antileprotics Antiseptics and disinfectants 	1-4	8
8.	Chemotherapeutic drugs for fungi and viruses infections	a1, a2, a3, b1, b2, b3, b4, b5, c1-	Pharmacokinetics, Pharmacodynamics [drug benefits : MOA, therapeutic		



	(Antifungals& antivirals)	2, d1, d3	<p>action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</p> <p>Antifungals (antimycotics)</p> <ul style="list-style-type: none"> • Polyene antibiotics : nystatin, amphotericin B, griseofulvin • antimetabolites : flucytosine <p>azoles : clotrimazole, miconazoles, etc</p> <p>Antivirals</p> <ul style="list-style-type: none"> • anti-herpes simplex • anti-influenza • anti-AIDS • immunomodulators e.g. interferone 	5-7	6
9.	Midterm exam	a1-3, b1-5, c1-3		8	2

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10.	Chemotherapeutic drugs for parasitic infections	a1, a2, a3, b1, b2, b3, b4, b5, c13, d1-3	Pharmacokinetics, Pharmacodynamics [drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of : Antiprotozoals <ul style="list-style-type: none"> • Antamoebics and anti giardials • Anti-leishmanials and antitoxoplasmosis • Antimalarials 	9-11	6
			Anthelmintics <ul style="list-style-type: none"> • For common worms infection • For tape worm : trematodes (taenia, H. nana) infections • For schistosoma (Bilharzia)infections • For filarisis 		



11.	Chemotherapeutic drugs for cancer (Anticancer ; antineoplastic)	a1, a2, a3, b1, b2, b3, b4, b5, c1, c3, d2	<p>Pharmacokinetics, Pharmacodynamics [drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</p> <ul style="list-style-type: none"> • Antimetabolites : methotrexate, 5-fluorouracil. 6-mercaptopurine • Alkylating agents: nitrogen mustards, alkyl sulphonates, nitrosurea • Natural products: antibiotics, plant alkaloids, enzymes, interferons • Hormones and hormones anatgonists • Radioactive isotopes • Miscellaneous: cisplatin, mitotane , etc 	12-15	8
12.	Final Exam	a1-3, b1-5		16	2
Number of Weeks /and Units Per Semester				16	32

VI- a-Teaching strategies of the course:

Lecture method, Group Discussion, Problem solving sessions and tutorials and brainstorming and.

b- Assessment Methods:

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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
1	Homework Assignments	a1-3, b1-5, d1-3	Sporadic through the semester	10
2	Reports	c1-3, d1-3		

VI. 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)
4.	Attendance, Participation, reports, Quizzes and Homework-assignments	All Weeks	10	10%	a1-4,b1-4, d1-3
5.	Theoretical mid-semester exam	8 th	20	20%	a1, a2, a3, b1, b3
6.	Final Exam (theoretical)	16 th	70	70%	a1-4, b1-5
Total			100	100%	

VII. Students' Support:

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

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VIII. Learning Resources:	
1- Required Textbook(s) (maximum two).	
3-	Katzung–Basic and Clinical Pharmacology, (2007), McGraw-Hill
4-	Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.
2- Recommended Books and Reference Materials.	
4.	Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.
5.	Udaykumar. Text book of medical pharmacology
6.	Lectures Notes and Practical Manual.
3- Electronic Materials and Web Sites etc.	
	www.en.wikipedia.org/
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.
3 - Computing resources:	- Computer laboratory with internet facilities.
X. 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.



	<ul style="list-style-type: none"> 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.



IX. 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	Plagiarism: <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	Other policies: <ul style="list-style-type: none">General policies of the Students' Affairs of the University and the Quality Assurance Unit.