Course Specification Therapeutics I

I. Course Identification and General Information:

1	**Course Title:**	Therapeutics I				
2	**Course Code & Number:**	**B1101481**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2				2
4	**Study level/ semester at which this course is offered:**	**Fourth Year/ First Semester**				
5	**Pre –requisite (if any):**	**B1101362**				
6	**Co –requisite (if any):**	**NA**				
8	**Program (s) in which the course is offered:**	Bachelor of PharmD				
9	**Language of teaching the course:**	**English**				
10	**Location of teaching the course:**	**Thamar University - Health Science Faculty**				
11	**Prepared By:**	**Dr. Abdulrazzaq Y. A. Al Khazzan**				
12	**Date of Approval**					

II. Course Description:

This course involves medicines used for cardiovascular diseases in relation to the pathophysiologic conditions of the patient. The course discusses underlying causes, pathophysiology, and signs and symptoms of diseases. Goals of therapy, non-pharmacotherapy & pharmacotherapy approaches, therapeutic plan, patient counseling, drug monitoring and evaluation of the therapeutic outcomes will be well-explained. Prerequisite courses regarding normal & abnormal body functions as well as classes of drugs related to sub-topics of this course must be studied firstly. This course is taught primarily through series of instructor-student interactive lectures and interactive class discussions.

III. Course Objectives:

This course aims to:

1. Making the student familiar with common diseases selected from cardiovascular system.
2. Equip student to explain clinical presentations and complications of CV selected diseases.
3. Enable student to select an appropriate therapy regimen, advise and educate patient about the correct use of their medications.
4. Help student to interest with diseases prophylaxis methods, lifestyle modifications, and the safety of medications use in special groups of patients.

Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Knowledge and Understanding PILOs	Knowledge and Understanding CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
A5 Outline principles of clinical pharmacology, therapeutics and Pharmacovigilance,	a1. Recognize essential information about selected cardiovascular diseases, specially the definition, causes and risk factors, pathogenesis, signs & symptoms, and diagnostic tools. a2. Select appropriate treatment regimen for patients with cardiovascular disorders including; doses, optimum use, adverse effects, doses for special groups of patients, and contraindications.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Intellectual Skills PILOs	Intellectual Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
B2 Design risk reduction strategies to ensure patient safety and prevent medication errors, drug interaction, and adverse drug effects,	b1 Choose suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy.
B3 Solve problems to reduce drug therapy problems	b2 Implement patient-counseling and educational programs to dealing and reducing drug therapy problems.
B4 Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	b3 Design drug therapy regimen using patient individualization therapy, to achieve drug optimizing and safety.

Professional and Practical Skills	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Professional and Practical Skills PILOs	**Professional and Practical Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
C1 Advise the patients and health care professionals for optimizing medicines use.	c1 Practice and recommend suitable advice for the patients and health care providers on the safe and effective use of cardiovascular medicines.

Transferable (General) Skills :	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Transferable (General) Skills PILOs	**Transferable (General) Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
D2 Use information systems and computer software in order to enhance the delivery of pharmaceutical care,	d1 Familiarize with drug information resources and how to use them. d2 Assess the scientific data regarding cardiovascular diseases and drugs obtained from different information sources. d3 Describe appropriate search strategy for use with computerized secondary databases.
D3 Work effectively individually and in a team	
D4 Have the skills of decision-making and time management and life- long learning	

Alignment Course Intended Learning Outcomes		
(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Recognize essential information about selected cardiovascular diseases, specially the definition, causes and risk factors,	Lectures (in various ways, cooperative and participatory teaching, etc.)	- Quiz - Exam - in-class participation

pathogenesis, signs & symptoms, and diagnostic tools.		
a2. Select appropriate treatment regimen for patients with cardiovascular disorders including; doses, optimum use, adverse effects, doses for special groups of patients, and contraindications.	Lectures (in various ways, cooperative and participatory teaching, etc.)	- Quiz - Exam - in-class participation

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 Choose suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy.	- Critical thinking and problem solving - Class discussion	- Discussion - Oral questions
b2 Implement patient-counseling and educational programs to dealing and reducing drug therapy problems.		
b3 Design drug therapy regimen using patient individualization therapy, to achieve drug optimizing and safety.	- Critical thinking and problem solving - Class discussion	- Discussion - Oral questions

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 Practice and recommend suitable advice for the patients and health care providers on the safe and effective use of cardiovascular medicines.	- Lectures (in various ways, cooperative and participatory teaching, etc.)	- Homework - Exam

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1 Familiarize with drug information resources and how to use them.	- Duties & activities - Seminars - Home works	Evaluate discussions, seminars and assignments
d2 Assess the scientific data regarding cardiovascular diseases and drugs obtained from different information sources.		
d3 Describe appropriate search strategy for use with computerized secondary databases.	- Duties & activities - Seminars - Home works	Evaluate seminars and assignments

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	Cardiovascular Disorders	- Orientation and overview	1	2	a1
2		- Hypertension	2	4	a1, a2, b1, b2, b3, c1, d1, d2, d3
3		- Heart Failure	2	4	a1, a2, b1, b2, b3, c1, d1, d2, d3
4		- Stable Ischemic Heart Disease	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
5		- Acute Coronary Syndromes	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
6		- Arrhythmias	2	4	a1, a2, b1, b2, b3, c1, d1, d2, d3
7		**Mid-term exam**	1	1	a1, a2, b1, b3
8		- Venous Thromboembolism	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
9		- Stroke	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
10		- Dyslipidemias	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
11		- Hypovolemic Shock	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
12	**Final-term exam**		1	2	a1, a2, b1, b3
Number of Weeks /and Units Per Semester			**15**	**29**	

B – Case Studies and Practical Aspect: (Clinical cases in separate course specification)				
Order	**Tasks/ Experiments**	**Number of Weeks**	**contact hours**	**Learning Outcomes (CILOs)**
1				
2				
3				
4				
Number of Weeks /and Units Per Semester				

VI. Teaching strategies of the course:

1. Interactive lectures
2. Class discussion
3. Brainstorming
4. Duties & activities
5. Seminars
6. Home works
7. Office hours (Tutorials)

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework/Assignment/quiz (1)	a1, a2, b1, b3, d1, d2, d3	5th	5
2	Homework/Assignment/quiz (2)	a1, a2, b1, b3, d1, d2, d3	10th	5

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Quizzes	5th	5	5%	a1, a2, b1, b3, d1, d2, d3
2	Assignments & Homework, Tasks & Presentation	10th	5	5%	a1, a2, b1, b3, d1, d2, d3
3	Mid-Term exam	7th	30	30%	a1, a2, b1, b3
4	Final Exam theory		60	60%	a1, a2, b1, b3
Total			**100**	**100%**	

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

1. Marie A. Chisholm-Burns and others, (2019), Pharmacotherapy: Principles & practice, 5nd edition, McGraw-Hill Companies, Inc., United States of America.
2. Joseph Dipiro, (2020), Pharmacotherapy: pathophysiologic approaches, 11th edition, McGraw-Hill Companies, Inc., United States of America

2- Essential References.

1. Koda-Kimble *et al*, (2018), Applied Therapeutics: The Clinical Use of Drugs, 11th edition, Lippincott Williams & Wilkins, Philadelphia, United States of America.
2. Walker and Edwards, (2018), Clinical Pharmacy and Therapeutics, 6th edition, Elsevier Ltd., UK

3- Electronic Materials and Web Sites *etc*.

1. Word Document or Portable Data Files (PDF) for Lectures that would be Delivered.
2. American College of Clinical Pharmacy (ACCP) http://www.accp.com

General pathology Course Specification

I. Course Identification and General Information:

١	**Course Title:**	**General pathology**				
٢	**Course Code & Number:**	**B1101424**				
٣	**Credit hours: 3**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2		0		3
٤	**Study level/ semester at which this course is offered:**	4 Level/1st semester				
٥	**Pre –requisite (if any):**					
٦	**Co –requisite (if any):**					
٨	**Program (s) in which the course is offered:**	**Bachelor of Pharma D**				
٩	**Language of teaching the course:**	**English**				
١٠	**Location of teaching the course:**	**Thamar University**				
11	**Prepared By:**	**Dr: Walid Aldahibi**				
12	**Date of Approval**					

II. Course Description:

The curriculum of general pathology aims at preparing the students in basic understanding of diseases and their pathogenesis. Introduction to pathology, basic definitions and familiarization with the common terms used in pathology, causes and mechanisms of cell injury, reversible and irreversible injury, systemic pathology, introduction of hyperplasia, hypoplasia, hypertrophy, atrophy, metaplasia, necrosis and apoptosis and microscopic features of pathological matters.

III. Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Knowledge and Understanding PILOs		Knowledge and Understanding CILOs
After completing this program, students would be able to:		After completing this course, students would be able to:
A1	**a1**	Demonstrate knowledge and understanding of the pathological terminologies, the concept of cell injury, the change produces thereby, in the different tissues and organs and the body capacity for healing.
A6	**a2**	Explain the etiopathogenesis, the pathological effects, and the c1inicopathological correlation of common infectious and non-infectious diseases.
A2,A4	**a3**	Demonstrate knowledge and understanding of the concept of neoplasia with respect to etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Intellectual Skills PILOs	Intellectual Skills CILOs	
After completing this program, students would be able to:	After completing this course, students would be able to:	
B1	**b1**	Select the necessary techniques for sample reception & processing according to the nature of specimen received.
B4	**b2**	Correlate normal and altered morphology (gross and microscopy) of different organ systems in different diseases to the extent needed of understanding of the disease processes and their clinical significance
B1	**b3**	Integrate the normal homeostatic mechanism, to recognize the derangements of these mechanism and the effect on human system.

Transferable (General) Skills :		
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)		
Transferable (General) Skills PILOs	Transferable (General) Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:
D2, D5	d1	Communicate effectively and display ethical conduct during classes and in interactions with instructors, other students and patients.
D4,D6	d2	Evaluate research and published studies to remain informed of new techniques and procedures.

	Alignment Course Intended Learning Outcomes to Teaching Strategies and Assessment Strategies		
	(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes		**Teaching strategies**	**Assessment Strategies**
a1	Demonstrate knowledge and understanding of the pathological terminologies, the concept of cell injury, the change produces thereby, in the different tissues and organs and the body capacity for healing.	-Interactive Lectures -Self-learning -Brain storming, problem solving	Quiz, written exam, homework,
a2	Explain the etiopathogenesis, the pathological effects, and the c1inicopathological correlation of common infectious and non-infectious diseases.	PowerPoint, presentations, Tutorial	Written exam, Quiz, assignment
a3	Demonstrate knowledge and understanding of the concept of neoplasia with respect to etiology, gross andmicroscopic features, diagnosis and prognosis in different tissues	lecture, group discussion, electronic learning, laboratory session,	Written exam, laboratory performance,

	and organs of thebody.	tutorial seminar	assignment.
	(B) Alignment Course Intended Learning Outcomes of Intellectual Skillsto Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes		**Teaching strategies**	**Assessment Strategies**
b1	Select the necessary techniques for sample reception & processing according to the nature of specimen received.	Lecture, tutorial, laboratory session, Brainstorm	Written exam lab report, quiz
b2	Correlate normal and altered morphology (gross and microscopy) of different organsystems in different diseases to the extent needed of understanding of the diseaseprocesses and their clinical significance	Tutorial, laboratory session. Problem solving	Assignment , oral examination, lab report, practical exam
b3	Integrate the normal homeostatic mechanism, to recognize the derangements of these mechanism and the effect on human system.	Lecture, Laboratory session, , problem based study	Written exam, practical exam, assignment .
	(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes		**Teaching strategies**	**Assessment Strategies**
d1	Communicate effectively and display ethical conduct during classes and in interactions with instructors, other students and patients,	Group Discussion, laboratory performance presentation. Seminar	Oral presentation, oral exam, seminar, laboratory performance assessment
d2	Evaluate research and published studies to remain informed of new techniques and procedures.	Electronic learning, workshop participation, assignment	assignment, workshop report, research report.

V- Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Learning Outcomes	Number of Weeks	contact hours
1	Cellular response to injury:	Stress and adaptation Cell injury. Necrosis & apoptosis. Pathologic calcification, deposition & pigmentation. Cellular aging.	a1-a3,b2,b3	1	2
2	Acute inflammation:	Definition, signs, components & mechanism Chemical mediators of inflammation. Outcomes, morphological types. Systemic and local effect of inflammation. Defects in leukocyte function.	a1a2, b1-b3, d1	1	2
3	Chronic inflammation:	Chronic inflammation: Definition, causes, mechanism & morphology. Granulomatous inflammation. Morphologic patterns in inflammation. Role of lymphatic in inflammation.	a1,a2, b1-b3, d1, d2	1	2
4	Cell Regeneration	Cell Regeneration, healing & repair. Scar & keloid Stem cell concept in disease and therapy	a1,a2, b1-b3, d1, d2	1	2
5	Homodynamic disturbances	Edema Hyperemia & congestion.	a1,a3,b2,3,d2,d2	1	2
6	Hemostasis & coagulation	Components of hemostasis. Thrombosis. Embolization. Ischemia and Infarction	a1, a3	1	2
7	Midterm exam	Exam	a1-a3, b1-b3, d1, d2	1	2
8	Neoplasia	Neoplasia Neoplasia: Definition,	a1-a3,b1, b2,3,d2,d2	2	4

		incidence, terminology & classification. Characteristics of benign & malignant tumors. Dysplasia & carcinoma in situ. Epidemiology of cancer, role of heredity. Premalignant conditions. Molecular basis of cancer (oncogenes & tumor suppressor genes). Biology tumor growth. Etiology of cancer, (Chemical, radiation& viral oncogenesis). Clinical effects of tumors, cachexia &paraneoplastic conditions. Grading & staging of tumors. Laboratory diagnosis of tumors.			
9	Medical genetics	:Introduction & principles. Mendelian disorders: types & characteristics. Cytogenetic disorders. Multifactorial disorders. Investigations& diagnosis of genetic disorders	a1,a2,b1-b3, d1,d2	1	2
10	Immunological disorders:	Definition , cells , types , immune response , HLA and cytokines Immunodeficiency Hypersensitivity reactions Tolerance Autoimmunity Immunity to infections Vaccines Transplantation immunology Tumour immunology Miscellaneous e.g. immunodiagnosis, immunotherapy, immunomodulation	a1,a2,b1-b3, d1,d2	2	4

11	Pathology of infectious disease	Pathology of infectious disease	a2- b1-b3, d1,d2	1	2
12	Pathophysiology of systemic disease	• Renal diseases • Endocrine diseases • Musculoskeletal diseases Gastrointestinal , liver , pancreas diseases	a1-a3,b1-b3,d1,d2,	2	4
13	Final exam		a1-a3,b1-b3,d1,d2,	1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VI- Teaching strategies of the course:

- Lectures using data show, video animation and seminars, electronic learning

- Solving Problem method, Laboratory work, directed reading, independent study and discussion

I. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Seminar on Molecular basis of cancer (oncogenes & tumor suppressor genes)	a3,b1,d2	8	5
2	Lab report	b1-b3, c1-c2	Every week	5
3	Presentation, homework	a1, d1, d2	6	5

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Presentation & Home works	6	5	5%	a1, d1, d2
2	Lab Report	ALL	5	5 %	b1-b3, c1-c3
3	seminar	Every week	5	5%	b1-b3, c1-c2
4	Quizzes	3,5,10	5	5%	a1,a2,b1,b2
5	Midterm exam	7	10	10%	a1-a3, b1-b3, d1, d2
	Midterm practical	8	10	10%	b1-b3,c1-c2,d1,d2
6	Final Exam (theoretical)	16	40	50%	a1-a3,b1-b3,d1,d2,
7	Final Exam (practical)	15	20	20%	b1-b3,c1-c2,d1,d2
	Total		100	100%	

VII- Learning Resources:

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

1- Cotran RS, Kumar V , Collin T, Robbins SL, (2020), Robbins Pathologic Basis of Disease: 10th edition, , W.B.Sunders Co. Philadelphia, London, Toronto, Montreal, Sydney, Tokyo

2- Essential References.

1- Simon Herrington. C (2020), Muir's Textbook of Pathology,CRC Press,SBN 9780367146726.
2- Alasdair D.T. Govan, R. MacFarlane (Editor). Pathology Illustrated. Last edition . Chur Livingstone. ISBN-10: 044305956X

3- Electronic Materials and Web Sites *etc.*	
	www.webpathology.com www.webpathology.com http://www.afip.org/consultation/vetpath/index.htm http://web.vet.cornell.edu/public/oed/neuropathology/index.asp Other learning material such as computer-based programs/CD, professional standards/regulations Other learning material such as computer-based programs/CD, professional standards/regulations

VIII- Course Policies:

١	Class Attendance: Absence from lectures and/or tutorials shall not exceed 25%. Students who exceed the 25% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college shall not be allowed to take the final examination and shall receive a mark of zero for the course. -
٢	Tardy: Students should be attending the classes, as it has required for the assessments if the student is 15 minutes late in attending to the class for more than two classes he will loss 50% of quizzes mark -
٣	Exam Attendance/Punctuality: All examination and their roles will be according to Students affairs regulations -
٤	Assignments & Projects: Student, who is submitting the assignments or the projects on time, will be awarded good percentage in grading of participation.
٥	Cheating: All students must be an ideal behavior, respect each other, their teachers, and respect the roles of the colleague. In addition, students should follow safety roles while working in the lab. Those who has been caught in any cheating case will be punished according to the Students affairs regulations -

6	Plagiarism: Student will be punished depend upon gravity of the action and according to Students affairs regulations which might be ranged from rewriting the homework to suspension or dismissal
7	Other policies: Using mobile or another electronic device capable to store or transfer data in class during the lecture or the exam is forbidden. -

Course Specification Biopharmaceutics & Pharmacokinetics

I. Course Identification and General Information:

1	**Course Title:**	Biopharmaceutics & Pharmacokinetics				
2	**Course Code &Number:**	**B1101457**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr.	Tr.	
		2				2
4	**Study level/ semester at which this course is offered:**	4thlevel/ 1st semester				
5	**Pre –requisite (if any):**	Pharmaceutics III				
6	**Co –requisite (if any):**					
7	**Program (s) in which the course is offered:**	PharmD				
8	**Language of teaching the course:**	English / Arabic				
9	**Location of teaching the course:**	Themar University				
10	**Prepared By:**	Dr. Abdulkarim Kassem Alzomor				
11	**Date of Approval**	**2021**				

II. Course Description:

This course is covers routs of drugs administration, the mechanism of drugs absorption, distributions, metabolism and excretion and the different factors, which effect in these processes. The course covers Bioavailability, Bioequivalence, the importance of bioequivalence study and the protocols for designed bioequivalence study. The course will introduce the student the types of model, order of kinetics and changes in the drug's absorption, distribution and elimination with time following one and two compartment I.V bolus, oral and I.V infusion. It provides students with principle of the linear and non-linear pharmacokinetic models and their application. The principles of clinical pharmacokinetics are also introduced in order to be able to formulate or modify drug dose-regimens according to the need of patients.

III.

IV. Course Intended Learning Outcomes (CILOs):

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

a1 Identify the biologic, physiologic, and pathologic factors, which influence drugs' absorption, disposition ant response in the body.

a2 Explain pharmacokinetics orders, models and parameters.

Knowledge and Understanding PILOs		**Knowledge and Understanding CILOs**	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
A1	Explain the fundamentals of general sciences, the basic and biomedical sciences, and their relations to pharmacy profession.	a1	Identify the biologic, physiologic, and pathologic factors, which influence drugs' absorption, disposition ant response in the body.
A4	Define basic principles of drug: target identification, design, informatics, and mechanisms of action.	a2	Explain pharmacokinetics orders, models. and parameters.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

b1 Predict the mechanism for drugs metabolism, excretion and drug accumulation in the body and cause toxic effect.

b2 Interpret the pharmacokinetics parameters results for different pharmaceutical dosage form.

Intellectual Skills PILOs		Intellectual Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
B1	Classify the synthetic and natural drugs according to their mechanism of action, systemic effect, therapeutic uses, contraindication and toxicity	b1	Predict the mechanism for drugs metabolism, excretion and drug accumulation in the body and cause toxic effect.
B4	Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety		Interpret the pharmacokinetics parameters results for different pharmaceutical dosage form.

Professional and Practical Skills

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

c1 Handle efficiently and safely the chemical materials and tools used in the laboratory.

Professional and Practical Skills PILOs		Professional and Practical Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
C1	Handle the chemical, biological, and pharmaceutical materials safely	c1	Handle efficiently and safely the chemical materials and tools used in the laboratory.

Transferable (General) Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

d1 Communicate effectively and behave in discipline with colleagues.
d2 Develop his skills in the field of pharmacokinetics by using new technology in this field.
d3 Participate efficiently with colleagues in a team work

Transferable (General) Skills PILOs		Transferable (General) Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
D1	Communicate effectively and behave in discipline with colleagues.	d1	Communicate effectively and behave in discipline with colleagues.
D2	Develop his skills in the field of pharmacokinetics by using new technology in this field.	d2	Develop his skills in the field of pharmacokinetics by using new technology in this field.
D3	Work effectively individually and in a team	d3	Participate efficiently with colleagues in a team work

V. Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
a1	Identify the biologic, physiologic, and pathologic factors, which influence drugs'	- Lectures, Discussions	- Quizzes, Written exam

	absorption, disposition ant response in the body.	- Self - learning	
a2	Explain pharmacokinetics orders, models. and parameters.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
b1	Predict the mechanism for drugs metabolism, excretion and drug accumulation in the body and cause toxic effect.	- Discussions and - Training - Problem solving	- Quizzes, Homework - Observation - Task's Evaluates
b2	Interpret the pharmacokinetics parameters results for different pharmaceutical dosage form.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
c1	Handle efficiently and safely the chemical materials and tools used in the laboratory	- Discussions and Training	- Quizzes, Homework - Observation

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
d1	Communicate effectively and behave in discipline with colleagues.	- Group discussions - Cooperative learning. - Self – learning - Inductive and deductive	- Homework -Evaluates of Oral Presentation
d2	Develop his skills in the field of pharmacokinetics by using new technology in this field.		
d3	Participate efficiently with colleagues in a team work.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	**Introduction to Biopharmaceutics & Routes of Drug Administration**	- Definition and importance of drug administration. - Types of route administration - Advantage and disadvantage for different routes. - Definition of some terms used in biopharmaceutics - Aims of studying of biopharmaceutics - Plasma –time level curve and drug parameters. - Bioavailability, Advantages and Disadvantages	1	2	a1, b1, d2
2	**GIT drug absorption**	- Definition - Mechanism of drug absorption - Physiological factors affecting oral absorption - Physical-Chemical factors affecting oral absorption - Formulation factors affecting oral absorption - Techniques for the GIT absorption assessment	1	2	a2, b1, d1, d2
3	**Biopharmaceutics study of drug distribution**	- Definitions - Volume of distribution - Drug distribution to special tissue o Brain o Placenta - Factors affecting drug distribution - Binding to plasma proteins - Factors affecting protein binding - Drug interaction in protein binding	1	2	a2, b1, d1, d3
4	**Biopharmaceutics study of drug**	- Definitions - Role of drug metabolism	1	2	

	metabolism	- Drug metabolism sites - Metabolic pathway - Metabolism enzymes - Metabolism phases - Factors affecting drug metabolism - Drug interaction in metabolism - Extrahepatic metabolism - Prodrugs			a2, b1, d1, d2
5	**Biopharmaceutics study of Drug excretion**	- Definitions - Role and pathway of excretion - Types of excretion - Renal excretion - Non-renal excretion o Biliary excretion o Mammary excretion o Salivary excretion o Skin excretion o Pulmonary excretion o GIT excretion - Genital excretion - Factors Affecting Renal Excretion - Clearance - Drug interaction	1	2	a2, a2, b1d1, d3
6	**Bioavailability and bioequivalence**	- Historical aspects. - Definitions. - Objectives and significance of BA/BE studies. - Factors affecting Bioavailability. - Measurement of Bioavailability. - Methods for enhancing Bioavailability. - Introduction to Bioequivalence. - Limitations of BA/BE studies - Protocol design of bioavailability assessment. - Methods of bioequivalence determination	1	2	a1,a2 c1, , d1, d2,d3
7	**Introduction to pharmacokinetics**	- Terminology and definitions - Models define, Important and classification - Compartment model	1	2	a2, b2,c1, d2

		- Definition - Basis of Classification and types - Model selection criteria - Exponent - Logarithm - Derivatives and integration - Trapezoidal law - Calculation Area Under the curve - Types of graves and paper - Line equation - Slope and intercept			
8	**Order of pharmacokinetics**	- Zero order pharmacokinetics - Define - Equation - Parameters and units - First order pharmacokinetics - Define - Equation - Parameters and units - Problems	1	2	a2, b2, c1, d1. d2
9	**One compartment open model IV bolus & Urine excretion**	- One Compartment I.V Bolus - First-order kinetics - Volume of Distribution - Plasma data - Area under the Curve - Half-life - Duration of action - Elimination Rate Constant - Clearance - Methods of calculations drug parameters from urine: Rate Method and Sigma Minus Method: - Differences between the two method - Problems must be considered when calculation drugs parameters from urine - Parameters determine from rate method: - Elimination Rate Constant (K) - Excretion Rate Constant (Ke)	2	4	a2, b2, c1, d1. d2, d3

		- Metabolism Rate Constant (Km) - Half-life - Volume of Distribution - Clearance - Area under the Curve			
10	**Two and three compartment first order elimination kinetics**	- Two compartments (Distribution phase and Elimination phase) - Residual Method: to determine - Intercept and rate for elimination phase (B & b) - Intercept and rate for distribution phase (A& a) - Pharmacokinetics parameters calculate from two compartment: - K, K12, K21 - Plasma volume distribution (Vp) - Tissue volume distribution (Vt) - Problems	1	2	a2, b2,c1, d1, d2,d3
11	**Pharmacokinetics for oral drug absorption**	- Pharmacokinetics of Oral drug absorption - Zero order drug absorption: - Equation - First order drug absorption: - Equation for calculation drug absorption from plasma or urine. - Bioavailability parameters: - Equation for calculation time to reach drug maximum peak (Tmax). - Calculation maximum concentration for drug absorption (Cmax). - Methods for determination absorption rate constant (Ka (- Residual method - Flip flop Method - Wagner nelson - Problems	1	2	a2, b2,c1, d1, d2,d3
12	**Pharmacokinetics for Intravenous infusion**	- Intravenous Infusion: one compartment - Zero order absorb and first order eliminate (equation)	1	2	

		- Continuous infusion – steady state - Combined infusion and bolus administration (Loading Dose) - Combined slow and fast infusion - Intravenous Infusion: Two compartment - Problems			a2, b2,c1, d1, d2,d3
13	**pharmacokinetics (dose dependent kinetics)**	- Michaels- Menten's kinetics - Pharmacokinetic characteristics. - In-vivo estimation of Km and Vm - Problems	1	2	a2, b2,c1, d1, d2,d3
Number of Weeks /and Units Per Semester			**14**	**28**	

VI. Teaching strategies of the course:

- Lectures, Discussions and Exercises.
- Group discussions
- Field visits
- Problem solving
- Simulation & Practical presentations
- Self-learning
- Cooperative learning, Training

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Class attendance and participation	a1, a2,b1, c1, d1, d2,d3	weekly	5
2	Reports on kinetics some drugs	a2, b2, c1, d1,d2	12	5
3	Exercises and home work	a1, b1, b2, c1, c2, d1, d2, d3	weekly	5

I.Schedule of Assessment Tasks for Students During the Semester:					
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	1-13	15	15%	a1, a2,b1, b2, c1, d1, d2,d3.
2	Quizzes 1	5	2.5	2.5%	a1, b1
3	Mid-semester exam of theoretical part (written exam	8	20	20%	a1, a2, a3, b1
6	Quizzes 2	11	2.5	2.5%	a2, b2, c1
7	Final exam of theoretical part (written exam)	16	60	60%	a1, a2, b1, b2, c1, c2, d1, d2
Total			100	100%	

VIII. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

1. Curtis L . Smith, Pharm.D., FCCP, BCPS (2018). Pharmacokinetics , Ferris State University Lansing, Michigan.

2. Michel E. Winter (2011). Basic clinical pharmacokinetics, Fifth edition, Lippincotts and William, San Fransisco.

2- Essential References.

1. Michel E. Winter (2011). Basic clinical pharmacokinetics, Fifth edition, Lippincotts and William, San Fransisco.

2. V. Venkateswarlu 2008) .Biopharmaceutics and Pharmacokinetics, PharmaMed Press ISBN: •81-88449-51-2.

3- Electronic Materials and Web Sites *etc.*

- www.boomer.org

Course Specification

Pharmacology 3

I. Course Identification and General Information:

1	**Course Title:**	**Pharmacology 3**				
2	**Course Code &Number:**	**B1101463**				
3	**Credit hours: 3**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2	0		0	2
4	**Study level/ semester at which this course is offered:**	Level 4/ semester1				
5	**Pre –requisite (if any):**	Physiology, Pharmacology 1				
6	**Co –requisite (if any):**	Pharmacology 2				
7	**Program (s) in which the course is offered:**	Bachelor of Pharmacy Doctor (Pharma D)				
8	**Language of teaching the course:**	English				
9	**Location of teaching the course:**	Thamar University - Faculty of Medical Sciences				
10	**Prepared By:**	Dr. Ahmed G. Al- Akydy				
11	**Date of Approval**	2021				

II. Course Description:

This course is an extension of pharmacology 2 course. It provides the student with the general knowledge on drugs that affecting cardiovascular, blood, Gastrointestinal, respiratory and renal systems. This course involves agents used in the treatment of hypertension, ischemic heart disease, heart failure, cardiac arrhythmias, dyslipidaemic, haemorrhagic and thromboembolic disorders. In addition to agents used in the treatment anemias, gastrointestinal, respiratory and renal diseases.

III. Course Objectives:

The overall aims of the course are:

1. To raise knowledge of student about commonly used drugs to treat cardiovascular and blood disturbances.
2. To build knowledge about the drugs used in the treatment of peptic ulcer, nausea, vomiting, constipation, bronchial asthma, cough chronic obstructive pulmonary disease.
3. To identify the mechanism, therapeutic uses, side effects/toxicity, contraindications, and interactions of the major classes acting on the cardiovascular, respiratory renal and gastrointestinal systems.

IV. Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

a1 **Describe** the major drug categories as they relate to major disorders affecting cardiovascular, such hypertension angina, cardiac arrhythmias, heart failure, dyslipidaemia, thromboembolism and anaemia.

a2 **Enumerate** the different categories of agents that use in the treatment of respiratory, renal and gastrointestinal disorders.

a3 **Explain** in detail the mechanisms of action, therapeutic uses, contraindications and adverse effects of commonly prescribed drugs used in the treatment of cardiovascular, respiratory, gastrointestinal and renal disorders.

Knowledge and Understanding PILOs		Knowledge and Understanding CILOs	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
A1	Explain the fundamentals of general sciences and the basic and biomedical sciences and their relations to pharmacy profession.		
A2	Illustrate the fundamentals of social and behavioral sciences relevant to pharmacy, ethics of health care and its impact on their relationship with patients and other healthcare professionals.		
A3	Describe relationships between chemical structure of compounds of pharmaceutical and medicinal interest and biological activities	a1	**Describe** the major drug categories as they relate to major disorders affecting cardiovascular, such hypertension angina, cardiac arrhythmias, heart failure, dyslipidaemia, thromboembolism and anaemia.
		a2	**Enumerate** the different categories of ag that use in the treatment of respiratory, r and gastrointestinal disorders.

A4	Define basic principles of drug: target identification, design, informatics, and mechanisms of action	a3	**Explain** in detail the mechanisms of action, therapeutic uses, contraindications and adverse effects of commonly prescribed drugs used in the treatment of cardiovascular, respiratory, gastrointestinal and renal disorders.
A5	Outline principles of clinical pharmacology, therapeutics and Pharmacovigilance.		

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

b1 Compare between the different categories of drugs used in the treatment hypertension, angina, bronchial asthma, and renal and gastrointestinal disorders, based on their mechanism of action, pharmacological effects, therapeutic uses, adverse effects and contraindications**.**

b2 Design a proper management strategy, including the appropriate dose, route of administration, and duration of therapy, for patients with various clinical situations of cardiovascular, gastrointestinal, renal and respiratory diseases.

b3 Evaluate and resolve the common serious problems, as toxicity, drug interactions, related to medications used in the treatment of cardiovascular, gastrointestinal, renal and respiratory diseases**.**

Intellectual Skills PILOs		Intellectual Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
B1	Classify the synthetic and natural drugs according to their mechanism of action, systemic effect, therapeutic uses, contraindication and toxicity	**b1**	**Compare** between the different categories of drugs used in the treatment hypertension, angina, bronchial asthma, and renal and gastrointestinal disorders, based on their mechanism of action, pharmacological effects, therapeutic uses, adverse effects and contraindications**.**

B2	Design risk reduction strategies to ensure patient safety and prevent medication errors, drug interaction, and adverse drug effects,		
B3	Solve problems to reduce drug therapy problems	**b3**	**Evaluate** and resolve the common serious problems, as toxicity, drug interactions, related to medications used in the treatment of cardiovascular, gastrointestinal, renal and respiratory diseases**.**
B4	Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	**b2**	**Design** a proper management strategy, including the appropriate dose, route of administration, and duration of therapy, for patients with various clinical situations of cardiovascular, gastrointestinal, renal and respiratory diseases.

Professional and Practical Skills

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

c1 **Apply** knowledge with principles of pharmacology to calculate appropriate dosages and regimen of drugs that are used in the treatment of different states of cardiovascular, respiratory, gastrointestinal, and renal disorders.

c2 **Write** a prescription in legal, and correct manner, of the medications that use to manage various clinical conditions of cardiovascular, respiratory, gastrointestinal, and renal diseases.

c3 **Detect** and manage problems, such as, side effects and drug interactions, related to drugs that are used in the treatment of cardiovascular, respiratory, gastrointestinal, and renal diseases.

Professional and Practical Skills PILOs		**Professional and Practical Skills CILOs**	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
C1	Handle the chemical, biological, and pharmaceutical materials safely		
C2	Operate different pharmaceutical equipment and instruments		
C3	Extract active substances from different sources.		
C4	Carry outpatient physical assessment.	c1	**Apply** knowledge with principles of pharmacology to calculate appropriate dosages and regimen of drugs that are used in

			the treatment of different states of cardiovascular, respiratory, gastrointestinal, and renal disorders**.**
C5	Advise the patients and health care professionals for optimizing medicines use.	c2	**Write** a prescription in legal, and correct manner, of the medications that use to manage various clinical conditions of cardiovascular, respiratory, gastrointestinal, and renal diseases.
		c3	**Detect** and manage problems, such as, side effects and drug interactions, related to drugs that are used in the treatment of cardiovascular, respiratory, gastrointestinal, and renal diseases.

Transferable (General) Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

d1 Present the medical information in written, verbal and electronic forms during the course study

d2 **Work** independently and together with colleagues, while considering high ethical standards

d3 Effectively **manage** time and learn continuously

Transferable (General) Skills PILOs		Transferable (General) Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
D1	Communicate effectively and ethically with patients, public, and health care professionals.	d2	**Work** independently and together with colleagues, while considering high ethical standards
D2	Use information systems and computer softwares in order to enhance the delivery of pharmaceutical care,	d1	**Present** the medical information in written, verbal and electronic forms during the course study
D3	Work effectively individually and in a team	d2	**Work** independently and together with colleagues, while considering high ethical standards.

D4	Have the skills of decision-making and time management and lifelong learning	d3	Effectively **manage** time and learn continuously

V. Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
a1	**Describe** the major drug categories as they relate to major disorders affecting cardiovascular, such hypertension angina, cardiac arrhythmias, heart failure, dyslipidaemia, thromboembolism and anaemia.	• Lectures • Discussion Sessions • Assignments	• Periodic exam (Quizzes) • Evaluate assignments • Mid & final exam
a2	**Enumerate** the different categories of ag that use in the treatment of respiratory, and gastrointestinal disorders.		
a3	**Explain** in detail the mechanisms of action, therapeutic uses, contraindications and adverse effects of commonly prescribed drugs used in the treatment of cardiovascular, respiratory, gastrointestinal and renal disorders.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
b1	**Compare** between the different categories of drugs used in the treatment hypertension, angina, bronchial asthma, and renal and gastrointestinal disorders, based on their mechanism of action, pharmacological effects, therapeutic	• Discussion Sessions • Problem solving • Group discussion • Assignments	• Oral presentations • Evaluate assignments • Mid & final exam

	uses, adverse effects and contraindications.		
b2	**Design** a proper management strategy, including the appropriate dose, route of administration, and duration of therapy, for patients with various clinical situations of cardiovascular, gastrointestinal, renal and respiratory diseases.		
b3	**Evaluate** and resolve the common serious problems, as toxicity, drug interactions, related to medications used in the treatment of cardiovascular, gastrointestinal, renal and respiratory diseases.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
c1	**Apply** knowledge with principles of pharmacology to calculate appropriate dosages and regimen of drugs that are used in the treatment of different states of cardiovascular, respiratory, gastrointestinal, and renal disorders.	• Discussion sessions • Assignments	• Oral presentations • Theory & Practical exams • LAB report • Evaluate assignments
c2	**Write** a prescription in legal, and correct manner, of the medications that use to manage various clinical conditions of cardiovascular, respiratory, gastrointestinal, and renal diseases.		
c3	**Detect** and manage problems, such as, side effects and drug interactions, related to drugs that are used in the treatment of cardiovascular, respiratory, gastrointestinal, and renal diseases.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
d1	**Present** the medical information in written, verbal and electronic forms during the course study**.**	• Discussion Sessions • Assignments that require collecting information from the internet.	• Oral presentations • Writing
d2	**Work** independently and together with colleagues, while considering high ethical standards.		
d3	Effectively **manage** time and learn continuously**.**		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	Cardiovascular System (C.V.S)	- Diuretics	1W	2	a2; a3; b2; b3; c1; c2; c3; d3; d1
		- Antihypertensive drugs	1W		a1; a3; b1; b2; b3; c1; c2; c3; d1; d2
		- Drugs used for ischemic heart disease (angina and myocardial infarction)	1W	2	a1; a3; b1; b2; b3; c1; c2; c3; c4;d1; d2
		- Drugs used in treatment of heart failure.	1W	2	a1; a3; b1; b2; b3; c1; c2; c3; d1; d2
		- Antiarrhythmics	1W	2	a1; a3; b1; b2; b3; c1; c2; c3; d1; d2
2	**Blood**	- Drugs used in anemia - Plasma expanders	1W	2	a1; a3; b1; b2; b3; c1; c2; c3; d1; d2
		- Coagulants, anticoagulants & thrombolytics. - Haemostatics	1W	2	a1; a3; b1; b2; b3; c1; c2; c3; d1; d2
		- Drugs used in dyslipidemia - Drugs used in gout	1W	2	a1; a3; b1; b2; b3; c1; c2; c3; d1;

					d2
3	Gastrointestinal System	- Emetics and antiemetic drugs	1W	2	a2; a3; b1; b2; b3; c1; c2; c3; d1; d2
		- Liver disease and gallstones - Antidiarrheal and laxatives drugs	1W	2	a2; a3; b1; b2; b3; c1; c2; c3; d1; d2
		- Antiulcer and antacid drugs	1W	2	a2; a3; b1; b2; b3; c1; c2; c3; d1; d2
		- Inflammatory bowel disease (IBD). - Digestant, appetizer and anorexigenic drugs	1W	2	a2; a3; b1; b2; b3; c1; c2; c3; d1; d2
4	Respiratory system	- Drugs used for bronchial asthma and COPD	1W	2	a2; a3; b1; b2; b3; c1; c2; c3; d1; d2
		- Cough therapy	1W	2	a2; a3; b1; b2; b3; c1; c2; c3; d1; d2
Number of Weeks /and Units Per Semester			**14**	**28**	

B – Case Studies and Practical Aspect: (if any)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	- Introduction - Diuretics application on rabbit or rats	1	1	c1
2	- Study the analgesic effect of opioid drugs in mice using the tail-flick method	1	1	c1; c3
3	- Study the analgesic effect of opioid drugs in mice using hot plate method	1	1	c1; c3
4	- Study the analgesic effect of opioid drugs against acetic acid-induced writhing in mice	1	1	c1; c3
5	- Study the effect of pentobarbital on righting reflex	1	1	c1; c3
6	- Study the anticonvulsant property of phenobarbital against strychnine-induced convulsions in rats	1	1	c1, c3; c4
7	- Study the muscle relaxant property of diazepam in mice using rotarod apparatus	1	1	c1; c3
8	- Study the anticonvulsant property of diazepam against pentylenetetrazol-induced convulsions in rats	1	1	c1; c3; c4

9	Study of general anesthesia	**1**	**1**	c1; c3
10	Study of local anesthesia	**1**	**1**	c1; c3
11	Local anesthetics	**1**	**1**	c1; c3
12	Review	**1**	**1**	c2; c3; c4
Number of Weeks /and Units Per Semester		**12**	**12**	

VI. Teaching strategies of the course:

- Lectures
- Discussion sessions
- LAB Class
- Media Presentations: Power Point, Video
- Assignments
- Solving of problems

V. Assignments:

No	Assignments	Mark	Week Due	Aligned CILOs(symbols)
1	Participation	2.5	Weekly	a1; a2; a3; b1; b2;c1; c2; c3; d1; d2
2	Quizzes	2.5	Weekly	a1; a2; a3; b1; b2;c1; c3
3	Research	2.5	6th W	a1; a3; b1; b2; b3; c3; d1; d2; d3

4	Assignments	2.5	6th W	a1; a2; a3; b1; b2;c1;c2; d1; d2
5	Mid – Exam (theoretical)	10	7th W	a1; a2; a3; b1; b2;c1c3
6	Final Exam (practical)	30	15th W	a1; a3; b1; b2;c1; c2;c3
	Total score	**50%**		

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments & Homework, Tasks & Presentation	Fortnightly	5	5%	a1; a2; a3; b1; b2; c1;c2;c3; d1; d2
2	Quizzes	W6	2.5	2.5%	a1; a2; a3; b1; b2;c1; c3
3	Mid-Term exam	W8	10	10%	a1; a2; a3; b1; b2; c1; c3
4	Practical reports	W12	2.5	2.5%	a1; b3; c2; c3; d1; d2
5	Final exam practical	W 15	30	30%	a1; a3; b1; b2;c1; c2;c3
6	Final Exam theory	W16	50	50%	a1; a2; a3; b1; b2; c1; c3
Total			**100**	**100%**	

VII. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

	1) Katzung B.G., Trevor A.J., (2015). Basic & Clinical Pharmacology(13Ed); McGraw-Hill Education, New York. 2) Whalen K.; Feild C., Radhakrishnan R.(2019). Lippincott Illustrated Reviews Pharmacology, (7Ed). Wolters Kluwer, New York.
2- Essential References.	
	1) Ritter J.M., Flower R., Henderson G., Loke Y.K., Mac Ewan D. (2020). Rang and Dale's Pharmacology (9 Ed). Elsevier Ltd, United Kingdom. 2) Brunton L.L., Chabner B.A., Knollmann B.C. (2011). Goodman & Gilman's The Pharmacological Basis of Therapeutics (12 Ed). McGraw-Hill companies, Inc. New York.
3- Electronic Materials and Web Sites *etc*.	
	- http://www.jpharmacol.com - http://www.cvpharmacology.com - http://www.fda.gov

Course Specification Medicinal Chemistry III

I. Course Identification and General Information:						
١	**Course Title:**	**Medicinal Chemistry III**				
٢	**Course Code &Number:**	**B1101438**				
٣	**Credit hours:**	C.H				TOTAL Credit Hours
		Th.	Seminar	Pr	Tr.	
		2		1		3
٤	**Study level/ semester at which this course is offered:**	4Level / 1st Semester				
٥	**Pre –requisite (if any):**	Organic Chemistry II				
٦	**Co –requisite (if any):**					
٨	**Program (s) in which the course is offered:**	Bachelor of Pharm D				
٩	**Language of teaching the course:**	English				
١٠	**Location of teaching the course:**	Faculty of health sciences				
11	**Prepared By:**	Associ. Prof Mokhtar Al-Ghorafi				
12	**Date of Approval**					

II. Course Description:

This course aims to provide the student with the necessary basics knowledge in chemical structure and properties, structure-activity relationships, metabolism and therapeutic uses, of many drugs such as antibacterial, antiviral agents ,antifungal and anticancer agents ,in addition to the correlation between chemical structures and pharmacokinetic and pharmacodynamic properties of the drugs .

III. Course Objectives:

- Identify the categories of certain classes of chemotherapeutics agents and their effects
- Predict the biological response and possible side effects from the chemical structure of drug compounds.
- Understand other related courses depending on the background in medicinal chemistry.
- Acquire the knowledge about chemical structure , properties, structure-activity relationships, metabolism and therapeutic uses,

IV. Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Knowledge and Understanding PILOs	Knowledge and Understanding CILOs
After completing this program, students would be able to:	**After completing this course, students would be able to:**
A1 **Illustrate the physicochemical properties of chemotherapeutic agents based on molecular structure**	a1,a3,a4
A2 Describe the structure-activity relationship, chemistry, mode of action, and metabolism of different classes of chemotherapeutic agents	

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Intellectual Skills PILOs	Intellectual Skills CILOs
After completing this program, students would be able to:	**After completing this course, students would be able to:**
B1 Differentiate the structure activity relationships (SAR) of all classes of chemotherapeutic agents	**b1**

B2 Predict the physical, chemical properties and biological activity of chemotherapeutics agents based on molecular structure.	

Professional and Practical Skills	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Professional and Practical Skills PILOs	**Professional and Practical Skills CILOs**
After completing this program, students would be able to:	**After completing this course, students would be able to:**
C1 Apply skills on practical applications of pharmaceutical analysis of drugs	c1,c2,c3
C2 Use efficiently equipments and suitable methods for assay of drugs.	

Transferable (General) Skills :	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Transferable (General) Skills PILOs	**Transferable (General) Skills CILOs**

.	After completing this course, students would be able to:
D1 Work efficiently in scientific research with teamwork.	**d1 ,d3**
D2 Adopt the principles of lifelong learning needed for continuous professional development.	

V. Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
A1 Illustrate the physicochemical properties of chemotherapeutic agents based on molecular structure	Lectures Discussions,	Quizzes Midterm Exam Final Written Exam
A2 Describe the structure-activity relationship,chemistry, mode of action, and metabolism of different classes of chemotherapeutic agents	Lectures Discussions,	Quizzes Midterm Exam Final Written Exam

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
B1 Differentiate the	Lectures	

structure activity relationships (SAR) of all classes of chemotherapeutic agents	Discussions,	Quizzes -Midterm Exam Final Written Exam
B2 Predict the physical, chemical properties and biological activity of chemotherapeutics agents based on molecular structure.	Lectures Discussions	Quizzes -Midterm Exam Final Written Exam

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C1 Apply skills on practical applications of pharmaceutical analysis of drugs	Lectures. Lab Experiments	laboratory and other written reports Quizzes Final Practical Exam
C2 Use efficiently equipments and suitable methods for assay of drugs.	Lectures. Lab Experiments	laboratory and other written reports Quizzes Final Practical Exam
(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
D1 Work efficiently in scientific research with	Discussion Self-Learning Seminars	Oral discussion Discussion.

teamwork.		Group work
D2 Adopt the principles of lifelong learning needed for continuous professional development.	Discussion Self-Learning Seminars	Oral discussion Discussion. Group work

Course Content: .V					
A – Theoretical Aspect:					
Order	**Units/Topics List**	**Sub Topics List**	**Number of Weeks**	**contact hours**	**Learning Outcomes (CILOs)**
1	**Chemotherapeutic agents**	• Introduction to chemotherapy. •Antibacterials. •Sulphonamide antibiotics •B-lactam(classic and non-classic) •tetracycline •macrolide •aminoglycoside •lincosomide •fluroquinlone	5	10	A1,A2,B1,B2
2	•Antiprotozoal drugs. • Anthelmintic drugs.	.mechanism of action Classification •SAR of antiprotozoal drugs,anthelmintic drugs.	1	2	A1,A2,B1,B2
3	•Antiviral drugs.	mechanism of action Classification •SAR of Antiviral drugs	1	2	A1,A2,B1,B2
4	• Disinfectants &	mechanism of action Classification •Disinfectants &	1	2	A1,A2,B1,B2

	antiseptics	antiseptics			
5	**Mid-Term Theoretical Exam**		1	2	A1,A2,B1,B2
6	**Cancer chemotherapy**	• SAR of Anti-cancer drugs •	1	2	A1,A2,B1,B2
7	**Antimycobacterial agents**	mechanism of action Classification • **SAR of Antimycobacterial agents**	1	2	A1,A2,B1,B2
8	**Anti-fungal**	mechanism of action Classification **SAR of Anti-fungal**	1	2	A1,A2,B1,B2
9	**Vitamins and Minerals,**	SAR of **Vitamins,**	2	4	A1,A2,B1,B2
10	**Final Theoretical Exam**	-MCQs and essay questions	1	2	A1,A2,B1,B2
Number of Weeks /and Units Per Semester			**15**	**30**	

	B – Case Studies and Practical Aspect: (if any)			
Order	**Tasks/ Experiments**	**Number of Weeks**	**contact hours**	**Learning Outcomes (CILOs)**
1	• Assay of Sulphonamide drug	1	2	c1-c2
2	Assay of antibacterial	4	8	c1-c2
3	• Assay of Antiprotozoal drugs. • Anthelmintic drugs.	2	4	c1-c2
4	Assay of Anti-cancer drugs	1	2	c1-c2
5	• Assay of Antiviral drugs.	1	2	c1-c2
6	Assay of anti-fungal	2	2	c1-c2
7	**Assay of antiseptics**	2	4	c1-c2
8	- **Final Exam**	**1**	2	c1-c2
Number of Weeks /and Units Per Semester		**15**	**30**	

VI. Teaching strategies of the course:

- **Lectures**
- **Seminars**
- **Discussions**
- **Lab Experiments**
- **Training**
- **Self Learning**
-

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Class attendance and participation	**a1,a2,b1,b2**	weekly	2.5
2	Homework, presentation	**a1,a2,b1,b2**	9	2.5

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

No.	Assessment Method		Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments		1-12	5	**5%**	**a1,b1,b2,c1, a2, d1,d2**
2	Quizzes 1		**5**	**2.5**	**2.5%**	**a1,a2, c1,b1**
3	Mid-semester exam of theoretical part (written exam		**7**	**10**	**10%**	**a1,a2,b1,c1, d1,d2**
	Quizzes 2		**12**	**2.5**	**2.5%**	**a2, b1, b2, c1, d1, d2**
4	Lab. Term works	Attitude	1-10	5	**5%**	**c1, c2,d1,d2**
5		Accomplishments		5	**5%**	
6	Final exam (practical)		12	20	20%	**c1, c2,d1,d2**
7	Final exam of theoretical part (written exam)		16	50	50%	**a1,a2,b1,b2,c1, d1,d2**
Total				100	100%	

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

1- . - An Introduction of Medicinal Chemistry, 5th edition, Graham Patrick, Oxford University Press, 2013.

Foye's Principles of Medicinal Chemistry, 7thedition, Thomas L. Lemke and David A. Williams, Lippincott Williams & Wilkins, 2013.

2- Essential References.

Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry, 12th edition, J. N. Delgado and W. A. Remers, Lippincott-Raven, 2011.

3- Electronic Materials and Web Sites *etc*.

https://guides.library.vcu.edu/c.php?g=47681&p=298306

http://www.phc.vcu.edu/othercoolsites.html

ttp://pharmacy.creighton.edu/

Course Specification

I. Course Identification and General Information:

1	**Course Title:**	Clinical Cases I				
2	**Course Code & Number:**	**B1101364**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
					1	1
4	**Study level/ semester at which this course is offered:**	**Fourth Year/ First semester**				
5	**Pre –requisite:**	B1101471				
6	**Co –requisite:**	**NA**				
8	**Program (s) in which the course is offered:**	**Bachelor of PharmD**				
9	**Language of teaching the course:**	**English**				
10	**Location of teaching the course:**	**Thamar University - Health Science Faculty**				
11	**Prepared By:**	**Dr. Abdulrazzaq Y. A. Al Khazzan**				
12	**Date of Approval**					

II. Course Description:

Clinical cases are four tutorial courses designed to integrate and support the courses of theory therapeutics. Course of clinical cases I emphasizes on cardiovascular disorders that begin with an orientation and introduction followed by cases study regarding; Hypertension, Heart Failure, Ischemic Heart, Venous Thromboembolism, Stroke, Dyslipidemias, and Hypovolemic Shock topics. Components to be covered in each topic are case summary, problem identification, desired outcome, therapeutic alternatives, optimal plan, outcome evaluation, and patient education. Therapeutics I is the co-requisite course clinical cases I. Case-based learning and group discussion are two methods of teaching this course.

III. Course Objectives:

This course aims to:

1. Making student able to discuss basic information regarding the selected diseases of CVS.
2. Equip student to identify the treatment goals, algorithm, and optimal therapy regimen for patients with CV diseases.
3. Enable student to provide an appropriate advising and educating for CV diseases patients about his/her diseases and medications.
4. Help student to recommend prophylaxis methods, lifestyle modifications, and safety use of medications for patients with CV diseases.

Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Knowledge and Understanding PILOs	Knowledge and Understanding CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
A5 Outline principles of clinical pharmacology, therapeutics and Pharmacovigilance,	a1. Highlight information of presenting case concerning the CV diseases such as, causes, risk factors, pathogenesis, signs & symptoms, and diagnostic tools. a2. Select appropriate treatment regimen for patients with cardiovascular disorders including; doses, optimum use, adverse effects, doses for special groups of patients, and contraindications.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Intellectual Skills PILOs	Intellectual Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
B2 Design risk reduction strategies to ensure patient safety and prevent medication errors, drug interaction, and adverse drug effects,	b1 Summarize suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy. b2 Illustrate drug-related issues using patient-counseling and educating programs to reducing and dealing with drug therapy problems. b3 Formulate drug therapy regimen using patient individualization therapy, to achieve medication optimizing and safety.
B3 Solve problems to reduce drug therapy problems	
B4 Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	

Professional and Practical Skills	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Professional and Practical Skills PILOs	**Professional and Practical Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
C1 Advise the patients and health care professionals for optimizing medicines use.	c1 Use an appropriate programs to provide advices for patients and health care providers on the safe and effective use of cardiovascular medicines.

Transferable (General) Skills :	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Transferable (General) Skills PILOs	**Transferable (General) Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
D2 Use information systems and computer software in order to enhance the delivery of pharmaceutical care,	d1 Evaluate with drug information resources to get reliable and valid clinical data. d2 Collaborate with colleagues and other health care providers to perform pharmaceutical care for patient effectively. d3 Take an appropriate decision according to evidence-based studies.
D3 Work effectively individually and in a team	
D4 Have the skills of decision-making and time management and life- long learning	

Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Highlight information of presenting case concerning the CV diseases such as, causes, risk factors, pathogenesis, signs & symptoms, and diagnostic tools.	Lectures (in various ways, cooperative and participatory teaching, etc.)	- Quiz - Exam - in-class participation

a2. Select appropriate treatment regimen for patients with cardiovascular disorders including; doses, optimum use, adverse effects, doses for special groups of patients, and contraindications.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 Summarize suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy.	- Class discussion - Interactive lectures - Class discussion - Brainstorming - Duties & activities - Seminars	- Quiz - Exam - Oral questions
b2 Illustrate drug-related issues using patient-counseling and educating programs to reducing and dealing with drug therapy problems.		
b3 Formulate drug therapy regimen using patient individualization therapy, to achieve medication optimizing and safety.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 Use an appropriate programs to provide advices for patients and health care providers on the safe and effective use of cardiovascular medicines.	- Duties & activities - Seminars - Homework	- Exam - Oral questions

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1 Evaluate with drug information	- Duties & activities	- Quiz

resources to get reliable and valid clinical data.	- Seminars - Home works	- Exam - Oral questions
d2 Collaborate with colleagues and other health care providers to perform pharmaceutical care for patient effectively.		
d3 Take an appropriate decisions according to evidence-based studies.		

V. Course Content:

A – Theoretical Aspect: (taken in separated course)

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1					
2		-			
3		-			
4		-			
	-				
Number of Weeks /and Units Per Semester					

B – Case Studies:

Order	Cases topic	Number of Weeks	Contact hours	Learning Outcomes (CILOs)
1	- Orientation and overview	1	1	a1
2	- Hypertension cases	2	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
3	- Heart Failure cases	2	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
4	- Stable Ischemic Heart Disease cases	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
5	- Acute Coronary Syndromes cases	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
6	- Arrhythmias cases	2	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
7	- Venous Thromboembolism	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
8	- Stroke	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
9	- Dyslipidemias	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
10	- Hypovolemic Shock	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
Number of Weeks /and Units Per Semester		13	13	

VI. Teaching strategies of the course:

1. Interactive lectures
2. Class discussion
3. Brainstorming
4. Duties & activities
5. Seminars
6. Home works
7. Office hours (Tutorials)

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework/Assignment/quiz (1)	a1, a2, b1, b3, d1, d2, d3	5th	5
2	Homework/Assignment/quiz (2)	a1, a2, b1, b3, d1, d2, d3	10th	5

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Quizzes	5th	5	5%	a1, a2, b1, b3, d1, d2, d3
2	Presentation	10th	5	5%	a1, a2, b1, b3, d1, d2, d3
3	Mid-Term exam	7th	30	30%	a1, a2, b1, b3
4	Final Exam theory		60	60%	a1, a2, b1, b3
Total			**100**	**100%**	

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

1. Terry L. Schwinghammer *et al*, (2017), Pharmacotherapy Casebook: A Patient-Focused Approach, 10th edition, McGraw-Hill Education, United States of America.
2. Cate Whittlesea and Karen Hodson, (2019), Clinical Pharmacy and Therapeutics, 6th edition, Elsevier Ltd., UK

2- Essential References.

1. Marie A. Chisholm-Burns and others, (2019), Pharmacotherapy: Principles & practice, 5nd edition, McGraw-Hill Companies, Inc., United States of America.
2. Joseph Dipiro, (2020), Pharmacotherapy: pathophysiologic approaches, 11th edition, McGraw-Hill Companies, Inc., United States of America
3. Koda-Kimble *et al*, (2018), Applied Therapeutics: The Clinical Use of Drugs, 11th edition, Lippincott Williams & Wilkins, Philadelphia, United States of America.

3- Electronic Materials and Web Sites *etc*.

1. Word Document or Portable Data Files (PDF) for Lectures that would be Delivered.
2. American College of Clinical Pharmacy (ACCP) http://www.accp.com

Course Specification
Therapeutics II

I. Course Identification and General Information:

1	**Course Title:**	Therapeutics II				
2	**Course Code & Number:**	**B1101482**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2				2
4	**Study level/ semester at which this course is offered:**	**Fourth Year/ First Semester**				
5	**Pre –requisite (if any):**	**B1101414** **B1101463**				
6	**Co –requisite (if any):**	**NA**				
8	**Program (s) in which the course is offered:**	**Bachelor of PharmD**				
9	**Language of teaching the course:**	**English**				
10	**Location of teaching the course:**	**Thamar University - Health Science Faculty**				
11	**Prepared By:**	**Dr. Abdulrazzaq Y. A. Al Khazzan**				
12	**Date of Approval**					

II. Course Description:

This course dealing with woman's and man's health topics whether the pathophysiologic of the disease or the optimal drug therapy for specific conditions. The course discusses underlying causes, pathophysiology, and clinical manifestations of diseases. Goals of therapy, non-pharmacotherapy & pharmacotherapy approaches, therapeutic plan, patient counseling, drug monitoring and evaluation of the therapeutic outcomes will be well-explained. Courses of pathophysiology and pharmacology related to topics of women's and men's health must be studied as prerequisite. Instructor-student interactive lectures and interactive class discussions is the primary method for teaching this course.

III. Course Objectives:

This course aims to:

1. Acquire the student familiar with common woman's and man's health diseases.
2. Prepare student to illustrate causes, risk factors, clinical manifestations and complications of common woman's and man's diseases.
3. Enable student to select an appropriate therapy regimen, advice and educate patients about the correct use of their medications.
4. Making student to be interest with diseases prophylaxis methods, lifestyle modifications, and the safety of medications used for treatment specific conditions in woman's and man's.

Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Knowledge and Understanding PILOs	Knowledge and Understanding CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
A5 Outline principles of clinical pharmacology, therapeutics and Pharmacovigilance,	a1. Describe essential information about selected diseases, specifically the definition, causes and risk factors, pathogenesis, signs & symptoms, and diagnostic tools. a2. Choose appropriate treatment regimen for patients either with woman's or man's disorders that include; doses, optimum use, adverse effects, doses for special conditions, and contraindications.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Intellectual Skills PILOs	Intellectual Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
B2 Design risk reduction strategies to ensure patient safety and prevent medication errors, drug interaction, and adverse drug effects,	b1 Select suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy.
B3 Solve problems to reduce drug therapy problems	b2 Implement patient-counseling and educational programs to dealing and reducing drug therapy problems.
B4 Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	b3 Purpose drug therapy regimen using patient individualization therapy, to achieve drug optimizing and safety.

Professional and Practical Skills	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Professional and Practical Skills PILOs	**Professional and Practical Skills CILOs**
After completing this program, students would be able to:	**After completing this course, students would be able to:**
C1 Advise the patients and health care professionals for optimizing medicines use.	c1 Provide the suitable advices for the patients and health care providers on the safe and effective use of medicines for woman's and man's disorders.

Transferable (General) Skills :	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Transferable (General) Skills PILOs	**Transferable (General) Skills CILOs**
After completing this program, students would be able to:	**After completing this course, students would be able to:**
D2 Use information systems and computer software in order to enhance the delivery of pharmaceutical care,	d1 Make better known drug information resources and how to be used. d2 Evaluate the scientific data regarding woman's and man's diseases and drugs obtained from different information sources. d3 Exploit appropriate search strategies for use in computerized secondary databases.
D3 Work effectively individually and in a team	
D4 Have the skills of decision-making and time management and life- long learning	

Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Describe essential information about selected diseases, specifically the definition, causes and risk factors, pathogenesis, signs & symptoms, and diagnostic tools.	Cooperative and Participatory Lectures	- Quiz - Exam - In-class participation
a2. Choose appropriate treatment regimen for patients either with woman's or man's disorders that include; doses, optimum use, adverse effects, doses for special conditions, and contraindications.	Cooperative and Participatory Lectures	- Quiz - Exam - In-class participation

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 Select suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy.	- Critical thinking - Class discussion	- Discussion - Oral questions
b2 Implement patient-counseling and educational programs to dealing and reducing drug therapy problems.		
b3 Purpose drug therapy regimen using patient individualization therapy, to achieve drug optimizing and safety.		
	- Critical thinking - Class discussion	- Discussion - Oral questions

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1 Provide the suitable advices for the patients and health care providers on the safe and effective use of medicines for woman's and man's disorders.	- Cooperative and Participatory Lectures	- Homework - Exam

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1 Make better known drug information resources and how to be used.	- Duties & activities - Seminars - Home works	Assessment discussions, seminars and assignments
d2 Evaluate the scientific data regarding woman's and man's diseases and drugs obtained from different information sources.		
d3 Exploit appropriate search strategies for use in computerized secondary databases.	- Duties & activities - Seminars - Home works	Evaluate seminars and assignments

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	Woman's and man's Disorders	**(Gynecologic and Obstetric Disorders)**			
		- Pregnancy and Lactation: Therapeutic Considerations	2	4	a1, a2, b1, b2, b3, c1, d1, d2, d3
2		- Contraception	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
3		- Menstruation-Related Disorders	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
4		- Hormone Therapy in Menopause	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
5		**Urologic Disorders**			
6		- Erectile Dysfunction	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
7		**Mid-term exam**	1	1	a1, a2, b1, b3
8		- Benign Prostatic Hypertrophy	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
9		- Urinary Incontinence	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
10		**Bone and Joint Disorders**			
11		- Osteoporosis	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
12		- Rheumatoid Arthritis	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
13		- Osteoarthritis	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
14		- Gout and Hyperuricemia	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
Final-term exam			1	2	a1, a2, b1, b3
Number of Weeks /and Units Per Semester			**14**	**27**	

B – Case Studies and Practical Aspect: (Not applicable)				
Order	**Tasks/ Experiments**	**Number of Weeks**	**contact hours**	**Learning Outcomes (CILOs)**
1				
2				
3				
4				
Number of Weeks /and Units Per Semester				

VI. Teaching strategies of the course:

1. Interactive lectures
2. Class discussion
3. Brainstorming
4. Duties & activities
5. Seminars
6. Home works
7. Office hours (Tutorials)

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework/Assignment/quiz (1)	a1, a2, b1, b3, d1, d2, d3	5th	5
2	Homework/Assignment/quiz (2)	a1, a2, b1, b3, d1, d2, d3	10th	5

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Quizzes	5th	5	5%	a1, a2, b1, b3, d1, d2, d3
2	Assignments & Homework, Tasks & Presentation	10th	5	5%	a1, a2, b1, b3, d1, d2, d3
3	Mid-Term exam	7th	30	30%	a1, a2, b1, b3
4	Final Exam theory		60	60%	a1, a2, b1, b3
Total			**100**	**100%**	

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

1. Wells BG, DiPiro J, Schwinghammer TL., DiPiro C.; (2021), Pharmacotherapy handbook, 11th ed New York: McGraw-Hill.
2. Marie A. Chisholm-Burns *et al*, (2019), Pharmacotherapy: Principles & practice, 5th edition, McGra Hill Companies, Inc., United States of America.

2- Essential References.

1. Joseph Dipiro, (2020), Pharmacotherapy: pathophysiologic approaches, 11th edition, McGr Hill Companies, Inc., United States of America
2. Walker and Edwards, (2018), Clinical Pharmacy and Therapeutics, 6th edition, Elsevier Ltd UK

3- Electronic Materials and Web Sites *etc.*

1. Word Document or Portable Data Files (PDF) for Lectures that would be Delivered.
2. American College of Clinical Pharmacy (ACCP) http://www.accp.com

Course Specification Community Pharmacy

I. Course Identification and General Information:

1	**Course Title:**	Community Pharmacy				
2	**Course Code &Number:**	**PH1125167**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr.	Tr.	
		2				2
4	**Study level/ semester at which this course is offered:**	4thlevel/ 1st semester				
5	**Pre –requisite (if any):**	Pharmaceutics III				
6	**Co –requisite (if any):**					
7	**Program (s) in which the course is offered:**	PharmD				
8	**Language of teaching the course:**	English / Arabic				
9	**Location of teaching the course:**	Themar University				
10	**Prepared By:**	Dr. Abdulkarim Kassem Alzomor				
11	**Date of Approval**	**2021**				

II. Course Description:

This course is covers the basic knowledge and skills that are required to practice pharmacy in community settings. It provides well-structured guide to making differential diagnosis for different body system carried out by the community pharmacist..

III. Course Objectives

1. To understand the organizational structure and management of community pharmacy
2. To learn the student the various roles of pharmacists in the delivery of health care services in community pharmacy practice settings .
3.To provide the student with the methods of patient assessment and care as they relate specifically to the drug and non -drug management of minor ailments

IV. Course Intended Learning Outcomes (CILOs):

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

Knowledge and Understanding PILOs		**Knowledge and Understanding CILOs**	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
A1	Explain the fundamentals of general sciences, the basic and biomedical sciences, and their relations to pharmacy profession.	a1	Explain the roles of community pharmacist at the community setting..
A4	Define basic principles of drug: target identification, design, informatics, and mechanisms of action.	a2	Recognize signs and symptoms of simple illness, as well as, differentiate between the simple aliments and major diseases

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

Intellectual Skills PILOs		Intellectual Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
B1	Classify the synthetic and natural drugs according to their mechanism of action, systemic effect, therapeutic uses, contraindication and toxicity	b1	Identify between simple and severe illness, in order to treat the patient with suitable OTC drugs; or make referral for the physician when needed.
B4	Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	b2	Recall methods of patients assessment for symptoms in the Community Pharmacy to verify the degree of illness and hence treatment by non-prescription or prescription medications

Professional and Practical Skills			
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes) **After completing the course, the student will be able to:**			
Professional and Practical Skills PILOs		**Professional and Practical Skills CILOs**	
After completing this program, students would be able to:		After completing this course, students would be able to:	
C1	Handle the chemical, biological, and pharmaceutical materials safely	c1	Apply the most effective, safe and economic non-prescription medications based on best data to ensure patient's drug related needs

Transferable (General) Skills :			
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes) **After completing the course, the student will be able to:** d1 Communicate effectively and behave in discipline with colleagues. d2 Develop his skills in the field of pharmacokinetics by using new technology in this field. d3 Participate efficiently with colleagues in a team work			
Transferable (General) Skills PILOs		**Transferable (General) Skills CILOs**	
After completing this program, students would be able to:		After completing this course, students would be able to:	
D1	Communicate effectively and behave in discipline with colleagues.	d1	Communicate effectively and behave in discipline with colleagues.
D2	Develop his skills in the field of pharmacokinetics by using new technology in this field.	d2	Develop his skills in the field of pharmacokinetics by using new technology in this field.
D3	Work effectively individually and in a team	d3	Participate efficiently with colleagues in a team work

V. Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
a1	Explain the roles of community	- Lectures, Discussions	- Quizzes, Written exam

	pharmacist at the community setting..	- Self - learning	
a2	Recognize signs and symptoms of simple illness, as well as, differentiate between the simple aliments and major diseases		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
b1	Identify between simple and severe illness, in order to treat the patient with suitable OTC drugs; or make referral for the physician when needed.	- Discussions and - Training - Problem solving	- Quizzes, Homework - Observation - Task's Evaluates
b2	Recall methods of patients assessment for symptoms in the Community Pharmacy to verify the degree of illness and hence treatment by non-prescription or prescription medications.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
c1	Apply the most effective, safe and economic non-prescription medications based on best data to ensure patient's drug related needs	- Discussions and Training	- Quizzes, Homework - Observation

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
d1	Communicate effectively and behave in discipline with colleagues.	- Group discussions - Cooperative learning. - Self – learning - Inductive and deductive	- Homework -Evaluates of Oral Presentation
d2	Participate efficiently with colleagues in a team work.		

I. Course Content**:**

A. Theoretical Aspect:

Order	Topic List / Units	Sub Topics List	Week Due	Contact Hours	ILOs
1	• Introduction to community pharmacy practice	- Definition - Roles of community pharmacist - Adverse drug effects - Drug –drug interaction	**2**	**4**	a1 ,a2**,b1**
2	• Over the counter drugs (OTC)	Introduction Types	**1**	**2**	a1, a2, b1, b2, c1, d1, d2
3	• Respiratory system	- Common cold & Influenza - Cough - Sore throat - Allergic Rhinitis	**2**	**4**	a1, a2, b1, b2, c1, d1, d2
4	• **Gastroenterology**	- Mouth ulcers - Heart burn - Nausea and vomiting - Diarrhoea	**1**	**2**	a1, a2, b1, b2, c1, d1, d2
5	• **Gastroenterology**	- Constipation - Irritable bowel syndrome (IBS) - Haemorrhoids	**1**	**2**	a1, a2, b1, b2, c1, d1, d2
6	• Worm infections	- Giardiasis, and amoebiasis, - Roundworm, and pinworm	**1**	**2**	a1, a2, b1, b2, c1, d1, d2
7	• Dermatology	- Scabies and head lice - Fungal infections and athlete’s foot	**1**	**2**	a1, a2, b1, b2, c1, d1, d2
8	• Dermatology	- Nappy rash - Hair loss and Dandruff	**1**	**2**	a1, a2, b1, b2, c1, d1, d2
9	• Central nervous system • Musculoskeletal conditions	- Pain (headache and migraine) - Insomnia - Acute low back pain	**1**	**2**	a1, a2, b1, b2, c1, d1, d2
10	• Women’s health	- Cystitis - Vaginal thrush - Dysmenorrhoea - Oral contraceptive	**1**	**2**	a1, a2, b1, b2, c1, d1, d2
11	• Ear problems	- Earache, Ear wax, Otitis externa	**1**	**2**	a1, a2, b1, b2, c1, d1, d2

12	• Eye conditions	- Red eye, Eyelid disorders	**1**	**2**	a1, a2, b1, b2, c1, d1, d2
	Number of Weeks /and Units Per Semester		**14**	**28**	

V. Teaching strategies of the course:

- Lectures, Discussions and Exercises.
- Group discussions
- Field visits
- Problem solving
- Simulation & Practical presentations
- Self-learning
- Cooperative learning, Training

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Class attendance and participation	a1, a2,b1, c1, d1, d2,	weekly	5
2	Reports on kinetics some drugs	a2, b2, c1, d1,d2	12	5
3	Exercises and home work	a1, b1, b2, c1, c2, d1, d2	weekly	5

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	1-13	15	15%	a1, a2,b1, b2, c1, d1, d2,
2	Quizzes 1	5	2.5	2.5%	a1, b1

3	Mid-semester exam of theoretical part (written exam	8	20	20%	a1, a2, b1
6	Quizzes 2	11	2.5	2.5%	a2, b2, c1
7	Final exam of theoretical part (written exam)	16	60	60%	a1, a2, b1, b2, c1, d1, d2
Total			100	100%	

VII. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

2.Paul Rutter. Community pharmacy, symptoms, diagnosis, and treatment &pharmacy practice . 4th edition, 017 Elsevier Ltd.

3.Jon Waterfield, Community Pharmacy Handbook , London & Chicago, pharmaceutical press , latest edition

2- Essential References.

1. A. BLENKINSOPP, P. PAXTON, J. BLENKINSOPP. Symptoms in the Pharmacy, A Guide the Management of Common Illness. 7 edition, 2014 John Wiley & Sons Ltd, Aptara Inc., New Delhi, India.

3- Electronic Materials and Web Sites *etc.*

- www.sciencedirect.com
- www.pubmed.com

Course Specification

I. Course Identification and General Information:

1	**Course Title:**	Therapeutics III: **Endocrine and Renal diseases**				
2	**Course Code & Number:**	**B1101483**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2				2
4	**Study level/ semester at which this course is offered:**	**Fourth Year/ Second semester**				
5	**Pre –requisite (if any):**	**B1101472**				
6	**Co –requisite (if any):**	**NA**				
7	**Program (s) in which the course is offered:**	**Bachelor of PharmD**				
8	**Language of teaching the course:**	**English**				
9	**Location of teaching the course:**	**Thamar University - Health Science Faculty**				
10	**Prepared By:**	**Dr. Abdulrazzaq Y. A. Al Khazzan**				
11	**Date of Approval**					

II. Course Description:

Endocrine and Renal diseases are involving important topics related to defects on organs resulting in imbalance of hormones, electrolytes, or minerals required for body functions. The course discusses brief definition, pathophysiology, underlying causes, clinical manifestations, the optimal drug therapy, patient counseling, drug monitoring, and evaluation the therapeutic outcomes for diabetes mellitus, thyroid, adrenal gland, pituitary gland, acute & chronic kidney, and fluid & electrolytes disorders. Pathophysiology and pharmacology courses associated to Endocrine and Renal diseases should be taken as prerequisites. Methods of instructor-student interactive lectures and interactive class discussions are primary in teaching this course.

III. Course Objectives:

This course aims to:

1. Making the student familiar with common Endocrine and Renal diseases.
2. Equip student to illustrate pathophysiology, causes, risk factors, clinical manifestations and complications of common Endocrine and Renal diseases.
3. Enable student to select an appropriate therapy regimen, advice and educate patients about the correct use of their medications.
4. Prepare student to suggest prophylaxis methods, lifestyle modifications, and the safety of medications used for treatment of Endocrine and Renal diseases.

Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Knowledge and Understanding PILOs	Knowledge and Understanding CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
A5 Outline principles of clinical pharmacology, therapeutics and Pharmacovigilance,	a1. Explain basic information regarding endocrine & renal diseases including; definition, pathogenesis, causes, risk factors, clinical manifestations, and diagnostic tools. a2. Design appropriate treatment regimen that include; doses, optimum use, adverse effects, doses for special conditions, and contraindications for patients with Endocrine and Renal disorders.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Intellectual Skills PILOs	Intellectual Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
B2 Design risk reduction strategies to ensure patient safety and prevent medication errors, drug interaction, and adverse drug effects,	b1 Recommend suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy. b2 Provide patient-counseling and educational programs to dealing and reducing drug therapy problems. b3 Suggest drug therapy regimen using patient individualization therapy, to achieve drug optimizing and safety.
B3 Solve problems to reduce drug therapy problems	
B4 Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	

Professional and Practical Skills	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Professional and Practical Skills PILOs	**Professional and Practical Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
C1 Advise the patients and health care professionals for optimizing medicines use.	c1 Give patients and health care providers suitable advices on the safe and effective use of medicines for patient with endocrine and renal disorders.

Transferable (General) Skills :	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Transferable (General) Skills PILOs	**Transferable (General) Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
D2 Use information systems and computer software in order to enhance the delivery of pharmaceutical care,	d1 Make better familiar with the reliable drug information resources and how to be used. d2 Assess information concerning endocrine and renal diseases and their drugs obtained from different information sources. d3 Use appropriate search strategies for research in computerized secondary databases.
D3 Work effectively individually and in a team	
D4 Have the skills of decision-making and time management and life- long learning	

Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Explain basic information regarding endocrine & renal diseases; including definition, pathogenesis, causes, risk factors, clinical manifestations, and diagnostic tools.	Cooperative and Participatory Lectures	- Quiz - Exam - In-class participation
a2. Design appropriate treatment regimen that include; doses, optimum use, adverse effects, doses for special conditions, and contraindications for patients with Endocrine and Renal disorders.	Cooperative and Participatory Lectures	- Quiz - Exam - In-class participation

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 Recommend suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy.	- Critical thinking - Class discussion	- Discussion - Oral questions
b2 Provide patient-counseling and educational programs to dealing and reducing drug therapy problems.		
b3 Suggest drug therapy regimen using patient individualization therapy, to achieve drug optimizing and safety.	- Critical thinking - Class discussion	- Discussion - Oral questions

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1 Give patients and health care providers suitable advices on the safe and effective use of medicines for patient with endocrine and renal disorders.	- Cooperative and Participatory Lectures	- Homework - Exam

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1 Make better familiar with the reliable drug information resources and how to be used.	- Duties & activities - Seminars - Home works	- Assessment discussions, seminars and assignments
d2 Assess information concerning endocrine and renal diseases and their drugs obtained from different information sources.		
d3 Use appropriate search strategies for research in computerized secondary databases.	- Duties & activities - Seminars - Home works	Evaluate seminars and assignments

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	Endocrinology disorders	- Diabetes mellitus	2	4	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Thyroid disorders	2	4	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Adrenal gland disorders	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Pituitary gland disorders	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
2	- **Mid-semester exam**		1	1	a1, a2, b1, b3
3	Renal disorders	- Acute Kidney Injury	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Chronic and End-Stage Renal Disease	2	4	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Fluids and Electrolytes	2	4	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Acid–Base Disturbances	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
4	- **Final-semester exam**		**1**	**2**	a1, a2, b1, b3
Number of Weeks /and Units Per Semester			**14**	**27**	

B – Case Studies and Practical Aspect: (Not applicable)				
Order	**Tasks/ Experiments**	**Number of Weeks**	**contact hours**	**Learning Outcomes (CILOs)**
1				
2				
3				
4				
Number of Weeks /and Units Per Semester				

VI. Teaching strategies of the course:

1. Interactive lectures
2. Class discussion
3. Brainstorming
4. Duties & activities
5. Seminars
6. Home works
7. Office hours (Tutorials)

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework/Assignment/quiz (1)	a1, a2, b1, b3, d1, d2, d3	5th	5
2	Homework/Assignment/quiz (2)	a1, a2, b1, b3, d1, d2, d3	10th	5

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Quizzes	5th	5	5%	a1, a2, b1, b3, d1, d2, d3
2	Assignments & Homework, Tasks & Presentation	10th	5	5%	a1, a2, b1, b3, d1, d2, d3
3	Mid-Term exam	7th	30	30%	a1, a2, b1, b3
4	Final Exam theory		60	60%	a1, a2, b1, b3
Total			**100**	**100%**	

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

1. Wells BG, DiPiro J, Schwinghammer TL., DiPiro C.; (2021), Pharmacotherapy handbook, 11th ed New York: McGraw-Hill.
2. Marie A. Chisholm-Burns *et al*, (2019), Pharmacotherapy: Principles & practice, 5th edition, McGra Hill Companies, Inc., United States of America.

2- Essential References.

1. Joseph Dipiro, (2020), Pharmacotherapy: pathophysiologic approaches, 11th edition, McGr Hill Companies, Inc., United States of America
2. Walker and Edwards, (2018), Clinical Pharmacy and Therapeutics, 6th edition, Elsevier Ltd UK

3- Electronic Materials and Web Sites *etc.*

1. Word Document or Portable Data Files (PDF) for Lectures that would be Delivered.
2. American College of Clinical Pharmacy (ACCP) http://www.accp.com

Course Specification

I. Course Identification and General Information:

1	**Course Title:**	Therapeutics IV: **Neurologic and psychiatric disorders**				
2	**Course Code & Number:**	**B1101484**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2				2
4	**Study level/ semester at which this course is offered:**	**Fourth Year/ Second semester**				
5	**Pre –requisite (if any):**	**B1101473**				
6	**Co –requisite (if any):**	**NA**				
7	**Program (s) in which the course is offered:**	**Bachelor of PharmD**				
8	**Language of teaching the course:**	**English**				
9	**Location of teaching the course:**	**Thamar University - Health Science Faculty**				
10	**Prepared By:**	**Dr. Abdulrazzaq Y. A. Al Khazzan**				
11	**Date of Approval**					

II. Course Description:

Neurologic and psychiatric disorders are involving many diseases related to brain and neurons that affect all neurotransmitter systems and mental functions. The course discusses brief definition, pathophysiology, underlying causes, clinical manifestations, the optimal drug therapy, patient counseling, drug monitoring, and evaluation the therapeutic outcomes for Alzheimer, Multiple Sclerosis, Epilepsy, Parkinson, Pain Management, Headache, Substance-Related Disorders, Schizophrenia, Major Depressive, Bipolar, Generalized Anxiety, Panic, and Social Anxiety, Sleep Disorders. Pathophysiology and pharmacology courses associated to neurologic and psychiatric disorders should be taken as prerequisites. Methods of instructor-student interactive lectures and interactive class discussions are primary in teaching this course.

III. Course Objectives:

This course aims to:

1. Give the student knowledge regarding common neurologic and psychiatric disorders.
2. Help student to identify pathophysiology, causes, risk factors, clinical manifestations and complications of common neurologic and psychiatric disorders.
3. Qualify student to select an appropriate therapy regimen, advice and educate patients about the correct use of their medications.
4. Enable student to recommend prophylaxis methods, lifestyle modifications, and the safety of medications used for treatment of neurologic and psychiatric disorders.

Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Knowledge and Understanding PILOs	Knowledge and Understanding CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
A5 Outline principles of clinical pharmacology, therapeutics and Pharmacovigilance,	a1. Explain basic information regarding neurologic and psychiatric disorders including; definition, pathogenesis, causes, risk factors, clinical manifestations, and diagnostic tools. a2. Design appropriate treatment regimen that include; doses, optimum use, adverse effects, doses for special conditions, and contraindications for patients with neurologic and psychiatric disorders.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Intellectual Skills PILOs	Intellectual Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
B2 Design risk reduction strategies to ensure patient safety and prevent medication errors, drug interaction, and adverse drug effects,	b1 Recommend suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy. b2 Provide patient-counseling and educational programs to dealing and reducing drug therapy problems. b3 Suggest drug therapy regimen using patient individualization therapy, to achieve drug optimizing and safety.
B3 Solve problems to reduce drug therapy problems	
B4 Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	

Professional and Practical Skills	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Professional and Practical Skills PILOs	**Professional and Practical Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
C1 Advise the patients and health care professionals for optimizing medicines use.	c1 Give patients and health care providers suitable advices on the safe and effective use of medicines for patient with neurologic and psychiatric disorders.

Transferable (General) Skills :	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Transferable (General) Skills PILOs	**Transferable (General) Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
D2 Use information systems and computer software in order to enhance the delivery of pharmaceutical care,	d1 Make better familiar with the reliable drug information resources and how to be used. d2 Assess information concerning neurologic and psychiatric disorders and their drugs obtained from different information sources. d3 Use appropriate search strategies for research in computerized secondary databases.
D3 Work effectively individually and in a team	
D4 Have the skills of decision-making and time management and life- long learning	

Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Explain basic information regarding neurologic and psychiatric disorders; including definition, pathogenesis, causes, risk factors, clinical manifestations, and diagnostic tools.	Cooperative and Participatory Lectures	- Quiz - Exam - In-class participation
a2. Design appropriate treatment regimen that include; doses, optimum use, adverse effects, doses for special conditions, and contraindications for patients with neurologic and psychiatric disorders.	Cooperative and Participatory Lectures	- Quiz - Exam - In-class participation

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 Recommend suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy.	- Critical thinking - Class discussion	- Discussion - Oral questions
b2 Provide patient-counseling and educational programs to dealing and reducing drug therapy problems.		
b3 Suggest drug therapy regimen using patient individualization therapy, to achieve drug optimizing and safety.	- Critical thinking - Class discussion	- Discussion - Oral questions

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1 Give patients and health care providers suitable advices on the safe and effective use of medicines for patient with neurologic and psychiatric disorders.	- Cooperative and Participatory Lectures	- Homework - Exam

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1 Make better familiar with the reliable drug information resources and how to be used.	- Duties & activities - Seminars - Home works	- Assessment discussions, seminars and assignments
d2 Assess information concerning neurologic and psychiatric disorders and their drugs obtained from different information sources.		
d3 Use appropriate search strategies for research in computerized secondary databases.	- Duties & activities - Seminars - Home works	Evaluate seminars and assignments

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	Neurologic disorders	- Alzheimer Disease	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Multiple Sclerosis	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Epilepsy	2	4	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Parkinson Disease	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Pain Management	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Headache	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
2	- **Mid-semester exam**		1	1	a1, a2, b1, b3
3	Psychiatric disorders	- Substance-Related Disorders	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Schizophrenia	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Major Depressive Disorder	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Bipolar Disorder	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Generalized Anxiety Disorder, Panic Disorder, and Social Anxiety Disorder	1	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
		- Sleep Disorders	1	2	a1, a2, b1, b2, b3, c1, d1, d2,

					d3
4	- **Final-semester exam**		1	2	a1, a2, b1, b3
Number of Weeks /and Units Per Semester			**15**	**29**	

B – Case Studies and Practical Aspect: (Not applicable)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1				
2				
3				
4				
Number of Weeks /and Units Per Semester				

VI. Teaching strategies of the course:

1. Interactive lectures
2. Class discussion
3. Brainstorming
4. Duties & activities
5. Seminars
6. Home works
7. Office hours (Tutorials)

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework/Assignment/quiz (1)	a1, a2, b1, b3, d1, d2, d3	5th	5
2	Attention-Deficit/Hyperactivity Disorder	a1, a2, b1, b3, d1, d2, d3	10th	5

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Quizzes	5th	5	5%	a1, a2, b1, b3, d1, d2, d3
2	Assignments & Presentation	10th	5	5%	a1, a2, b1, b3, d1, d2, d3
3	Mid-Term exam	7th	30	30%	a1, a2, b1, b3
4	Final Exam theory		60	60%	a1, a2, b1, b3
Total			**100**	**100%**	

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

1. Wells BG, DiPiro J, Schwinghammer TL., DiPiro C.; (2021), Pharmacotherapy handbook, 11th ed New York: McGraw-Hill.
2. Marie A. Chisholm-Burns *et al*, (2019), Pharmacotherapy: Principles & practice, 5th edition, McGra Hill Companies, Inc., United States of America.

2- Essential References.

1. Joseph Dipiro, (2020), Pharmacotherapy: pathophysiologic approaches, 11th edition, McGr Hill Companies, Inc., United States of America
2. Walker and Edwards, (2018), Clinical Pharmacy and Therapeutics, 6th edition, Elsevier Ltd UK

3- Electronic Materials and Web Sites *etc.*

1. Word Document or Portable Data Files (PDF) for Lectures that would be Delivered.
2. American College of Clinical Pharmacy (ACCP) http://www.accp.com

Course Specification

I. Course Identification and General Information:

1	**Course Title:**	Clinical Cases II				
2	**Course Code & Number:**	**B1101466**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
					1	1
4	**Study level/ semester at which this course is offered:**	**Fourth Year/ Second semester**				
5	**Pre –requisite:**	**NA**				
6	**Co –requisite:**	B1101473				
7	**Program (s) in which the course is offered:**	**Bachelor of PharmD**				
8	**Language of teaching the course:**	**English**				
9	**Location of teaching the course:**	**Thamar University - Health Science Faculty**				
10	**Prepared By:**	**Dr. Abdulrazzaq Y. A. Al Khazzan**				
11	**Date of Approval**					

II. Course Description:

Clinical cases II course is a tutorial course designed to train students to dealing well with the real cases that would be encountered them in the future clinical training. This course emphasizes on endocrinologic and renal disorders that include cases studies in the following topics: diabetes mellitus, thyroid, adrenal gland, pituitary gland, acute & chronic kidney, and fluid & electrolytes. Components to be covered in each topic are case summary, problem identification, desired outcome, therapeutic alternatives, optimal plan, outcome evaluation, and patient education. The co-requisite course of clinical cases II is Therapeutics III. Case-based learning and group discussion are two methods of teaching this course.

III. Course Objectives:

This course aims to:

1. Making student able to discuss basic information related to endocrinology and renal disorders.
2. Equip student to identify the treatment goals, algorithm, and optimal therapy regimen for patients with endocrinology and renal diseases.
3. Enable student to provide an appropriate advising and educating for patients with endocrinology and renal disorders about his/her diseases and medications.
4. Help student to recommend prophylaxis methods, lifestyle modifications, and safety use of medications for patients with endocrinology and renal diseases.

Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Knowledge and Understanding PILOs	Knowledge and Understanding CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
A5 Outline principles of clinical pharmacology, therapeutics and Pharmacovigilance,	a1. Highlight information of presenting case concerning the endocrinologic and renal diseases such as, causes, risk factors, pathogenesis, signs & symptoms, and diagnostic tools. a2. Select appropriate treatment regimen for patients with endocrinologic and renal disorders including; doses, optimum use, adverse effects, doses for special groups of patients, and contraindications.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Intellectual Skills PILOs	Intellectual Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
B2 Design risk reduction strategies to ensure patient safety and prevent medication errors, drug interaction, and adverse drug effects,	b1 Summarize suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy. b2 Illustrate drug-related issues using patient-counseling and educating programs to reducing and dealing with drug therapy problems. b3 Formulate drug therapy regimen using patient individualization therapy, to achieve medication optimizing and safety.
B3 Solve problems to reduce drug therapy problems	
B4 Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	

Professional and Practical Skills	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Professional and Practical Skills PILOs	**Professional and Practical Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
C1 Advise the patients and health care professionals for optimizing medicines use.	c1 Use an appropriate programs to provide advices for patients and health care providers on the safe and effective use of medicines for endocrinologic and renal disorders.

Transferable (General) Skills :	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Transferable (General) Skills PILOs	**Transferable (General) Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
D2 Use information systems and computer software in order to enhance the delivery of pharmaceutical care,	d1 Evaluate with drug information resources to get reliable and valid clinical data. d2 Collaborate with colleagues and other health care providers to perform pharmaceutical care for patient effectively. d3 Take an appropriate decision according to evidence-based studies.
D3 Work effectively individually and in a team	
D4 Have the skills of decision-making and time management and life- long learning	

Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Highlight information of presenting case concerning the endocrinologic and renal diseases such as, causes, risk factors, pathogenesis, signs & symptoms,	Lectures (in various ways, cooperative and participatory teaching, etc.)	- Quiz - Exam - in-class participation

and diagnostic tools.		
a2. Select appropriate treatment regimen for patients with endocrinologic and renal disorders including; doses, optimum use, adverse effects, doses for special groups of patients, and contraindications.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 Summarize suitable methods for prescribing, dispensing, and administering of medications to ensuring their safety and efficacy.	- Class discussion - Interactive lectures - Class discussion - Brainstorming - Duties & activities - Seminars	- Quiz - Exam - Oral questions
b2 Illustrate drug-related issues using patient-counseling and educating programs to reducing and dealing with drug therapy problems.		
b3 Formulate drug therapy regimen using patient individualization therapy, to achieve medication optimizing and safety.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 Use an appropriate programs to provide advices for patients and health care providers on the safe and effective use of medicines for endocrinologic and renal disorders.	- Duties & activities - Seminars - Homework	- Exam - Oral questions

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1 Evaluate with drug information resources to get reliable and valid clinical data.	- Duties & activities - Seminars - Home works	- Quiz - Exam - Oral questions
d2 Collaborate with colleagues and other health care providers to perform pharmaceutical care for patient effectively.		
d3 Take an appropriate decisions according to evidence-based studies.		

V. Course Content:

A – Theoretical Aspect: (It is covered in a separate course**)**

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1		-			
2		-			
3		-			
4		-			
	-				
Number of Weeks /and Units Per Semester					

B – Case Studies:

Order	Cases topic	Number of Weeks	Contact hours	Learning Outcomes (CILOs)
1	- Diabetes mellitus	2	2	a1
2	- Thyroid disorders	2	2	a1, a2, b1, b2, b3, c1, d1, d2, d3
3	- Adrenal gland disorders	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
4	- Pituitary gland disorders	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
5	- Drug-Induced Acute Kidney Injury	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
6	- Acute Kidney Injury	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
7	- Progressive Renal Disease	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
8	- End-Stage Renal Disease	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
9	- Electrolyte Abnormalities in Chronic Kidney Disease	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
10	- Acid–Base Disturbances	1	1	a1, a2, b1, b2, b3, c1, d1, d2, d3
Number of Weeks /and Units Per Semester		12	12	

VI. Teaching strategies of the course:

1. Interactive lectures
2. Class discussion
3. Brainstorming
4. Duties & activities
5. Seminars
6. Home works
7. Office hours (Tutorials)

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework/Assignment/quiz (1)	a1, a2, b1, b3, d1, d2, d3	5th	5
2	Homework/Assignment/quiz (2)	a1, a2, b1, b3, d1, d2, d3	10th	5

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Quizzes	5th	5	5%	a1, a2, b1, b3, d1, d2, d3
2	Presentation	10th	5	5%	a1, a2, b1, b3, d1, d2, d3
3	Mid-Term exam	7th	30	30%	a1, a2, b1, b3
4	Final Exam theory		60	60%	a1, a2, b1, b3
Total			**100**	**100%**	

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

1. Terry L. Schwinghammer *et al*, (2017), Pharmacotherapy Casebook: A Patient-Focused Approach, 10th edition, McGraw-Hill Education, United States of America.
2. Cate Whittlesea and Karen Hodson, (2019), Clinical Pharmacy and Therapeutics, 6th edition, Elsevier Ltd., UK

2- Essential References.

1. Marie A. Chisholm-Burns and others, (2019), Pharmacotherapy: Principles & practice, 5nd edition, McGraw-Hill Companies, Inc., United States of America.
2. Joseph Dipiro, (2020), Pharmacotherapy: pathophysiologic approaches, 11th edition, McGraw-Hill Companies, Inc., United States of America
3. Koda-Kimble *et al*, (2018), Applied Therapeutics: The Clinical Use of Drugs, 11th edition, Lippincott

	Williams & Wilkins, Philadelphia, United States of America.
3- Electronic Materials and Web Sites *etc.*	
	1. Word Document or Portable Data Files (PDF) for Lectures that would be Delivered. 2. American College of Clinical Pharmacy (ACCP) http://www.accp.com

Course Specification

Pharmacology 4

I. Course Identification and General Information:

1	**Course Title:**	**Pharmacology 4**				
2	**Course Code &Number:**	**B1101465**				
3	**Credit hours: 3**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2	0		0	2
4	**Study level/ semester at which this course is offered:**	Level 4/ semester2				
5	**Pre –requisite (if any):**	Physiology, Pharmacology 1, Pharmacology 2				
6	**Co –requisite (if any):**	Pharmacology 3				
7	**Program (s) in which the course is offered:**	Bachelor of Pharmacy Doctor (Pharma D)				
8	**Language of teaching the course:**	English				
9	**Location of teaching the course:**	Thamar University - Faculty of Medical Sciences				
10	**Prepared By:**	Dr. Ahmed G. Al- Akydy **– Dr. Ahmed Al-Washli**				
11	**Date of Approval**	2021				

II. Course Description:

This course is a complementary study to what has been studied in pharmacology 3. This course will be offered students with knowledge of the therapeutic uses, adverse effects and drug interactions in both clinical pharmacy practice in the area of pharmacology of chemotherapeutic agents, which involve: antibacterial, Antiprotozoal, antihelmenthitic, antiviral, antifungal, anticancer, as well as, Immunopharmacology agents

III. Course Objectives:

The overall aims of the course are:

1. To raise knowledge of student about commonly used drugs to treat infectious diseases and neoplasms .
2. To build knowledge about the drugs used in the treatment of bacterial, viral, protozoal, helminthic infections and cancer.
3. To identify the mechanism, therapeutic uses, side effects/toxicity, contraindications, and interactions of the major classes acting use in the treatment of infectious diseases and malignances.

IV. Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

a1Classify the various organisms and determine drugs that use in the treatment of each microorganism.

a2 **Enumerate** the different categories of agents that use in the treatment of neoplasm.

a3 **Explain** in detail the mechanisms of action, therapeutic uses, contraindications and adverse effects of commonly prescribed drugs used in the treatment of microorganisms, cancer and immune –induced diseases

Knowledge and Understanding PILOs		Knowledge and Understanding CILOs	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
A1	Explain the fundamentals of general sciences and the basic and biomedical sciences and their relations to pharmacy profession.		
A2	Illustrate the fundamentals of social and behavioral sciences relevant to pharmacy, ethics of health care and its impact on their relationship with patients and other healthcare professionals.		
A3	Describe relationships between chemical structure of compounds of pharmaceutical and medicinal interest and biological activities	a1	Classify the various organisms and determine drugs that use in the treatment of each microorganism.
		a2	**Enumerate** the different categories of ag that use in the treatment of neoplasm
A4	Define basic principles of drug: target identification, design, informatics, and mechanisms of action	a3	**Explain** in detail the mechanisms of action, therapeutic uses, contraindications and adverse effects of commonly prescribed drugs used in the treatment of microorganisms, cancer and immune –induced diseases
A5	Outline principles of clinical pharmacology, therapeutics and Pharmacovigilance.		

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

b1 Select appropriate management strategy for patients in the treatment various clinical conditions, including infectious diseases, malignant tumors, immunological origin diseases.

b2 determine the appropriate dosage form and the appropriate route of administration of drugs in the treatment of cancer and infectious diseases

b2 Evaluate and mange the problems related to drugs used in the treatment of cancer and infectious diseases.

Intellectual Skills PILOs		Intellectual Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
B1	Classify the synthetic and natural drugs according to their mechanism of action, systemic effect, therapeutic uses, contraindication and toxicity	**b1**	**b1 Select** appropriate management strategy for patients in the treatment various clinical conditions, including infectious diseases, malignant tumors, immunological origin diseases.
B2	Design risk reduction strategies to ensure patient safety and prevent medication errors, drug interaction, and adverse drug effects,	**b3**	**Evaluate** and mange the problems related to drugs used in the treatment of cancer and infectious diseases.
B3	Solve problems to reduce drug therapy problems	**b3**	**Evaluate** and mange the problems related to drugs used in the treatment of cancer and infectious diseases.
B4	Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	**b2**	**determine** the appropriate dosage form and the appropriate route of administration of drugs in the treatment of cancer and infectious diseases

Professional and Practical Skills

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

c1Apply the knowledge with the clinical skills in diagnoses of the different infectious and cancer diseases to present the proper treatment

c2 Calculate and **adjust** drug dosage and dose regimen of drugs that used in the treatment of cancer, and infectious diseases.

c3 **Manage** problems that result from chemotherapeutic drugs, and drugs affecting immune system.

Professional and Practical Skills PILOs		Professional and Practical Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
C1	Handle the chemical, biological, and pharmaceutical materials safely		
C2	Operate different pharmaceutical equipment and instruments		
C3	Extract active substances from different sources.		
C4	Carry outpatient physical assessment.	c1	c1Apply the knowledge with the clinical skills in diagnoses of the different infectious and cancer diseases to present the proper treatment
C5	Advise the patients and health care professionals for optimizing medicines use.	c2	**Calculate** and **adjust** drug dosage and dose regimen of drugs that used in the treatment of cancer, and infectious diseases.
		c3	**Manage** problems that result from chemotherapeutic drugs, and drugs affecting immune system.

Transferable (General) Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

d1 Use different sources to obtain information and knowledge

d2 Work effectively either individually or within a team, considering legalizations and ethics of pharmacy profession

d3 Manage time Efficiently

Transferable (General) Skills PILOs		Transferable (General) Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
D1	Communicate effectively and ethically with patients, public, and health care professionals.	d2	Work effectively either individually or within a team, considering legalizations and ethics of pharmacy profession
D2	Use information systems and computer softwares in order to enhance the delivery of pharmaceutical care,	d1	Use different sources to obtain information and knowledge
D3	Work effectively individually and in a team	d2	Work effectively either individually or within a team, considering legalizations and ethics of pharmacy profession
D4	Have the skills of decision-making and time management and lifelong learning	d3	Manage time Efficiently

V. Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
a1	a1Classify the various organisms and determine drugs that use in the treatment of each microorganism.	• Lectures • Discussion Sessions • Assignments	• Periodic exam (Quizzes) • Evaluate assignments • Mid & final exam
a2	**Enumerate** the different categories of ag that use in the treatment of neoplasm.		
a3	**Explain** in detail the mechanisms of action, therapeutic uses, contraindications and adverse effects of commonly prescribed drugs used in the treatment of microorganisms, cancer and immune –induced diseases		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
b1	**b1 Select** appropriate management strategy for patients in the treatment various clinical conditions, including infectious diseases, malignant tumors, immunological origin diseases.	• Discussion Sessions • Problem solving • Group discussion • Assignments	• Oral presentations • Evaluate assignments • Mid & final exam
b2	**determine** the appropriate dosage form and the appropriate route of administration of drugs in the treatment of cancer and infectious diseases		
b3	**Evaluate** and mange the problems related to drugs used in the treatment of cancer and infectious diseases.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

c1	c1Apply the knowledge with the clinical skills in diagnoses of the different infectious and cancer diseases to present the proper treatment	• Discussion sessions • Assignments	• Oral presentations • Theory & Practical exams • LAB report • Evaluate assignments
c2	**Calculate** and **adjust** drug dosage and dose regimen of drugs that used in the treatment of cancer, and infectious diseases.		
c3	**Manage** problems that result from chemotherapeutic drugs, and drugs affecting immune system.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
d1	Use different sources to obtain information a knowledge	• Discussion Sessions • Assignments that require collecting information from the internet.	• Oral presentations • Writing
d2	Work effectively either individually or within a team, considering legalizations and ethics of pharmacy profession		
d3	Manage time Efficiently		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	**Chemotherapeutic drugs**	- Introduction into antimicrobial drugs	1W	2	a1; c1; d1 d3;d1
		- Cell wall synthesis inhibitors - Penicillins	1W		a1; a3; b1; b2;b3, c1; c2;c3; d1

		- **Cell wall synthesis inhibitors** o Cephalosporins, o Carbapenems o Monobactam - Other cell wall synthesis inhibitors	1W	2	a1; a3; b1; b2;b3; c1; c2;c3;d1
		- **Protein synthesis inhibitors** - Tetracyclines, Chloramphenicol, Macrolides, lincosamide, Streptogramins, Oxazolidinones	1W	2	a1; a3; b1; b2;b3; c1; c2;c3; d1
		- **Protein synthesis inhibitors** - Aminoglycosides	1W	2	a1; a3; b1; b2;b3; c1; c2;c3; d1
2		- **Sulphonamides**, Trimethoprim - **Quinolones**	1W	2	a1; a3; b1; b2;b3; c1; c2;c3;d1
		- Drugs used for tuberculosis and leprosy	1W	2	a1; a3; b1; b2;b3; c1; c2;c3; d1
		- Antiprotozoal drugs: amoebiasis, giardiasis, Leishmaniasis,	1W	2	a1; a3; b1; b2;b3; c1; c2;c3;d1
		- Antiprotozoal drugs: malaria, toxoplasmosis, Trypanosomiasis			a1; a3; b1; b2;b3; c1; c2;c3; d1
3		- Anthelmintic drugs	1W	2	a2; a3; b1; b2;b3 ; c1; c2;c3;d1
		- Anti fungal agents.	1W	2	a2; a3; b1; b2;b3; c1; c2;c3; d1
		- Antiviral agents.	1W	2	a2; a3; b1; b2;b3; c1; c2;c3;d1
		- Chemotherapy of cancer	1W	2	a2; a3; b1; b2;b3; c1;

					c2;c3;d1
4	Immunopharmacology	- Immunomodulators	1W	2	a3; b1; c3;d1
Number of Weeks /and Units Per Semester			**14**	**28**	

VI. Teaching strategies of the course:

- Lectures
- Discussion sessions
- LAB Class
- Media Presentations: Power Point, Video
- Assignments
- Solving of problems

VII. Assignments:

No	Assignments	Mark	Week Due	Aligned CILOs(symbols)
1	Participation	5	Weekly	a1; a2; a3; b1; b2; c2; c3
2	Quizzes	5	Weekly	a1; a2; a3; b1; b2;c2; c3
3	Research	5	6th W	a1; a3; b1; b2; b3; c2; c3; d1; d1; d3
4	Assignments	5	6th W	a1; a2; a3; b1; b2;c1;c2; d1; d3

5	Mid – Exam (theoretical)	20	7th W	a1; a2; a3; b3; c2
	Total score	**40%**		

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments & Homework, Tasks & Presentation	Fortnightly	10	10%	a1; a2; a3; b1; b2;c1;c2; d1; d3
2	Quizzes	W6	5	5%	a1; a2; a3; b1; b2;c2; c3
3	Mid-Term exam	W8	20	20%	a1; a2; a3; b3; c2
4	Practical reports	W12	5	5%	a1; a2; a3; b3; c1; c2; c3, d1
6	Final Exam theory	W16	60	60%	a1; a2; a3; b3; c2
Total			**100**	**100%**	

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

1) Katzung B.G., Trevor A.J., (2015). Basic & Clinical Pharmacology(13Ed); McGraw-Hill Education, New York.

2) Whalen K.; Feild C., Radhakrishnan R.(2019). Lippincott Illustrated Reviews Pharmacology, (7Ed). Wolters Kluwer, New York.

2- Essential References.

1) Ritter J.M., Flower R., Henderson G., Loke Y.K., Mac Ewan D. (2020). Rang and Dale's Pharmacology (9 Ed). Elsevier Ltd, United Kingdom.

2) Brunton L.L., Chabner B.A., Knollmann B.C. (2011). Goodman & Gilman's The Pharmacological Basis of Therapeutics (12 Ed). McGraw-Hill companies, Inc. New York.

3- Electronic Materials and Web Sites *etc.*

- http://www.jpharmacol.com
- http://www.cvpharmacology.com
- http://www.fda.gov

Course Specification of

Toxicology

I. Course Identification and General Information:						
1	**Course Title:**	Toxicology				
2	**Course Code &Number:**	**B1101447**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2		1		3
4	**Study level/ semester at which this course is offered:**	*Level 4/ semester 2*				
5	**Pre –requisite (if any):**					
6	**Co –requisite (if any):**	Clinical cases 1				
7	**Program (s) in which the course is offered:**	Bachelor of Pharmacy Doctor (Pharma D)				
8	**Language of teaching the course:**	English				
9	**Location of teaching the course:**	Thamar University - Faculty of Medical Sciences				
10	**Prepared By:**	**Dr. Ahmed G. Al- Akydy – Dr. Ahmed Al-Washli**				
11	**Date of Approval**	2021				

II. Course Description:

The course provides student with comprehensive knowledge and clear understanding of the principles of toxicology including the mechanism of toxicity, target organ and treatment of toxicity. Natural toxins including plants, animal, pesticides, heavy metals, toxic gases, irritant toxins, household toxin and food toxins, as well as antidotes and their mechanism of action. Also the course covers experiments of simple tests for toxicological screening.

III. Course Objectives:

1. To provide student with general knowledge on toxicology
2. To describe sources, mechanisms of action and toxic profile of various poisons including drugs
3. To describe symptoms of toxicity, appropriate measures for management and first aid measures after exposure to different types of toxic substances.
4. To describe methods for identification of poisons.

I. Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

a1understand the general terminology in toxicology including toxicity, toxins and their antidotes.

a2. Know the basic principles of toxicokinetics and toxicodynamics

a3.Outline different types of toxicants, including plants, animal, pesticides, heavy metals, toxic gases, irritant toxins, household toxin and food toxins, and describe the different approaches to manage their toxicity.

Knowledge and Understanding PILOs		Knowledge and Understanding CILOs	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
A1	Explain the fundamentals of general sciences and the basic and biomedical sciences and their relations to pharmacy profession.	a1	**Understand** the general terminology in toxicology including toxicity, toxins and their antidotes.
A2	Illustrate the fundamentals of social and behavioral sciences relevant to pharmacy, ethics of		

	health care and its impact on their relationship with patients and other healthcare professionals.		
A3	Describe relationships between chemical structure of compounds of pharmaceutical and medicinal interest and biological activities	a2	**Know** the basic principles of toxicokinetics and toxicodynamics
A4	Define basic principles of drug: target identification, design, informatics, and mechanisms of action	a3	**Outline** different types of toxicants, including plants, animal, pesticides, heavy metals, toxic gases, irritant toxins, household toxin and food toxins, and describe the different approaches to manage their toxicity.
A5	Outline principles of clinical pharmacology, therapeutics and Pharmacovigilance.		

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

b1Detect, and analyze, toxin-related problems from different sources

b2 .Evaluate the effects of a given toxic agent on the human body

b3. Appraise the effectiveness of the preventive measures available to reduce the burden of toxic agents and protect human and other living organisms from toxic agents

Intellectual Skills PILOs		**Intellectual Skills CILOs**	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
B1	Classify the synthetic and natural drugs according to their mechanism of action, systemic effect, therapeutic uses, contraindication and toxicity	**b1**	**Detect**, and analyze, toxin-related problems from different sources
B2	Design risk reduction strategies to ensure patient safety and prevent medication errors, drug interaction, and adverse drug effects,	**b3**	**Appraise** the effectiveness of the preventive measures available to reduce the burden of toxic agents and protect human and other living organisms from toxic agents

B3	Solve problems to reduce drug therapy problems	**b3**	**Appraise** the effectiveness of the preventive measures available to reduce the burden of toxic agents and protect human and other living organisms from toxic agents
B4	Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	**b2**	**Evaluate** the effects of a given toxic agent on the human body

Professional and Practical Skills

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

c1Apply the knowledge with the clinical skills and some screening laboratory methods in diagnoses and identifying of the different toxicities

c2Use the appropriate antidotes for the corresponding poison, their mechanisms of actions, routes of administration and any special precautions.

C3 Apply different methods and techniques in the management and treatment of poisoning cases of therapeutic and non-therapeutic agents.

Professional and Practical Skills PILOs		**Professional and Practical Skills CILOs**	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
C1	Handle the chemical, biological, and pharmaceutical materials safely		
C2	Operate different pharmaceutical equipment and instruments		
C3	Extract active substances from different sources.		
C4	Carry outpatient physical assessment.	c1	**Apply** the knowledge with the clinical skills and some screening laboratory methods in diagnoses and identifying of the different

			toxicities
C5	Advise the patients and health care professionals for optimizing medicines use.	c2	**Use** the appropriate antidotes for the corresponding poison, their mechanisms of actions, routes of administration and any special precautions.
		c3	**Apply** different methods and techniques in the management and treatment of poisoning cases of therapeutic and non-therapeutic agents.

Transferable (General) Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

d1 Use different sources to obtain information and knowledge about different issues in toxicology
d2. communicate effectively with general population, others health care providers regarding any issu the field of toxicology.

Transferable (General) Skills PILOs		**Transferable (General) Skills CILOs**	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
D1	Communicate effectively and ethically with patients, public, and health care professionals.	**d2**	**Communicate** effectively with general population, others health care providers regarding any issue in the field of toxicology.
D2	Use information systems and computer softwares in order to enhance the delivery of pharmaceutical care,	**d1**	**Use** different sources to obtain information an knowledge about different issues in toxicology
D3	Work effectively individually and in a team	**d2**	**Communicate** effectively with general population, others health care providers regarding any issue in the field of toxicology.
D4	Have the skills of decision-making and time management and lifelong learning		

II. Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
a1	**Understand** the general terminology in toxicology including toxicity, toxins and their antidotes.	• Lectures • Discussion Sessions • Assignments	• Periodic exam (Quizzes) • Evaluate assignments • Mid & final exam
a2	**Know** the basic principles of toxicokinetics and toxicodynamics		
a3	**Outline** different types of toxicants, including plants, animal, pesticides, heavy metals, toxic gases, irritant toxins, household toxin and food toxins.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
b1	**Detect**, and **analyze**, toxin-related problems from different sources	• Discussion Sessions • Problem solving • Group discussion • Assignments	• Oral presentations • Evaluate assignments • Mid & final exam
b2	**Evaluate** the effects of a given toxic agent on the human body		
b3.	**Appraise** the effectiveness of the preventive measures available to reduce the burden of toxic agents and protect human and other living organisms from toxic agents		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:			
Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
c1	**Apply** the knowledge with the clinical skills and some screening laboratory methods in diagnoses and identifying of the different toxicities	• Discussion sessions • Assignments	• Oral presentations • Theory & Practical exams • LAB report • Evaluate assignments
c2	**Use** the appropriate antidotes for the corresponding poison, their mechanisms of actions, routes of administration and any special precautions.		
c3	**Apply** different methods and techniques in the management and treatment of poisoning cases of therapeutic and non-therapeutic agents.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
d1	**Use** different sources to obtain informa and knowledge about different issues in toxicology	• Discussion Sessions • Assignments that require collecting information from the internet.	• Oral presentations • Writing
d2	**Communicate** effectively with general population, others health care provider regarding any issue in the field of toxico		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	General principles of toxicology	- Definitions - Classification of toxicology - Types of poisoning - Mode of poisoning	1w	2	a1; a2; b2;
		- Toxicokinetics: Absorption, Distribution, Metabolism & Excretion - Toxicodynamics: ○ Mechanism of toxicity ○ Toxic action (acute toxicity, chemical carcinogenesis, teratogenesis) - General factors affecting toxicity	1w	2	a2; b2;
2	General Management of poisoning	- Decontamination - Emesis - Stomach lavage - Chelators - Enhancing elimination of the toxin - Alkalization & acidification of urine - Dialysis (hemodialysis, peritoneal dialysis) - antidotes	1w	2	a3; b1; c2; d2
3	Corrosives and Irritants	- Acids ○ Uses ○ Exposure Routes and Pathways ○ Toxicokinetics, ○ Mechanism of Toxicity (Acute Toxicity, Chronic Toxicity) ○ Clinical Management of each of substances	1w	2	a1; a2; a3; b1; b2; b3; c2; d2
		- Alkalies	1w	2	a1; a2; a3; ; b1;

		○ Uses ○ Exposure Routes and Pathways ○ Toxicokinetics ○ Mechanism of Toxicity(Acute Toxicity, Chronic Toxicity ○ Clinical Management of each of substances			b2; b3;c2; d2
4	Common Heavy Metals toxicity	- Lead - Mercury	1w	2	a1; a2; a3; ; b1; b2; b3; c2; d2
		- Arsenic - Iron	1w	2	a1; a2; a3; ; b1; b2; b3; c2; d2
5	Pesticides	- Halogenated & cholinesterase inhibitor insecticides	1w	2	a1; a2; a3; ; b1; b2; b3; c2; d2
		- Rodenticides - Herbicides - Fungicides	1w	2	a1; a2; a3; ; b1; b2; b3c2; d2
6	Gaseous Poisoning	- CO - Cyanide	1w	2	a1; a2; a3; ; b1; b2; b3; c2; d2
7	Volatile poisons	- Ethanol - Methanol - Ethylene glycol	1w	2	a1; a2; a3; ; b1; b2; b3; c2; d2
8	Poisonous plants	- Opium - Coca - Cannabinoids - Mushrooms - Mycotoxins	1w	2	a1; a2; a3; ; b1; b2; b3; c2; d2
9	Poisonous animals	- Scorpion venom - Snakes venom - Rabbits	1w	2	a1; a2; a3; ; b1; b2; b3; c2; d2
10	Food Poisonings	- Bacterial and fungal toxins	1w	2	a1; a2; a3; ; b1; b2; b3; c2; d2
Number of Weeks /and Units Per Semester			**14**	**24**	

B – Case Studies and Practical Aspect: (if any)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes (CILOs)

1	Introduction ○ General instructions ○ Methods of extraction of poisons	**1w**	**1**	**c1**
2	The normal characteristics of poisonous animals	**1w**	**1**	**c1**
3	Dose Calculations	**1w**	**1**	**c1**
4	Determination of LD50	**1w**	**1**	**c1**
5	Detection of alkaline and Acidic corrosives	**1w**	**1**	**c1**
6	Detection of unknown corrosive poisons	**1w**	**1**	**c1**
7	Detection of heavy metal using chemical& Reinschesb tests	**1w**	**1**	**c1**
8	Toxicity of Cyanide and volatile poisons	**1w**	**1**	**c1**
9	Detection of Organophosphorus	**1w**	**1**	**c1**
10	Detection of analgesics (Salicylates + acetaminophen)	**1w**	**1**	**c1**
11	Detection of analgesics (morphine and related drugs)	**1w**	**1**	**c1**
12	Detection of CNS depressants (Barbiturates + BDZs + TCA	**1w**	**1**	**c1**
13	Detection of stimulants (amphetamines, decongestants, methylxanthines)	**1w**	**1**	**c1**
14	Detection of anticoagulants	**1w**	**1**	**c1**
Number of Weeks /and Units Per Semester		**14**	**14**	

VI. Teaching strategies of the course:

- Lectures
- Discussion sessions
- LAB Class
- Media Presentations: Power Point, Video
- Assignments
- Solving of problems

VII. Assignments:

No	Assignments	Mark	Week Due	Aligned CILOs(symbols)
1	Participation	2.5	Weekly	a1; a2; a3; b2;c2;
2	Quizzes	2.5	Weekly	a1; a2; a3; b2;c2;
3	Research	2.5	6th W	a3; b1; b1; b3; c1; c3; d1; d2
4	Assignments	2.5	6th W	a1; a2; a3; b2; c2; d1; d2
5	Mid – Exam (theoretical)	10	7th W	a1; a2; a3; b2
	Final Exam (practical)	30	15th W	a1; a2; a3; b2; c1; c3
	Total score	**50%**		

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning

					Outcomes
1	Assignments & Homework, Tasks & Presentation	Fortnightly	5	5%	a1; a2; a3; b2; c2; d1; d2
2	Quizzes	W6	2.5	2.5%	a1; a2; a3; b2;c2
3	Mid-Term exam	W8	10	10%	a1; a2; a3; b2
4	Practical reports	W12	2.5	2.5%	a1; b3; c2; c3; d2; d3; d4
5	Final exam practical	W 15	30	30%	a1; a2; a3; b2; c1; c3
6	Final Exam theory	W16	50	50%	a1; a2; a3; b2
Total			**100**	**100%**	

VI. Learning Resources:

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

1. Klaassen CD. "*Casarett & Doull's Tox*icology – The basic science of poisons", 8th edition, McGraw Hill, 2013
2. Modern medical Toxicology VV pillay. 2008

2- Essential References.

1. Emergency Toxicology by Peter Viccellio, Lippincott Williams &Wilkins;2nd edition (1998).
2. Poisoning & Toxicology Compendium by Leikin, Jerrold B. LexiComp,U.S. (1998) Casarett & Doull's essentials of Toxicology 2008.

	3. Casarett and Doull's essentials of Toxicology, 3 rd edition, 2015, Curtis D. Klaassen and John B. Wa III
3- Electronic Materials and Web Sites *etc.*	
	Electronic Web Sites: • **www.google.com** • **www.pubmed.com** • **www.biomed.net** • **www.ncbi.nlm.nih.gov**

Course Specification of

clinical Nutrition

I. Course Identification and General Information:							
1	**Course Title:**	**Clinical Nutrition**					
2	**Course Code &Number:**	**B1101477**					
3	**Credit hours:**	C.H					TOTAL
		Th.	Seminar	Pr	Tr.		
		2					2
4	**Study level/ semester at which this course is offered:**	*Level 4/ semester 2*					
5	**Pre –requisite (if any):**	Clinical Biochemistry, Pharmacology					
6	**Co –requisite (if any):**	Therapeutics					
7	**Program (s) in which the course is offered:**	Bachelor of Pharmacy Doctor (Pharma D)					
8	**Language of teaching the course:**	English					
9	**Location of teaching the course:**	Thamar University - Faculty of Medical Sciences					
10	**Prepared By:**	**Dr. Ahmed G. Al- Akydy – Dr. Ahmed Al-Washli**					
11	**Date of Approval**	2021					

II. Course Description:

This course provides student with the fundamental concepts of clinical nutrition and the role of nutrition and dietetics in promoting health and in preventing and treating diseases. The course explains macro and micronutrients in terms of chemical structure, biological role, dietary sources and requirements, consequences of deficiency and toxicity. It also explains energy balance, diagnosis and interventions and tools of nutrition whether enteral or parenteral nutrition for the management of mal-and overnutrition disorders.

III. Course Objectives:

The overall aims of the course are:

1. To enable the student to acquire and understand the basic knowledge and skills necessary to maintain optimal health and prevent diseases through appropriate nutrition.
2. To recognize the role of nutrition in the management of different types of diseases
3. To collaborate with other members of the health care team in the management of mal and overnutrition conditions.
4. To build knowledge about the principles of enteral and parenteral nutrition

I. Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

a1 Describe the major concepts in clinical nutrition and define the basic information about the types and amounts of macro- and micronutrients needed for maintaining health.

a3 Determine causes, diagnosis of different types of nutrition disorders

a3 illustrate the basics of nutrition therapy or nutritional care process using either enteral or parenteral nutrition.

Knowledge and Understanding PILOs		Knowledge and Understanding CILOs	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
A1	Explain the fundamentals of general sciences and the basic and biomedical sciences and their relations to pharmacy profession.	a1	**Describe** the major concepts in clinical nutrition and define the basic information about the types and

			amounts of macro- and micronutrients needed for maintaining health.
A2	Illustrate the fundamentals of social and behavioral sciences relevant to pharmacy, ethics of health care and its impact on their relationship with patients and other healthcare professionals.		
A3	Describe relationships between chemical structure of compounds of pharmaceutical and medicinal interest and biological activities		
A4	Define basic principles of drug: target identification, design, informatics, and mechanisms of action		
A5	Outline principles of clinical pharmacology, therapeutics and Pharmacovigilance.	a2	**Determine** causes, diagnosis of different types of nutrition disorders
		a3	**Illustrate** the basics of nutrition therapy or nutritional care process using either enteral or parenteral nutrition.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

b1 Evaluate the nutritional status of individuals and interpret its relation with their nutrition-related conditions

b2 **design**, and **select** the best medical nutrition therapy intervention for individuals with different mal- an overnutrition diseases

b3 **assess** different nutrition regimes for different groups of healthy or diseased individuals and suggest appropriate modifications when needed.

Intellectual Skills PILOs	Intellectual Skills CILOs
After completing this program, students would be able to:	**After completing this course, students would be able to:**

B1	Classify the synthetic and natural drugs according to their mechanism of action, systemic effect, therapeutic uses, contraindication and toxicity		
B2	Design risk reduction strategies to ensure patient safety and prevent medication errors, drug interaction, and adverse drug effects,	**b1**	**Evaluate the** nutritional status of individuals and interpret its relation with their nutrition-related conditions
B3	Solve problems to reduce drug therapy problems	**b3**	**Assess** different nutrition regimes for different groups of healthy or diseased individuals and suggest appropriate modifications when needed.
B4	Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	**b2**	**Design**, and **select** the best medical nutrition therapy intervention for individuals with different mal- an overnutrition diseases

Professional and Practical Skills

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

c1 Apply the knowledge with the clinical skills in diagnoses of the different nutrition disorders to provide the appropriate nutritional therapy.

c2 Calculate the nutritional requirements, and use the laboratory and physical parameters to monitor pharmaco- and nutritional therapy for different nutrition –related statues.

c3 Provide good advices about balanced diet to promote healthy nutrition and to achieve goals of nutritional therapy

Professional and Practical Skills PILOs		**Professional and Practical Skills CILOs**	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
C1	Handle the chemical, biological, and pharmaceutical materials safely		
C2	Operate different pharmaceutical equipment and instruments		
C3	Extract active substances from different		

	sources.		
C4	Carry outpatient physical assessment.	c1	Apply the knowledge with the clinical skills in diagnoses of the different nutrition disorders to provide the appropriate nutritional therapy.
		c2	Calculate the nutritional requirements, and use the laboratory and physical parameters to monitor pharmaco- and nutritional therapy for different nutrition –related statues.
C5	Advise the patients and health care professionals for optimizing medicines use.	c3	Provide good advices about balanced diet to promote healthy nutrition and to achieve goals of nutritional therapy

Transferable (General) Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

d1 Work effectively either individually or within a team, considering legalizations and ethics of pharm profession
d2 Use different sources to obtain information and knowledge

Transferable (General) Skills PILOs		**Transferable (General) Skills CILOs**	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
D1	Communicate effectively and ethically with patients, public, and health care professionals.		
D2	Use information systems and computer softwares in order to enhance the delivery of pharmaceutical care,	**d2**	Use different sources to obtain information an knowledge
D3	Work effectively individually and in a	**d1**	Work effectively either individually or within a team, considering legalizations and ethics

	team		of pharmacy profession
D4	Have the skills of decision-making and time management and lifelong learning		

II. Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
a1	**Describe** the major concepts in clinical nutrition and define the basic information about the types and amounts of macro- and micronutrients needed for maintaining health	• Lectures • Discussion Sessions • Assignments	• Periodic exam (Quizzes) • Evaluate assignments • Mid & final exam
a2	**Determine** causes, diagnosis of different types of nutrition disorders		
a3	**Illustrate** the basics of nutrition therapy or nutritional care process using either enteral or parenteral nutrition.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

b1	**Evaluate the** nutritional status of individuals and interpret its relation with their nutrition-related conditions.	• Discussion Sessions • Problem solving • Group discussion • Assignments	• Oral presentations • Evaluate assignments • Mid & final exam
b2	**Design**, and **select** the best medical nutrition therapy intervention for individuals with different mal- an overnutrition diseases		
b3	**Assess** different nutrition regimes for different groups of healthy or diseased individuals and suggest appropriate modifications when needed		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:			
Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
c1	**Apply** the knowledge with the clinical skills in diagnoses of the different nutrition disorders to provide the appropriate nutritional therapy.	• Discussion sessions • Assignments	• Oral presentations • Theory & Practical exams • LAB report • Evaluate assignments
c2	**Calculate** the nutritional requirements, and use the laboratory and physical parameters to monitor pharmaco- and nutritional therapy for different nutrition – related statues.		
c3	**Provide** good advices about balanced diet to promote healthy nutrition and to achieve		

	goals of nutritional therapy		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
d1	Work effectively either individually or wi team, considering legalizations and ethi pharmacy profession	• Discussion Sessions • Assignments that require collecting information from the internet.	• Oral presentations • Writing
d2	Use different sources to obtain information and knowledge		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)

1	**Fundamentals of clinical Nutrition**	- Introduction clinical nutrition
		  ○ Science of the nutrition
		- Macronutrients
		  ○ Carbohydrates
		  ○ Lipids
		  ○ Proteins
		  ○ Major-minerals
			1w	2	a1; d2

		- Micronutrients
		  ○ Vitamins
		  ○ Trace - minerals
			1w	2	a1; d2

		- Energy
		  ○ Nutrient requirements
		  ○ Estimating energy expenditure
			1w	2	a1; b3, c2; d2

2	**Nutrition throughout the life cycle**	- Pediatrics & Geriatrics Nutrition - Athletes nutrition - Pregnancy & lactation Nutrition	1w	2	a1, b3; c3; d1
3	**Diet for hospitalized patients**	- Enteral nutrition	1w	2	a3; b3; c2; d2

		- Parenteral nutrition	1w	2	a3; b3; c2; d2
4	**Nutritional Disorders**	- Obesity & management of body weight	1w	2	a2; b1; b2; c1; d2
		- Protein- Energy Malnutrition (PEM) ▪ Marasmus (M) ▪ Kwashiorkor(K)	1w	2	a2; b1; b2;c1; d2
		- The Energy-releasing vitamins deficiency and excess ▪ Thiamine (Vit B1) deficiency "beriberi" ▪ Riboflavin (Vit B2) Deficiency ▪ Niacin (VIT B3) deficiency "Pellagra" ▪ Pyridoxine (VIT B6) deficiency	1w	2	a2; b1; b2;c1;d2
		- The hematopoietic vitamins and minerals ○ Cobalamine (Vit B12) Deficiency ○ Folic Acid (Vit B9) deficiency ○ Iron - Deficiency	1w	2	a2; b1; b2; c1;d2
		- Other vitamins and minerals deficiency & excess ○ Ascorbic Acid Deficiency (Scurvy) ○ Vit A deficiency ○ Vit D: Deficiency ○ Vitamin E Deficiency ○ Vitamin K Deficiency ○ Iodine deficiency ○ Zinc deficiency	1w	2	a2; b1; b2; c1; d2
		- Acid-base disorders - Electrolyte abnormalities	1w	2	a2; b1; b2; c1; d2
5	**Diet Therapy**	- Diabetes Mellitus. Cardiovascular diseases - Gout - Gastrointestinal Disorders.	1w	2	a3; b3;c3; d1
		- Burns - Renal & hepatic diseases Allergy & food intolerance - Cancer.	1w	2	a3; b3; c3; d1

Number of Weeks /and Units Per Semester		

VI. Teaching strategies of the course:

- Lectures
- Discussion sessions
- LAB Class
- Media Presentations: Power Point, Video
- Assignments
- Solving of problems

V. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Participation	5	Weekly	a1; a2; a3; b1; b2;c2
2	Quizzes	5	Weekly	a1; a2; a3; b2,c2
3	Research	5	6th W	a2; b3; c2;c3; d2
4	Assignments	5	6th W	a1; a2; a3; b1;b2;b3; c1; d2
	Mid – Exam (theoretical)	20	7th W	a1; a2; a3; b1
	Total score	**40%**		

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments & Homework, Tasks & Presentation	Fortnightly	10	10%	a1; a2; a3; b1;b2;b3; c1; d2
2	Quizzes	W6	5	5%	a1; a2; a3; b2,c2
3	Mid-Term exam	W8	20	20%	a1; a2; a3; b1
4	Practical reports	W12	5	5%	a1; a2; a3; c2; b1
6	Final Exam theory	W16	60	60%	a1; a2; a3; b1
Total			**100**	**100%**	

VI. Learning Resources:

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

1. Mahan, Kathleen and Raymond, Janice (2017). **Krause's Food & the Nutrition Care Process**. Saunders; 14th ed.
2. Roth R.A. (2003).Nutrition & Diet Therapy (10 Ed). Delmar, Cengage Learning. USA.

2- Essential References.

1. Elia M., Ljungqvist O., Stratton R.J., Lanham-New S.A. (2013). Clinical nutrition (2 Ed); Wiley-Blackwell, Oxford. UK.
2. Ferraro K., Winter C.H. (2014). Diet therapy in advanced practice nursing: nutrition prescriptions for improved patient outcomes (2Ed). McGraw-Hill Education.

3. Whitney, Eleanor Noss and Rolfes, Sharon Rady (2016), **Understanding Nutrition**. Wadsworth Publishing; 14th ed

4. Chisholm-Burns M.A., Wells B.G., Schwinghammer T.L., Malone P.M., Kolesar J.M., Dipiro J.T. (2013). Pharmacotherapy principles & practice (3rd Ed). McGraw-Hill Education, LLC.

3- Electronic Materials and Web Sites *etc.*

- http://www.nutramed.com
- http://www.fda.gov
- http://www.cdc.gov
- http://www.chinese-food-info.com

Course Specification of

Hospital pharmacy

I. Course Identification and General Information:							
1	**Course Title:**	Hospital pharmacy					
2	**Course Code &Number:**	**PH1125268**					
3	**Credit hours:**	C.H				TOTAL	
		Th.	Seminar	Pr	Tr.		
		2				2	
4	**Study level/ semester at which this course is offered:**	*Level 4/ semester 2*					
5	**Pre –requisite (if any):**	Community Pharmacy					
6	**Co –requisite (if any):**						
7	**Program (s) in which the course is offered:**	Bachelor of Pharmacy Doctor (Pharma D)					
8	**Language of teaching the course:**	English					
9	**Location of teaching the course:**	Thamar University - Faculty of Medical Sciences					
10	**Prepared By:**	**Dr. Ahmed G. Al- Akydy – Dr. Ahmed Al-Washli**					
11	**Date of Approval**	2021					

II. Course Description:

This course provides the student with knowledge the basic principles related to development, functions, organization and administration of pharmaceutical services within a hospital. Methods of drug distribution, I.V. admixture unit, pharmacy and therapeutic committee, hospital formulary, purchasing and inventory control, determining actual needs of the inquirer, in-patients, outpatients and ambulatory patients with respect to filling prescriptions, counseling and rational patient-oriented drug use are involved.

III. Course Objectives:

1. To Know the different pharmacy services within the hospital and the methods of and methods of drug distribution, patient counseling I.V. admixture unit.
2. To Illustrate the importance of pharmaceutical skills to the pharmacy profession such as, drug information, drug therapy monitoring.
3. To perform calculations, compounding preparations, manipulation of IV admixtures, total parenteral nutrition (TPN), and preventing incompatibilities during therapy.

I. Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

a1. Understand the principles of organization hospital pharmacy departments, and the different services of hospital pharmacy, such as, IV admixture preparation, awareness about drug in-compatibilities, TPN preparation and drug distribution.

a2, Describe the role of the pharmacist in the hospital setting, the rule of pharmacy and therapeutic committee and drug formulary

a3. Explain the different in and out -patient pharmacy services

Knowledge and Understanding PILOs		Knowledge and Understanding CILOs	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
A1	Explain the fundamentals of general sciences and the basic and biomedical sciences and their relations to pharmacy profession.	a2	**Describe** the role of the pharmacist in the hospital setting, the rule of pharmacy and therapeutic committee and drug formulary
A2	Illustrate the fundamentals of social and behavioral sciences relevant to pharmacy, ethics of health care and its impact on their relationship with patients and other healthcare professionals.		
A3	Describe relationships between chemical structure	a1	**Understand** the principles of

	of compounds of pharmaceutical and medicinal interest and biological activities		organization hospital pharmacy departments, and the different services of hospital pharmacy, such as, IV admixture preparation, awareness about drug in-compatibilities, TPN preparation and drug distribution.
A4	Define basic principles of drug: target identification, design, informatics, and mechanisms of action		
A5	Outline principles of clinical pharmacology, therapeutics and Pharmacovigilance.	a3	**Explain** the different in and out - patient pharmacy services

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

b1. Predict possible incompatibilities during IV admixture and other prescription related problems

b2. Recognize and select guide lines in preparing hospital formulary.

b3. Interpret patient profile and medication histories for in-patients and out-patients.

Intellectual Skills PILOs		Intellectual Skills CILOs	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
B1	Classify the synthetic and natural drugs according to their mechanism of action, systemic effect, therapeutic uses, contraindication and toxicity		
B2	Design risk reduction strategies to ensure patient safety and prevent medication errors, drug interaction, and adverse drug effects,	b1	**Predict** possible incompatibilities during IV admixture and other prescription related problems
B3	Solve problems to reduce drug therapy problems		

B4	Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	b2	**Recognize** and **select** guide lines in preparing hospital formulary.
		b3	**Interpret** patient profile and medication histories for in-patients and out-patients.

Professional and Practical Skills

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

c1. Apply the proper pharmacy services related to drug distribution systems, IV admixture preparation, awareness about drug in-compatibilities, and TPN preparation.
c2. Employ proper and safe dispensing, labeling, storing, and, conduct the procurement and inventory control systems utilized by the hospital.

c3- Analyze the rationale and patient-oriented drug use.

Professional and Practical Skills PILOs		**Professional and Practical Skills CILOs**	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
C1	Handle the chemical, biological, and pharmaceutical materials safely	c2	**Employ** proper and safe dispensing, labeling, storing, and, conduct the procurement and inventory control systems utilized by the hospital.
C2	Operate different pharmaceutical equipment and instruments		
C3	Extract active substances from different sources.		
C4	Carry outpatient physical assessment.		
C5	Advise the patients and health care	c1	**Apply** the proper pharmacy services related

	professionals for optimizing medicines use.		to drug distribution systems, IV admixture preparation, awareness about drug in-compatibilities, and TPN preparation.
		c3	**Analyze** the rationale and patient-oriented drug use.

Transferable (General) Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

d1. Interact effectively with patients, the public and health care professionals; including communication, interpretation and presentation of pharmaceutical information and data both written and oral

d2. Advice the patients and other health care professionals about safe and proper use of medicines

d3, Work effectively in a team in a variety of health care settings.

Transferable (General) Skills PILOs		**Transferable (General) Skills CILOs**	
After completing this program, students would be able to:		**After completing this course, students would be able to:**	
D1	Communicate effectively and ethically with patients, public, and health care professionals.	d1	**Interact** effectively with patients, the public and health care professionals; including communication, interpretation and presentation of pharmaceutical information and data both written and oral
D2	Use information systems and computer softwares in order to enhance the delivery of pharmaceutical care,	**d2**	**Advice** the patients and other health care professionals about safe and proper use of medicines
D3	Work effectively individually and in a team	**d3**	**Work** effectively in a team in a variety of health care settings.
D4	Have the skills of decision-making and time management and lifelong learning		

II. Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
a1	**Understand** the principles of organization hospital pharmacy departments, and the different services of hospital pharmacy, such as, IV admixture preparation, awareness about drug in-compatibilities, TPN preparation and drug distribution.	• Lectures • Discussion Sessions • Assignments	• Periodic exam (Quizzes) • Evaluate assignments • Mid & final exam
a2	**Describe** the role of the pharmacist in the hospital setting, the rule of pharmacy and therapeutic committee and drug formulary		
a3	**Explain** the different in and out - patient pharmacy services		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
b1	**Predict** possible incompatibilities during IV admixture and other prescription related problems	• Discussion Sessions • Problem solving • Group discussion • Assignments	• Oral presentations • Evaluate assignments • Mid & final exam
b2	**Recognize** and select guide lines in preparing hospital formulary.		
b3	**Interpret** patient profile and medication histories for in-patients and out-patients.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:			
Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
c1	**Apply** the proper pharmacy services related to drug distribution systems, IV admixture preparation, awareness about drug in-compatibilities, and TPN preparation.	• Discussion sessions • Assignments	• Oral presentations • Theory & Practical exams • LAB report • Evaluate assignments
c2	**Employ** proper and safe dispensing, labeling, storing, and, conduct the procurement and inventory control systems utilized by the hospital.		
c3	**Analyze** the rationale and patient-oriented drug use.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
d1	**Interact** effectively with patients, the public and health care professionals; including communication, interpretation and presentation of pharmaceutical information and data both written and oral	• Discussion Sessions • Assignments that require collecting information from the internet.	• Oral presentations • Writing
d2	**Advice** the patients and other health care professionals about safe and proper use of medicines		
d3	**Work** effectively in a team in a variety of health care settings.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	General Introduction to hospital pharmacy		1w	2	a1;
2	Function of hospital	- Hospital organization - Hospital pharmacy - Departments	1w	2	a1;
3	Pharmacy and therapeutics committee		1w	2	a2; d3;
4	The abilities and responsibilities of hospital pharmacists	- Roles of pharmacists in the hospital - Educational activities and training services	1w	2	a2; d1;
5	**Drug Store Management and Inventory Control**	- Organization and Structure - Organization of hospital pharmacy - Storage conditions.	1w	2	a1;
		- Purchase and Inventory - Control Procurement and stocking	1w	2	a1; c2
6	Drug distribution services	- Complete floor stock system - Individual or patient	1w	2	a1;
		- Prescription order system - Combination of system - Unit dose system	1w	2	a1; c1;
		- Dispensing of drugs to ambulatory patients. - Drug information services - Drug formulary	1w	2	a1; a2; a3; b2; c1; c3; d2;
7	Out -patient pharmacy		1w	2	a1; a3; b3; d1;
8	**Inpatient pharmacy service**	- I.V. admixtures and TPN\ - Parenteral and sterile products admixture	1w	2	a1; a3; b1; b3; c1; d1;

		- Drug in-compatabilies in infusion solutions, Patient counseling			
		- Practice the appropriate aseptic technique used in the preparation of IV admixture	1W	2	a1; a3; b1; b3; c1;
		- Total Parenteral Nutrition - Drug therapy monitoring	1W	2	a1; a3;b1; b3; c1; d2;
		- Rational use of drugs - Essential drug list - Patient-data base.	1W	2	a1; a2; a3; b1; b2; b3;c3; d2;
Number of Weeks /and Units Per Semester			**14**	**24**	

VI. Teaching strategies of the course:

- Lectures
- Discussion sessions
- Media Presentations: Power Point, Video
- Assignments
- Solving of problems

V. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Participation	5	Weekly	a1; a2; a3; b2; c1
2	Quizzes	5	Weekly	a1; a2; a3; b1; c1
3	Research	5	6th W	a2; b2; b3; c2; c3; ; d2

4	Assignments	5	6th W	a2; a3; b2; b3; c1; c2
	Mid – Exam (theoretical)	20	7th W	a1; a2; a3; b1
	Total score	**40%**		

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments & Homework, Tasks & Presentation	Fortnightly	10	10%	a2; a3; b2; b3; c1; c2
2	Quizzes	W6	5	5%	a1; a2; a3; b1; c1
3	Mid-Term exam	W8	20	20%	a1; a2; a3; b1
4	Practical reports	W12	5	5%	a1; a2; a3; b1; c1
6	Final Exam theory	W16	60	60%	a1; a2; a3; b1
Total			**100**	**100%**	

VI. Learning Resources:

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

1. Introduction to hospital and health system, pharmacy practice by: David Hold ford,

	Thomas Brown. 2010 2. Hospital Pharmacy by: Stephens, Martin, Second edition (Mar 2011)
2- Essential References.	
	1. Hand book of Hospital pharmacy 2. Pharmacy Practice Manual: A Guide to the Clinical Experience by: Larry E. Boh, Lippincott Willia Wilkins; Second edition (March 15, 2001) 3. A practical Guide to pharmaceutical care by John P. Rovers, Jay D. Currie, Harry P. Hagel, Randy P. McDonough, Jenelle L. Sobotka. APhA Publications; 2nd edition (2003).
3- Electronic Materials and Web Sites *etc.*	
	www.pharmaceuticalpractice . http://www.ashp.org/ http://www.ahfsdruginformation.com/

Course Specification Community Health

I. Course Identification and General Information:

1	**Course Title:**	Community Health				
2	**Course Code &Number:**	**PH1123282**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2				2
4	**Study level/ semester at which this course is offered:**	4th Year / 2nd semester				
5	**Pre –requisite (if any):**	B1101336				
6	**Co –requisite (if any):**					
7	**Program (s) in which the course is offered:**	**Pharm D**				
8	**Language of teaching the course:**	**English**				
9	**Location of teaching the course:**	**Themar University campus**				
10	**Prepared By:**	**Dr. Abdulrahman Al-Haifi**				
11	**Date of Approval**	**2021**				

II. Course Description:

This course Introduce the student to the bases and principles of public health that include the definitions of common terminologies and meanings used in public health practice; Health indicators and statistical principles of survey studies; the principles of sanitary environment and ability of identification of environmental hazards

III. Course Objectives:

This course aims to:

1- Develop a graduate who would take a leadership role with other health care members in educating, motivating, supervising and leading them in health promotion, prevention and control of diseases

2- Prepare a community- oriented physician capable of implementing preventive and control measures for common communicable and non – communicable diseases on the individual, family and community levels and within the primary health care (PHC) setting following MOH policies and protocols.
3- Prepare a graduate who would become an advocate for preventive public health programs and resources
4- Able to determination of the deferent methods can be used from control of this pollutant
5- Suggested the deferent mechanisms for environment protection from the pollutant in her or his environment

IV. Course Intended Learning Outcomes (CILOs):

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

Knowledge and Understanding PILOs	Knowledge and Understanding CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
A1	a1 Describe health, disease , spectrum of health and patterns of care a2 Describe major epidemiological study designs, advantages and limitations a3 Describe prevention and control of infection, hospital infection and primary health care.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

Intellectual Skills PILOs	Intellectual Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
B1	b1 Calculate measures of disease frequency and measures of association between risk factors and disease b2 Construct and interpret tables and graphs

	b3 Identify the dimensions of quality in health care, and how to utilize appropriately quality concepts and processes for performance improvement

Professional and Practical Skills

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

Professional and Practical Skills PILOs	Professional and Practical Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
C1	c1 Apply epidemiologic skills in a public health setting, specifically in the formulation or application of public health programs and policies

Transferable (General) Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

Transferable (General) Skills PILOs	Transferable (General) Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
D1	d1 Apply appropriate health education and communication strategies in different settings using behavioral change models d2 Communicate effectively with clients, community members, colleagues from other disciplines

V. Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to

Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1 Describe health, disease , spectrum of health and patterns of care	- Discussion Sessions - Assignments that require collecting information from the internet	- Writing Exam - Semester activities - Final Exam
a2 Describe major epidemiological study designs, advantages and limitations		
a3 Describe prevention and control of infection, hospital infection and primary health care		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 Calculate measures of disease frequency and measures of association between risk factors and disease	- lectures (L) - Small group discussion	- Oral presentations - Evaluate assignments - Mid& final exam
b2 Construct and interpret tables and graphs		
b3 Identify the dimensions of quality in health care, and how to utilize appropriately quality concepts and processes for performance improvement		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 Apply epidemiologic skills in a public health setting, specifically in the formulation or application of public health programs and policies	- Solving of some clinical cases. - Presentations	- Oral presentations - Midterm exams - Semester activities

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1 Apply appropriate health education and communication strategies in different settings using behavioral change models	- Discussion Sessions - Assignments that require collecting information from the internet	- Oral presentations - Semester activities
d2 Communicate effectively with clients, community members, colleagues from other disciplines		

VI. Course Content:

A. **Theoretical Aspect:**

No	Topics List	Sub Topics List	No Of Weeks	Contact Hours	ILOS
1	**Public health**	Concept of health, public health, environment and environmental health.	1	2	a1, a3, b1, c1
2	**Determinations of health**	Hereditary, environment, life style, socio and economic condition, health and family and family welfare services.	1	2	a1, a2 b3, c1
3	**Personal hygiene**	Clothing, clean lines, physical exercise, rest and sleep, health sitting, and reading. Miscellaneous: food and drink, constipation, and habits.	2	4	a1, a3, b3, c1
4	**Safe water supply**	Water sources, water pollution, and purification of water.	1	2	a1, b2,
5	**Air pollution**	Sources, prevention and control of air pollution.	1	2	a1-a3 b2,b3
6	**Waste disposal**	Solid wastes, excrete disposal, Sanitary principle, methods of disposal, soil, noise, radiation, and food	2	4	a4-a3, b2,b3, c1

		pollution.			
7	**Housing**	Indicators of mortality and morbidity. Disability rate.	1	2	a1, b2
8	**Epidemiology of infectious diseases**	Definition of infection, methods of infections. Definitions of diseases, types of diseases, epidemic , endemic, pandemic,	2	4	a1-a3 b1-b3
9	**School and hospital health**	Diseases effect on schoolchildren, & community acquired infections. Hospital acquired infections.	1	2	a1, b4,c1, d1, d2
10	**Prevention communicable diseases**	Prevention and control of major communicable diseases in Yemen.	1	2	a1, a3, b3, c1, d1-d2
11	**Vaccination.**	Live attenuated vaccine Killed vaccine	1	2	a1-a3, b1-b3 ,c1, d2
Number of Weeks /and Units Per Semester			**14**	**28**	

VII. Teaching strategies of the course:

- Lectures
- Discussion sessions
- Media Presentations: Power Point, Video
- Assignments
- Solving of problems

VIII. Assignments:

No	Assignments	Mark	Week Due	Aligned CILOs(symbols)
1	Participation	2.5	Weekly	
2	Quizzes	2.5	Weekly	
3	Research	2.5	6th W	
4	Assignments	2.5	6th W	
5	Mid – Exam (theoretical)	30	7th W	
	Total score	**40%**		

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments & Homework, Tasks & Presentation	Fortnightly	7.5	7.5%	a1; a2; a3; b1; b2;c1; d2
2	Quizzes	W6	2.5	2.5%	a1; a2; a3; b1; b2;c1

3	Mid-Term exam	W8	30	30%	a1; a2; a3; b1; b2; c1
4	Final Exam theory	W16	60	60%	a1; a2; a3; b1; b2;c1
Total			**100**	**100%**	

X. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

1. Pollution and environment protection, third Edition, Mohammed al-aodat,1998.

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2- Essential References.

1. Environmental Pollution, first Edition, Mothana al-omar, 2000

3- Electronic Materials and Web Sites *etc*.

Course Specification of Clinical Pharmacokinetics

I. Course Identification and General Information:

1	**Course Title:**	Clinical Pharmacokinetics				
2	**Course Code &Number:**	**B1101458**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2				2
4	**Study level/ semester at which this course is offered:**	4thlevel/ 2nd semester				
5	**Pre –requisite (if any):**	Biopharmaceutics & Pharmacokinetics				
6	**Co –requisite (if any):**					
7	**Program (s) in which the course is offered:**	PharmD				
8	**Language of teaching the course:**	English / Arabic				
9	**Location of teaching the course:**	Semester				
10	**Prepared By:**	Regular				
11	**Date of Approval**					

II. Course Description:

This course aims to involve the clinically oriented PharmD student in the process of clinical pharmacokinetic and pharmacodynamic monitoring of drug therapy. It is mainly concerned with the application of concepts and techniques of pharmacokinetics and pharmacodynamics to the rational design of individualized drug dosage regimens in the total clinical context, taking into account such special problems as hepatic and renal functional impairment, and the effects of disease, immaturity of drug metabolizing enzymes, and drug interactions.

III. Course Objectives:

IV. Course Intended Learning Outcomes (CILOs):

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

a1 Understand the basic pharmacokinetic principles and key pharmacokinetic parameters.

a2 Discuss the effect of different disease states on the pharmacokinetics and pharmacodynamics of drugs

a3 Understand the theoretical basis of therapeutic drug monitoring.

Knowledge and Understanding PILOs		Knowledge and Understanding CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
A1	Explain the fundamentals of general sciences, the basic and biomedical sciences, and their relations to pharmacy profession.	a1	understand the basic pharmacokinetic principles and key pharmacokinetic parameters.
A2	Illustrate the fundamentals of social and behavioral sciences relevant to pharmacy, ethics of health care and its impact on their relationship with patients and other healthcare professionals.	a2	Discuss the effect of different disease states on the pharmacokinetics and pharmacodynamics of drugs
A5	Outline principles of clinical pharmacology, therapeutics and Pharmacovagelance	a3	Understand the theoretical basis of therapeutic drug monitoring.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

b1 Identify the problems associated with dosage regimens through analyzing patient data.

b2 Develop a strategy for therapeutic drug monitoring for a range of narrow therapeutic window drugs

Intellectual Skills PILOs		Intellectual Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
B3	Solve problems to reduce drug therapy problems	**b1**	Identify the problems associated with dosage regimens through analyzing patient data.
B4	Select drug therapy regimen using mathematical, genomic, clinical pharmacokinetic and pharmacodynamics principles for optimizing the patient therapy and medication safety	**b2**	develop a strategy for therapeutic drug monitoring for a range of narrow therapeutic window drugs

Professional and Practical Skills

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

c1 Identify clinical manifestations of potential toxicities associated with patient's medication and recommend the appropriate course of action.

Professional and Practical Skills PILOs		Professional and Practical Skills CILOs	
After completing this program, students would be able to:		After completing this course, students would be able to:	
C5	Advise the patients and health care professionals for optimizing medicines use.	c1	Identify clinical manifestations of potential toxicities associated with patient's medication and recommend the appropriate course of action.

Transferable (General) Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

After completing the course, the student will be able to:

d1 Communicate effectively to other healthcare professionals

d2 Use different information sources to solve pharmacokinetics problems.

d3 Participate efficiently with colleagues in a team work

Transferable (General) Skills PILOs	Transferable (General) Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:

D1	Communicate effectively and ethically with patients, public, and health care professionals.	**d1**	Communicate effectively to other healthcare professionals
D2	Use information systems and computer soft wares in order to enhance the delivery of pharmaceutical care	**d2**	Use different information sources to solve pharmacokinetics problems.
D3	Work effectively individually and in a team	**d3**	Participate efficiently with colleagues in a team work

V. Alignment Course Intended Learning Outcomes

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
a1	Understand the basic pharmacokinetic principles and key pharmacokinetic parameters.	- Lectures, Discussions and Exercises. - Practical presentations - Self - learning	- Quizzes, Written exam.
a2	Discuss the effect of different disease states on the pharmacokinetics and pharmacodynamics of drugs		
a3	Understand the theoretical basis of therapeutic drug monitoring		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
b1	Identify the problems associated with dosage regimens through analyzing patient data.	- Discussions - Training - Field visits - Problem solving	- Quizzes, Homework - Observation - Task's Evaluates
b2	Develop a strategy for therapeutic drug monitoring for a range of narrow therapeutic window drugs		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:			
Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
c1	Advise the patients and health care professionals for optimizing medicines use	- Discussions - Training - Field visits - Problem solving	- Quizzes, Homework - Observation - Task's Evaluates

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
d1	Communicate effectively to other healthcare professionals	- Group discussions - Cooperative learning. - Self – learning - Inductive and deductive	- Homework - Evaluates of Oral Presentation
d2	Use different information sources to solve pharmacokinetics problems.		
d3	Participate efficiently with colleagues in a team work		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	**Introduction to clinical pharmacokinetics**	- Concepts, Equations and Calculations	1	2	a1, a2, a3
2	**Design of dosage regimens**	- Det. of dose & dosing interval - Effect of changing dose and dosing interval on C∞ max, C∞ min & C∞ av - Conversion from IV infusion to oral dosing - Nomograms and tabulations in designing dosage regimens - dosing in infants, children, elderly and obese patients	4	8	a1, a2, a3, b1, b2, d1, d2, d3
3	**Dosage individualization**	- Dosage individualization o Variability o Genetics o Age and weight o Disease (renal & hepatic disease) o Interacting drugs o Concentration monitoring	4	8	a1, a2, a3,b1, b2, d1, d3
4	**Therapeutic drug monitoring**	- Therapeutic drug monitoring o Aminoglycosides o Carbamazepin o Digoxin Theophylline o Phenytoin o Lidocaine o Lithium o Methotrexate - Immunosuppressant	4	8	a1, a2, a3,b1, b2, d1, d2.

5	**Case Discussions**	- Include all the above	1	2	a1, a2, a3, b1, b2, c1, d1, d2,d3
Number of Weeks /and Units Per Semester			**14**	**28**	

VI. Teaching strategies of the course:

- Lectures, Discussions and Exercises.
- Group discussions
- Field visits
- Problem solving
- Simulation & Practical presentations
- Self-learning
- Cooperative learning, Training

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Class attendance and participation	a1, a2, a3, b1, b2, c1, d1, d2,d3	weekly	5
2	Exercises and home work	a1, a2, a3, b1, b2, c1, d1, d2,d3	weekly	10

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	**Assignments**	1-14	15	15%	a1, a2, a3, b1, b2, c1, d1, d2, d3
2	**Quizzes 1**	5 and 10	5	5%	a1, b1

3	**Mid-term exam of theoretical part (written exam**	7	20	20%	a1, a2, a3, b1
4	**Final exam of theoretical part (written exam)**	16	60	60%	a1, a2, b1, b2, c1, c2, d1, d2
Total			**100**	**100%**	

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

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

1. Basic clinical pharmacokinetics, By Michael E. Winter. Edition: 5 – 2009 (ISBN-13: 978-0781779036)
2. Applied clinical pharmacokinetics, By Larry Bauer. 3rd Edition – 2014 (ISBN-13: 9780071794589)
3. Applied pharmacokinetics & pharmacodynamics: principles of therapeutic drug monitoring, By Michael E. Burton. Edition: 4 – 2006 (ISBN-13: 978-0071603935)
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