

Clinical pharmacy

1	Course name	Clinical Pharmacy
2	Course Code	PH402
3	Course type: /general/specialty/optional	general
4	Accredited units	4 units (3 hrs/week theoretical 2 hrs/week practical)
5	Educational hours	5 hours/week
6	Pre-requisite requirements	Pharmacology 1& 2
7	Program offered the course	Department of Pharmaceutical Care
8	Instruction Language	English
9	Date of course approval	12/2021

Brief Description:	<ul style="list-style-type: none"> The common diseases covering etiology, clinical picture, diagnosis, investigations and therapy 	
Textbooks required for this Course:	<ul style="list-style-type: none"> Patient Assessment in Clinical Pharmacy Applied Therapeutics: The Clinical Use of Drugs. Marry Anne Koda-Kimble Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton & Lange 	
Course Duration	28 weeks	
Delivery	Lecture-based, Group interaction and discussion, medical clerkshipetc.	
Course Objectives:	<p>By the end of the course, students should be able to:</p> <ul style="list-style-type: none"> Understanding the pathophysiology of selected disease states Understanding the rationale for drug therapy and the management of a range of acute and chronic conditions. Identifies Drug Therapy Problems (DTPs) Makes Clinical Decisions through individualizing therapeutic plans. Skills in the critical evaluation of a range of health services literature 	
Course Assessments	Midyear exam	20%
	Quizzes, reports, presentation	10%
	Practical continuous assessment, exam	10%
	Final Practical exam	20%
	Final theoretical exam	40%
	Total	100%
Session 1 (Week 1)	Introduction to the Patient Care Process:	

	<ul style="list-style-type: none"> • Definition of clinical pharmacy. • Define and understand the role of the patient care process in providing care. • Describe the components of comprehensive patient history taking. • Apply a process to assess a patient for drug-related problems. • Outline the components of patients' comprehensive care plans. • Develop appropriate documentation of patient care.
Session 2 (Week 2)	Principles of Patient Assessment <ul style="list-style-type: none"> • Describe the role of patient assessment in pharmacy practice. • Describe the steps of symptoms assessment. • Physical Assessment skills for Pharmacists • List available comprehensive guides to physical assessment.
Session 3 (Week 3)	Critical Care Assessment: <ul style="list-style-type: none"> • Describe the role of the pharmacist in the intensive care unit (ICU) and in the care of critically ill patients • Describe the steps of critical care assessment, including collecting patient history, assessing the history of present illness, and conducting a review of systems Apply knowledge of routes of administration, intravenous compatibility, and pharmacokinetic. • Changes in the critically ill to ensure effective and safe medication delivery to the patient.
Session 4 (Week 4)	Drug interactions and adverse drug reactions
Session 5 (Week 5)	Clinical pharmacokinetics and therapeutic drug monitoring of selected drugs (Vancomycin, Aminoglycosides, digoxin, theophylline, carbamazepine)
Session 6 (Week 6)	Drug therapy in special populations: Pregnancy, Lactation, Pediatric, Geriatric: <ul style="list-style-type: none"> • Describe the goals of therapy and management strategy for menopause. • Assess women for menopausal symptoms and who may be considering hormone therapy. • Describe the goals of therapy and the therapeutic options for women seeking hormonal contraceptives. • Assess women who are seeking combined hormonal contraception.
Session 7 (Week 7)	Drug therapy in special populations: Pregnancy, Lactation, Pediatric, Geriatric: <ul style="list-style-type: none"> • Recognize challenges related to patient assessment that are unique to pediatrics and neonatology. • Describe the required components of a complete pharmacy assessment that are unique to pediatrics and neonatology. • Gain a basic understanding of the differences in pediatric assessment as it relates to vital signs and common laboratory parameters • Describe the process of comprehensive geriatric assessment. • Identify the domains of comprehensive geriatric assessment. • Describe practical tools that pharmacists cause in their assessment of older adults.
Session 8 (Week 8)	Drug management of endocrine disorders: Diabetes Mellitus. <ul style="list-style-type: none"> • Describe the diagnostic criteria and tests for diabetes. • Describe glycemic control targets for different populations with diabetes. • Describe treatment options for patients with diabetes. • Apply various tests to assess glycemic control.

	<ul style="list-style-type: none"> Describe hypoglycemia, its symptoms and its treatment, and how to avoid it.
Session 9 (Week 9)	Drug management of cardiovascular disorders: Dyslipidemia: <ul style="list-style-type: none"> Understanding the pathophysiology and its classifications and Major Risk Factors Identify appropriate standards for the diagnosis of dyslipidemia and determine risk and prognosis for developing cardiovascular disease. Outline the management and treatment lines of hyperlipidemia
Session 10 (Week 10)	Hypertension: <ul style="list-style-type: none"> Understanding approach of assessing a patient with hypertension. To outline the various methods of diagnosis and monitoring for those with hypertension. To outline appropriate follow-up and monitoring parameters for patients with hypertension. Complications of Hypertension General Management of hypertension and Special patient groups Resistant hypertension, hypertensive urgencies and emergencies
Session 11 (Week 11)	Midyear Exam
Session 12 (Week 12)	
Session 13 (Week 13)	
Session 14 (Week 14)	
Session 15 (Week 15)	Heart Failure: <ul style="list-style-type: none"> To define heart failure (HF) To review the diagnosis of HF including common signs and symptoms, risk factors and common diagnostic tests To highlight goals of therapy in patients with HF To outline a general approach to a patient with HF including initial assessment and ongoing evaluation and monitoring To provide an approach to pharmacotherapy in HF including parameters for initiation and titration of therapy.
Session 16 (Week 16)	Coronary heart disease: <ul style="list-style-type: none"> Pathophysiology of disease. Clinical presentation and diagnosis. Modifiable and non-modifiable Risk factors Clinical syndromes Medical management and prevention Evaluation of therapeutic outcomes.
Session 17 (Week 17)	Thrombosis: <ul style="list-style-type: none"> clinical manifestations of venous thromboembolism pulmonary embolism management of bleeding and excessive anticoagulation general approach to the treatment of venous thromboembolism. treatment of venous thromboembolism in special populations. clinical presentation and diagnosis of PE & pharmacologic treatment options

<p>Session 18 (Week 18)</p>	<p>Stroke:</p> <ul style="list-style-type: none"> • Pathophysiology and classification • Etiology and Risk factors. • Clinical presentation (including diagnostic considerations. • General approach to treatment. • general information regarding safety and efficacy • Use available parameters to measure and monitor target lipid goals for patients under treatment for dyslipidemia. Review recommendation of pivotal clinical trials).
<p>Session 19 (Week 19)</p>	<p>Drug management of respiratory disorders:</p> <p>Asthma:</p> <ul style="list-style-type: none"> • Describe the epidemiology, risk factors, clinical presentation and diagnosis of asthma. • Describe the goals of therapy and management strategies for asthma. • Conduct an initial assessment of patients newly diagnosed with asthma. • Describe the role of inhaled medications and optimal inhalation device use in asthma management. • Conduct a follow-up assessment of patients with asthma.
<p>Session 20 (Week 20)</p>	<p>Chronic Obstructive Pulmonary Disease:</p> <ul style="list-style-type: none"> • Non-specific & specific immunity. • Cells involved in the immune response • Types of immunoglobulin & mechanism of antibody production. • Hypersensitivity reactions. • Serological tests.
<p>Session 21 (Week 21)</p>	<p>Drug management of neurological disorders:</p> <p>Epilepsy:</p> <ul style="list-style-type: none"> • Describe the epidemiology, etiology, risk factors, and pathophysiology of epilepsy. • Describe the classification of different seizure types. • Conduct initial assessment of patients newly diagnosed with epilepsy. • Apply the general principles of antiepileptic drug therapy in the follow-up assessment of patients with epilepsy.
<p>Session 22 (Week 22)</p>	<p>Drug management of psychiatric disorders:</p> <p>Depression:</p> <ul style="list-style-type: none"> • Describe the disease burden, epidemiology, diagnosis, prognosis, and management of major depressive disorder and other depressive disorders. • Conduct initial assessment of patients who present with new diagnosis of depression or who are suspected of having depression but have not been formally diagnosed. • Outline monitoring parameters and follow-up plans for patients using pharmacological therapy to manage their depression. • Provide guidance to patients on how to manage partial/non-response or adverse effects of medications.
<p>Session 23 (Week 23)</p>	<p>Drug management of bone and joint disorders:</p> <p>Osteoporosis:</p> <ul style="list-style-type: none"> • Assess fracture risk in patients using bone mineal density and risk factors. • Identify potential complications from osteoporosis drug therapy. • Assess appropriate monitoring parameters in osteoporosis including lab work and imaging.

	<p>Rheumatoid Arthritis:</p> <ul style="list-style-type: none"> • Describe the epidemiology, etiology, clinical presentation, and diagnosis of rheumatoid arthritis. • Describe the goals of therapy and the management strategy for rheumatoid arthritis. • Conduct an initial assessment of a patient newly diagnosed with rheumatoid arthritis. • Conduct a follow-up assessment of a patient on disease-modifying antirheumatic drug therapy, considering the regimen's effectiveness and safety and the patient's ability to adhere
<p>Session 24 (Week 24)</p>	<p>Drug management of infectious diseases:</p> <ul style="list-style-type: none"> • Describe the core elements of approach to infectious disease assessment. • Describe the use of empiric, definitive, and prophylactic antimicrobial therapies. • Describe the use of an antibiogram. • Describe the approach to interpretation of culture results.
<p>Session 25 (Week 25)</p>	<p>CNS infection:</p> <ul style="list-style-type: none"> • Pathophysiology of CNS infections ⊗ • Most common pathogens & risk factors • Antibiotic selection issues • Appropriate empirical antimicrobial regimens • Prevention strategies • Adjunctive therapy <p>Components of monitoring plan</p>
<p>Session 26 (Week 26)</p>	<p>Oncology:</p> <ul style="list-style-type: none"> • Pathophysiology, Type of cancer and risk factors • Diagnosis and staging of tumor cancer • Clinical presentation and Complications of Malignancy • Oncology management. Combination chemotherapy, Adjuvant Chemotherapy, Neoadjuvant chemotherapy. • Complication of cancer chemotherapy.
<p>Session 27 (Week 27)</p>	<p>Leukemia and Lymphoma:</p> <ul style="list-style-type: none"> • Types and symptoms • Risk factors and diagnostic methods, • Management of therapy, <p>Chronic Non-cancer pain:</p> <ul style="list-style-type: none"> • To identify key features of chronic non-cancer pain as a pathological form of pain • To review assessment strategies that allow the clinical pharmacist to assess pain and evidence of reduced coping in chronic pain Patients. • To link pain and coping assessments to pharmacotherapy optimization and management
<p>Session 28 (Week 28)</p>	<p>Drug management of anemia:</p> <ul style="list-style-type: none"> • Describe the classification of anemia. • Complete a patient assessment and interpret laboratory findings to determine the most likely cause of anemia. • Apply a monitoring and follow-up plan for patients initiated on treatment for anemia.

	Final theoretical Exam
Practical Part:	<p>➤ Practical Part:</p> <p>Clinical pharmacy Clerkship: the fundamental goal of the clinical pharmacy clerkship is to provide a structured, practical and closely supervised professional experience that enables the students to better assume their future role as a competent clinical pharmacist. This goal includes the development of professional judgment, pharmaceutical care practice competencies and technical skills. At the completion of clerkship, the students should be able to demonstrate competencies in the following areas</p> <ul style="list-style-type: none"> ➤ To obtain accurate medication histories & gather other relevant patient’s data. ➤ To learn medical terminologies commonly used by health care professionals in the patient care areas. ➤ To learn interpretation of common clinical laboratory tests. ➤ To perform effective drug regimen reviews and identify actual and potential medication – related problems. ➤ To develop a pharmaceutical care plan for the patient. ➤ To recommend a therapeutic drug monitoring plan, including drug concentration monitoring and indicators of efficacy and toxicity. ➤ To assess drug therapy regimen in a patient with alter renal or hepatic function. ➤ To demonstrate an awareness of the assessment skills in areas necessary to monitor medication outcomes. ➤ Communicate effectively with health care professionals and others both orally and in ➤ To perform complete and accurate patient counseling and enhance patient education and compliance. ➤ To provide drug information to health care professionals and patients and to demonstrate competencies in the following areas: <ul style="list-style-type: none"> • Indication – specific prescribing practice • Appropriate drug dosage selection • Appropriate dosage – form selection • Drug use in pregnancy • Drug use in pediatrics • Drug use in geriatrics • Dosage adjustment in renal impairment • Dosage adjustment in hepatic impairment • Management of drug interactions • Detection & management of adverse reaction & drug induced diseases. ➤ To demonstrate professional attitude, motivation and ethics. ➤ To demonstrate the fundamental knowledge of pharmacotherapeutics in the areas necessary to provide the service. ➤ To provide the student opportunities to engage in scholarly activities (i.e, special projects, presentations, research activities).
	Final Practical Exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor’s

	note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.
	<p>Description / routine activities of students during the clerkship</p> <ul style="list-style-type: none"> • Student will perform the following activities during clerkship rotations: <ul style="list-style-type: none"> ○ Taking history from the patient with special emphasis on medication history. ○ Participation in Medical Rounds to learn how health care professionals; ○ Assess/ identify patient's disease and medication related problems ○ Treat/ resolve actual disease and medication related problems ○ Prevent potential disease and medication related problem ○ Learning medical terminologies commonly used by health care professionals in patient- care areas. ○ Developing written and oral communication skills i.e. how to communicate effectively with health care professionals and others, both orally and in writing. ○ Monitoring patient compliance statue & adherence to drug therapy and to identify the factors responsible for non-compliance. ○ Patient education and counseling to improve compliance during patient stay at the hospital and at the time of discharge. ○ Reviewing patient medication therapy in the ward in order to learn how health care professionals diagnose/ detect/ identify & manage the following medication related problems. <ul style="list-style-type: none"> ○ Untreated condition(s) ○ Drug(s) without indication(s) ○ Improper drug selection/ taking wrong drug ○ Sub therapeutic dose ○ Excessive dose ○ Improper duration ○ Drug(s) not administered/ Failure to receive medication ○ Drug interactions ○ Adverse drug reactions/ intolerances ○ Requiring dose adjustment in renal impairment. ○ Requiring dose adjustment in hepatic impairment ○ Therapeutic duplication ○ Pregnancy/ lactation related problem(s) ○ Inappropriate dosage-form/ route of administration ○ Non-compliance ○ Use of narrow therapeutic index drug(s) without monitoring ○ Poly-pharmacy

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| | <ul style="list-style-type: none">○ Cost related problems○ Miscellaneous medication related problems• Developing pharmaceutical care plan for the patient.• Learning how to provide Drug information to the patients and health care professionals.• Any other activity which the supervisor considers necessary to be performed by the students. |
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Hospital pharmacy

1	Course name	Hospital pharmacy
2	Course Code	PH308
3	Course type: /general/specialty/optional	Specialty
4	Accredited units	3 units (2 hr. lecture, 1 lab /week)
5	Educational hours	4 hrs/week
6	Pre-requisite requirements	Pharmacology I,II and pharmaceuticals
7	Program offered the course	Bachelor Degree in Pharmaceutical Sciences
8	Instruction Language	English Language
9	Date of course approval	12/2021

Brief Description:	Teaching of the syllabus will be in accordance with current Libyan regulation and WHO proposals. This course will provide students with a fundamental understanding of the national and international legislation and law in pharmacy. activities of the pharmacist. Good Storage Practice. Classifications of hospitals, its function and pharmacy department. Drug information center. Large volume medications and principles of radio pharmaceuticals and radiopharmaceuticals. As well as the use of nuclear radiation in the management of some disease.	
Textbooks required for this Course:	1. Modern dispensing and hospital pharmacy. N K Jain, G D Gupta 2018 2. Hospital pharmacy sciences 3. Aulton's pharmaceuticals 4. Sciences direct website 5. Additional Resources: Lectures Notes	
Course Duration	24 weeks	
Delivery	Lectures (Tools: board, data show, video). Practical classes (Lab experiments+ preparation and sterilization of normal saline, evaluation of prescription form,	
Course Objectives:	At the end of the course students will be able to: - Explain local and international legalization in the field of pharmacy. - Describe the organization structure of hospital and hospital pharmacy. - Understand the manufacturing practice of various large volume medications. - Understand the admixtures and incompatibilities of medications. - Describe the management of inventory control in the hospital pharmacy. - Classify the radioactive materials and understanding their clinical uses .	
Course Assessments	Midyear exam	20%
	Quizzes, reports, presentation	10%
	Practical continuous assessment, exam	10%
	Final Practical exam	20%
	Final theoretical exam	40%
	Total	100%
Content Breakdown Topical Coverage	Content Breakdown Topical Coverage	
Session 1 (Week 1)	Unit I: Outlines of pharmacy legislation including Local regulations. (4 hr.)	
Session 2 (Week 2)	Outlines of pharmacy legislation including Local regulations.	
Session 3 (Week 3)	Unit II: Pharmacy as a system in health –care delivery. (8 hr.) - Introduction. -The scope of pharmacy & activities of the pharmacist: - The procedure for procurement & warehousing of drugs and pharmaceuticals in the hospitals	
Session 4 (Week 4)	-The scope of pharmacy & activities of the pharmacist: - The responsibility of the hospital pharmacist.	

	<ul style="list-style-type: none"> - Different methods of drug distribution systems in hospitals. - The procedure for Distribution of Narcotic and other controlled substances
Session 5 (Week 5)	<ul style="list-style-type: none"> -The scope of pharmacy & activities of the pharmacist. - Hospital pharmacist's participation in continuing education programme. - inventory control, methods and types of inventory control.
Session 6 (Week 6)	<ul style="list-style-type: none"> - Pharmacy as a profession.
Session 7 (Week 7)	Unit III: Storage of medical products. (5 hr.) including: <ul style="list-style-type: none"> - outlines of Good Storage Practice (GSP).
Session 8 (Week 8)	<ul style="list-style-type: none"> - Outlines of Good Storage Practice (GSP).
Session 9 (Week 9)	<ul style="list-style-type: none"> - Outlines of Good Storage Practice (GSP). Unit IV: Hospital and its organization: (7 hr.) <ul style="list-style-type: none"> - The hospital and its requirements.
Session 10 (Week 10)	<ul style="list-style-type: none"> - Classifications of hospitals. - Functions of hospitals. - The hospital pharmacy department.

Session 11 (Week 11)	Midyear exam
Session 12 (Week 12)	
Session 13 (Week 13)	
Session 14 (Week 14)	
Session 15 (Week 15)	<ul style="list-style-type: none"> - The practices of hospital pharmacist in hospital.
Session 16 (Week 16)	<ul style="list-style-type: none"> - Location, facilities and personal. - The pharmacy and therapeutic committee.
Session 17 (Week 17)	Unit VI: Drug information center (DIC): (6 hr.) <ul style="list-style-type: none"> - Primary source of informations. - Secondary source of informations. - Tertiary source of informations.
Session 18 (Week 18)	<ul style="list-style-type: none"> - Guidelines to establish (DIC) in hospitals. - Services offered by DIC.
Session 19 (Week 19)	<ul style="list-style-type: none"> - Common faults in advising patients. - The hospital formulary.
Session 20 (Week 20)	Unit VII: In-patient pharmacy service: (6 +2hr.) <ul style="list-style-type: none"> - Fluid and electrolyte therapy.
Session 21 (Week 21)	<ul style="list-style-type: none"> - Fluid and electrolyte therapy.
Session 22(Week 22)	<ul style="list-style-type: none"> - Fluid and electrolyte therapy. - Parenteral nutrition.
Session 23 (Week 23)	Unit VIII: Parenteral admixtures and incompatibilities.(3 hr)
Session 24 (Week 24)	Unit IX: Methods of I.V administration and sets including flow rates, & flow control. (5 hr.)
Session 25 (Week 25)	<ul style="list-style-type: none"> - Methods of I.V administration and sets including flow rates, & flow control.

Session 26 (Week 26)	Unit X: Radio pharmacy: (6 hr.) - Introduction. - importance of radiopharmaceuticals, frequently used radio pharmaceuticals in the hospital.
Session 27 (Week 27)	- Therapeutic and diagnostic radio-pharmaceuticals in pharmacy
Session 28 (Week 28)	- The method for handling radiopharmaceuticals in hospital. - Radio-pharmaceutical quality control.
	Final theoretical exam
Practical work	Part II: Practical in Hospital Pharmacy: (One lab/ week) 1) Test for pyrogens on water for injection. 2) Evaluation of the plastic transfusion bottles used for large volume parenterals. 3) Operation of the sterilization equipment (Autoclave). 4) Test for hydrolytic resistance of glass containers used for parenterals. 5) Evaluation of prescription form. 6) Preparation and sterilization of normal saline IP. 7) Preparation and sterilization of dextrose injection IP. 8) Study of drug profile of radiopharmaceuticals. 9) Study of poisons information service. 10) Study of drug information service.
	11. Final practical Exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pharmacy practice

1	Course name	Pharmacy Practice
2	Course Code	PH 407
3	Course type: /general/specialty/optional	Specialty
4	Accredited units	3 Units (Theoretical 2 Lecture/Week Practical 2 hours/Week)
5	Educational hours	4 hr/week
6	Pre-requisite requirements	Pharmaceutics I, II and Pharmacology I, II
7	The program offered the course	Department of Pharmaceutical care
8	Instruction Language	English
9	Date of course approval	12/2021

Brief Description:	The course provides the students with knowledge in pharmacy practice laws and therapeutic plan. Also provides the students with the knowledge about Patient's factor's in drug-product selection. Study the Responding to symptoms in pharmacy practice. The course provides the students with information in pharmacy system. In this course the students will be learning various skill such as dispensing of drugs, responding to minor ailments by providing suitable safe medication, patient counselling for improved patient care in the community set up.
Textbooks required for this Course:	<ol style="list-style-type: none"> 1. Parthasarathi G, Karin Nyfort-Hansen, Milap C Nahata. <i>A textbook of Clinical Pharmacy Practice- essential concepts and skills</i>, 1st ed. Chennai: Orient Longman Private Limited; 2004. 2. William E. Hassan. <i>Hospital pharmacy</i>, 5th ed. Philadelphia: Lea & Febiger; 1986. 3. Tipnis Bajaj. <i>Hospital Pharmacy</i>, 1st ed. Maharashtra: Career Publications; 2008. 4. Scott LT. <i>Basic skills in interpreting laboratory data</i>, 4th ed. American Society of Health System Pharmacists Inc; 2009. 5. Parmar N.S. <i>Health Education and Community Pharmacy</i>, 18th ed. India: CBS Publishers & Distributors; 2008. <p>Journals:</p> <ol style="list-style-type: none"> 1. Therapeutic drug monitoring. ISSN: 0163-4356 2. Journal of pharmacy practice. ISSN : 0974-8326 3. American journal of health system pharmacy. ISSN: 1535-2900 (online) 4. Pharmacy times (Monthly magazine)
Course Duration	28 week
Delivery	<p>Lectures</p> <p>Practical classes (Lab experiments+ computerized experiments simulation)</p> <p>Tutorials and group discussions</p> <p>E-tutorials (if applicable)</p> <p>Presentations</p> <p>Assignments (if applicable)</p> <p>Videos.</p>
Course Objectives:	<p>Upon completion of the course, the student shall be able to</p> <ol style="list-style-type: none"> 1. know various drug distribution methods in a hospital 2. appreciate the pharmacy stores management and inventory control 3. monitor drug therapy of patient through medication chart review and clinical review 4. obtain medication history interview and counsel the patients 5. identify drug related problems 6. detect and assess adverse drug reactions 7. interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states 8. know pharmaceutical care services 9. do patient counseling in community pharmacy; 10. appreciate the concept of Rational drug therapy.

Course Assessments	Midyear exam	20%
	Quizzes, reports, presentation	10%
	Practical continuous assessment, exam	10%
	Final Practical exam	20%
	Final theoretical exam	40%
	Total	100%
Content Breakdown Topical Coverage	Content Breakdown Topical Coverage	
Session 1 (Week 1)	<p>Unit I: Pharmaceutical care: 8 hr.</p> <ul style="list-style-type: none"> • Introduction to Pharmaceutical care • Pharmaceutical care and the scope of Pharmacy Practice • Essential components of pharmaceutical care <p>Drug related problems.</p> <ul style="list-style-type: none"> • The response of the profession of pharmacy to drug related problems. • Exploration of the drug process. • Clinical skills and Pharmacist's role in pharmaceutical care. 	
Session 2 (Week 2)	<p>The development of the concept of pharmaceutical care.</p> <ul style="list-style-type: none"> • The pharmacist's functions. • Functions related to the individual patient. • Functions related to the community. 	
Session 3 (Week 3)	<ul style="list-style-type: none"> • The Pharmacist's Working up of Drug Therapy (The PWDT process) • Data collection (Patient data, patient past medical history, patient family history, patient social history, patient history of present illness, physical finding, laboratory and test results. 	
Session 4 (Week 4)	<ul style="list-style-type: none"> • Clinical Skills and Pharmacist's role in pharmaceutical care • Pharmaceutical care as the model of Pharmacy Practice 	
Session 5 (Week 5)	<p>Unit II: Therapeutic Plan 8 hr.</p> <ul style="list-style-type: none"> • The CORE pharmacotherapy plan • The CORE pharmacotherapy problems. • The FARM progress note 	
Session 6 (Week 6)	<p>Patient's factor's in drug-product selection:</p> <ul style="list-style-type: none"> • The pharmacist's responsibility and role in drug product selection • Factors affecting drug-product selection • Patient acceptance consideration. • Patient age consideration • Environmental consideration 	
Session 7 (Week 7)	<ul style="list-style-type: none"> • Disease state consideration • Patient compliance 	

	<ul style="list-style-type: none"> • Biopharmaceutical consideration
Session 8 (Week 8)	<ul style="list-style-type: none"> • Performance of drugs in clinical practice and factories effects their methods of presentation • Concept of optimized drug products and controlled release delivery systems (CR-DDS) <ol style="list-style-type: none"> 1. Definitions 2. Optimized controlled release (CR) products 3. Advantages of sustained /controlled drug therapy 4. Categories of non-immediate delivery systems 5. Types of CR-DDS (examples)
Session 9 (Week 9)	Unit III: Drug supply (6 hours) <ul style="list-style-type: none"> • The goal of drug supply • The drug supply process
Session 10 (Week 10)	<ul style="list-style-type: none"> • Problems in the drug supply process
Session 11 (Week 11)	Midyear Exam
Session 12 (Week 12)	
Session 13 (Week 13)	
Session 14 (Week 14)	
Session 15 (Week 15)	
Session 16 (Week 16)	Unit IV: Responding to symptoms in pharmacy practice through OTC and counseling: <ul style="list-style-type: none"> • Responding to symptoms in Pharmacy Practice 10 hours) • The Communication Process <ol style="list-style-type: none"> 1. The goal of effective communications 2. The scope of medication-counseling sessions <ol style="list-style-type: none"> a) In organized health care setting b) In the community setting 3. Patient assessment and consultation self-medication <ol style="list-style-type: none"> a) Importance of communication skills. b) Provision of pharmaceutical care through Patient-Pharmacist communication process
Session 17 (Week 17)	Non-Prescription medications (OTC medications) <ul style="list-style-type: none"> • OTC criteria according to international stranded • Label requirements for non-prescription medicine • Non-prescription medication as a primary therapy and related conditions <ol style="list-style-type: none"> a) Antidiarrheal and other gastrointestinal products b) Laxative products c) Antacids and other gastrointestinal reflux disease products
Session 18 (Week 18)	<ol style="list-style-type: none"> d) Cold and Allergy product e) Internal analgesics (management of headache, pain and fever)

	f) Menstrual products g) Acne Products h) Others
Session 19 (Week 19)	In-home monitoring devices 4- In-Home testing and monitoring devices a) Diabetes care products and monitoring kits b) Pregnancy testing and ovulation prediction testing kits c) Fecal occult blood kits
Session 20 (Week 20)	d) Cholesterol monitoring kit e) Home blood pressure and temperature monitoring f) Home respiratory devices
Session 21 (Week 21)	Unit V: Dispensing prescriptions 2 hr.
Session 22 (Week 22)	Unit VI: Mathematical principles of drug therapy 2 hr.
Session 23 (Week 23)	Unit VII: Pharmacy system 6 hr.
Session 24 (Week 24)	Pharmacy system
Session 25 (Week 25)	Pharmacy and therapeutic committee Organization, functions, Policies of the pharmacy and therapeutic committee in including drugs into formulary, inpatient and outpatient prescription, automatic stop order, and emergency drug list preparation.
Session 26 (Week 26)	Unit VIII: Pharmacy information and research 4 hr.
Session 27 (Week 27)	Pharmacy information and research
Session 28 (Week 28)	Pharmacy information and research
	Final theoretical exam
Practical Work	One lab per week: N.B. Practical sessions are illustrating the theoretical concepts of the above
	Final practical exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	Independent learning, critical thinking, and problem solving. Basic IT and presentation skills. Integration of different fields of knowledge. Team working. Communication skills.
Course Change	The details of course contents are updated according to the outcomes of new research and published paper. Content of the courses is revised on an ongoing basis to ensure that the course fit the graduation competences and community needs. Any changes will be approved by the department' scientific committee and department council.

Pathology

1	Course name	Pathology
2	Course Code	PH 206
3	Course type: /general/specialty/optional	General
4	Accredited units	3 units (2 hours theory and 1 lab /week)
5	Educational hours	4 hours/week
6	Pre-requisite requirements	Physiology
7	Program offered the course	Department of pharmaceutical care
8	Instruction Language	English
9	Date of course approval	12/2021

Brief Description:	The Pathology module is divided into two parts- general pathology and systemic pathology. It is designed to cover the following topics: cellular injury and adaptation, acute and chronic inflammation, regeneration and repair, circular disturbance, disturbances of cell growth. The students also study in this subject the Pathology of the immune reaction, bacterial and protozoal diseases, tumor pathology and endocrine CVS, GIT, respiratory and urinary system diseases.	
Textbooks required for this Course:	1. Textbook: Pathology and therapeutics for Pharmacists: Green & Harris, Pharmaceutical Press. 2. Rubin's Pathology, Clinicopathologic Foundations of Medicine, 6th edition 2011 edited by Rubin, Strayer, and Rubin (Lippincott Williams and Wilkins).	
Course Duration	28 weeks	
Delivery	<ul style="list-style-type: none"> Lecture-based, Group interaction and discussion, Use of video technique, practical classes. 	
Course Objectives:	The broad objectives of the module were for the students to understand the etiology, pathogenesis and key morphological and clinical features of major disease conditions, as well as to correlate these with the fundamental principles of therapy.	
Course Assessments	Midyear exam	20%
	Quizzes, reports, presentation	10%
	Practical continuous assessment, exam	10%
	Final Practical exam	20%
	Final theoretical exam	40%
	Total	100%
Content Breakdown Topical Coverage	Content Breakdown Topical Coverage	
Session 1(Week 1)	General Pathology: Unit I: Cellular response to injury: <ul style="list-style-type: none"> Causes of cell injury. Mechanism of cell injury. Morphological alteration in cell injury. Necrosis (pathological cell's death): Coagulative, Gaseous necrosis, liquifactive, fat, Zenker's necrosis. Apoptosis. Gangrene 	
Session 2 (Week 2)	Unit II: Intracellular accumulation and Extracellular depositions: Intracellular accumulation: <ul style="list-style-type: none"> Steatosis (fatty change) Cholesterol and cholesterol esters Extracellular depositions: <ul style="list-style-type: none"> Pathological calcification Amyloidois 	
Session 3 (Week 3)	Unit III: Cellular adaptations/ growth disturbances.	
Session 4 (Week 4)	Unit IV: inflammation Acute inflammation :	

	<ul style="list-style-type: none"> • Definition • local signs and symptoms, systemic effects • outcomes of acute inflammation • types acute inflammation • abscess, furuncle, carbuncle, • serous inflammation, fibrinous inflammation • chemical mediators and regulators of inflammation
Session 5 (Week 5)	Chronic inflammation, repair and cell injury: <ul style="list-style-type: none"> • Definition • Cells of chronic inflammation, • Types of chronic inflammation, granuloma, • Healing and repair
Session 6 (Week 6)	Unit V: Regeneration and repair : <ul style="list-style-type: none"> • Healing of wounds: <ul style="list-style-type: none"> a) Primary and secondary types, b) Factors affecting wound healing.
Session 7 (Week 7)	Unit V: circulatory disturbances: <ul style="list-style-type: none"> • Edema: definition, types, pathogenesis. • Embolism: definition, types. • Infarction: definition, types. • Hemorrhage and shock: mechanism and types. • Congestion: active and passive.
Session 8 (Week 8)	Unit VI: Disturbances of cell growth: Aplasia -Hypoplasia. - Hyperplasia. - Atrophy.- Hypertrophy. Hematoma.- Metaplasia.- Anaplasia.
Session 9 (Week 9)	Unit VII: General tumor pathology: a) Neoplasia (tumors) Definition, classification, differences between benign and malignant tumors, types of benign and malignant tumors, malignancies of hematopoietic cells (Leukemia) and lymphomas.
Session 10 (Week 10)	b) Carcinogenesis: Clinical aspects of tumors, diagnosis of cancer, cancer arraigning and staging.
Session 11 (Week 11)	Midterm exam
Session 12 (Week 12)	
Session 13 (Week 13)	
Session 14 (Week 14)	
Session 16 (Week 15)	Unit VIII: Pathology of the immune reaction: Introduction to the immune system. Cells and other elements involved in the immune response (T,B ...cells) Hypersensitivity reactions; types (I, II,III, IV).
Session 17 (Week 16)	HLA system. Transplant pathology. Auto-immune diseases:Types, etiology, pathogenesis, clinical features, pathology and prognosis of selected major illness (SLE, Scleroderma). Acquired immune deficiency syndromes.
Session 18 (Week 17)	Unit IX: Infections: a) Tuberculosis:

	incidence, pathogenesis, primary complex secondary TB and features of pulmonary TB.
Session 19 (Week 18)	<p>b) Syphilis: Mode of transmission, stages, signs and symptoms, organs involved and effects. Congenital syphilis.</p> <p>c) Gonorrhoea:</p> <p>Unit X: Protozoal and Helminthic diseases: Amoebiasis, Leishmaniasis, Hydatid disease.</p>
Session 20 (Week 20)	<p>Malaria.</p> <p>Bilharziosis: Geographical distribution, types, and complications.</p>
Session 21 (Week 21)	<p>Systemic pathology:</p> <p>Unit XI: Cardiovascular system: Atherosclerosis- pathogenesis, risk factors, complications. Hypertension. Ischemic heart disease (IHD)- types of angina pectoris, rheumatic heart disease. Infective endocarditis.</p>
Session 22 (Week 22)	<p>Unit XII: Respiratory system: Tonsillitis, bronchitis, bronchial asthma, pneumonia- bronchiectasis- Bronchogenic carcinoma.</p>
Session 23 (Week 23)	<p>Unit XIII: Gastro-intestinal system: Gastritis-Peptic Ulcer, Ulcerative colitis, Crohn's disease, Zollinger- Ellison syndrome, Pancreatitis</p>
Session 24 (Week 24)	<p>Unit XIV: Biliary system and liver: Cholecystitis- Hepatitis- Cirrhosis- complications.</p>
Session 25 (Week 25)	<p>Unit XV: Urinary system: Glomerulonephritis: definition, types. Drug-nephritic syndrome-induced tubule- cystitis – interstitial nephritis- pyelonephritis.</p>
Session 26 (Week 26)	<p>Unit XVI: Endocrine system: Thyroid: hypothyroidism, hypothyroidism goiter, pyelonephritis-diabetes mellitus, types, complications Adrenal glands.</p>
Session 27 (Week 27)	<p>Unit XVII: Hematopoietic system: Classification of anaemias- Iron deficiency anemia – Vitamin B12 and folate deficiency anaemia- aplastic anaemia- thrombocytopenia- leucopenia.</p>
Session 28 (Week 28)	<p>Unit XVIII: Genetic mechanism of diseases: Structure of the genome and its disorders, selected definitions, mutation of genes, mendelian disorders, normal karyo type, cytogenetic disorders, role of molecular diagnostics.</p>
	Final theoretical Exam.
Practical work (one/week)	<p>Practical Part: List of Museum specimens: 1. Fibrinous pericarditis, Diphtheria of larynx, Brain abscess, acute appendicitis 2. Infarction of spleen, CVC liver, Cerebral hemorrhage. 3. Adenoma thyroid, Fibroadenoma Breast (Carcinoma stomach, Carcinoma Ureter). 4. Lipoma (Leiomyoma Uterus, Metastasis Lung, Malignant Melanoma skin).</p>

	<p>5. Miliary Tuberculosis, lung (Tuberculosis lymphadenitis, Gumma liver-Bilharzial Hepatic fibrosis- Tuberculosis small intestine- Hydatid cyst liver, Amebic liver abscess).</p> <p>6. Acute bacterial endocarditis (recent infection heat, Atherosclerosis , Lobar pneumonia, Bronchogenic carcinoma.</p> <p>7. Crohn's disease, Ulcerative colitis-Micro-nodular cirrhosis- Macro-nodular cirrhosis- Chronic cholecystitis- Chronic gastric ulcer.</p> <p>8. Acute pyelonephritis, Acute cystitis, Goiter.</p>
	Final Practical Exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.