



<b>Paramedical program</b>	
<b>Specialization</b>	<b>Pharmacy</b>
<b>Course number</b>	<b>020805222</b>
<b>Course title</b>	<b>Pharmacology 3</b>
<b>Credit hours</b>	<b>3</b>
<b>Theoretical hours</b>	<b>2</b>
<b>Practical hours</b>	<b>3</b>

## Brief Course Description:

Study drugs of chemotherapy ,Antibiotics, Anti T. B , Anti cancer Anti amoebic , Anti malarial, Anti thelmintics , endocrine system, and reproductive system.

## Course Objectives:

Upon the completion of the course, the student will be able to:

- 1- Understand the principle, theories and elements of chemotherapy, pharmacological effects and clinical applications.
- 2- Identify chemotherapy ( Antibiotics, Antibacterial, anti tuberculosis, Anthelmentics, Anti amoebic, anti malarial , antiviral ... )
- 3- To comprehend the mechanism of action of each pharmacological group, pharmacological effects, actual and potential side effects and contraindications.
- 4- Understand the concept of bacterial resistance and how it develops.
- 5- Identify chemotherapeutic agents used in treatment of cancers.
- 6- To study Hormones and drugs of endocrine system
- 7- To study drugs of reproductive system
- 8- Know his/her role as a pharmacist assistant (as one of health care providers) and how he/she could improve patient knowledge about drugs.
- 9- Effectively communicate with patients about the effectiveness and safety of drugs
- 10- Collaborate and cooperate with other health providers to implement patient related care plan.

**Detailed Course Description:**

Unit number	Unit subject	Unit content	Time needed
1.	<b>Anti Bacterial drugs</b>	<ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Bases of classification of these drugs</li> <li>▪ Bacterial Resistance</li> <li>▪ Mechanisms of action , uses , spectrum , side and adverse effect , dosing and contraindication of :               <ol style="list-style-type: none"> <li>1. Anti metabolite                   <ul style="list-style-type: none"> <li>** Sulfonamides</li> </ul> </li> <li>2. Cell wall inhibitors                   <ul style="list-style-type: none"> <li>** B lactam antibiotics ( Penicilins, Cephalosporines, Carbapenems, Monobactam</li> <li>** non- B lactam ( Vancomycin, Fusidic acid, Bacitracin, Ticoplanin, Daptomycin, Cycloserine)</li> </ul> </li> <li>3. Protein synthesis inhibitors                   <ul style="list-style-type: none"> <li>** Macrolides (Erythromycin, Azithromycin, Roxithromycin, Clarithromycin, Spiramycin, )</li> <li>** Aminoglycosides (Amikacin, streptomycin, kanamycin, Neomycin, Tobramycin, Gentamicin)</li> <li>** Tetracyclines (Tetracycline, Doxycyclin, Minocyclin, Glycyclin)</li> <li>** Chloromphenicol</li> <li>** Lincosamides (Clindamycin, Lincomycin)</li> </ul> </li> <li>4. Drugs that inhibit DNA synthesis.                   <ul style="list-style-type: none"> <li>** Fluroquinolone ( Ciprofloxacin, Ofloxacin, Norfloxacin, Gatifloxacin, Gemifloxacin )</li> </ul> </li> <li>5. Drugs that inhibit cell membrane                   <ul style="list-style-type: none"> <li>** polymixin</li> </ul> </li> </ol> </li> <li>▪ Drugs used in the treatment of tuberculosis : first and second lines drugs ( streptomycin , isoniazide, ethambutol , pyrazinamide ,rifampicin , rifabutin , ethionamide , capreomycin , cycloserine , amikacin)</li> <li>▪ Antiseptics and disinfectants.(phenols , halogens,</li> </ul>	

		<p>alcohols , aldehydes , acids , heavy metals )</p> <ul style="list-style-type: none"> <li>▪ Drugs used in the treatment of Urinary tract infection ( nalidixic acid , nitrofurantoin , phenazopyridine , methenamine )</li> </ul>	
2.	<b>Anti Parasite drugs</b>	<ul style="list-style-type: none"> <li>▪ Anti Amaebics What is amoebic dysentery , the two form of amoebiasis ( bowel lumen amoebiasis and tissue invading amoebiasis ) The action , uses , side effects , contraindications of ( emetine , diloxanide, paromomycin , iodoquinol , chloroquine , metronidazole , tinidazole , benznidazole )</li> <li>▪ Anthelmintics Types of of worms , the action , uses , side effects and cotraindication of each of ( albendazole , mebendazole , niclosamide , piperazine , praziquantel , pyrantel pamoate , levamisole , niridazole , bithionol ) Anti schistosomal agent</li> <li>▪ Antimalarials drugs Life cycle of malarial parasite and site of drug action .</li> </ul> <p>The action , uses , side effects and contraindications of (quinine, chloroquine , primaquine , mefloquine , amodiaquine , pyrimethamine , proguanil , sulfonamides , artemisinin , halofantrine , mepacrine )</p>	
3.	<b>Antifungal drugs</b>	<p>Fungal infections ( superficial and systemic infections )</p> <p>Antifungal drugs :Mechanisms of action , uses , spectrum , side and adverse effect , dosing and contraindication of :</p> <p>** Amphotericin B, Flucytosine, Azoles, Echinocandins, Nystatin, Griseofulvin, Terbinafine, Tolnaftate, undecylenic acid .</p>	

4.	<b>Antiviral drugs</b>	<p>Classification of viral drugs ( drugs that directly impair virus replication , drugs that modulate the host immune system )</p> <ul style="list-style-type: none"> <li>▪ Antiviral drugs ( action , uses side effects and contraindication of : ** Acyclovir, Valacyclovir, Famciclovir, Penciclovir, idoxuridine, vidarabine , Trifluridine, Amantadine, Rimantadine, zidovudine, didanosine Interferones.</li> </ul>	
5.	<b>Anticancer and Immuno-suppressant agents</b>	<ul style="list-style-type: none"> <li>▪ introduction to cancer ( definition , cancer cell cycle, classification according to tumor origin ) classification to cytotoxic agents</li> <li>▪ Alkylating agents( nitrogen mustard , nitrous urea, cisplatin ,carboplatin , oxaliplatin , bulphan</li> <li>▪ Antimetabolites ( purine analogues , pyrimidine analogues , antifolates )</li> <li>▪ Plant Alkaloids ( vinca alkaloids , podophyllotoxin , taxanes )</li> <li>▪ Antibiotics (actinomycin , anthracyclines , doxorubicin , daunorubicin , valrubicin , idarubicin , epirubicin , bleomycin , plicamycin , dactinomycin )</li> <li>▪ Anticancer hormones ( Estrogen &amp; Androgen Inhibitors, prednisolone</li> <li>▪ Radioactive isotops</li> <li>▪ Immunotherapy ( interferon , levamisole , interleukins )</li> <li>▪ Miscellaneous Taxol, Mitotane , asparaginase</li> </ul>	

6	<b>Hormones</b>	<ul style="list-style-type: none"> <li>▪ Introduction to endocrine glands</li> <li>▪ Pituitary gland hormones (anterior pituitary (somatotropin ,TSH , ACTH , prolactin , gonadotropins( LH , FSH ) , posterior pituitary (oxytocin ,ADH)) Drugs ( bromocriptine , desmopressin )</li> <li>▪ Thyroid gland hormones ( thyroxin ) Drugs ( levothyroxine ,liothyronine , radioactive iodine , lugol's iodine , carbimazole , methimazole , propylthiouracil )</li> <li>▪ Parathyroid gland hormones( parathormone ) Drugs ( etidronatedisodium )</li> <li>▪ Suprarenal gland (adrenal gland ) hormones ( glucocorticoids , mineralocorticoids ) Drugs (prednisolone , triamcinolone , dexamethasone , betamethasone , flucinolone , flumethasone , beclomethasone )</li> <li>• Pancreas hormones ( glucagon, insulin ) <ul style="list-style-type: none"> <li>** Diabetes Mellitus</li> <li>**Manufactured insulins ( regular human insulin ,intermediate acting insulin( NPH , isophane insulin , suspension monotard ,semilent) long acting analogs (protamine zinc insulin ) ,mixture of soluble and biphasic insulin ( biphasic isophaneinsulin , biphasic insulin aspart , biphasic insulin lispro )</li> <li>** Oral Hypoglycemic drugs: (Bignanides ( metformin )Sulfonyl ureas ( tolbutamide, chlorpropamide, glipizide, glyburide , glimipride , gliclazide ), Meglitinides, Thiazolidinediones,( rosiglitazone, pioglitazone ) Dipeptidyl peptidase inhibitors, <math>\alpha</math>- Glucosidase inhibitors( acarbose )</li> </ul> </li> <li>▪ Sex hormones ( gonadotrophic hormone FSH -LH , androgen , estrogen , progesterone ) <ul style="list-style-type: none"> <li>** Oral contraceptives</li> <li>** Drugs induced fertilization</li> <li>** Drugs used in the treatment of male impotence</li> </ul> </li> </ul>	
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		<p>The indications , side effects , contraindication of ( ethinyl estradiol , diethyl stilbesterol , mestranol , clomiphene , tamoxifen , medroxy progesterone , norgesterol , medroxyprogessteron , norethisterone , levonorgestrol , mifepristone , methyl testosterone , mesterolone , sustanon , cyproterone , sildenafil , vardenafil , tadalafil , alprostadil , prostaglandin E1 )</p>	
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**Evaluation Strategies:**

Exams		Percentage	Date
Exams	Midterm Exam	30%	--/--/----
	Final Exam	50%	--/--/----
Case discussion and presentation		20%	--/--/----

**Teaching language:**

- English



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### Teaching Methodology:

- Lectures, Discussions, quizzes and exams, Home works and home assignments.
- Case studies, presentations, group discussion, and field visits to hospitals and case report (cancer centre, endocrine department)

### References:

1. Lang, Basic & Clinical Pharmacology, Bertram G. Katzung, Anthony J. Trevor. 13e.2017
2. Lippincott's Illustrated Reviews: Pharmacology, Richard A. Harvey, Richard D. Howland, Mary J. Mycek, Pamela C. Champe , Publisher: Lippincott Williams & Wilkins, 5th edition 2012
3. Goodman & Gilman's The Pharmacological Basis of Therapeutics, Laurence L. Brunton, John S. Lazo, Keith L. Parker, Publisher: McGraw-Hill, 12th edition 2011
4. Jordan National Drug Formula , version 2 / 2011 / [www.jfda.jo.rdu](http://www.jfda.jo.rdu)