
501101 First Aid**(3-3-0)****Pre-Requisite :**

The course includes simple knowledge about the emergency care for a victim of sudden illness or injury until more skillful medical treatment is available ; the course outline is ; wounds , bleeding , fractures , trauma , shock , suffocation and respiratory failure, burns, coma & loss of consciousness , drawing intoxication , nuclear & radiation cases , civil defenses activities, first aid box.

501211 Organic Pharmaceutical Chemistry**(4-3-1)****Pre-Requisite : 101113**

This course includes :types of bonds in organic molecules,acids and bases in terms of the difference concepts/ definitions. Electron delocalization and resonance. Effects of structure on reactivity. This includes the inductive effects, resonance effects and steric effects.Unstable intermediates of carbon. Hyperconjugation and tautomerism. Nucleophilic substitution reactions which include unimolecular (S_N1) and bimolecular (S_N2) nucleophilic substitution reactions.Elimination reactions, both unimolecular (E1) and bimolecular (E2). Free radical substitution reactions.Electrophilic addition reactions of alkenes and alkynes. Nucleophilic addition reactions of aldehydes and ketones. Substitution reactions of carboxylic acids and their derivatives. Electrophilic aromatic substitution reactions. Nucleophilic aromatic substitution reactions. Oxidation and reduction aromatic compounds.

501221 Pharmacy orientation**(1-1)****Pre-Requisite : Second Year**

This course deals with the pharmaceutical occupational History and the modern developments fields of work and The educational requirements.

501242 Analytical Pharmaceutical Chemistry**(1-0-1)**

Pre-Requisite: 101241

The course includes , experiments involving the determination of pharmaceuticals either raw materials or finished products using different methods of analysis like gravimetric , alkalimetric, acidimetric, non-aqueous and oxidation reduction.

501251 Pharmacognosy

(4-3-1)**Pre-Requisite : 105102**

The course includes, the taxonomical classification, morphological , anatomical description of natural drugs, the methods for collection, drying and preparation, storage and preservation, the chemical constituents and uses.

501311 Medicinal chemistry (1)

(3-3-0)**Pre-Requisite: 501211**

Introduction to the general role of physical , chemical aspects of drugs in relation to biological activity, drugs metabolism , receptors concepts and the relationships between the chemical structures and activity in the area of autonomic nervous system.

501312 Medicinal chemistry (2)

(3-3-0)**Pre-Requisite : 501311**

In this course the chemistry , structural activity relationships, drug receptors or enzymes interaction to induce pharmacological activity (ies) in the area of antihistaminic, diuretics, cardiovascular system , central nervous systems endocrine and others.

501313 Phytochemistry

(3-3-0)**Pre- Requisite :501251**

The course includes the study of the different groups of chemical substances present in natural drugs , used in pharmaceutical preparations.

501321 Pharmacy Ethics and Jurisprudence**(2-2-0)****Pre-Requisite : Third Year**

This course deals with principal Ethics concepts which command the pharmacy occupation and basis of Ethics .The relationship between the pharmacist & the patient and the laborers in health care field. The subject includes the legislation's & regulations which control the pharmacy occupation practice in Jordan.

501341 Pharmaceutics (I)**(3-2-1)****Pre- Requisite: 101221**

The course includes Introduction ,Solutions of Electrolytes and Nonelectrolytes, Buffer system is Pharmacy ,Isotonic solutions, Solubility and distribution Phenomena, Complexation and Protein Binding, Diffusion and Dissolution ,Interfacial Phenomena ,Colloids , Rheology , Surface Active Agents and Solubilization Phenomena, Drug stability ,Kinetics

501342 Pharmaceutics (II)**(3-2-1)****Pre-Requisite: 501341**

The course includes Introductory remarks , general aspects and definitions factors that affect the proper dose of a drug ,weights and measures pharmaceutical calculations ,e prescription, Latin terms and abbreviation introduction to pharmaceutical preparations : solutions, suspensions emulsions and creams , powder and oral unit - dosage forms , ointments pastes and gels, jellies, suspositories and pessaries, Inhalers implants colour and flavours , preservatives, reducing and antioxidants ,containers and closures,principles of compounding and dispensing , labelling and packaging methods. The stability of medicines and their ingredienst ,chemical physical and therapeutic incompatibilities ,amentals of fluid and electrolyte therapy ,introduction of sterile dosage forms. Extermporaneous parenteral preparations, handling and administration.

501350 Pharmacology for Medical Technology Students (3-3-0)**Pre-Requisite : 502212**

The Course aims to study general pharmacological principles of drugs that will enable the student to use drugs properly and safely in clinical practice , Also to be familiar with the therapeutic , toxic reactions and contraindications of drugs commonly used in clinical practice, and drug classes will be emphasized.

501351 Pharmacology (I) (3-3-0)**Pre-Requisite : 502212**

This course deals with the general & basic pharmacological principles that will enable the students to evaluate and use drugs effectively and safely. The autonomic and the central nervous systems in addition to other systems are discussed in this course.

501411 Chemotherapy (3-3-0)**Pre-Requisite : 501451**

The course deals with the chemistry , mechanism of action(s) , stability and structural aspects of drugs used in treatment of cancer and bacterial and viral infections.

501413 Instrumental Methods of Analysis (3-1-2)**Pre-Requisite : 101241**

This course deals with differentiation between quantitative and qualitative analysis. Understand the applications and the use of instrumental techniques in purity analysis and structural elucidation such as , U.V spectroscopy , Fluorimetry ,I.R spectroscopy ,Mass spectroscopy ,N.M.R. spectroscopy and Atomic Absorption.

501421 Industrial Pharmacy (4-3-1)**Pre-Requisite : 501441**

The course includes Preformulation, Size Reduction / P.S.A./ Microscope and Sieve Analysis, Mixing / Granulation / Drying, Tablets/ Capsules(Solid Dosage Forms),Surfactants / Introduction to emulsions and semisolids

Solubilization / Introduction to liquid dosage forms. Suppositories , Introduction to sterile Dosage forms, Cempendial Specifications. Introduction to G.M.P.

501422 Pharmacy Administration (2-2-0)

Pre-Requisite : Fourth Year

The main objectives of this course are to provide students with informed knowledge about principles and concepts of pharmacy accounting and management systems, these systems to evaluate, control, and analyse inventories of medicines, as well as the study of accounting cycle.

501441 Pharmaceutics (3) (3-2-1)

Pre-Requisite : 501342

This course was designed to provide the student with the basic and essential information as: Provide information on the most common self diagnosed conditions, recognize the active ingredients utilized in various O.T.C drugs, assist the self medicating patient in selecting the most suitable drug or the most appropriate course action, Ensure that the patient is aware of the necessary information for safe and effective use of the drugs, Describe the side effect and precautions of OTC drugs. Recommend the proper dosage and instructions related to use of OTC drugs.

501442 Biopharmaceutics (2-2-0)

Pre-Requisite : 501342

This course covers the study of factors which are influence the time course of a drug in the plasma and at its sit(s) of action. These factors include the foods , the effect of the diseases state, coadministration of other drugs, physical and chemical properties, of the administrated , the type of dosage form, etc... .

501443 Pharmacokinetics (3-2-1)

Pre-Requisite : 501442

This subject is emphasis on the Study of the time course of drug absorption, distribution, metabolism, and excretion. It also concerns the relationship of these processes to the intensity and time course of pharmacologic effects of drugs and chemicals.

501451 Pharmacology (II)**(3-2-1)****Pre-Requisite : 501351**

This course is a continuation to pharmacology (I) with emphasis on anti microbial agents , anti inflammatory drugs, respiratory & gastro intestinal agents along with other topics are also encountered.

501453 Clinical Nutrition**(3-3-0)****Pre-Requisite : 502212**

The course deals with human nutrition & health , it include: review the main components of human nutrition disease development ; the natural substances present in food and their toxicity , disease caused by the consumption of unproper balance diet , the study the correlation between diet and various diseases then describe the various physiological status as pregnancy and lactation which demand special nutrition.

501521 Therapeutics**(4-3-1)****Pre-Requisite : 501451**

This course deals with Principles of therapy, Factors modifying dosage of drugs, Drug interactions, Management of hypertension, Management of angina pectoris, Atherosclerosis , The use of fibrinolytics and anticoagulants,

Heart failure, Management of bronchial asthma, Drug treatment of peptic ulcer, Chemical mediators in the central nervous system and their relation to disease, Treatment of parkinsonism, Treatment of epilepsy, Management of pain, Anti-inflammatory drugs/ rheumatic diseases, Treatment of gout, Management of affective disorders, Diabetes mellitus ,Drugs in pregnancy, Drugs and the elderly.

501522 Communication Skills**(3-3-****0)****Pre-Requisite : Fifth Year**

This consist of an historical back ground on the issue of communication form the ancient Greek through to Roman till present. The meaning and signification of the communication process it attempt .The emerge of

contemporary interest in different type of communicative behavior and its relevance to people's needs is discussed.

501523 Seminar (1-1)

Pre-Requisite : Fifth Year

This subject aims to identify the student with pharmaceutical ethics & how it is used in the study & evaluation of drugs including research presentation in some of the occupational fields.

501531 Toxicology (2-2-0)

Pre- Requisite : 501350 or 501351

This course offers an introduction to the study of the general principles, history, groups, mechanisms, and chemical disposition of drugs and toxic chemicals and their harmful interaction to biological systems. Also, it offers the basics in the clinical toxicology, organ toxicology, and toxic substances control and management.

501560 Biological Products (3-3-0)

Prerequisite : fifth years

The course include studying the hormones, Prostaglandin's, Vitamines, Serums, Vaccines and Immunological products.

501561 Clinical Pharmacokinetics (4-2-2)

Prerequisite : fifth years

This subject is emphasis on the monitoring of drug therapy, using serum drug concentrations as a guide. The plasma drug concentrations as well as the changes in plasma drug concentrations which accrue over time can be predicted by the using of pharmacokinetics and biopharmaceutics principles. The monitoring process must be applied rationally to specific patient.

501562 Drug Information systems (3-3-0)

Prerequisite : fifth years

The course includes the application and the use of computers in retrieving information related to drug substances , in addition to the information related to toxic substances especially those related to drug products.

501563 Quality Assurance (3-3-0)**Prerequisite : fifth years**

The course includes studying the proper implementation of Good Manufacturing Practice (GMP) in pharmaceutical Industry with the emphasis to the importance of the implementation of quality control and quality assurance in the production of pharmaceutical Products.

501564 Drugs design (3-3-0)**Pre-Requisite : Fifth Year**

The course covers the various physical , chemical , biochemical and receptors concepts, that are utilized in the construction of a drug . Examples are provided , the students are stimulated to think of certain new possible modifications.

501565 Advanced Instrumental Analysis (3-3-0)**Pre-Requisite : Fifth Year**

The course aims to allow students to understand properly the quantitative analysis of pharmaceuticals , the concept of loading some drugs to E.VA polymer then they studied the release of the drug , the application of HPLC in determination of drugs in biological samples as well as in pharmaceutical preparations and finally theory and application of DSC in purity analysis , polymorphism , presence of solvates and drug excipient interaction.

501566 Pharmaceutical Microbiology(Sterile products) (3-3-0)**Pre-Requisite : Fifth Year**

This course was designed to provide the student with the basic and essential information on the pharmaceutical aspect of microbiology this include :

1) Commonly used disinfectants antiseptics and preservatives. 2) Methods of sterilization 3)Microbial contamination and spoilage of pharmaceutical products. 4)Aseptic area and aseptic processing 5) Employing microorganisms in different assays.

501567 Over the Counter Drugs**(3-3-0)****Prerequisite : fifth years**

This subject concentrate on the practical aspects of prescribing an O.T.C product(s) .To achieve this, the students were devided in to groups. Each group is assigned by a case to study. During lecture time a group must present a case for study , followed by an open discussion to the whole class. If a medicine(s) to be prescribed it is essential then for each group to know the brand name(s) for local and international manufacturers . The brand name(s) of any medicine must be taken from a community pharmacy.

501568 Pharmaceutical Marketing**(3-3-0)****Pre-Requisite : Fifth Year**

By the end of this course the students should have a better understanding about selling concepts and techniques, with special emphasis on pharmaceutical detailing . This course will introduce the essentials of marketing principles and concepts.

501569 Cosmetics**(3-3-0)****Pre-Requisite : Fifth Year**

The course includes Relation between cosmetics and therapy, Causes and symptomatology of skin diseases, Forms of cosmetics preparations , Percutaneous absorption, Dentifrice's Shampoos, Deodorants and anti-prespirant preparations mouthwashes Preparations with protective action against organic solutions and solvents.

Preparations with protective action against dry soils, Preparations with protective actions against UV radiation's, Evaluation of sunburn preventives Preparations with protective action against mechanical stress, Body and baby preparations, Insect - repellent preparations , Decorative preparations.

501570 Herbal medicine**(3-3-0)****Pre-Requisite: Fifth Year**

The course includes the study of the therapeutic effects of the natural constituents in plants and the relation between the chemical structure of these constituents and the therapeutic actions on diseases.

501571 Pharmaceutical biotechnology**(3-3-0)****Pre-Requisite: Fifth Year**

The course covers modern technology for the development and manufacturing of new class of drugs form biological systems. The aim is to allow the students to gain basic knowledge and understanding of the principles involved in the industrial production and applications of biotechnology drugs through various biotechnological processes .These include recombinat DNA technology and genetic engineering , monoclonal antibody technology , vaccine technology and finally fermentation technology to manufacture antibiotics using various types of bioreactors. The method of pharmaceutical manufacturing of a number of drugs using the above technologies are thoroughly demonstrated.

501572 Advanced Industrial Pharmacy**(3-3-0)****Pre-Requisite: Fifth Year**

This course covers the organization structure of pharmaceutical manufacturing companies and duties of responsibilities of various departments, such as , research & development , production, quality affairs, marketing. The course also covers the stages of new drug development and approval process by FDA. In addition , it includes the design and development of various dosage forms, advanced drug delivery systems and packaging of these dosage forms.

502211 Biochemistry I**(3-3-0)****Pre-Requisite: 101113**

This course covers the **Proteins**: chemistry, structure, fractionation and purification, **Enzymes**: classification and function.

Carbohydrates: chemistry, structure, classification and metabolism

Lipids: chemistry, structure, classification and metabolism.

cholesterol metabolism,

Nucleic Acids, structure and metabolism, purine and pyrimidine metabolism. **Protein synthesis**.

502212 Biochemistry (II)**(3-2-1)****Prerequisite : 502211**

This course covers : 1) Proteins and amino acids metabolism .2) Fate of carbon skeleton. Interconversion of carbohydrates, fates and proteins .metabolism of creatine, ketone bodies, metabolism of heme. The hexose monophosphate shunt, Gluconeogenesis, plasma lipoproteins. Hormones, vitamins, Introduction to Immunoglobulins.

502221 General microbiology**(3-2-1)****Prerequisite: 105102**

The course is designed to introduce students to the microbial world, Morphology, physiology, growth & physical and chemical factors that affect growth are considered. Sterilization, disinfection and antisepsis is dealt with Anti- microbial chemotherapeutics and antibiotics and Microbial genetics is considered. Host - parasite relationship which includes virulence, pathogenic organisms & defence mechanisms of the body is dealt with.

502222 Medical Microbiology**(3-2-1)****Prerequisite : 502221**

To study the interaction between the humans and microorganisms, the course has been prepared for students in medical science to help them understand the unique as well as the fundamental properties of microorganisms, and their relationship to the disease caused by them the course includes. Classification of microorganisms, the groups presented with appropriate discussion of their physiology & structure, pathogenesis, epidemiology, associated clinical syndromes, human body defense mechanisms, laboratory diagnosis & treatment, prevention & control of diseases

502231 Anatomy & Physiology(I)**(3-2-1)****Pre-Requisite : 105102**

The objective of this course is to provide the student an understanding of the structure and functions of the human body. It includes an overview on the levels of organization, life processes, Basic components and functions of cells and tissue types. It also includes the structure and function of the integumentary, Skeletal and muscular systems, with emphasis on their role in homeostasis of the body.

502232 Anatomy & Physiology (II)**(3-2-1)****Pre- Requisite : 502231**

following systemic approach the course covers the structure and function of the Nervous, Endocrine, Circulatory, Respiratory, Digestive, urinary and reproductive systems, with emphasis on control of: hormone secretion, absorption and metabolism of food, fluid-electrolytes and acid-base balance.

502241 Public Health (Community Health)**(2-2-0)****Pre- Requisite : 105102**

The course is intended to introduce the student to the concept of community health. It includes concepts of health and factors which affect human health. It deals with water and its fitness for human consumption, sewage and its disposal, food hygiene, food poisoning and household insects & vermin. Special attention is paid to communicable diseases, their control and Immunisation. The student is also acquainted with school health, Dental Health, family nutrition, alcoholism, smoking drug addiction & cancer prevention.

502251 Clinical hematology (1)**(3-2-1)****Pre- Requisite : 502212**

This course covers the basics of hematology including the physiology of red blood cells, white blood cells, platelets & the pathological changes of each in hereditary or acquired diseases such as anemias & leukemias. The laboratory work involves the measurement of all parameters in hematology (HB, HCT, RBC, WBCS, ...) & the changes of each parameter in disease states.

502253 Clinical Histology (4-3-1)**Pre -Requisite : 502232**

Definition:

The course is designed to orient students with handling and processing of pathological specimens for histo- pathological examination.

Cutting of specimens , processing , embedding & section cutting is dealt with Both routine & special staining procedures are emphasized . Preparation of specimens for various types of microscopes are also discussed .Preparation of cytology specimens is included.

502212 Clinical biochemistry (1) (4-3-1)**Pre -Requisite : 502212**

The course covers the study of the medical importance , methods of determinations and reference ranges of the various biochemical indicators present in human blood and other biological fluids. A brief review of the pathophysiological processes that can result in a change in the levels of these biochemical markers in body fluids is provided the course enables the student to master the correct interpretation of the biochemical test results in studying and diagnosis of various disorders. The laboratory part covers the application of the above knowledge and techniques that yields accurate and precise information to aid in patient diagnosis and treatment.

502311 Clinical biochemistry (2) (4-3-1)**Pre-Requisite : 502311**

The course covers the biochemical test, applied for the study of various clinical disorders of human organs(e.g. livers and pancreas) and systems such as the endocrine system. It also covers a number of specialized investigations such as tumor marker ,therapeutic drug monitoring, fetal , pediatric and pregnancy monitoring .The laboratory work involves the performance of various tests related to the above disorders or to biochemical monitoring.

502314 Clinical biochemistry (2-2-0)**Pre- Requisite: 502212**

The aim of the course is to enable the student to evaluate various biochemical tests used in clinical laboratory medicine and the correct interpretation of the results in studying and diagnosis of various diseases.

This should help in the administration of proper therapy in order to cure the patient illness.

502321 Clinical Microbiology**(4-3-1)****Pre- Requisite : 502222**

Infectious disease are now describe in terms of the conflict between the host and the parasites , to simplified the subject the infection are classified according to the particular organ system involved , the course of includes :

The proper methods for collecting and safety handling clinical specimens , the recommended procedures for the cultivation & diagnosis of pathogens isolated from clinical materials , the tests for the susceptibility of bacteria to antibiotics and their selection is treatment , serologic procedures for diagnosis of infections in the urinary tract , gastrointestinal tract, circulatory system, CNS , genital trut & respiratory tract.

502341 Immunology and virology**(2-2-0)****Pre-Requisite : 502221**

This course covers two parts:

First part covers : the basics of immunology and the mechanisms of the immune system in health & disease states. **Second part:** covers the basic knowledge of viruses , including classification of viruses, the most important viruses to cause diseases in humans, how these viruses cause disease & the body changes following each viral, infection.

502342 Parasitology**(3-2-1)****Pre-Requisite: 502221**

The causes deals with the study of parasitic life. Classification, Morphology , life cycle, and diseases caused by protozoa & Helminths are discussed, Laboratory diagnosis of parasitic diseases, epidemiology , treatment and prevention are considered. Practical deal with stained , preserved and sometimes fresh specimens.

502351 Clinical hematology (2)**(3-2-1)****Pre- Requisite : 502251**

This course is a continuation of clinical hematology (1) , covering the malignant diseases in hematology such as leukemias. The lab work involves the diagnostic tests of such diseases & the identification of the abnormal cells .

502352 Clinical Pathology**(4-3-1)****Pre-Requisite: 502351**

This course provides a solid and detailed review of basic disease processes and mechanisms such as acute & chronic inflammation, wound healing , cell injury, immunological diseases , host - parasite interactions and neoplasia. The laboratory work covers the study of pathological changes in several disease states of each organ.

502212 Clinical Immunology and Serology**(3-2-1)****Pre-Requisite: 502212**

This course covers the basics of immunology & the mechanisms of the immune system in health & disease states .The laboratory work involves measurement of antibodies and their different classes in different diseases and also performing the new techniques in the field of immunology.

502371 Quality Control**(3-2-1)****Pre- Requisite: 502212**

The course deals with general laboratory tests .It includes examination of specimens such as urine, stool, CSF, Semen , synovial & other body fluids. Quality assurance and quality control in clinical biochemistry, hematology & microbiology are also dealt with.

502431 Pathophysiology**(3-3-0)****Pre-Requisite: 502232**

Advanced study of concepts of altered health with emphasis on wound healing, cell differentiation, Neoplasm. Body defenses. Temperature regulation. Blood flow and cardiac function. Metabolism and

gastrointestinal disorders .Fluid and electrolytes. Respiratory & Renal altered functions.

502441 Clinical Virology (2-1-1)

Pre-Requisite : 502321

This course covers the basic knowledge of viruses, including classification of viruses , the most important viruses to cause disease in humans , how these viruses cause disease & the body changes due to the viral infection. The laboratory work involves the diagnosis of the viruses by measuring either the viral particles or the specific antibodies that arise following infection.

502461 Selected Topics (2-2-0)

Pre- Requisite : Fourth Years

Introduce the students to clinical nutrition, Immune hematology , cytogenetics, radiochemistry , Nosocomial infections, use of DNA probes and medical mycology.

502481 Laboratory Training (I) (15)

Pre- Requisite : Fourth Years

Application of what the students have already studied in hospital laboratories, students work in the various disciplines of clinical pathology to acquire practical experience

502482 Laboratory training (2) (15)

Pre- Requisite : Fourth Years

This is a continuation of laboratory training (1). Students work in Microbiology , Hematology & blood banks, Clinical Biochemistry , Pathology & immunology laboratories.