Courses Description

0300131 General Chemistry 1

This course is a fundamental course for most undergraduate students. It gives an introduction to chemical facts and concepts as a mean to help understanding the world around us. Basic concepts: matter, units of measurements, uncertainty in measurements, stoichiometery equations, atomic and molecular weights, chemical calculation, reaction in solution and their calculations, structure of the atom, periodic properties of the elements, chemical bonding, molecular geometry and gases.

0300132 General Chemistry 2

This course begins with the study of intermolecular forces and the physical properties of solutions, study of the principles of thermochemistry and thermodynamics. Aspects of chemical kinetics and chemical equilibrium, fundamentals of acid-base equilibria and solubility equilibria will be covered.

0300133 General Chemistry laboratory 1

This course involves safety laboratory rules, and introduction to laboratory equipments. Experiments for determination of density, empirical and molecular formula of compounds. Experiments involve stoichiometry, and limiting reactants. Volumetric analysis and quantitative analysis involve chemicals in everyday life and chemicals tests for anions and cations.

0300141 General Biological Sciences 1

This course covers the following subjects: the Chemical context of life, Water and the fitness of the environment, Carbon and molecular diversity of life, the Structure and function of macromolecules. A tour of the cell, Membrane structure and function, Cellular respiration, Meiosis and sexual life cycles, Mendel and the gene idea, The chromosomal basis of inheritance, The molecular basis of inheritance. From gene to protein, Organization and control of eukaryotic genomes, DNA technology, The genetic bases of development.

0300143 Practical General Biological Sciences 1

The microscope, the cell, biochemical characters of living organism, physical characters of the cell, biochemistry of the cell, cell division, genetics, animal tissues, plant tissues.

1101102 Mathematics and pharmaceutical statistics

The purpose of this course is to get students familiar with the fundamental concepts of statistics which is useful in the fields of health and medical sciences. This course represents an introduction to the field and provides a survey of data and data types. Specific topics include tools for describing central tendency and variability in data; methods for performing inference on population means and proportions via sample data; statistical hypothesis testing and its application to group comparisons; issues of power and sample size in study designs; and random sample and other study types. While there are some formulae and computational elements to the course, the emphasis is on interpretation and concepts.

1101213 Pharmaceutical Organic Chemistry 1

This course is a study of the nomenclature and synthesis of organic pharmaceutical compounds. Classification of these compounds, their physical and chemical properties, their method of preparation, reactivity and mechanisms of reactions of polyfunctional aliphatic and aromatic compounds, alkyl halide, carboxylic acids and amino compounds. Isomerism and stereoisomerism of organic compounds, alcohol, ethers, aldehydes and ketones also will be studied.

1101214 Pharmaceutical Organic Chemistry 2

The course is designed to illustrate the importance of organic compounds (aromatic, cyclic, heterocyclic, polycyclic aromatic) through discussion of their nomenclature, synthesis, and reactions with a concentration on their medical and pharmaceutical importance

1101216 Pharmaceutical Organic Chemistry Practical

This lab class is divided into three parts: the first part includes the various separation and purification techniques of organic compounds that an organic chemist uses daily; including crystallization, distillation, extraction and chromatography. The second part concentrates on the chemical reactions of certain organic compounds; amines, aromatic compounds and organic halides. The third part deals with the synthesis of certain organic compounds of pharmaceutical importance.

0701259 Human Anatomy for Pharmacy

Study of the general structure of human body, study of the different systems including: skin, skeletal, muscular, nervous, sense organ, lymphatic, cardiovascular, respiratory, digestive, urinary and reproductive system. In addition, study of the types of tissues and the study of the histology of the above mentioned system.

0701364 Human Physiology for Pharmacy

A theoretical and practical course covers basic issues in human physiology, physiology of the circulatory, respiratory, nervous, digestive, excretory, endocrine and reproductive systems are covered. Hormonal balance in females prior to and during pregnancy and lactation and the physiology of body temperature regulation will be illustrated.

1101416 Pathophysiology for Pharmacy

This course is designed to overview the basics of pathological conditions including tissue injury and mechanisms of tissue repair. It focuses on diseases affecting the main organ systems including cardiovascular, respiratory, renal, gastrointestinal, hepatic, hematologic and endocrine disorders. In addition, a comprehensive look at cancer and diabetes mellitus is included. A detailed discussion of the immune system is also included early on. The student is expected to get hands on the underlying cause of diseases, prognosis, and possible complications based on the knowledge of pathological alterations

1101211 Biochemistry for Pharmacy 1

This course is designed to provide understanding of the biological macromolecules of life - nucleic acids, proteins, carbohydrates and lipids - and their building blocks, including their structure and composition, and synthesis and degradation. The composition and function of biological membranes and the biological transport in membranes will be discussed. Finally, we will examine energy metabolism in the human body, bioenergetics and oxidative phosphorylations.

1101212 Biochemistry for Pharmacy 2

This is the second course in a two semester sequence in the fundamentals of biochemistry. This course will introduce the different metabolic pathways of macromolecule including: glycolysis, the citric acid cycle, glucose and glycogen metabolism, fatty acid catabolism, lipid biosynthesis, amino acid metabolism and the synthesis and degradation of nucleotides. We will also examine storage and expression of genetic information.

1101215 Pharmaceutical Analytical Chemistry

This course includes the principles of qualitative and quantitative analysis, methods expressing of the concentrations, principles of volumetric analysis, acid-base equilibria in aqueous and in non-aqueous solutions, acid-base titration and their applications in both solutions, the use of standard methods in the equilibrium calculation. Precipitation titration using silver nitrate, complex metric titration, oxidation-reduction titration weight analysis methods and electrochemistry

1101217 Pharmaceutical Analytical Chemistry Practical

This course is a practical picture of the theoretical course, exemplified by doing various experiments in acid-base titrations for the determination of pharmaceutical products with acid-base properties and to know how to use the mathematical equation in determination of the quantities of these compounds in the samples to be analyzed. In addition the analysis of drugs by oxidation-reduction, complex metric, precipitation titration and weight analysis

1101350 Physical Pharmacy and pharmaceutics

The course introduces the students to the fundamentals of physical pharmacy including discussion of: intermolecular forces; states of matter, solubility and solutions; ionic equilibria and buffers, rheology. The rest of the course deals with pharmaceutical dosage forms that include oral pharmaceutical solutions such as syrups and elixirs, topical pharmaceutical solutions and aerosols.

1101220 Physical Pharmacy Practical

This practical course involves pharmaceutical calculations and applications of the physicochemical principles and pharmaceutical dosage forms discussed in pharmaceutics and physical pharmacy.

1101340 Pharmaceutical Microbiology and immunology 1

This course is aimed at providing the student with background knowledge of the nature of microorganisms (bacteria, viruses and parasites), their structure, physiology, metabolism and reproduction, the role of microorganisms in infection in man and spoilage of matter. Physical and chemical means of control of microorganisms will also be discussed. The immune system of the human will be studied.

1101311 Pharmacology 1

Pharmacology is the study of drugs. This course will cover a brief introduction about pharmacology, pharmacokinetics, pharmacodynamics and receptors. Moreover, this course provides the students with the basic information of the drugs working on the autonomic nervous system (ANS), cardiovascular (CV) system and autocoids regarding their

mechanism of action, biotransformation, side effects, contraindications and their clinical uses. In addition, this course will introduce the students to several diseases affecting the CV system such as hypertension, heart failure, angina and cardiac arrhythmia and the classes of drugs that are available to treat these diseases.

1101312 Pharmacology 2

Pharmacology is the study of drugs. This course will provide the students with the basic information of the drugs working on the endothelium, endocrine system and the central nervous system; regarding their mechanism of action, biotransformation, side effects, contraindications and their clinical uses. In addition, this course will introduce the students to several diseases affecting the CNS such as epilepsy, depression and Parkinson, the classes of drugs that are available to treat these diseases.

1101313 Instrumental Analysis

This course provides the student with the principles of instrumental analysis upon which modern measuring devices are based. This includes the exploration of the instrumental methods of analysis used to check the purity of raw material and quality control of pharmaceutical preparations; using chromatographic methods, spectroscopic methods; UV-Visible, IR, NMR, Mass, Atomic absorption, and Flame emission.

1101315 Instrumental Analysis Practical

This course familiarizes the students with basic principles for the performance of qualitative and quantitative analysis. Students will also learn important principles for utilizing and handling chromatographic and spectrophotometric instruments in order to use them in the pharmaceutical industry and scientific research.

1101317 Pharmaceutics 1

The first part of the course introduces the students to the fundamentals of physical pharmacy including discussion of: phase equilibria, interfacial tension and rheology. The rest of the course deals with pharmaceutical dosage forms, including: suspensions, emulsions, colloidal dispersions and semisolid dosage forms.

1101318 Pharmaceutics 2

The first part of the course introduces the students to the fundamentals of biopharmaceutics including discussion of: drug dissolution, drug diffusion, complexation and distribution phenomena. The second part of the course deals with pharmaceutical dosage forms, including: sterile dosage forms (parenterals and ophthalmic solutions) and solid dosage forms such as suppositories and capsules. The rest of the course introduces the student to current good compounding practices.

1101319 Pharmaceutics 1 Practical

This practical course involves applications of the physicochemical principles and pharmaceutical dosage forms discussed in pharmaceutics 1.

1101347 Pharmaceutics 2 Practical

This practical course involves applications of the physicochemical principles and pharmaceutical dosage forms discussed in pharmaceutics 2.

1101341 Pharmaceutical Microbiology and immunology 2

The students will learn about the infections related to each of the human systems (skin and eye, gastrointestinal, respiratory, nervous, reproductive, urinary, cardiovascular and lymphatic systems). The students will study the different methods of sterilization, disinfection, anti-sepsis, preservation and control of contamination. Antimicrobial efficacy and potency evaluation will be studied

1101308 Pharmaceutical Microbiology and Immunology Practical

Characterize the different microorganism practically. The student will learn how to measure the efficacy and potency of antimicrobial agents. Different techniques for sterility testing will be covered.

1101324 Medicinal Chemistry 1

This 3-credit hour's course explains the effects of drug structure and physicochemical properties on pharmacokinetics ADME (Absorption, Distribution, Metabolism and Excretion), pharmacodynamics (reaction of drug with its receptor), and drug metabolism (phase I (oxidative, reductive, and hydrolytic biotransformations) and phase II (conjugation). Prodrugs also will be discussed

1101339 Simulation pharmacy practical

Students in this course will have in-class training under direct supervision of a faculty member. This course designed to teach students the most important needed skills to practice pharmacy; Includes leadership, communication skills, patient counseling, etc. Evaluation will be conducted at the end of training.

1101500 Practical Training in Pharmacy

During this course students will train in different pharmaceutical institutions such as community and hospital pharmacies, drug manufacturing companies and others under direct supervision of a faculty member. Evaluation will be conducted at the end of the training through examination.

1101411 Medicinal Chemistry 2

In this course, the knowledge from prerequisite courses will be applied. Recognize the relation between molecules for design of certain synthetic leads. The categories of drug classes and their efficacies including antibiotics, antibacterial, antiviral, antifungal, anthelmintic, anticancer, steroids and hormones will be identified.

1101425 Pharmacology 3

This course is a continuation of the previous pharmacological courses; pharmacology I and pharmacology II that is intended to familiarize students with the mechanism of action, effects, and therapeutic value of the primary agents in the major drug categories with emphasis on clinical pharmacology. Topics to be covered during this module include;

chemotherapeutic agents, Asthma and GI drugs. Upon completion students should be able to place major drugs into correct therapeutic categories, identify indications and side effects, and know the major drug-drug or drug- food interactions as well as be able to solve case studies related topic efficiently.

1101415 Pharmacoeconomics

This course covers the essential principles and applications of pharmaco-economics in pharmaceutical institutions and medications pricing in Jordan. It deals also with various pharmacoeconomical approaches and tools used to aid policy makers in the health system to rationalize their decisions regarding allocation of medications and pharmaceutical services needed to achieve stated health care goals for patients and the society.

1101417 Industrial Pharmacy

This is an introductory course where pharmacy students are introduced to principles of pharmaceutical manufacturing and the necessary knowledge in the area of pharmaceutical technology, and to help them to understand the fundamentals and importance of the unit operations in the manufacture of dosage forms. Students are acquainted with the basic requirements of Good manufacturing practices (GMP) and the basic operations involved in production of a pharmaceutical dosage form. It includes milling, mixing, drying, and techniques used to formulate and prepare solid dosage forms (granules, capsules, tablets, coated tablets).

1101419 Industrial Pharmacy Practical

An application of unit processes in mixing, granulation, tableting, coating, and capsule filling and evaluation.

1101429 Pharmacognosy and phytochemistry

This course focuses on study of basic information on pharmacognosy and medicinal plants regarding classification and identification of their components, providing information on different naturally occurring secondary metabolites. The course will emphasize the chemical, biological and therapeutic activities of these compounds.

This course focuses on study of basic information on pharmacognosy and medicinal plants regarding classification and identification of their components, providing information on different naturally occurring secondary metabolites. The course will emphasize the chemical, biological and therapeutic activities of these compounds.

1101423 Pharmacognosy and Phytochemistry Practical

Physical and microscopical examination of medicinal plants and identification of them and of their components with emphasis on the primary metabolites (carbohydrates, lipids, amino acids and drugs derived from them).

1101449 Herbal medicine

This course will provide students with basic knowledge and understanding of the scientific name of the medicinal plants, family, synonyms(s), English name, local name, parts used and macroscopical characters, also the active constituents of each plant, structure of the main constituent. Dosage forms, medicinal uses, clinical pharmacology, toxicity, contra indicators, warnings, precautions, adverse reactions, posology, trade name and company

1101418 Biopharmaceutics and Pharmacokinetics

The effect of the physicochemical properties of active ingredients, pharmaceutical dosage forms, physiological factors and routes of administration on drug availability, will be discussed, study of the pharmacokinetics concepts, terminology, models, factors affecting drug absorption, distribution, metabolism and excretion and their importance in drug response and side effects. Emphasis will be placed upon the prediction of plasma levels of drugs in different routes of drug administration.

1101431 Application in Pharmacokinetics

Handling kinetic data and solving problems that might be encountered in a clinical set up. Emphasis will be placed upon the concept and calculation of pharmacokinetics parameters, the correlation model of pharmacokinetics data, and interpretation of the pharmacokinetics parameters as half-life and volume of distribution of drugs.

1101428 Clinical Pharmacy and Therapeutics 1

This course aims to provide students with the knowledge of clinical manifestations, complications, goals of pharmacotherapy and patient education of selected cardiovascular and endocrinologic disorders. In addition, it aims to provide the students with the knowledge of clinical uses, pharmacokinetics, clinically significant side effects & drug interactions and contraindications to medications used in the treatment of cardiovascular, lipid disorders, acute and chronic kidney diseases, endocrinologic disorders and palliative care in oncology disorders.

1101412 Medicinal Chemistry 3

This course is a continuation for what was discussed in the past two courses, where structure activity relationship of other classes of drugs will be covered including: sympathetic and parasympathetic systems, CNS (antipsychotic, antiepileptic, sedative-hypnotics, anxiolytic, antidepressants and CNS stimulants), cardiovascular system (anticoagulants, antihypertensive, antihyperlepidemic, antianginal and CHF), antihistamines, diuretics, general and local anesthetics, and antidiabetic drugs

1101414 Medicinal Chemistry Practical

Medicinal chemistry laboratory introduces various quality control methodologies that are considered standards in pharmaceutical literature. Analysis of raw material as well as different formulated preparations will be preformed using standard analytical techniques.

1101523 Clinical Pharmacy and Therapeutic 2

This course includes the study of the principles of general medicine and the factors influencing the selection of the appropriate medicine and the the knowledge of clinical uses, pharmacokinetics, clinically significant side effects & drug interactions and contraindications to medications the dosage necessary a number of common diseases such as respiratory diseases, infectious diseases, Gastrointestinal diseases, rheumatologic disorders, neurological diseases and epilepsy. The course also includes an explanation of the best treatment forms for these diseases according to the specific needs of each case. The student after the study of the course will be able to develop the optimal treatment plan for the patient based on the principle of science and the best evidence after studying the diseases suffered by the patient such as respiratory infections.

1101342 Clinical Biochemistry for Pharmacy

This course will introduce the different biological samples that can be obtained from patients, for example, blood and urine, study of the clinical aspects of biochemical analysis and how lab values might be changed in different disease states. Utilization of laboratory findings in the diagnosis and treatment of diseases will be discussed.

1101528 Ethics and Legislations for Pharmacy

This course discusses the ethics of pharmacy profession and current laws that govern the practice of pharmacy profession in Jordan.

1101525 Clinical Pharmacy and Therapeutics 3

This course includes the study of the principles of general medicine and the factors influencing the selection of the appropriate medicine and the dosage necessary to treat a number of common diseases. The course also includes explaining the basics and selecting the best treatment forms for these diseases according to the specific needs of each case. After studying the course, the student will be able to develop the best treatment plan for the patient based on the principle of science based on the best evidence that require knowledge of clinical uses, pharmacokinetics, clinically significant side effects & drug interactions and contraindications to medications used in the treatment of disorders such as:diseases of the skin, obstetrics and gynecology, digestive system, nervous system and some types of cancer tumors.

1101430 Case studies in therapeutics 1

This module is complementary part to the theoretical lectures provided by clinical pharmacy and therapy 3. This course is designed to give the student a detailed knowledge concerning case solving in some of the diseases which will be discussed during the course such as: common chronic diseases/asthma (acute, chronic)/diabetes mellitus (type I, type II, gestational, most common complications)/hypertension (mild, moderate, severe, crisis, gestational)/ischemic heart diseases (angina, MI)/congestive heart failure, dyslipidemia and other cardiovascular diseases/types of peptic ulcer (gastric, duodenal ulcer, stress ulcer, ZE syndrome)/inflammatory bowel diseases (Crohn's disease, ulcerative colitis)/constipation/diarrhea and other GI diseases/rheumatic disorder and some neurological and psychological disorders.

1101432 Case studies in therapeutics 2

This module is complementary part to the theoretical lectures provided by clinical pharmacy and therapy 3. This course is designed to give the student a detailed knowledge concerning case solving in some of the diseases which will be discussed during the course such as: infectious agents/ respiratory tract infection/upper (common cold, tonsillitis, otitis media, sinusitis)/ lower (pneumonia all types, SARS, pulmonary TB, COPD), urinary tract infection (upper, lower), sepsis, CNS disease and infection (epilepsy and meningitis), acute and chronic renal failure, gastrointestinal disorders such as peptic ulcer disease, hepatitis, osteoporosis and osteoarthritis

1101514 Toxicology for Pharmacy

This 2-credit hour’s course covers the basic principles of general toxicology. Students receive basic background information on important traditional areas in toxicology, as well as in areas that are currently developing. This background information will include principles, definitions, and basic information, and is designed to bring participants up to current levels

of understanding of toxicology as it applies to both the human health and environmental areas. In this course different basic toxicology topics will be illustrated. This course deals with different problems in poisoning and how to treat them. Furthermore, it is concerned with chemical and physical properties of poisons, pharmacokinetics of toxic agents, physiologic and behavioral effects of these poisons in humans, and the effective prevention and management of those effects.

1101435 Nonprescription Drugs (OTC)

This module focuses on how to assist the patient with optimal use of non-prescription drugs. Patients counseling regarding the proper and safe usage of drugs will be discussed. The types of preparations that are considered OTC will be introduced, for example, analgesics, cough medications, allergy medications, sun burns and others. In addition, the course discusses the management of a group of commonly encountered medical conditions and ailments using evidence based approach with emphasis on the role of the community pharmacist. It aims to enable students to develop communication and clinical decision making skills and to respond appropriately to patients compliments symptoms in pharmacy excluding and/refereeing cases require more specialized medical care

1101553 Pharmaceutical Biotechnology and pharmacogene

This course is aimed to provide students with detailed knowledge of the main technological application of pharmaceutical biology. The course is concerned with the methods used in drug modification, cell targeting and cell engineering to develop new therapies that can be applied in different disease state. The student is expected to get the basic knowledge and information about the commonly used methods in cell modifications, genetic engineering, in vitro models of cancer investigation and the application of immune component in scientific research.

1101529 Pharmaceutical Marketing and promotion

This course provides the basic principles of marketing, marketing management and pharmaceutical promotion and their applications in pharmaceutical institutions. It also covers basic skills needed for promotion of medications such as analysis, planning and effective communication.

1101559 Pharmaceutical quality and regulatory affairs

This 2credit hours course aimed to discuss pharmaceutical and medical device regulatory affairs. Regulatory affairs is a profession developed from the desire of governments to protect public healthby controlling the safety and efficacy of products in areas including pharmaceuticals, veterinary medicines, medical devices, pesticides, agrochemicals, cosmetics and complementary medicines, and by the companies responsible for the discovery, testing, manufacture and marketing of these products wanting to ensure that they supply products that are safe and make a worthwhile contribution to public health and welfare.

1101555 Drug Design

This course focuses on the process of finding new medications based on the knowledge of the biological targets. This course will introduce the students on the most recent advances in designing and testing new drug entities in silico and in the different biological systems (cell lines and animals).

1101556 Toxic Medicinal Plants

Poisonous and hallucinogenic plants will be studied in this course. Emphasis will be on plants endogenous to Jordan. Their names and their main constituents. The methods of identifying and testing these plants will be discussed. The treatment of accidental and intentional poisoning of these plants will be studied.

1101557 Pharmaceutical Technology

Current topics of interest in the general area of pharmaceutics, pharmaceutical industry, and pharmaceutical technology. The use of the most advanced techniques in manufacturing drugs will be discussed. New preparations of pharmaceuticals will be introduced.

1101563 Cosmetics

The course will provide you with knowledge and understanding of the various disciplines within cosmetic science, toiletry and perfumery industries. This course will cover the methodologies used to develop the major types of cosmetic and toiletries products, role of cosmetology and cosmetic products, categories of cosmetic products and evaluation of particular categories, regulation and legislation of cosmetic products, differentiation between cosmetics and familiar products such as medicines, medicinal devices and food supplements, and cosmeceuticals. Among the product types to be discussed will be: creams, lotions, hair products (including shampoos, conditioners, waving products etc…..), skin products, nails products, and related washing products. It will orientate you to the practices and knowledge needed to understand cosmetic science and help you to develop your skills for independent & collaborative learning, reflection and your own self development. You will be introduced to scientific research methods and will apply these to a given formulation problem.

1101558 Specialized Topics in Pharmacy

Preparation of a research project in a selected topic in pharmacy under the supervision of a faculty member. Presentation and oral discussion is required.

1101560 Drug delivery systems

The course drug delivery systems was designed to provide the students with the underlying concepts and system designs for the controlled delivery of drugs . This course introduce novel pharmaceutical formulations such as Solid dispersion systems, Sustained release dosage forms, Microencapsulation& microspheres, Nanoparticles (Polymeric nanoparticles), Liposomes, Niosomes&Transfersome, Controlled release tablet dosage forms, Bio-adhesive drug delivery systems, Transdermal drug delivery systems, Implantable controlled drug delivery systems, Ophthalmic drug delivery systems, Drug targeting.

Although the primary source of information for this course is the material covered in lectures, tutorials, and practical classes, effective learning can be enhanced through self-

directed use of other resources such as textbooks and Web based sources. Your practical classes will be directly related to the lectures and it is essential and required to prepare for practical classes before attendance via the pre-lab modules. It is up to you to ensure you perform well in each part of the course: preparing for classes; completing assignments; studying for exams and seeking assistance to clarify your understanding.

1101561 Selected topics in pharmacy physics

This is an advanced course where pharmacy students cover physicochemical aspects that are relevant to the design, manufacture and stability of dosage forms, with emphasis on such topics as covers solubility, diffusion, dissolution and interfacial phenomena. This also includes physicochemical methods for the characterization of pharmaceutical preparations and methods of measurement of drug physicochemical properties (pH, XRD, DSC, TGA, particle size, etc.). It covers also solid state properties, solid phase transitions and their consequences on pharmaceutical product formulation.

1101562 Parapharmaceuticsals

Parapharmaceuticals course is designed to focus on a wide range of "**non-drug products**" such as vitamins and minerals, infants' formula and others to dissipate all the misconceptions linked to the current practice and public views on the use and selection of these products. In addition, the course discusses the management of a group of commonly encountered medical conditions and ailments using evidence-based approach with emphasis on the role of the community pharmacist.

1101564 Selected topics in microbiology

This course defines advanced applications of microbiology, an in-depth study of the problem of resistance of microorganisms to different antibiotics and policies to contain this problem, examine the use of micro-organism in pharmaceutical industry such as vaccines , study the use of micro- organisms in genetic engineering.

1101565 Cancer: types and treatment

This course is designed to provide students with a 'state-of-the-art' course in modern cancer pharmacology that meets the demand of employers and provides an expert view of the available cancer medicines. The course will be covering the molecular basis of cancer that necessary for understanding cancer hallmarks, surviving and progression. In sequence the course will overview the possible potential targets for cancer treatment. A detailed discussion for each type of cancer and recommended chemotherapy is included. At the end, the student is expected to get hands on the underlying cause of cancer, prognosis, and possible targets for management.

1101566 Hallucinogenic drugs

This 3-credit hour elective course covers a group of drugs of abuse which is hallucinating agents. Students receive basic background information about those drugs, as well as their development. In this course different topics will be illustrated. This course deals with physiological and psychological effects hallucinogens on humans and their relationship with addiction. Furthermore, it is concerned with chemical and physical properties of the most common agents and the different routes of administration. This course will increase students' skills in researching and reading scientific information regarding the topics and improve their ability to summaries and write the essential information in literature review form.

1101569 Hematology and Immunology

This course demonstrates the application of blood analysis and immunoassay in understanding the mechanism of the diseases and the mechanism of drugs. It focuses on utilization of modern methods to link the pharmacologic reaction and biochemical reactions with blood analysis and antigen-antibody reactions. It is also applied for diagnostic and therapeutic purposes.

1101522 Pharmaceutical care and Pharmacy practice

This course deals with the optimal mechanism and how to apply pharmacological information, clinical skills, rational methods of communication with patients, and the provision of pharmaceutical services in the practice of community pharmacy, hospital pharmacies and clinical pharmacy based on the evidence-based principle. The roles of health care workers and the social determinants of current and future health and practice of pharmacy. Pharmaceutical care is the philosophy of pharmaceutical practice where the patient is the main beneficiary of the pharmacist's actions. In pharmaceutical care, it focuses on attitudes, behaviors, obligations, concerns, ethics, and pharmaceutical knowledge. It is the responsibility and skills of the pharmacist to provide optimal and the rational patient care based on evidence-based science to achieve specific therapeutic outcomes for the patient's health status and improve quality of life

1101571 Advanced Clinical Pharmacy (Pediatrics)

This course includes the study of the general principles of general anesthesia and the factors influencing the selection of the appropriate medicine and the dosage necessary for the patient based on the principle of science based on the best evidence for treating a number of common diseases in children only such as cystic fibrosis, Kawasaki disease, meningitis, diabetes in children, Diseases of anemia, thalassemia, measles and chickenpox. This course also explains the general principles for calculating the dosage of medicines in children.

1101567 harmaceutical Accounting and Management

This course provides the basic principles of management and accounting in pharmaceutical business. It also covers the applications of managerial accounting in pharma institutions, particularly in preparation and interpretation of financial statements, budgeting, feasibility studies, and evaluation of pharmaceutical projects.

1101568 Pharmaceutical Intellectual property

This course portrays the history, types, and principles of intellectual property and their applications in pharmaceutical manufacturing. It also covers the importance of intellectual property in pharmaceutical industry research and development (R & D), locally and internationally, and its impact on the global trading system, private data and protection of the patency and the brand for pharma products and prevention of monopoly. The course involves exposure to contemporary and future impact of intellectual property on marketing strategies in pharmaceutical industry.

1101577 Drug informatics

The objective of this course is to introduce students to the basic principles of drug information and their databases, by identifying the different types of drug information banks, how to use them, as well as understanding the principle mechanism of these sources to be

able to retrieve / use the needed drug information from appropriate evidence based sources. In addition, the student will be able to perform statistical analysis on drugs.

1101578 Selected topics in pharmacology

This course is a complementary advanced course to what students have learned in Pharmacology 1, Pharmacology 2 and Pharmacology 3. The aim of these courses is to introduce students to the mechanism of action of the drug, the toxicity and therapeutic value of the drugs presented in the main systems with emphasis on the clinical side of pharmacology. This specific course aims to introduce students to selected concepts in pharmacology, especially in children, aging, skin, immunology and vaccines, in addition to modern medicine.

1101581 Advanced Pharmaceutical marketing and promotion

This course covers the advanced concepts of pharmaceutical marketing management and promotion and their applications in pharmaceutical institutions. It also covers the advanced skills of pharma (medico) marketing planning including SWOT analysis, preparing marketing plans, time and territory management, customer relationship management (CRM), handling promotional tools and designing promotional campaigns.

1101573 Advanced clinical pharmacy and therapeutics / surgery

This 2 credit hours in surgery therapeutics. The course will include discussion of the principles of therapeutics in surgery wards and how to select the appropriate treatment plan based on evidenced based medicine.

1101576 Clinical nutrition

This course will discuss the basic principles of clinical nutrition during both normal and diseased conditions. Obesity and its relation with physical exercises, home parenteral nutrition, food-induced allergy, special nutrition for disease states, and the diagnosis of diseases related to vitamins and minerals deficiency.

1101570 Advanced research methods

This course provides students with a foundation to begin. Topics relevant to new research methods will be covered, including, literature search, key software’s in the area of research, research ethics, advising and monitoring, scientific authorship, data management, data presentation, research misconduct, scientific writing, research proposals, manuscript preparation, thesis writing, human participants and animal subjects in research, and laboratory safety. This will be covered by writing a critical appraisal of a selected subject of the student's interest.

1101574 Advanced Clinical Pharmacy and Therapeutics (Obstetric and gynecology)

This course includes the study of the principles of general medicine and the factors that influence the selection of the appropriate medicine and the dose necessary to treat a number of diseases that affect pregnant women and nursing and the pharmacological treatment of these diseases including menopause , menstruation related disorder and hormonal treatment in menopause. This course includes follow-up of the patient. The course also includes how to increase the benefits and reduce the damage from the treatments and skills in dispensing Consultations for pregnant

and lactating women. Where the student after the study of the course of the development of the optimal treatment plan for the patient based on the principle of science based on the best evidence after studying the diseases suffered by pregnant women and breastfeeding

1101572 Advanced Clinical Pharmacy and Therapeutics (Intensive Care Unit/ICU)

This course includes the study of the principles of general medicine and the factors influencing the selection of the appropriate medicine and the dose necessary to treat a number of diseases that require Intensive Care Unit (ICU) level of care based on applying evidence based medicine approach. The patient require the ICU level of care that related to the management of electrolyte imbalances (i.e. sodium, calcium, phosphorus, magnesium and potassium), arterial blood gases (i.e. in a relation to respiratory acidosis and alkalosis, metabolic acidosis and alkalosis), Systemic Inflammatory Response Syndrome (SIRS) and sepsis, diseases that require ICU treatment of care such Acute Kidney Injury/Failure (ARF), Acute Respiratory Distress Syndrome (ARDS), Shock, Traumatic Brain Injury, Ruptured Brain Aneurysm, postoperative ICU, and Cancer- related ICU. This course includes follow-up patient as the course includes how to increase the benefits and reduce the damage of treatments and Skills in disbursement and counseling for patients. After the study of the course, students can develop the rational pharmaceutical care for the ICU patient.

1101554 Quality Assurance for Pharmacy

A theoretical course deals with the quality control programs and methods used for the validation and assurance in pharmacy. The quality and services provided by the pharmacist in different pharmaceutical establishments will be discussed with emphasis on the quality assurance in pharmaceutical industry.

1101579 Photochemistry of natural products

The main objective of this course is to show students how nature contributes to contemporary medicine. This course provides students with a basic understanding and knowledge of the chemistry of natural products of medicinal importance, semi-synthetic derivatives, and synthetic analogues based on natural product templates. Biosynthetic approach will be used to classify natural products into distinct groups and to display the relationships between diverse structures encountered in nature. Detailed information is given for biologically important natural products and drugs of natural origin, including sources, principal components, structural component analysis, drug use, mechanism of action, and current status use. A preliminary chapter is used to outline natural products resources, taxonomy, plant description and morphology, the role of natural products in drug discovery and development, and approaches to discover new drug leads from nature. Genetic based natural products and drug discovery will also be reviewed.

1101580 Advanced pharmacy practice

This course deals with advanced and up-to-date information on the best methods for application of pharmacological information, clinical skills and clinical practices, proper methods of communication with patients, and the provision of pharmaceutical service in relation to the practice of the profession. This course also includes a detailed explanation of how to assess the patient's health status, the optimal mechanism for taking the patient's medical record history and providing the patient with pharmaceutical advice based on evidence-based medicine