



**College of Health Sciences
Pharmaceutical Sciences Dep.**



PHARMACY TECHNICIAN DIPLOMA GUIDE

PREPARED BY:

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IN COOPERATION WITH PHARMACEUTICAL SCIENCES

DEP. STAFF MEMBERS

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COURSES DESCRIPTION:

FIRST SEMESTER:

Course Title: Introduction to Pharmacy

Course No.: PHS 101

Semester/Year: 1/1

Lec.+lab/week: (2+0) hours

An introductory course in pharmacy describing the history and evolution of the profession. Some important definitions concerning pharmaceutical sciences, types of dosage forms, routes of drug administration, prescription types and parts, drug misuse and quality control are included. The duties of pharmacists and pharmacy technicians and their roles in the society are also described, in addition to the general laws regulating pharmacy practice, and pharmaceutical services in Kuwait.

Course Title: Pharmaceutical Terminology

Course No.: PHS 102

Semester/Year: 1/1

Lec.+lab/week: (2+0) hours

This course is designed to provide the student with basic techniques and knowledge in constructing, writing and understanding essential medical and pharmaceutical terms that are related to pharmaceutical practice. It also includes important medical and pharmaceutical abbreviations that are used in writing medical notes and prescriptions. It introduces the student to the basic rules for interpreting, constructing, and spelling medical terms, with emphasis on spelling, definition and pronunciation, in addition to discussing terminologies related to body system, pathology, and diagnostic procedures.

Course Title: Pharmaceutical Calculations

Course No.: PHS 106

Semester/Year: 1/1

Lec.+lab/week: (2+0) hours

Pharmaceutical calculations including reading, interpreting, and solving calculation problems encountered in the preparation and distribution of drugs. Conversion of measurements within the apothecary, avoirdupois, and metric systems will be discussed with emphasis on the metric system of weight and volume. Calculations involving units of potency, calculation of the doses,



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ratios and proportions, percentages, dilution and concentration, reducing and enlarging formulas and finally basic statistical concepts will be discussed.

Course title: Introduction to Pharmaceutical Chemistry

Course No.: PHS 109

Semester/Year: 1/1

Lec.+lab/week: (2+2) hours

A study of the introduction and basic principles of general, analytical and pharmaceutical chemistry, together with the physicochemical properties of atomic structure, chemical bonding, elements, compounds and mixtures. The practical part of the course aids in developing the fundamental analytical laboratory skills and techniques, in addition to learn the performance of qualitative analysis of cations, anions and salts in water solutions, preparation of standard solutions, official buffer preparation, and acid-base titration. Practical hours are included.

Course Title: Cell Biology

Course No.: M.SC. 130

Semester/Year: 1/1

Lec.+lab/week: (2+2) hours

Students will demonstrate knowledge of characteristics, structure and functions of the human cell. The course will be designed to prepare the student for further study in the different medical fields (pharmacology). It is an introductory study of human cell. Topics include: cell structure, types of human tissues, methods of transport of molecules across the plasma membrane, cell receptors, nucleic acids (DNA/RNA) components, protein synthesis, cell division (mitosis and meiosis). Special emphasis on the structure and function of cells and tissues of the human body. Practical hours are included.

Course Title: Organic Chemistry

Course No.: NSC 131

Semester/Year: 1/1

Lec.+lab/week: (2+2) hours

This course is designed to introduce the student with the basic principles of organic chemistry such as: general classification of organic compounds, shapes or organic compounds-hybridization, structural representation of organic molecules, functional groups, homologous series, common or trivial names, nomenclature of aliphatic, aromatic and substituted aromatic compounds. Structural



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isomerism and stereoisomerism is discussed. It deals also with fundamental concepts in reaction mechanism: cleavage or covalent bond, electron movement in organic reactions, electronic displacement in a covalent bond and types of organic reactions. The following laboratory techniques of methods of purification of organic compounds are performed: crystallization, melting point determination, extraction, simple and fractional distillation, boiling point determination and chromatographic separations. Practical hours are included.

Course title: English Remedial

Course No.: EL 99

Semester/Year: 1/1

Lec.+lab/week: (5+0) hours

This course is an English remedial course for students joining College of Health Sciences to shift to scientific majors. It is a communicative course that encourages students to acquire the language they learn and to adapt materials to their own situation.

In order to attain this goal, systemic attention is paid to language form through consolidation that follows each unit, and is devoted to study and practice of grammar, pronunciation, vocabulary and writing.

Course title: General English (1)

Course No.: EL 101

Semester/Year: 1/1

Lec.+lab/week: (3+0) hours

This a general compulsory English course for students who are joining The College of Health Sciences for all specialization. This course aims at helping students acquire the ability to use English for daily communication confidently. The emphasis will be on the basic skills listening, speaking, reading and writing. All four skills must be accomplished by both. This course is given to students scoring 60% and above in the placement test.

SECOND SEMESTER:

Course title: Pharmaceutics (1)

Course No.: PHS 104

Semester/Year: 2/1

Lec.+lab/week: (2+2) hours

Pharmaceutics (1) comprises units concerned with the physico-chemical, microbial and technological aspects of the design, manufacture, stability, storage and usage of dosage forms.



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It concerned with explaining the basic pharmaceutical techniques of the preparations of pharmaceutical dosage forms mainly fluid medicines. The student will learn to prepare, fill and label fluid dosage forms as well as appropriate dispensing aids such as colours, flavours and containers. Practical hours are included.

Course title: Introduction to Pharmacy Technician Professional Practice (1)

Course No.: PHS 121

Semester/Year: 2/1

Lec.+lab/week: (2+0) hours

The course introduces students to the field of pharmacy practice and its applications. It comprises several pharmaceutical concepts and topics including clinical pharmacy and pharmaceutical patient care and the technicians' role in its delivery, the importance of unit-dose delivery system, drug-use process, good-prescription writing, general dispensing procedures, patient education, compliance, and medication errors. Basic dispensing dosage calculation skills will be reviewed. Topics including drug packaging and labeling, adverse drug reactions, drug interactions, drug stability and storage conditions, validity and expiry date, and routes of administration are discussed.

Course title: Pharmaceutical Chemistry

Course No.: PHS 213

Semester/Year: 2/1

Lec.+lab/week: (3+3) hours

This course provides students with different classes of pharmaceutical compounds such as analgesics, CNS depressants, CNS stimulants, antimicrobial and antifungal agents, antihistamines and oral antibiotics. The major pharmacological and medicinal uses, physicochemical properties with emphasis on chemical structure and mode of action, identity tests and methods of quantitative analysis will be discussed. The practical part of this course deals with chemical assay, titrimetric and instrumental methods of analysis. Practical hours are included.

Course Title: Anatomy and Physiology (Pharmacy)

Course No.: M.SC. 159

Semester/Year: 2/1

Lec.+lab/week: (3+0) hours

This course is designed to familiarize the student with the structure and organization of various systems of the human body. It deals with the structure and function of the cells and tissues,



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nervous systems, sensory system, endocrine system, blood, circulatory system, lymphatic system, respiratory system, urinary system and reproductive system.

Course Title: Biochemistry

Course No.: NSC 177

Semester/Year: 2/1

Lec.+lab/week: (2+2) hours

This course is designed to introduce the student to chemical and molecular basis of life itself; i.e. Biochemistry. The course deals with the chemistry of major biomolecules (e.g. carbohydrates, lipids, proteins, etc.), their structures, reactions and metabolism in the human body, as well as their utilization for energy production and maintenance of bodily functions. Practical hours are included.

Course Title: Arabic Word Processing

Course No.: 29 (102)

Semester/Year: 2/1

Lec.+lab/week: (0+4) hours

This course is designed to train students with the advanced skills in typing, formatting and processing Arabic texts using computers. It also enables students to gain skills in fonts and paragraph formatting processes, dealing with documents, statistics, letters, reports and meeting minutes. Skills in table construction and formatting, in addition to statistical diagrams and data will be included. Symbols, pictures, diagrams, accounting and calculation equations used in working fields and many other beneficial expertise will be given using advanced computer programs.

Course Title: Research and Libraries

Course No.: 10 (104)

Semester/Year: 2/1

Lec.+lab/week: (2+0) hours

The course introduces the student to the importance of library and how to use it efficiently to benefit from its references and services provided. It also provides the student with the knowledge and skills to perform a scientific research on scientific bases.



THIRD SEMESTER:

Course title: Pharmacology I

Course No.: PHS 103

Semester/Year: 3/2

Lec.+lab/week: (3+0) hours

The course provides the student with pharmacokinetic, pharmacodynamic and pharmacotherapeutic knowledge of drugs helping in safe and effective pharmacy practice. This course contains drugs acting on central nervous system which includes Analgesic narcotic drugs, hypnotic and sedative drugs, Tranquilizer drugs, and CNS stimulants. In addition, this course covers preanesthetic medications, local and general anesthetics, drugs acting on autonomic nervous system which consist of sympathomimetic drug, sympatholytic drugs, direct acting and indirect acting parasympathetic system and cholinergic blocking drugs. Moreover, the course covers non steroidal anti-inflammatory drugs, rheumatoid arthritis drugs, anti-gout agents and anti infective agents such as antibacterial, antifungal and antiviral drugs.

Course title: Pharmacy Administration

Course No.: PHS 105

Semester/Year: 3/2

Lec.+lab/week: (2+0) hours

This course provides students with basic information on the hospital organization, the different departments and the supporting services. It also explains the pharmacy organizations, and its personnel. It provides necessary information for the student to perform his occupational duties in different health institutions including their legal requirements, types of medical prescriptions, the role of the pharmacist and pharmacy technician in the management of health care. It enables students to understand some concepts and techniques such as medication errors, labeling the drugs and the different systems used for drug dispensing in hospitals.

Course Title: Pharmaceutics II

Course No.: PHS 204

Semester/Year: 3/2

Lec.+lab/week: (2+2) hours

Pharmaceutics II is a continuation of pharmaceutics I. in this course the student will study pharmaceutical dosage forms such as ointments, creams, suppositories, tablets and capsules, and how to prepare them. The student will also learn the different routes of drug administration,



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their advantages and disadvantages, drug absorption and factors affecting drug bioavailability and drug-drug interactions. Practical hours are included.

Course title: Pharmacognosy

Course No.: PHS 211

Semester/Year: 3/2

Lec.+lab/week: (2+2) hours

This course is a study of pharmacologically active principles derived from plants. It is divided into two parts. The first part briefly deals with basic types of active substances such as alkalis and glycosides. Students learn the formula of such substances, their properties, extraction methods and sources. In the second part, students are introduced to the composition of different parts of the plants in detail including some kinds of herbs and their uses.

Course title: Pharmaceutical Microbiology

Course No.: PHS 218

Semester/Year: 3/2

Lec.+lab/week: (3+3) hours

The course covers classification and structure of microorganisms, gene transfer, microbial growth, industrial fermentation, microbial contamination, spoilage and preservation of pharmaceutical preparations, principles of sterilization, microbial pathogenicity, immunity system, examples of infectious diseases, and antimicrobial agents. The practical part covers microbial morphology, aseptic techniques, media preparation, spore resistance, immunity to disease, microbial contamination, antimicrobial preservatives and disinfectants, sterilization and sterility testing of pharmaceutical preparations; microbial susceptibility to antibiotics. Practical hours are included.

Course title: Quality Control

Course No.: PHS 220

Semester/Year: 3/2

Lec.+lab/week: (2+0) hours

This course provides the student with the general methods of quality control of pharmaceutical compounds and their dosage forms including chemical, pharmaceutical and biological quality control methods. The course also comprises a review of the applications of different instrumental techniques used in quality control including spectrophotometry, chromatography and biological assay.



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Course title: Pharmacy Technician Professional Practice (2): Clinics

Course No.: PHS 221

Semester/Year: 3/2

Field Training/week: (6) hours

This course provides an opportunity to work in a small-scale pharmacy settings under a pharmacist's supervision. Emphasis is placed on effective communication with personnel, developing proper employee attitude, and dispensing of medications. Student will be exposed to the practical aspects of dispensing, non-sterile compounding and inventory control at the training site in a primary health care unit of the Ministry of health. Activities will be performed by the student and evaluated by a preceptor. This practical field experience will be once a week throughout the term.

Course title: English Word Processing

Course No.: 29 (205)

Semester/Year: 3/2

Lec.+lab/week: (0+4) hours

This course is designed to train students with the advanced skills in typing, formatting and processing English texts using computers and how to use key board correctly. It also enables students to gain skills in fonts and paragraph formatting processes, dealing with documents, statistics, letters, reports and meeting minutes. Skills in table construction and formatting, in addition to statistical diagrams and data will be included. Symbols, pictures, diagrams, accounting and calculation equations used in working fields and many other beneficial expertise will be given using advanced computer programs.

FOURTH SEMESTER:

Course title: Pharmacology II

Course No.: PHS 203

Semester/Year: 4/2

Lec.+lab/week: (3+0) hours

Course provides student with pharmacokinetic, pharmacodynamic, pharmacotherapeutic knowledge about drugs to help safe and effective dispensing of medication to patient. It includes drugs for cardiovascular disorders, heart failure, cardiac arrhythmias, angina pectoris and hypertension. Also course includes diuretics, drugs for hyperlipidemia, drugs for blood disorders as drugs affecting blood coagulation and drugs for anemia. Drugs for gastrointestinal disorders such as antacids, ulcer healing drugs, antidiarrheal, laxatives and antiemetics. Drugs



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for endocrine disorders such as corticosteroids, insulin, oral hypoglycemics, sex hormones, oral contraceptives, thyroxin and antithyroid drugs will be discussed.

Course title: **Research Forum in Pharmacy**

Course No.: **PHS 215**

Semester/Year: **4/2**

Lec.+lab/week: **(2+0) hours**

In this course, introductory lectures in thesis writing will be given prior to student's selection of one of the topics suggested by their instructor. They consult various information sources such as references and periodicals to collect data related to their selected topic of medical and pharmaceutical interests. Each student will select a topic from a suggested list, collect information and scientific studies from the literature on this topic, organize and summarize these information, and presents a comprehensive report. Presentation is also required. In oral discussion, the student should be able to explain and defend the scientific contents of his/her report and also should be able to answer all questions on the content of the report.

Course title: **Advanced Pharmaceutical Applications**

Course No.: **PHS 217**

Semester/Year: **4/2**

Lec.+lab/week: **(2+0) hours**

This course deals with the design of dosage forms which includes preformulation study as well as study of the factors affecting drug performance in their dosage forms. The principles and applications of pharmacokinetics, bioavailability and bioequivalence will be outlined. Brand and generic names, formulations and conditions of preparation for ophthalmic, biologicals, antacids, and ear and nose preparations will be covered.

Course title: **Pharmacy Technician Professional Practice (3): Clinics**

Course No.: **PHS 222**

Semester/Year: **4/2**

Field Training/week: **(6) hours**

This course is a continuation of the previous one. Emphasis is placed on some pharmaceutical skills such as compounding, pharmaceutical preparations, dispensing of prescribed pharmaceutical products, drug inventories, storage, checking pharmacy records as well as on effective communication with personnel and developing proper employee attitude. Student will be exposed to the practical aspects of dispensing, non-sterile compounding and inventory control at the training site in a primary health care unit of the Ministry of health. Activities will



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be performed by the student and evaluated by a preceptor. Upon completion, students should be able to demonstrate an understanding of pharmacy operations, utilize references, effectiveness in reading prescriptions, drug packaging and labeling, dispense medications, receiving medicines requests from central medical stores, recording, and efficiently operate computers. This practical field experience will be once a week throughout the term.

Course title: Industrial Pharmacy

Course No.: PHS 224

Semester/Year: 4/2

Lec.+lab/week: (6+0) hours

The course covers important apparatuses used in drugs factories such as those used in mixing, combination, filtering, evaporating, drying, grinding, and pills pressing. The course also familiarizes students with medicine manufacturing steps and procedures, and problems encountered and solutions to such problems. Students are exposed to the industry of pharmaceuticals where they learn the significance of quality in manufacturing pharmaceutical products.

Course title: Toxicology and Safety

Course No.: PHS 225

Semester/Year: 4/2

Lec.+lab/week: (3+0) hours

This course provides students with the essential principles in general toxicology and poisons. It covers the effects of toxic agents on different systems, spectrum of toxic effects, margin of safety, dose - response relationship. It gives the student knowledge about the general measures for treatment of poisons, reduction in poison levels reaching tissues, main antidotes and life sustaining measures. The course also illustrates and familiarizes the student with the symptoms of the most important toxic substance and their treatment such as metals war gases, corrosives, clinical drugs, plant and animal toxicants, air pollution in addition to some household mixtures. Finally, the general way of analysis of poison.

Course title: Islamic Culture

Course No.: TI 101

Semester/Year: 4/2

Lec.+lab/week: (2+0) hours

This course deals with pillars of Islamic belief and some atheistic sects and grounds of their failure. It also covers Sharia'a Laws, Islamic opinion in personal and national economy and some



financial restrictions, the importance of education and attitudes building and also about health and self-care in Islam.

FIFTH SEMESTER:

Course title: Summer Field Training: Hospitals

Course No.: PHS 223

Semester/Year: 5/2

Field Training/week: (30) hours

An advance course of practical pharmacy training in different aspects of dispensing, compounding and inventory control in hospital settings of the Ministry of health and under minimal form of pharmacist supervision. Activities will be performed by the student and evaluated by a preceptor. Emphasis will be placed on effective communication with personnel, developing proper employee attitude, dispensing of medications, unit-dose dispensing, ward stock systems, automated dispensing, intravenous preparations, total parenteral nutrition (TPN), and sterile preparation. Students learn the role and duties of pharmacy technician in hospital pharmacies. Upon completion, students should obtain dispensing skills and be able to demonstrate an understanding of pharmacy operations, utilize references, ability to read and assess prescriptions, prepare patient charges, and efficiently operate computers. Skills in receiving drugs from central medical stores and recording will be reinforced. Time period of this practical field experience will be 30 hours per week for 7 weeks.