



UNIVERSITY
of
TECHNOLOGY,
MAURITIUS

School of Health Sciences

Diploma in Pharmacy Technician Studies

PROGRAMME DOCUMENT

DPTS v2.0

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University of Technology, Mauritius
School of Health Sciences

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Diploma in Pharmacy Technician Studies

A. PROGRAMME INFORMATION

Consumers depend greatly on pharmacies for provision of their prescription medications and over-the-counter medications. With the expansion in the health services offered, the demand for experienced and skilled technicians is projected to increase within the next decade. The future of pharmacy is expected to become more patient-oriented than compared to what it was in the past. Pharmacy technicians are now more involved with direct patient care, especially since it is recognized that they play a vital role for the smooth functioning of a pharmacy and delivery of improved healthcare. A pharmacy technician is a critical member of a health care team. Working alongside pharmacists, it is their role to ensure that the highest standards of quality and accuracy are abided by whilst preparing and dispensing drugs. They are the key link between patients and doctors, and have the vital responsibility to ensure that patients not only receive the adequate drugs, but also know how to take these as well. Duties involve dispensing pharmaceutical products, providing information about pharmaceutical services to customers, managing stock supplies and supervising other pharmacy staff, amongst others.

As well as producing skilled pharmacy technicians, this diploma is a gateway to a successful career in the field of pharmacy. Equipped with this Diploma, awardees will have the opportunity to contribute to the health and well-being of the Mauritian population. They will be able to integrate confidently in a variety of work environments, such as: hospitals, community or retail pharmacies, the sales or production department of a pharmaceutical company, health education organizations or long-term health care facilities.

The goals of this programme are based on those of the model curriculum for the training of pharmacy technicians devised by the *American Society of Health-System Pharmacists*. The goals took into consideration the most recent task analysis by the *Pharmacy Technician Certification Board (USA)* and other current trends and are intended to be responsive to changes in the pharmacy profession and the evolving role of pharmacy technicians.

The programme offers an exit point which will enable the student to qualify for the award of a Certificate in Pharmacy Technician Studies.

B. PROGRAMME AIMS

This programme has been designed to focus on dispensing techniques, customer care, health ethics, pharmaceutical sciences, legislation and inventory management. By interacting with experts who are active in the field of pharmacy, medicine and health sciences, the content taught in this course will ensure that students will learn about current trends and practices in the field of pharmacy.

Students will undertake a professional placement in a registered private pharmacy, where they will be given hands-on training and learn valuable work-related skills essential for the practice of their profession and for their future employability. This work experience will provide students the opportunity to implement their knowledge, develop critical independent thinking skills and encourage them to build a professional network.

C. PROGRAMME OBJECTIVES

This programme is conducted in a learner-centered environment which will enable students to gain the necessary skills required for a profession as a pharmacy technician. Training will focus on the following goal categories and objectives:

Goal Categories:

- Personal/Interpersonal Knowledge and Skills
- Foundational Professional Knowledge and Skills
- Processing and Handling of Medications and Medication Orders
- Sterile and Non-Sterile Compounding
- Procurement, Billing, Reimbursement and Inventory Management
- Patient- and Medication-Safety
- Technology and Informatics
- Regulatory Issues
- Quality Assurance

Objectives for each Goal Category:

Personal/Interpersonal Knowledge and Skills

- Demonstrate ethical conduct in all job-related activities.
- Present an image appropriate for the profession of pharmacy in appearance and behavior.
- Communicate clearly when speaking and in writing.
- Demonstrate a respectful attitude when interacting with diverse patient populations.
- Apply self-management skills, including time management, stress management, and adapting to change.
- Apply interpersonal skills, including negotiation skills, conflict resolution, and teamwork.
- Apply critical thinking skills, creativity, and innovation to solve problems.

Foundational Professional Knowledge and Skills

- Demonstrate understanding of healthcare occupations and the health care delivery system.
- Demonstrate understanding of wellness promotion and disease prevention concepts, such as use of health screenings; health practices and environmental factors that impact health; and adverse effects of alcohol, tobacco, and legal and illegal drugs.
- Demonstrate commitment to excellence in the pharmacy profession and to continuing education and training.
- Demonstrate knowledge and skills in areas of science relevant to the pharmacy technician's role, including anatomy/physiology and pharmacology.
- Perform mathematical calculations essential to the duties of pharmacy technicians in a variety of contemporary settings.
- Demonstrate understanding of the pharmacy technician's role in the medication-use process.
- Demonstrate understanding of major trends, issues, goals, and initiatives taking place in the pharmacy profession.
- Demonstrate understanding of non-traditional roles of pharmacy technicians.
- Identify and describe emerging therapies.
- Demonstrate understanding of the preparation and process for sterile and non-sterile compounding.

Processing and Handling of Medications and Medication Orders

- Assist pharmacists in collecting, organizing, and recording demographic and clinical information for direct patient care and medication-use review.
- Receive and screen prescriptions/medication orders for completeness, accuracy, and authenticity.
- Assist pharmacists in the identification of patients who desire/require counseling to optimize the use of medications, equipment, and devices.
- Prepare non-patient-specific medications for distribution (e.g., batch, stock medications).
- Distribute medications in a manner that follows specified procedures.
- Practice effective infection control procedures, including preventing transmission of blood borne and airborne diseases.
- Assist pharmacists in preparing, storing, and distributing medication products requiring special handling and documentation [(e.g., controlled substances, immunizations, chemotherapy, investigational drugs, drugs with mandated Risk Evaluation and Mitigation Strategies (REMS))].
- Assist pharmacists in the monitoring of medication therapy.
- Prepare patient-specific medications for distribution.
- Maintain pharmacy facilities and equipment, including automated dispensing equipment.
- Use material safety data sheets (MSDS) to identify, handle, and safely dispose of hazardous materials.

Sterile and Non-Sterile Compounding

- Prepare medications requiring compounding of sterile products.
- Prepare medications requiring compounding of non-sterile products.
- Prepare medications requiring compounding of chemotherapy/hazardous products.

Procurement, Billing, Reimbursement and Inventory Management

- Initiate, verify, and assist in the adjudication of billing for pharmacy services and goods, and collect payment for these services.
- Apply accepted procedures in purchasing pharmaceuticals, devices, and supplies.
- Apply accepted procedures in inventory control of medications, equipment, and devices.
- Explain pharmacy reimbursement plans for covering pharmacy services.

Patient- and Medication-Safety

- Apply patient- and medication-safety practices in all aspects of the pharmacy technician's roles.
- Verify measurements, preparation, and/or packaging of medications produced by other healthcare professionals (e.g., tech-check-tech).
- Explain pharmacists' roles when they are responding to emergency situations and how pharmacy technicians can assist pharmacists by being certified as a Basic Life Support Healthcare Provider.
- Demonstrate skills required for effective emergency preparedness.
- Assist pharmacists in medication reconciliation.
- Assist pharmacists in medication therapy management.

Technology and Informatics

- Use current technology in the healthcare environment to ensure the safety and accuracy of medication dispensing.

Regulatory Issues

- Compare and contrast the roles of pharmacists and pharmacy technicians in ensuring pharmacy department compliance with professional standards and relevant legal, regulatory, formulary, contractual, and safety requirements.
- Maintain confidentiality of patient information.

Quality Assurance

- Apply quality assurance practices to pharmaceuticals, durable and non-durable medical equipment, devices, and supplies.
- Explain procedures and communication channels to use in the event of a product recall or shortage, a medication error, or identification of another problem.

Part I - REGULATIONS

D. GENERAL ENTRY REQUIREMENTS

As per UTM 'Admissions Regulations' and 'Admission to Certificate and Diploma Programmes'

E. PROGRAMME ENTRY REQUIREMENTS

In addition to meeting the general entry requirements as per section D above, applicants are informed that credits at S.C or G.C.E 'O' level (or equivalent) in mathematics and chemistry are desirable.

F. PROGRAMME MODE AND DURATION

Full Time: Minimum Duration : 2 Years
 Maximum Duration : 4 Years

Part Time: Minimum Duration : 3 Years
 Maximum Duration : 5 Years

Each academic year includes 2 semesters.

G. TEACHING AND LEARNING STRATEGIES

The program includes didactic (lectures, tutorials and seminars), simulated (lab/practical), and experiential components. Self-learning is a key feature of the programme which will enable students to explore, investigate and research various issues related to the pharmaceutical field.

The University of Technology, Mauritius recognizes the importance of practical experience and its value to employers hence an essential component of this course is the *Professional Placement* where students are required to complete a placement in a pharmacy in a community or healthcare setting.

Professional Placement will be guided by a set of placement objectives based on programme goals and specifying the particular knowledge, skill, or attitudes the student is expected to develop and workplace skills will be supervised and assessed by practicing pharmacists, preferably with at least three years' experience.

H. STUDENT SUPPORT AND GUIDANCE

In addition to traditional lectures, individual or group tutorial sessions are arranged for students.

I. ATTENDANCE REQUIREMENTS

As per UTM Regulations

J. CREDIT SYSTEM

1 credit = 15 contact hours

1 hour of lecture/seminar = 2 hours of practical/tutorial

60 hours of Professional Placement = 1 credit

Professional Placement will be conducted for 180 hours per year

K. STUDENT PROGRESS AND ASSESSMENT

For the award of the Diploma degree, all modules must be passed in the examinations, coursework and other forms of assessment. All modules will have equal weighting (unless otherwise specified).

Written examinations for modules carrying 3 credits will be of maximum duration 3 hours and will contribute 70% of the total marks. Continuous assessment will carry 30% of total marks and will be based on assignments, practical reports, seminars, and class assessments.

The module *Health Research Methods, Epidemiology and Biostatistics* will be assessed by 100% coursework.

The learning objectives for the *Professional Placement* will be specified in the guidelines and are based on the outline syllabus for the modules and will state the roles and responsibilities of the student. The placement supervisor will be required to fill out a *performance feedback questionnaire* pertaining to student's performance during the placement. Students must demonstrate that they have achieved the learning objectives specified. The performance feedback questionnaire will carry 30% of the total marks for the module. Professional skills will be assessed via simulations under the supervision of an examiner and this assessment will carry 40% of the marks for the module. Students will also be assessed via a reflective portfolio which they will need to submit at the end of each year and which will carry 30% of the total marks for the module.

EXIT POINTS

Students may exit the program with a Certificate in Pharmacy Technician Studies with 33 credits.

L. EVALUATION OF PERFORMANCE

Grading

Grade	Marks x (%)
A	$70 \leq x \leq 100$
B	$60 \leq x < 70$
C	$50 \leq x < 60$
D	$40 \leq x < 50$
F	$x < 40$
A-D	Pass
F	Fail

M. PROGRAMME REVIEW COMMITTEE:

Dr. Meera Jhoti Somanah-Bhugowandeen (mjbhugowandeen@umail.utm.ac.mu)

Dr.Nardawoo Jaypaul (njaypaul@umail.utm.ac.mu)

Programme vetted by Mr. Johendra Ramchurn (Registered Pharmacist)

Part II - PROGRAMME STRUCTURE AND SYLLABUS OUTLINE

N. Diploma in Pharmacy Technician Studies

PROGRAMME STRUCTURE AND PLAN- (FULL-TIME)

		Semester 1	YEAR 1			Semester 2		
Code	Modules	Hrs L+T/P	Credits	Code	Modules	Hrs L+T/P	Credits	
DPTS 1101	Human Anatomy and Physiology	2 + 1	3	DPTS 1201	Pharmaceutics (Physical and Biological Pharmacy)	2 + 1	3	
DPTS 1102	Pharmaceutical and Medicinal Chemistry	2 + 1	3	DPTS 1202	Pharmacognosy	2 + 1	3	
DPTS 1103	Biology of Diseases	2 + 1	3	DPTS 1203	Pharmacy Practice I	2 + 1	3	
SHS 1101	Medical Microbiology and Vector Biology	2 + 1	3	DPTS 1204	Pharmacotherapy I	2 + 1	3	
DPTS 1104	Basic and Clinical Pharmacology	2 + 1	3	SHS 1201	Health Research Methods, Epidemiology and Biostatistics	2 + 1	3	
DPTS 1000	Professional Placement I					180hr of work placement	3	
		Semester 1	YEAR 2			Semester 2		
Code	Modules	Hrs L+T/P	Credits	Code	Modules	Hrs L+T/P	Credits	
DPTS 2101	Toxicology and Forensic Pharmacy	2 + 1	3	DPTS 2201	Pharmacovigilance and Pharmacoepidemiology	2 + 1	3	
DPTS 2102	Pharmacotherapy II	2 + 1	3	DPTS 2202	Complementary Alternative Therapies	2 + 1	3	
DPTS 2103	Pharmacy Practice II	2 + 1	3	DPTS 2203	Pharmacy Management and Organization	2 + 1	3	
DPTS 2104	Drug Development and Clinical Trials	2 + 1	3	DPTS 2204	Pharmaceutical Technology and Industrial Pharmacy	2 + 1	3	
DPTS 2000	Professional Placement II					180hr of work placement	3	
PROJ 2000	Project					-	6	

PROGRAMME STRUCTURE AND PLAN- (PART-TIME)

		Semester 1		YEAR 1		Semester 2			
Code	Modules	Hrs L+T/P	Credits	Code	Modules	Hrs L+T/P	Credits		
DPTS 1101	Human Anatomy and Physiology	2 + 1	3	DPTS 1104	Basic and Clinical Pharmacology	2 + 1	3		
DPTS 1102	Pharmaceutical and Medicinal Chemistry	2 + 1	3	DPTS 1201	Pharmaceutics (Physical and Biological Pharmacy)	2 + 1	3		
DPTS 1103	Biology of Diseases	2 + 1	3	DPTS 1202	Pharmacognosy	2 + 1	3		
SHS 1101	Medical Microbiology and Vector Biology	2 + 1	3	-	-	-	-		
		Semester 1		YEAR 2		Semester 2			
Code	Modules	Hrs L+T/P	Credits	Code	Modules	Hrs L+T/P	Credits		
DPTS 1203	Pharmacy Practice I	2 + 1	3	DPTS 2101	Toxicology and Forensic Pharmacy	2 + 1	3		
DPTS 1204	Pharmacotherapy I	2 + 1	3	DPTS 2102	Pharmacotherapy II	2 + 1	3		
SHS 1201	Health Research Methods, Epidemiology and Biostatistics	2 + 1	3	DPTS 2103	Pharmacy Practice II	2 + 1	3		
DPTS 1000	Professional Placement I					180hr of work placement	3		
		Semester 1		YEAR 3		Semester 2			
Code	Modules	Hrs L+T/P	Credits	Code	Modules	Hrs L+T/P	Credits		
DPTS 2104	Drug Development and Clinical Trials	2 + 1	3	DPTS 2203	Pharmacy Management and Organization	2 + 1	3		
DPTS 2201	Pharmacovigilance and Pharmacoepidemiology	2 + 1	3	DPTS 2204	Pharmaceutical Technology and Industrial Pharmacy	2 + 1	3		
DPTS 2202	Complementary Alternative Therapies	2 + 1	3	-	-	-	-		
DPTS 2000	Professional Placement II					180hr of work placement	3		
PROJ 2000	Project					-	6		

O: Syllabus Outline – (This outline is intended as a guide and is not prescriptive. Module content description below varies in quantum depending on nature of topics but overall module workload involved is the same for all modules bearing equal number of credits.)

DPTS1101- Human Anatomy and Physiology

Introduction to basic anatomical and physiological concepts, Structure and function of human body at molecular and cellular and physiological level with emphasis on the physiology of nervous, cardiovascular, immune, respiratory, endocrine, digestive, urinary and reproductive systems, Endocrine glands and hormones. The module will include a review of basic cell biology which learners will have to cover through self-learning : Ultrastructure of eukaryotic cells, DNA structure, replication, transcription and translation mechanisms, regulation of protein synthesis, Factors that affect gene expression, Cell division and control, Membrane structure and function

DPTS1102- Pharmaceutical and Medicinal Chemistry

Review of basic organic, inorganic and physical chemistry, Pharmaceutical analysis, methodology and techniques of analysis of drug contents and metabolites in blood and biological fluids, Analysis of selected drugs by instrumental methods, Principles of medicinal chemistry including chemical aspects of drug absorption, distribution, elimination, steric aspects, drug receptor interaction, rational drug design and drug metabolism, Outline of synthetic procedures, uses, structure activity relationship, physicochemical and general mode of action of selected drugs, Classification, structure, properties and uses of major pharmaceutical compounds and formulations, Stability, handling and storage, Classification and identification of pharmaceutical products obtained from plants and animals, Outline of their extraction procedures, purification techniques and application

DPTS1103- Biology of Diseases

Overview of basic and medical biochemistry, Concept of physical health, social health, mental health and spiritual health, Indicators of health care, Disease aetiology and the contribution of genetic and environmental factors to disease development, Pathogenic mechanisms, involved in diseases and manifestations of disease, pathophysiology and molecular basis of disease in the development of pharmacotherapeutic agents, Molecular assays used in diagnosis of diseases/disorders, Overview of principles of immunology, Immunological techniques used in medicine and pharmaceutical research

SHS1101- Medical Microbiology and Vector Biology

Pathogenic microbial organisms: viruses, fungi, bacteria, microalgae, protozoa, Mechanisms of infectious diseases, The role of vectors in disease transmission and epidemics, General techniques in microscopy, staining, isolation, identification and anti-bacterial assays, Good laboratory practice and safety, Physical and Chemical Control of Microbial Growth, Host-parasite relationships in transmission of infectious vector-borne diseases, Mechanism of action of antibacterial drugs, Importance of vaccinations, Infection control methods, Emerging infectious diseases and antibiotic misuse, Challenges faced in the development of new antibiotics and antimicrobial agents

DPTS1104- Basic and Clinical Pharmacology

Definition of pharmacology, Routes of drug administration, Drug receptors and drug targets, Dose-effect relationship of drugs, Pharmacology of various body systems, Overview of mode of action of therapeutic drugs used for treatment of common diseases and disorders including drugs acting on body systems, antimicrobial agents, antiviral agents, anticancer agents, anti-inflammatory drugs, hormone therapy, Principles of pharmacokinetics: drug absorption, distribution, metabolism and elimination, Factors influencing drug absorption, distribution, bioavailability and excretion, Factors affecting drug efficacy and sensitivity, Pharmacokinetic changes and issues during disease, pregnancy and old age, Dosage calculations, Assessment of bioavailability

DPTS1201- Pharmaceutics (Physical and Biological Pharmacy)

Complexation of drug action, Kinetic and drug stability, Surface and interfacial phenomenon, Colloids and macromolecular systems, Rheology, Micrometrics, Coarse dispersions, Diffusion and dissolution, Metrology, Classification of dosage forms, Pharmaceutical additives, Size reduction and size separation, Mixing and homogenisation, Clarification and Filtration, Heat processes, Extraction and galenicals, Posology and dosage forms: Powders, Liquid dosage forms, Emulsions and Suspensions, Semi-solid dosage forms, Tablets, Capsules, Sterile Dosage forms, Pharmaceutical applications of microbiological techniques, Stability and preservation of medicine, Overview of Biological pharmacy

DPTS1202- Pharmacognosy

Modern concepts of pharmacognosy, Sources of drugs from biological, marine and plant tissue culture, Classification and chemistry of Carbohydrates, Study of drugs dealing with biological sources, geographical distribution, collection, commercial production, Chemical constituents, chemical tests for identity, substitutes, adulterants and uses of specific drugs, Study of lipids, their chemistry, classification and biogenesis, Specific lipid containing drugs dealing with general methods of extraction and purification of fixed oils, biological sources, chemical constituents, tests for identity and uses, Drugs of animal origin, Tannin containing drugs, Protein containing drugs, Plant allergens and allergenic substances, Hallucinogens, narcotics, and common poisonous plants, Biogenesis of primary metabolites and their relationship to the formation of secondary metabolites, Evaluation of crude drugs

DPTS1203- Pharmacy Practice I

Healthcare professions and the multidisciplinary healthcare team, The health care delivery system, The role of the Pharmacy Technician in the medication-use process, Personal and Interpersonal Knowledge and Skills, Communication skills in the healthcare setting, Listening techniques, Interviewing techniques, Patient education and Counselling, The value of group work, Role of other health care personnel, Wellness promotion and disease prevention strategies, health practices and environmental factors that impact health, adverse effects of alcohol, tobacco, and legal and illegal drugs, Family planning, Mathematical calculations essential to the duties of pharmacy technicians, Awareness of emerging and alternative therapies impacting on traditional pharmacotherapy, First aid techniques for: choking, fainting, emergency treatment for shock, fractures, heart attack, recognising signs of stroke, resuscitation, minor surgery, wound dressing, WHO Essential drugs, Alternative to drugs. Techniques for health education and promotion, Drug abuse, Counselling about drug interactions and side effects, Incompatibility prescriptions, Computerisation and networking in prescription and dispensing, Current patents and propriety products

DPTS1204- Pharmacotherapy I

Processes involved in pharmacotherapy, Principles of pharmacotherapy, Factors affecting pharmacotherapy and therapeutic effectiveness of drugs, Drugs used for treatment of medical conditions in specific systems, dosage forms and alternative therapies used in the treatment of common medical conditions: gastrointestinal disorders, infectious diseases, haematology, joint disorders, surgery, respiratory diseases, cardiovascular disorders, renal disorders, endocrine disorders, women's health issues, neoplastic diseases, central nervous system disorders, dermatology, Selfcare

SHS1201- Health Research Methods, Epidemiology and Biostatistics

Research Concepts: Research issues, problems, questions, hypotheses, Measurement and Scaling in Research, Reliability, validity, Research Design and Survey Methods, Ethics in Research, Questionnaire Design, Quantitative Methods, Introduction to Biostatistics, Data Description, Hypothesis Testing, quantitative statistical tools, Factor Analysis, Chi-square and Regression Analysis; Data analysis with SPSS; Epidemiology: Epidemiological study designs, their strengths and limitations, inference and causation, bias and confounding, Age standardisation procedures, and application of epidemiological knowledge; Qualitative Methods: designing, gathering, processing and analysing

qualitative research information; Reporting and presenting research in health.

DPTS1000- Professional Placement I

Students are to complete a professional placement under the supervision of a qualified pharmacist in a pharmacy in a community or healthcare setting. This module is designed with the aim of providing the student with supervised dispensing and compounding practice and hands-on experience in an real-life environment. Topics to be covered include: Dealing with medical prescriptions, Familiarization to generic and brand names of drugs on the market, Preparation and Dispensing techniques for powders, pills, emulsions, ointments, mixtures, liniments, suppositories and syrups, Introduction to the various measuring systems, System International of Units, Conversion methods, Calculations and Measuring tools used for weight, dose and dilution, Handling and disposal of hazardous materials. Principles of the sterile technique with emphasis on skills, accuracy and quality assurance for the preparation of sterile compounds, Size separation, mixing, homogenization, filtration, heating and sterilization techniques, Application of mathematics for pharmaceutical calculations, Preparation techniques for powders, pills, emulsions, ointments, mixtures, liniments, suppositories and syrups, Preparation of injections and buffers, Maintenance of the laboratory and its equipment

DPTS2101- Toxicology and Forensic Pharmacy

Introduction to toxicology, Classification of poisons and toxicants, Risks and precautionary measures of handling toxicants, Safety protocols for labelling, transport, storage, handling and disposal of hazardous chemicals, Dose-response relationships, Toxicity indices, First aid treatment of the poisoned and overdosed patient, Preventive measures, Antidotes and its types, Basic principles of some analytical tools used in toxicology, Risk Assessment and Management

DPTS2102- Pharmacotherapy II

Issues in long term pharmacotherapeutic management of disease, Compliance, Polypharmacy, Patient drug record charts and medication reconciliation, Side-effects and adverse reactions, drug-drug contraindications and drug-food interactions of major classes of drugs used to treat common medical conditions, Contraindications in pregnancy, children, the elderly and disease states. Identification and treatment options of substance-abuse related problems, Drug therapy in problems associated with selected disease states, Mental health: psychiatric terminology and classification, aetiology, symptoms, treatment and prognosis, the most prevalent psychiatric conditions, Social and therapeutic implications of chronic diseases, Age-related diseases and special problems of the elderly, Therapeutic management in children, dependent patients and the elderly

DPTS2103- Pharmacy Practice II (Regulatory Pharmacy, Pharmacy Laws and Ethics)

The roles of pharmacists and pharmacy technicians in ensuring pharmacy department compliance with professional standards and relevant legal, regulatory, formulary, contractual, and safety requirements. Drug legislation, Pharmacy Council Act, Role of the National Pharmacovigilance Committee, Pharmacy Act, Dangerous Chemicals Act, Drug and Cosmetics Act, Narcotic and Psychotropic Drug Act, Drug and Remedies Act, Medicinal and Toilet Preparations Act, Poison Act, Labour Law, Medicinal Termination and Pregnancy Act, Insecticide Act, Pharmaceutical Product Regulations, Regulations and procedures for ordering and importation of drugs, Implementation of ISO Standards for the manufacture, marketing and management of medicines for human and veterinary use, Concept of Good Manufacturing Practice (GMP), The Clinical Trial Bill, Principles and significance of professional ethics. Maintaining confidentiality of patient information. Quality Assurance: application of quality assurance practices to pharmaceuticals, durable and non-durable medical equipment, devices, and supplies, Explaining procedures and communication channels to use in the event of a product recall or shortage, a medication error, or identification of another problem

DPTS2104- Drug Development and Clinical Trials

Drug discovery, Clinical trial design, monitoring and documentation, acceptance and drug marketing and monitoring, Drug development, Acute, subacute and chronic toxicity testing, teratogenicity and carcinogenicity, Legal and ethical problems regarding animal studies, Considerations of individual variations, side effects and drug interactions in drug development, Application of techniques of genomics and proteomics in drug design and development, Blood products, Radio Pharmaceuticals, Key principles of Good Clinical Practice (GCP), Declaration of Helsinki, Clinical Trial Act, Requirements and considerations of national and international regulatory bodies (e.g. Food and Drug Administration) during drug development commercialization and use, Pharmaceutical marketing: drug advertisement, DTC advertising, Generic v/s Brand name drugs

DPTS2201- Pharmacovigilance and Pharmacoepidemiology

Principles of pharmacovigilance and medication safety, Harmonisation in pharmacovigilance, Adverse drug reactions, Signal detection and follow up and causality assessment, Data mining techniques, Role of a Pharmacovigilance Committee and Clinical Research Regulatory Council, Guidelines on Good Pharmacovigilance Practices (GPP), Introduction to post-Marketing surveillance, Role of the pharmacist in detecting, documenting and reporting serious adverse events, serious adverse reactions, side effects or additional therapeutic effects of commercialized drugs, Impact of pharmacovigilance on drug manufacturers, The WHO programme for International Drug Monitoring, Setting up a National Pharmacovigilance Centre, Principles of pharmacoepidemiology

DPTS2202- Complementary and Alternative Therapies

Definition of Complementary and alternative therapies and integrative medicine, Allopathy and homeopathy, Herbal remedies, Dietary supplements (nutraceuticals), Chinese and Ayurvedic therapies including acupuncture, Drug-herb interactions, Risks associated with traditional remedies, Factors affecting use of complementary and alternative therapies, Regulatory and legal issues

DPTS2203- Pharmacy Management and Organisation

Introduction to management in a pharmacy setting, Purchasing, receiving and merchandizing. Initiating, verifying, and assisting in the adjudication of billing for pharmacy services and goods, and collect payment for these services. Use of accepted procedures in purchasing pharmaceuticals, devices, and supplies, Use of accepted procedures in inventory control of medications, equipment, and devices, Awareness of pharmacy reimbursement plans for covering pharmacy services, Use of current technology and implementation of ICT for pharmacy administrative procedures in the healthcare environment to ensure the safety and accuracy of medication dispensing, Maintain pharmacy facilities and equipment, including automated dispensing equipment, Pharmaceutical marketing and advertising strategies. Inventory control practices, Pricing strategies, Loss prevention practices, Budgeting and cost management, Efficient communication practices, Team motivation & management, Leadership skills, Storage, labelling and handling of drugs and chemical reagents, Generic v/s Brand names of drugs, Risk management and safety protocols, Principles of good salesmanship, Window display

DPTS2204- Pharmaceutical Technology and Industrial Pharmacy

Establishment of a pharmaceutical factory, Drug Manufacture and drug delivery systems, Product design and formulation, Pre-formulation studies, Monophasic and biphasic dosage forms, Processing and manufacturing technology/operations, Packaging technology, General principles and methods of bioassays of drugs, Quality assurance and drug analysis including physico-chemical and biological assay of drugs and control of microbial contamination, Introduction to pharmaceutical engineering, Unit operations concept and requirement, Conveying of solids, Materials of Pharmaceutical plant construction and factors affecting material selection for pharmaceutical plants, Safety hazards and environmental pollutants, Fluidity, Heat transfer dynamics, Distillation, Refrigeration, Drying, Leaching and extraction, Engineering drawings, Projection

DPTS2000- Professional Placement II

This module will focus on clinical pharmacy practice in the community and healthcare settings. Topics to be covered will include: Assisting pharmacists in the processing and handling of medications, prescriptions and patient medication records, Collecting, organizing, and recording demographic and clinical information for direct patient care and medication-use review, Receive and screen prescriptions/medication orders for completeness, accuracy, and authenticity, identification of patients who desire/require counselling to optimize the use of medications, equipment, and devices, prepare non-patient-specific medications for distribution (e.g., batch, stock medications), distribute medications in a manner that follows specified procedures, Practice effective infection control procedures, including preventing transmission of blood borne and airborne diseases, Assisting pharmacists in preparing, storing, and distributing medication products requiring special handling and documentation (e.g. controlled substances, immunizations, chemotherapy, investigational drugs), Assisting pharmacists in the monitoring of medication therapy, Prepare patient-specific medications for distribution, Use material safety data sheets (MSDS) to identify, handle, and safely dispose of hazardous materials, Assisting pharmacists in counselling of patients on therapeutic management, rational drug use, drug safety, drug side-effects and adverse event reporting

PROJ2000- Project

A 5,000 – 8,000 word project will have to be submitted. The work submitted should conform to the school's Undergraduate Dissertation Guidelines