DIPLOMA IN PHARMACEUTICAL SCIENCE (T25)

Course Overview

Medicines affect our quality of life on a daily basis. We take aspirin for headaches or apply topical antibiotics on cuts and knee scrapes. With the continual expansion of the healthcare industry and more multinational pharmaceutical companies making Singapore their global manufacturing base, exciting career opportunities abound in this sector!

Be equipped with the knowledge and skills related to drug action on diseases, medicine legislation, and patient counselling to be a pharmacy technician in hospital and retail pharmacies. You will also acquire skills in pharmaceutical analysis and current good manufacturing practices to work in the pharmaceutical manufacturing industry.

In Year 3, choose your specialisation in Pharmacy Practice or Pharmaceuticals & Biologics to undergo work-based training in these areas and apply your skills in the related fields during the six-month internship programme. Our broad-based training will equip you with in-demand and transferable skills for careers in various allied health professions, including opportunities beyond the pharmaceutical science industries.

Embark on a meaningful and rewarding career where you can play a part to safeguard health by making quality drugs and imparting knowledge on the safe use of medicines.

REAL-WORLD EXPERIENCE
Gain valuable experience in hospital and retail pharmacies, as well as the pharmaceutical manufacturing sector through internships. You will also have opportunities to attain scholarships and sponsorships that allow you to secure a full-time job upon graduation.

CERTIFIED TO PRACTISE
Graduates who have completed their internships in healthcare institutions will be issued the Letter of Competency Attainment from the Ministry of Health Pharmacy Technicians Entry-to-Practice Competency Standards.

DEVELOP NEW SKILLS
There are opportunities to participate in a wide range of student development activities such as community health outreach projects and competitions such as the WorldSkills Singapore Competition.

Entry Requirements

To be eligible for consideration for admission, applicants must obtain 26 points or better for the net ELR2B2 aggregate score (i.e. English Language, 2 relevant subjects and best 2 other subjects, including CCA Bonus Points) and meet the minimum entry requirements of this course. CCA cannot be used to meet the minimum entry requirements.

Subject	Grade
English Language (EL1)*	1-7
Mathematics (E or A)	1-6
One of the following Science subjects: • Biology • Biotechnology • Chemistry • Combined Science • Food & Nutrition • Physics/Engineering Science • Science (Chemistry, Biology) • Science (Physics, Biology) • Science (Physics, Chemistry)/Physical Science	1-6
Any two other subjects, excluding CCA	
2023 Planned Intake	**70**
Net ELR2B2 aggregate range (2023 JAE)	**5 - 10**

** Sijil Pelajaran Malaysia (SPM)/ Unified Examination Chinese (UEC) holders must have a minimum of grade 6 for the relevant English Language subject (e.g. Bahasa Inggeris).*

What You'll Learn

YEAR 1 | YEAR 2 | YEAR 3 | TPFUN

You will begin your journey by building a strong broad-based foundation through core subjects ranging from microbiology, cell biology, mathematics to conservation, nutrition and workplace safety.

Core Subjects

Subject Code	Subject	Credit Units
AMB1005	**Basic Microbiology** This subject investigates the important fundamentals of microbiology and its relevance to the food, biomedical and biotechnology industries. It covers the types of microorganisms, their cultivation and growth as well as their control.	4
AMT1004	**Cell Biology & Biochemistry** This subject introduces the biology of cells and the structure-function relationship of cells, cellular membranes and organelles. It covers basic concepts of organic chemistry and the structure-property relationship of essential biomolecules. Basic laboratory skills involving the study of cell structures with the use of cell staining and microscopy techniques, as well as basic biochemical analysis will also be introduced.	5
AMA1008	**Digitalisation in Applied Science** This subject covers the basic concept of data analytics as well as the processes of data cleaning, processing and visualisation of data in the contexts of applied science. Basic coding and fundamental computational thinking constructs such as variables, data type and logic will also be addressed.	2
APH1004	**Laboratory & Workplace Safety**	3

	This subject covers an introduction to Good Laboratory Practice, and the identification and classification of biological, chemical, physical and ergonomic hazards at the workplace and laboratories. It also involves the conduct of risk assessment, risk controls and monitoring as well as communication of these risks to all persons involved in compliance with the Workplace Safety and Health (Risk Management) Regulations.		
AMA1003	**Mathematics for Applied Science** This subject covers algebra, differentiation, integration and their applications in applied science contexts.	**3**	^
ANT1005	**Nutrition & Health** This subject examines the relationship between food, nutrition and health. It provides an introduction to macro- and micro- nutrients in relation to the well-being of the human body. It covers food sources of these nutrients and their interrelationships as well as the use of basic nutritional tools like My Healthy Plate, food composition tables and online nutritional databases for basic nutritional analysis.	**3**	^
ACH1009	**Principles of Inorganic & Physical Chemistry 1** This subject covers the basic theory and practical knowledge of inorganic and physical chemistry. Topics include fundamentals of chemistry, atomic structure and chemical bonding, stoichiometry and equilibria concepts of a chemical reaction.	**4**	^
AMA1004	**Statistics for Applied Science** This subject provides you with the basic statistical techniques that are essential for your course of study. Topics covered include basic probability and distributions, basic statistics, sampling distribution,	**3**	^

hypothesis testing, analysis of variance and chi-square testing.

YEAR 1 | **YEAR 2** | YEAR 3 | TPFUN

Get to understand how the human body works and how diseases occur. With your chemistry foundation, learn the essentials in drug development and analysis, and principles of drug action. Learn about Current Good Manufacturing Practice & Process Improvement, an essential skillset for the pharmaceutical industry.

Core Subjects —

Subject Code	Subject	Credit Units
AMT1002	**Cell Technology** This subject provides basic theoretical and practical knowledge of mammalian cell culture. It covers the requirements for establishing and maintaining cell cultures both in the laboratory and in large-scale operations. It also discusses the important applications of the cell culture technique in the biological and medical sciences.	**3**
APH3011	**Current Good Manufacturing Practice & Process Improvement** This subject covers the fundamental knowledge and applications of Current Good Manufacturing Practice (cGMP) in the pharmaceutical and biopharmaceutical industries. Topics include an overview of cGMP, documentation and record keeping, contamination control, in-process control, validation, and introduction to process improvement techniques.	**4**
APH2014	**Fundamentals of Pharmacy Practice & Pharmacology** This subject introduces the role of pharmacy technicians and the services provided by them at hospital and community pharmacies. The subject also covers the key principles and concepts of pharmacology. Topics	**4**

	include drug information resources, good dispensing practice, overview of drug discovery and development, pharmacodynamics, pharmacokinetics and toxicology.		
APH2015	**Human Systems & Pharmacotherapy 1** This subject integrates knowledge of human anatomy, physiology, and pathophysiology with pharmacotherapy. Students will apply the knowledge learnt and good pharmacy practice to handle clinical enquiries, make appropriate clinical recommendations, process prescriptions and perform patient counselling in therapeutic areas such as dermatology, ophthalmology, otolaryngology and respiratory.	**5**	^
APH2016	**Human Systems & Pharmacotherapy 2** This subject integrates knowledge of human anatomy, physiology, and pathophysiology with pharmacotherapy. Students will apply the knowledge learnt and good pharmacy practice to handle clinical enquiries, make appropriate clinical recommendations, process prescriptions and perform patient counselling in the therapeutic areas such as cardiovascular, endocrinology, musculoskeletal and infectious diseases.	**6**	^
APH2001	**Pharmaceutical Analysis 1** This subject equips students with the knowledge on the basic principles and applications of analytical instruments and techniques commonly used in the pharmaceutical industries and analytical laboratories, and the technical skills required to operate instruments for analysis. Basic concepts of laboratory quality management system will also be covered.	**4**	^
APH3012	**Pharmaceutical Analysis 2**	**4**	^

	This subject covers the knowledge and applications of pharmacopeia test methods to evaluate the quality of active drug substances and finished pharmaceutical products. This subject also provides further knowledge on gas chromatography and high performance liquid chromatography including method development and optimization for various applications such as stability testing of pharmaceuticals. Students will perform test samples analysis, interpretation of test results and data analysis.		
APH3021	**Pharmaceutics & Compounding** This subject covers the fundamental knowledge of pharmaceutical downstream manufacturing processes. The topics include industrial aspects of drug production, various manufacturing techniques such as granulation, compression, coating, encapsulation and packaging technologies. This subject also covers formulation design and extemporaneous compounding of various dosage forms as well as concepts and applications of aseptic dispensing.	**5**	^

YEAR 1 YEAR 2 **YEAR 3** TPFUN

Your learning journey will progress through on-the-job training where you get to apply your skillsets in a professional environment and learn from industry practitioners. You will deepen your knowledge and skills in pharmacy practice or pharmaceutical and biologics manufacturing.

Core Subjects —

Subject Code	Subject	Credit Units	
AMP3021	**Major Project** This subject provides a framework for you to solve practical problems, conduct research work and/ or develop studies, through a self-managed project. The scope of the subject includes project proposal,	**6**	^

investigative studies, analysis, interpretation of results, written report, and presentation.

Diploma Elective Cluster Subjects

Pharmacy Practice

Subject Code	Subject	Credit Units
APH2012	**Pharmaceutical Legislation, Marketing & Management** The subject provides an overview of legislations affecting the pharmaceutical industry. The subject is also designed to provide students with an understanding of basic marketing concepts, tools and techniques pertaining to the commercialisation of pharmaceutical products. Basic business operations of hospital and retail pharmacies will also be included.	5
APH3022	**Advanced Pharmacy Practice** This subject integrates knowledge of human anatomy, physiology, and pathophysiology with pharmacotherapy. Students will apply the knowledge learnt and good pharmacy practice to handle clinical enquiries, make appropriate clinical recommendations, process prescriptions and perform patient counselling in the therapeutic areas such as neurology and psychiatry. The subject also covers use of health screening and monitoring devices, as well as lifestyle modifications for health and disease management.	4

Pharmaceuticals And Biologics

Subject Code	Subject	Credit Units
APH2013	**Pharmaceutical Unit Operations**	4

	This subject emphasises the application of engineering principles in the unit operations commonly employed in the upstream, pharmaceutical industry. Topics covered include reagent handling, dissolution, extraction, distillation, crystallisation, filtration and drying. The subject also covers the various fractionation processes and mechanical operations including solids handling, sieving, milling and comminution. Commonly used equipment in pharmaceutical manufacturing will also be introduced.	
APH3015	**Biopharmaceutical Processing** This subject provides an overview of biopharmaceutical processing. It also covers the fundamental knowledge, applications and legislative requirement of biosafety, biosecurity and risk assessment relating to management of biological and other hazards.	**5**

YEAR 1 YEAR 2 YEAR 3 **TPFUN**

You will also take this set of subjects that equips you with the crucial 21st-Century life skills you need to navigate the modern world as an agile, forward-thinking individual and team player.

TP Fundamentals (TPFun) Subjects

Subject Code	Subject	Credit Units
ASI3028	**Student Internship Programme** This structured programme is designed to link your learning with the real work environment. You will be placed in organisation(s) with opportunities to apply the concepts and skills acquired in the course of your study. Besides reinforcing technical concepts and mastering of skills in areas that you have been trained, the practical training will enable you to build important skills	**16**

	such as problem-solving, communication, teamwork, and to cultivate good attitude and a strong work ethic.		
ATX1001	**Effective Communication** This subject introduces the fundamentals of effective communication. It also covers how to communicate with and convince an audience through writing and speaking tasks. The skills in this subject will include the application of strategies for communication, appropriate vocabulary, language features, visual aids, tone and style. The **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) framework will also be applied when planning and engaging in written and verbal communication. There will be opportunities to communicate and collaborate through active learning activities, apply digital and information literacy skills and build competence through self-directed learning.	**3**	
ATX1002	**Professional Communication** This subject covers professional communication skills for the workplace and employability skills in the areas of career preparation. It covers communication and interpersonal skills, including effective virtual communication etiquette, and conducting oneself professionally in the workplace. In addition, essential career preparation skills such as resume writing and interview skills, needed to seek and secure work would be included. The **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) framework would also be applied when engaging in written and verbal communication. There will be opportunities to communicate and collaborate through active learning activities, apply digital and information literacy skills and build competence through self-directed learning.	**3**	

GTP1301	**Current Issues & Critical Thinking** This subject covers current issues, including diverse local and global concerns, that will impact lives and may have critical implications for Singapore. There will be opportunities to build competence through self-directed learning, communicate and collaborate in active discussions and objectively analyse issues using digital and information literacy skills and critical thinking scaffolds.	**3**	^
GTP1201	**Career Readiness** This subject focuses on personal management skills. It develops an understanding of one's career interests, values, personality and skills for career success. It covers the necessary knowledge, skills and attitudes needed to succeed in the workplace and achieve professional goals. There will be exposure to apply digital and information literacy skills, build competence through self-directed learning methods, and acquire the skills of being a lifelong learner.	**1**	^
GTP1202	**Career Management** This subject focuses on career management skills. It covers the importance of workplace readiness skills to adapt and respond to the changing job market environment. Career ownership and continuous learning for lifelong employability will be emphasised. There will be exposure to apply digital and information literacy skills, build competence through self-directed learning, and acquire the skills of being a lifelong learner.	**1**	^
AGS1002	**Global Studies** This subject provides essential skills and knowledge to prepare students for an overseas experience. They will examine the elements of culture and learn the key principles of cross-cultural communication. In addition,	**3**	^

	they will gain an appreciation and awareness of the political, economic, technological and social landscape to function effectively in a global environment. The subject prepares students to be responsible global citizens and leaders who can contribute to the global community through effective communication and collaboration.		
GTP1302	**Guided Learning***	**3**	^
	The subject introduces students to the concepts and process of self-directed learning in a chosen area of inquiry. The process focusses on four stages: planning, performing, monitoring and reflecting. Students get to plan their individual learning project, refine and execute the learning plan, as well as monitor and reflect on their learning progress and project. The learning will be captured and showcased through a curated portfolio. The self-directed learning project will broaden and/or deepen a student's knowledge and skills. Students will enhance their problem solving and digital literacy skills through this subject.		
AIN1001	**Innovation & Entrepreneurship**	**2**	^
	The subject is designed for learners from all disciplines to embrace innovation in either their specialised field or beyond. Learners will be taught to apply the Design Thinking framework to develop problem statements, ideate and identify feasible solutions. Learners will be exposed to several tools for prototyping. In addition, commercial awareness will be imbued in learners through various innovation and entrepreneurship concepts or tools. This subject also prepares students to be self-directed lifelong learners who are digital and information literate. It nurtures communicative and collaborative citizens who can use objective analysis in problem-solving.		

GTP1101	**Leadership Fundamentals** This subject focuses on self-leadership based on the values of integrity, respect, and responsibility. Increasing awareness of self and others will lay the foundations for personal and relationship effectiveness. Consequential thinking, clear articulation of personal values and visions, emphatic listening, and collaboration in serving others are some of the essential skills covered in this leadership journey. There will be opportunities to build and to apply the concepts of being a values-centred leader.	**2**	^
GTP1102	**Leadership in Action** This subject focuses on Service Learning as an experiential platform to apply the tenets of Self and Team Leadership. Service Learning will be the capstone project for this subject, which will require an analysis of the diverse needs of the community, collaboration with community partners and demonstration of learning, including key elements of empathy. There will be opportunities to build and to apply the concepts of being a values-centred leader.	**1**	^
LSW1002	**Sports & Wellness** The subject enables students to build a good foundation for healthy living. Students will have the opportunity to participate in hands-on practical sessions where they will experience and develop both physical and technical skills in their chosen sports or fitness activities. Through a structured curriculum that facilitates group participation, practice sessions and mini competitions, students will be able to build lifelong skills such as resilience, leadership, communication and teamwork. Physical activity sessions will also be supplemented by health-related topics that span the dimensions of health, such as diet, nutrition, stress and weight	**2**	^

	management, to provide students with a holistic approach to healthy living. This subject also prepares students to be self-directed and accountable for lifelong learning for good health.		
TGS1001	**Sustainability & Climate Action*** This subject prepares students to be responsible global citizens and future leaders who can contribute to the global community. It introduces the topics of sustainability and explores how human societies can act to build a sustainable future. This subject focuses on the impact of climate change, potential solutions to climate change, and the future of the green economy from global and local perspectives.	**3**	

** Students must choose to take either **Sustainability & Climate Action** or **Guided Learning**.*

GRADUATION REQUIREMENTS

Cumulative Grade Point Average	min 1.0
TP Fundamental Subjects	40 credit units
Diploma Subjects - Core Subjects	71 credit units min
Diploma Subjects - Elective Subjects	9 credit units
Total Credit Units Completed	min 120 credit units