School of Applied Science

Contents

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The School offers five courses in food, chemical and life sciences, aimed at nurturing a passion for science and research in you, and preparing you for a rewarding career in the vibrant food, healthcare, chemical and life sciences industries, as well as further studies. Our ability-driven curriculum strives to develop competence, character and change-readiness to enable you to stay relevant and competitive in a rapidly changing global world.

Learning at the School of Applied Science (ASC) is practical, immersive and engaging. Through Problem-based Learning (PBL), the Student Internship Programme, Differential Research Programme (DRP), major projects and practicum at our learning enterprises (ice cream factory, animal clinic and central kitchen), you will develop critical thinking as well as interpersonal and problem-solving skills that are vital for success in the dynamic global economy. A strong emphasis on hands-on applications means that you will get the opportunity to integrate and apply your knowledge and skills in a real work environment. In addition, the online delivery mode, in the form of interactive course materials and e-lectures, enables you to access online resources and learn at your own pace and convenience.

The School also encourages your participation in competitions and involvement in programmes such as the Overseas Community Projects and the Student Leadership Programme. These, together with core subjects such as Leadership: Essential Attributes & Practice (LEAP) and Communication Skills, provide our students with a holistic curriculum. To keep abreast of the latest developments, the School has carved out niche areas in applied research that contribute to the professional growth of its staff and enhance students' learning. Some of the areas of research or student projects are in Traditional Chinese Medicine, membrane technology, plant technology, proteomics, microbiology and immunology, nanotechnology, analytical services, aquaculture, environment and water technology, baking science and technology, hydroponics and applied food science and nutrition research. These research projects, often undertaken with industrial involvement, open up a common ground for multi-disciplinary technical teams to collaborate and innovate.

Centres of Innovation

Centre of Innovation for Complementary Health Products (COI-CHP)

The establishment of the COI is a major milestone in TP's journey of supporting the modernisation of the complementary health products industry through technology innovation. In line with the national agenda, the COI will focus on Traditional Medicine research and product development related to ageing. It will benefit the CHP industry by providing consultancy and technical services, conducting training for the CHP workforce, and developing shared facilities and resources for CHP enterprises.

Centres of Excellence

Centre for Aquaculture & Veterinary Science (CAVS)

This new Centre will provide students with engaging and experiential learning in skills related to animal wellness, veterinary care and support for pet animals, research on marine and freshwater species for growth and development as well as animal model studies for biomedical research.

Centre for Applied Nutrition Services (CANS)

With an integrated team of experts, this Centre provides consultancy services in food, nutrition and culinary applications to the various food and health-related industries. The Centre's facilities include the Applied Nutrition Research Facility, Glycemic Index Research Unit and the Food and Culinary Applied Research Facility.

Centre for Molecular Diagnostics (CMD)

This Centre is a 'makerspace' serving the Surge Research and Education (SuRE) Programme. It focuses on creating point-of-care (POC) diagnostics and setting testing standards. The Centre is currently growing capabilities in real-time PCR, NGS, MALDI-ToF-MS, OIA wafer/paper-based low cost diagnostics, BioDot, etc.

A key contributor to the School's Research, Innovation and Enterprise activities, the Centre also supports the SkillsFuture initiative by strengthening pre-employment training for industry, as well as continuing education training (eg in the areas of biological testing and biosensor workshops). Industry partnership and projects include: OIA Food Toxin Test Kit (DSO/MINDEF/NEA), Continuous Flow Microfluidics (DSO, EHI, NEA, SIMTech), Multiplex Diagnostic Kit for Malaria (MOE-TIF), Kidney Panel Markers & Gout (MOE-TIF), and Thermo Fisher Scientific (biological testing capability partner).

Centre for Urban Sustainability (CUS)

This new Centre will be aligned in accordance with the National Research Foundation RIE 2020 Urban Solutions and Sustainability as well as Advanced Manufacturing (Advanced Materials) technology sectors. The Centre shall focus primarily on three scientific RIE thrusts, namely:

1. solid waste recycling for strategic building materials
2. renewable resources as functional materials
3. food waste reduction and recycling

The Centre will serve as a platform for enhanced industry engagement and students' training in real-life industry-driven projects. In addition to serving TP RIE's technology thrusts, the centre also plans to set up new CET programmes with corporate partners in the near future, in areas such as characterisation of urban wastes and by-products, materials formulation, testing and certification together with workplace safety for life science, building and infrastructure as well as chemical industries.

Learning Enterprises

TP Animal Clinic

The TP Animal Clinic, licensed by the Agri-Food & Veterinary Authority in May 2011, serves to provide real-life training for Veterinary Technology students. Working under close supervision of our veterinarian staff, the students prepare the animals for sterilisation as well as provide essential veterinary assistance required for pre-and post-surgery and anaesthesia procedures. The students are also directly involved in animal monitoring and recovery. Apart from offering animal sterilisation services to the public, both the Cat Welfare Society and SPCA work closely with the TP Animal Clinic on stray animal sterilisations.

TP Animal Wellness Facility

The first animal wellness and rehabilitation training facility as a learning enterprise in an Institute of Higher Learning in Singapore. Specialised amenities are available for enabling animal wellness exercises such as hydro and physiotherapy, basic pet grooming, nutrition counselling and planning of individual animal wellness and nutrition programmes.

Bistro Lab (Central Kitchen) & CU2⁺ (Staff Lounge)

Bistro Lab is based on a fast and casual dining concept to deliver orders quickly and for customers to receive good quality menu items. The menu offered at the hot section are set lunch meals and grab-and-go food items, whilst the bakery section offers a range of breads, cakes, and pastries, all with the option to take away. As one of the main objectives is to promote healthier eating, the cafeteria influences customers and 'nudges' them into selecting the healthier options. These 'nudges' include setting a reasonable or cheaper price for much healthier options, placing healthier options at a more convenient reach for customers, offering vegetables as a default side dish for set meals, and using descriptive menu labels, as some of the environmental cues. The staff lounge CU2⁺ is a dining space above the Bistro Lab for staff and their guest to dine in.

Off-site Facilities

TP-Blue Aqua Research & Breeding Centre

Blue Aqua International Pte Ltd has set up a joint research and training centre both at TP and their local farm. The Blue Aqua-Temasek Polytechnic Research Centre at the shrimp breeding farm creates opportunities for our students to have hands-on training in shrimp breeding, broodstock development and hatchery as well as farm operation and management.

TP-Apollo Live Feed Research & Production Station

ASC is partnering with APOLLO Aquarium, one of the oldest ornamental fish farms with more than 40 years' experience in the ornamental fish trade. This partnership has resulted in the establishment of a live feed R&D lab for both freshwater fish and marine foodfish fry. The joint partnership between APOLLO and ASC would eventually lead to a scale up of the live feed production for commercialisation to both local and regional fish farms in the near future. Being a one-stop centre for aquaculture R&D, ASC adopts an industry-centric approach in addressing the needs of both freshwater and marine food fish sectors. A collaboration such as this helps companies to innovate and stay competitive in the aquaculture industry.

TP-Lubitrade Ubin Aquaculture Research Station

To enhance farm productivity and management, ASC and Lubritrade Ocean (Ubin) Pte Ltd have set up the first-of-its-kind aquaculture field laboratory in a commercial farm setting at sea. ASC has the advantage to access 500 m² of farm space and work closely with the farm to conduct field tests, while Lubritrade Ocean can leverage on the R&D capabilities of ASC to better manage the health and nutrition of fish food. TP is the first & only polytechnic to have an off-shore aquaculture research station at a floating foodfish farm, where students apply what they learn about aquaculture, aquatic care and disease control/prevention, farm operation and management at the farm. The natural sea water conditions in net cage farming provides excellent testbed conditions for ASC to do translational aquaculture research. This also enables ASC to develop more realistic solutions to address the needs of the local fish farmers.

TP-Oceanus Innovation Centre @Xiamen

Oceanus Group Ltd is collaborating with TP on aquaculture technology and R&D. Oceanus Group Ltd is a Singapore listed company and the largest land-based abalone producer in China with an annual production of 137.9 million abalones using the tank system. Oceanus signed an MOU with ASC to conduct research in improving the quality and production of abalone. The R&D focuses on aquaculture nutrition, disease and detection, treatment and prevention, broodstock and seedstock growth.

Special Facilities

Agilent Partner Laboratory @ TP

This Lab brings together cutting-edge chemical analytical and bio-analytical technologies from Agilent and resources from TP to help businesses, in particular those that develop, manufacture or distribute traditional medicine and food products. Chemists at this Lab are able to conduct tests to screen, detect, identify and quantify chemicals in ingredients and products at various stages of the chain – from product innovation to quality control, from trace substance screening and identification to product authentication.

Blue Aqua Research Centre @TP

See description under TP-Blue Aqua Research & Breeding Centre.

APEC Centre @TP for Sustainable Development in Agriculture & Fishery Sectors

In November 2017, TP's Centre for Aquaculture and Veterinary Science was appointed as the Technology Resource Centre for the Asia Pacific Economic Cooperation (APEC) Policy Partnership on Food Security for the sustainable development of agricultural and fishery sectors. The appointment opens up opportunities for staff from different technical domains to work together in innovative R&D and contract services in the area of agrotechnology.

Minimum Entry Requirements

DIPLOMAS	MINIMUM ENTRY REQUIREMENTS	
To be eligible for: • [T33] Chemical Engineering • [T26] Food, Nutrition & Culinary Science • [T64] Medical Biotechnology • [T25] Pharmaceutical Science • [T45] Veterinary Technology	English Language (EL1) Mathematics (E or A) Any one of the following subjects Biology, Biotechnology, Chemistry, Combined Science, Food & Nutrition, Physics / Engineering Science, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry) / Physical Science Any two other subjects, excluding CCA	Grades 1 - 7 Grades 1 - 6 Grades 1 - 6 -

For details on ELR2B2 computation, visit: **www.tp.edu.sg/elr2b2**

Chemical Engineering

Oil refinery giants, major manufacturers of petrochemicals, specialty chemicals and pharmaceutical giants all have a strong presence in Singapore. These companies, rooted in such diverse fields, have one thing in common – they rely on chemical engineers in all aspects of their operations.

Chemical engineers are involved in the manufacture of products such as fuel, cosmetics, petrochemicals, plastics, processed foods and medicine so that we can enjoy and reap the benefits of scientific discoveries. They hold crucial responsibilities in the process industry such as running plant operations, designing reactors and process equipment, improving efficiency as well as looking into the safety and environmental aspects of processes.

This course will equip you with knowledge and skills in chemistry and analytical chemistry, and laboratory techniques so that you will be well trained to do research and testing for the Chemical and Pharmaceutical Industry. Moreover, you will be trained in chemical process technology, occupational safety and health, as well as environmental technology, so that you will be able to operate and optimise manufacturing systems that produce the products that we use every day in a safe and environmentally friendly way.

The extensive scope of this course will prepare you for higher education. Besides the National University of Singapore and Nanyang Technological University, you can also enrol in the Singapore Institute of Technology for further studies. You will have opportunities for local or overseas internships at multinational corporations and reputable institutions.

Career Opportunities

Trained to be versatile, you can conduct research or testing in laboratories, or be involved in production and technical sales in a broad range of companies in various industries. Specifically, you can embark on a rewarding career in Singapore's world-leading energy and chemical industry. Alternatively, you can consider a fulfilling career in the fast growing pharmaceutical and biotechnology industry, which produces medicines used by doctors worldwide to improve patients' quality of life.

Graduation Requirements

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

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on "Admission and Requirements". For international students, please refer to the section on "Information for International Students".

Entry Requirements for Singapore-Cambridge GCE O Level Qualification Holders

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.

For details on GCE O Level Minimum Entry Requirements, refer to page 6.

Course Structure

TP FUNDAMENTALS (TPFun) SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACS1005	Communication & Information Literacy (IComm)	1	2
ACS1006	Workplace Communication (WkComm)	1	2
ACS1007	Persuasive Communication (PComm)	1	2
AGS1002	Global Studies	1	3
AGS1003	Managing Diversity at Work*	1	3
AGS1004	Global Citizenship & Community Development*	1	3
AGS1005	Expressions of Culture*	1	3
AIN1001	Innovation & Entrepreneurship	1	2
GCC1001	Current Issues & Critical Thinking	1	2
LEA1011	Leadership: Essential Attributes & Practice 1	1	1
LEA1012	Leadership: Essential Attributes & Practice 2	1	1
LEA1013	Leadership: Essential Attributes & Practice 3	1	1
LSW1002	Sports & Wellness	1	2
MCR1001	Career Readiness 1	1	1
MCR1002	Career Readiness 2	1	1
MCR1003	Career Readiness 3	1	1
TGL1001	Guided Learning	1	3
ASI3028	Student Internship Programme	3	16

** Students must choose one of these three subjects or TGL1001 Guided Learning.*

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABM1004	Basic Microbiology	1	3
ACE1002	Thermodynamics	1	4
ACE1003	Mass & Energy Balance	1	4
ACH1008	Principles of Organic Chemistry	1	4
ACH1009	Principles of Inorganic & Physical Chemistry 1	1	4
ACH1010	Principles of Inorganic & Physical Chemistry 2	1	4
AMA1006	Engineering Mathematics 1	1	4
AMA1007	Applied Mathematics	1	3
ACE2002	Environmental Technology	2	4
ACE2009	Occupational Safety & Health	2	4
ACE2011	Unit Operations 1	2	4
ACE2012	Unit Operations 2	2	4
ACE2013	Chemical Reaction Engineering	2	4
ACE2014	Productivity Improvement	2	2
ACE2015	Process Control & Instrumentation	2	4
ACH2004	Principles of Instrumental Analysis	2	4
AMA2002	Engineering Mathematics 2	2	3
AMP3008	Major Project	3	8

DIPLOMA SUBJECTS – ELECTIVE CLUSTER SUBJECTS

Students will be required to read an Elective Cluster offered by the School and complete a minimum of 9 credit units. The Elective Cluster to be offered by the course, and the subjects under this Cluster, are summarised below.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
Applied Chemistry			
ACE3012	Chemical & Material Testing	3	4
ACH3005	Laboratory Analysis & Management	3	5
Chemical Processing			
ACE3004	Plant Safety & Loss Prevention	3	4
ACE3013	Petrochemical Plant Processes	3	5
Pharmaceutical & Biologics Technology			
APH3014	GMP in Pharmaceuticals/ Biologics	3	4
APH3015	Biopharmaceutical Processing	3	5

Food, Nutrition & Culinary Science

"TP's student interns are able to work independently with minimum supervision. They possess good technical knowledge and are able to carry out assignments competently. They demonstrate good service awareness and work well in the team throughout the attachment period."

Ms Sharon Suniega
R&D Manager
Lacto Asia Pte Ltd

What's in your favourite snack of crisps or instant noodles? Why do food manufacturers add chemicals to our packaged food? What safeguards are in place to ensure quality and food safety? Are the tastiest foods also the "unhealthiest"? What makes the "healthy" so beneficial for us?

Consumer interest in, and desire for, healthier snacks and meals are fuelled by easy access to information about food, shifting demographics, the mainstream acceptance of wellness ideals and changing eating habits. With improving awareness about the impact of diet on health, the high prevalence of lifestyle diseases and the ever-increasing healthcare costs, there is a big demand for tasty yet healthier food. Food must look as good as it tastes .... and taste as good as it looks!

This course explores these issues and more, as students receive practice-oriented training and learn to integrate food science, nutrition and culinary disciplines in their work. They will discover the science behind food and how its components react with each other and impact our health. Equipped with basic culinary and baking skills, students will learn how to develop innovative, healthier and safer food as well as plan and evaluate meals for different population groups.

Elective subjects in applied nutrition, food technology and central kitchen technology allow students to pursue their passion and deepen their knowledge and skills in these respective areas. The food science and technology subjects will equip them for the challenging food industry in developing innovative, healthier and safer foods – through the use of the latest processing technology, functional food ingredients and techniques of preservation. The nutrition and health-related subjects will provide them with the knowledge and skills to create and evaluate healthier meals for different population groups, assess their nutritional status, develop nutrition education programmes, and manage diet-related diseases. The culinary subjects give students a firm foundation in cooking and baking, an appreciation of our heritage cuisine and the use of modern catering technology to support efficient mass food production in a central kitchen setting.

With a curriculum designed to meet the skills and competencies detailed in the Skills Framework, opportunities for local and global internships and real-world collaborative projects with the industry, our students are made career-ready for the food and healthcare industries.

Career Opportunities

Our graduates can embark on a career in the food and healthcare industries. You may be employed as an assistant food technologist, QA/QC executive, nutrition/dietetic technologist, nutrition/health educator or junior R&D chef.

Graduation Requirements

Cumulative Grade Point Average : min 1.0
TP Fundamentals Subjects : 40 credit units
Diploma Subjects
  Core Subjects : 63 credit units
  Elective Subjects : min 17 credit units
Total Credit Units Completed : min 120 credit units

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Entry Requirements for Singapore-Cambridge GCE O Level Qualification Holders

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.

For details on GCE O Level Minimum Entry Requirements, refer to page 6.

Course Structure

TP FUNDAMENTALS (TPFun) SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACS1005	Communication & Information Literacy (IComm)	1	2
ACS1006	Workplace Communication (WkComm)	1	2
ACS1007	Persuasive Communication (PComm)	1	2
AGS1002	Global Studies	1	3
AGS1003	Managing Diversity at Work*	1	3
AGS1004	Global Citizenship & Community Development*	1	3
AGS1005	Expressions of Culture*	1	3
AIN1001	Innovation & Entrepreneurship	1	2
GCC1001	Current Issues & Critical Thinking	1	2
LEA1011	Leadership: Essential Attributes & Practice 1	1	1
LEA1012	Leadership: Essential Attributes & Practice 2	1	1
LEA1013	Leadership: Essential Attributes & Practice 3	1	1
LSW1002	Sports & Wellness	1	2
MCR1001	Career Readiness 1	1	1
MCR1002	Career Readiness 2	1	1
MCR1003	Career Readiness 3	1	1
TGL1001	Guided Learning	1	3
ASI3031	Student Internship Programme	3	16

** Students must choose one of these three subjects or TGL1001 Guided Learning.*

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABC1011	Fundamental Culinary Techniques	1	4
ABC1012	Fundamental Baking Techniques	1	4
ACH1009	Principles of Inorganic & Physical Chemistry 1	1	4
AFS1001	Food Chemistry	1	5
AMA1004	Statistics for Applied Science	1	3
AMB1004	Basic Microbiology	1	3
ANT1002	Basic Nutrition & Food	1	4
ANT1004	Basic Anatomy & Physiology	1	3
AFS2007	Food Additives	2	4
AFS2009	Sensory Science	2	4
AFS2011	Food Preservation	2	4
AFS2012	Food Safety Management	2	4
ANT2011	Nutrition Across the Life Span	2	4
AFS3008	Product Development & Marketing	3	5
AMP3016	Major Project	3	8

DIPLOMA SUBJECTS – ELECTIVE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABC2022	Heritage Cuisine	2	4
ABC2023	Catering Technology	2	4
ACH2004	Principles of Instrumental Analysis	2	4
AFS2010	Food Quality Assurance	2	4
ANT2009	Community Health & Nutrition	2	4
ANT2010	Principles of Biochemistry & Physiology for Nutrition	2	4

DIPLOMA SUBJECTS – ELECTIVE CLUSTER SUBJECTS

Students will be required to read an Elective Cluster offered by the School and complete a minimum of 9 credit units. The Elective Cluster to be offered by the course, and the subjects under this Cluster, are summarised below.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
Food Technology			
AFS3009	Food Packaging Technology	3	4
AFS3010	Food Processing Technology	3	5
Applied Nutrition			
ANT3004	Practical Sports Nutrition	3	4
ANT3005	Clinical Nutrition & Dietetic Practice	3	5
Central Kitchen Technology			
ABC3010	Central Kitchen Operations	3	7
ABC3011	Productivity Management	3	2

Medical Biotechnology

Cell therapy, personalised medicine, regenerative medicine, drug discovery, clinical diagnostics, genetic engineering – do these terms excite you? Do you want to be involved in the research and development that leads to new biological discoveries for improving healthcare and our everyday life? Or do you want to play a part in assisting medical doctors' diagnosis through performing a range of laboratory tests to help identify diseases? If your answer is yes, this course is for you.

The future of medicine relies on biotechnology. Demand for more sensitive and earlier detection tests will continue to fuel the biotechnology industry. This course provides detailed knowledge of key concepts in cell technology, molecular analysis, microbiology technology, biochemical analysis, clinical diagnostics, and how these approaches are applied in areas relevant to medical applications such as restoring functions of tissues or organs that are injured or diseased, using stem cells to treat diseases, developing customised treatment to individual patient, performing tests to assist medical doctors' diagnosis, etc.

Not only does this course equip you with broad theoretical knowledge and critical understanding of principles in biotechnology and clinical diagnostics, but it also helps you to gain the practical skills required to underpin a career within a research or clinical environment. You will also be exposed to new emerging technologies, such as stem cell therapy, point-of-care diagnostic testing, and personalised medicine research that would transform medicine and revolutionise the healthcare system.

After developing a solid foundation in biotechnology and clinical diagnostics in the first three semesters, you will choose one of the two diploma options in the 4th semester. The Personalised Medicine Research option mainly trains you to be research and production technologists in research institutes and biotechnology companies. The Medical Laboratory Technology option mainly trains you to be clinical technologists working in hospital clinical laboratories.

The elective subjects that you will take in the third year will allow you greater specialisation in your selected field, especially in the areas of translational medical research or clinical laboratory practice. To further hone your technical skills, you will undergo a six-month attachment either locally or overseas in the clinical laboratories, or biotechnology and biomedical industries.

Career Opportunities

Our graduates have found work in research institutions (both A*STAR and non-A*STAR), universities, hospitals, biotechnology companies and also government ministries and statutory boards. You may also work as a medical laboratory technologist at hospitals, clinical research technologist assisting in pre-clinical trials at contract research organisations, or in laboratory operations and maintenance at research and teaching institutions. Your solid broad-based training will also enable you to be employed as a marketing or product specialist for life sciences instruments and products. The laboratory skills and knowledge gained by our graduates are applicable worldwide.

Graduation Requirements

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

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Entry Requirements for Singapore-Cambridge GCE O Level Qualification Holders

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.

For details on GCE O Level Minimum Entry Requirements, refer to page 6.

Course Structure

TP FUNDAMENTALS (TPFun) SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACS1005	Communication & Information Literacy (IComm)	1	2
ACS1006	Workplace Communication (WkComm)	1	2
ACS1007	Persuasive Communication (PComm)	1	2
AGS1002	Global Studies	1	3
AGS1003	Managing Diversity at Work*	1	3
AGS1004	Global Citizenship & Community Development*	1	3
AGS1005	Expressions of Culture*	1	3
AIN1001	Innovation & Entrepreneurship	1	2
GCC1001	Current Issues & Critical Thinking	1	2
LEA1011	Leadership: Essential Attributes & Practice 1	1	1
LEA1012	Leadership: Essential Attributes & Practice 2	1	1
LEA1013	Leadership: Essential Attributes & Practice 3	1	1
LSW1002	Sports & Wellness	1	2
MCR1001	Career Readiness 1	1	1
MCR1002	Career Readiness 2	1	1
MCR1003	Career Readiness 3	1	1
TGL1001	Guided Learning	1	3
ASI3027	Student Internship Programme	3	16

** Students must choose one of these three subjects or TGL1001 Guided Learning.*

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABT1001	Cell Biology	1	4
ACH1009	Principles of Inorganic & Physical Chemistry 1	1	4
AMB1002	Human Anatomy & Physiology	1	5
AMB1004	Basic Microbiology	1	3
AMT1001	Biochemistry	1	5
AMT1002	Cell Technology	1	3
AMT1003	Molecular Biology	1	5
ABM2016	Biological Data Analysis	2	5
AMT2001	BioAnalytical Technology	2	5
AMT2002	Molecular Diagnostic Technology	2	5
AMT2003	BioApplication	2	4
AMP3017	Major Project	3	8

DIPLOMA SUBJECTS – OPTION SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABM2014	Clinical Chemistry	2	5
ABM2017	Histopathology	2	5
AMB2008	Clinical Microbiology	2	5
APM2001	Stem Cells & Tissue Engineering	2	5
APM2002	Synthetic Biology	2	5
APM2003	Systems Biology	2	5

DIPLOMA SUBJECTS – ELECTIVE CLUSTER SUBJECTS

Students will be required to read an Elective Cluster offered by the School and complete a minimum of 9 credit units. The Elective Cluster to be offered by the course, and the subjects under this Cluster, are summarised below.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
Clinical Laboratory Practice			
AMT3001	Blood Banking	3	4
AMT3002	Haematology	3	5
Translational Medical Research			
AMT3003	Translational Medical Science	3	9
Free Electives			
APH3004	Pharmaceutical Manufacturing Technology	3	4
APH3011	Current Good Manufacturing Practice & Process Improvement	3	4

Pharmaceutical Science

"The students from Temasek Polytechnic are generally well-rounded in terms of communication skills and clinical knowledge. The curriculum is well-balanced enough to provide sufficient coverage as well as depth to adequately equip the students for the internship programme."

Esther Ang Pei Jing
Outpatient Pharmacy
KK Women's & Children's Hospital

Do you have a passion to safeguard health by making quality drugs and imparting knowledge on the safe use of medicines? If so, this course is for you! You will learn about the effects of medicines on the human body and how they work to cure diseases, and acquire the knowledge and skills required to design, analyse, manufacture and market new therapies for diseases.

With a rapidly growing ageing population and higher incidence of lifestyle-related illnesses such as Type 2 diabetes and heart diseases, there is an increase demand for healthcare services, pharmaceutical and biologic drugs. Singapore has positioned herself to be a regional biomedical hub and has committed S$3.7 billion to the biomedical industry, attracting leading biopharmaceutical companies to make Singapore their global manufacturing base and creating many job opportunities in these industries. In addition, with new hospitals, polyclinics and nursing homes in the pipeline, there will also be an unprecedented need for pharmacy technicians and pharmacists in Singapore to work in this industry.

This course will build your foundation in chemistry and biology, and equip you with the knowledge and core skills in pharmacy practice, pharmaceutical and biopharmaceutical technologies and analysis. You will learn specialised subjects related to drug action on diseases, medicine legislations and patient counselling to prepare you for work in pharmacies. You will also learn about pharmaceutical manufacturing and bioprocessing technologies and good manufacturing practice.

In your third year of study, you can choose to specialise either in the Pharmacy Practice or Pharmaceuticals and Biologics elective cluster, where you will deepen your knowledge in these areas and apply your skills in the relevant fields during the six-month enhanced internship programme. You will be able to take up an internship position at hospitals, retail pharmacies, pharmaceutical manufacturing industry, or QC and research laboratories in Singapore or overseas. The internship enables you to apply theory to practice on real industry projects. During the course of your study, you can also take part in research projects offered by the school or research institutes in various research topics such as pharmaceutical science, analytical science, biologics and traditional medicine.

As part of the government's SkillsFuture initiatives to encourage continuing education and skill mastery, Continuing Education and Training (CET) programmes such as the Attach-and-Train for Biologics Sector and Advanced Diploma in Pharmaceutical Sciences as well as many other modular courses have been launched, providing ample opportunities for our Diploma in Pharmaceutical Science graduates to deepen and upgrade their skills.

Career Opportunities

Graduates can work as pharmacy technicians in hospitals, community and retail pharmacies, QA/QC assistants to conduct analysis and quality checks on finished pharmaceutical products or production technicians to manufacture drugs in the pharmaceutical and biopharmaceutical industry. For the research-inclined, you can also join research institutes or pharmaceutical companies to assist in research work on drug development and clinical trials. You can also embark on a career in technical sales and marketing for pharmaceutical and health products.

Graduation Requirements

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

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Entry Requirements for Singapore-Cambridge GCE O Level Qualification Holders

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.

For details on GCE O Level Minimum Entry Requirements, refer to page 6.

Course Structure

TP FUNDAMENTALS (TPFun) SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACS1005	Communication & Information Literacy (IComm)	1	2
ACS1006	Workplace Communication (WkComm)	1	2
ACS1007	Persuasive Communication (PComm)	1	2
AGS1002	Global Studies	1	3
AGS1003	Managing Diversity at Work*	1	3
AGS1004	Global Citizenship & Community Development*	1	3
AGS1005	Expressions of Culture*	1	3
AIN1001	Innovation & Entrepreneurship	1	2
GCC1001	Current Issues & Critical Thinking	1	2
LEA1011	Leadership: Essential Attributes & Practice 1	1	1
LEA1012	Leadership: Essential Attributes & Practice 2	1	1
LEA1013	Leadership: Essential Attributes & Practice 3	1	1
LSW1002	Sports & Wellness	1	2
MCR1001	Career Readiness 1	1	1
MCR1002	Career Readiness 2	1	1
MCR1003	Career Readiness 3	1	1
TGL1001	Guided Learning	1	3
ASI3029	Student Internship Programme	3	16

** Students must choose one of these three subjects or TGL1001 Guided Learning.*

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABT1001	Cell Biology	1	4
ACH1007	Organic & Biological Chemistry	1	4
ACH1009	Principles of Inorganic & Physical Chemistry	1	4
AMA1004	Statistics for Applied Science	1	3
AMB1002	Human Anatomy & Physiology	1	5
AMB1004	Basic Microbiology	1	3
APH1001	Principles of Pharmacology	1	3
APH1002	Basic Pathology & Immunology	1	3
APH1003	Introduction to Pharmacy Practice	1	3
AMB2007	Pharmaceutical Microbiology	2	3
APH2001	Pharmaceutical Analysis 1	2	4
APH2009	Pharmacy Practice 1	2	5
APH2010	Pharmacy Practice 2	2	4
APH2011	Bioprocess Technology & Analysis	2	3
AMP3012	Major Project	3	8
APH3004	Pharmaceutical Manufacturing Technology	3	4
APH3011	Current Good Manufacturing Practice & Process Improvement	3	4
APH3012	Pharmaceutical Analysis 2	3	4

DIPLOMA SUBJECTS – ELECTIVE CLUSTER SUBJECTS

Students will be required to read an Elective Cluster offered by the School and complete a minimum of 9 credit units. The Elective Cluster to be offered by the course, and the subjects under this Cluster, are summarised below.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
Pharmacy Practice			
APH2012	Pharmaceutical Legislation, Marketing & Management	2	5
APH3013	Health Management in Patient Care	3	4
Pharmaceuticals & Biologics			
APH2013	Pharmaceutical Unit Operations	2	4
APH3015	Biopharmaceutical Processing	3	5
Free Electives			
ACH1010	Principles of Inorganic & Physical Chemistry 2	1	4
ABT2013	Molecular Biology	2	4
ACE2009	Occupational Safety & Health	2	4
ACE2015	Process Control & Instrumentation	2	4

Veterinary Technology

Achieve your life-long dream of developing vaccines or treatment for animals suffering from diseases or working with animals in the veterinary, aquaculture and wildlife conservation, pet, animal theme park and scientific research communities.

Get a head start by assisting in real life animal sterilisations at TP's licenced TP Animal Clinic and, through our unique collaboration with Mount Pleasant Veterinary Group (2008) Pte Ltd and other animal hospitals, you will be clinically trained in all aspects of veterinary practice. With our intensive and practical training, you will graduate as a technically competent and much sought-after veterinary technologist.

Other than veterinary diagnostics, surgery and anaesthesia assistance, animal nutrition and health, aquaculture and bio conservation, you will also learn about molecular and cellular techniques as well as humane care and use of laboratory animals for scientific and veterinary research. Moreover, the growing importance of aquaculture for food productivity and for meeting the local consumer needs for seafood and fish, will ensure your expertise will be very much in demand in the years ahead. Your technical competency is further honed through a minimum six-month internship either locally or overseas in animal facilities and research institutions, animal or conservation parks, veterinary hospitals/ clinics and other animal-related organisations.

Career Opportunities

Our graduates can work in scientific research, wildlife and marine conservation parks, aquaculture, pet service and related industries, or the veterinary centres. You may be employed as a veterinary technologist in veterinary clinics/ hospitals, or as an animal welfare education officer/ assistant, animal health inspection assistant or animal care and management officer in animal welfare organisations.

Graduation Requirements

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

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

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AGS1004	Global Citizenship & Community Development*	1	3
AGS1005	Expressions of Culture*	1	3
AIN1001	Innovation & Entrepreneurship	1	2
GCC1001	Current Issues & Critical Thinking	1	2
LEA1011	Leadership: Essential Attributes & Practice 1	1	1
LEA1012	Leadership: Essential Attributes & Practice 2	1	1
LEA1013	Leadership: Essential Attributes & Practice 3	1	1
LSW1002	Sports & Wellness	1	2
MCR1001	Career Readiness 1	1	1
MCR1002	Career Readiness 2	1	1
MCR1003	Career Readiness 3	1	1
TGL1001	Guided Learning	1	3
ASI3030	Student Internship Programme	3	16

** Students must choose one of these three subjects or TGL1001 Guided Learning.*

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABM1004	Basic Microbiology	1	3
ABT1003	Biomolecules	1	5
ACH1009	Principles of Inorganic Chemistry 1	1	4
AMA1004	Statistics for Applied Science	1	3
AVT1004	Wildlife Ecology & Conservation	1	2
AVT1006	Animal Anatomy & Physiology	1	4
AVT1007	Animal Nutrition, Feeds & Feeding	1	4
AVT1008	Developmental Biology	1	3
AVT1009	Animal Care, Husbandry & Behaviour	1	3
AVT2006	Veterinary Immunology	2	3
AVT2009	Veterinary Pharmacology & Toxicology	2	3
AVT2012	Molecular & Cell Technology	2	4
AVT2016	Animal Diseases & Clinical Pathology	2	4
AVT2017	Aquatic Care, Health & Diseases	2	3
AVT2018	Clinical Diagnostic Techniques	2	4
AVT2019	Clinical Practicum	2	3
AVT2020	Surgery, Anaesthesia & Veterinary Practices	2	4
AVT2021	Molecular Genetics & Genomics	2	4
AMP3011	Major Project	3	8

DIPLOMA SUBJECTS – ELECTIVE CLUSTER SUBJECTS

Students will be required to read an Elective Cluster offered by the School and complete a minimum of 9 credit units. The Elective Cluster to be offered by the course, and the subjects under this Cluster, are summarised below.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
<u>Veterinary</u>			
AVT3010	Animal Breeding & Reproduction	3	4
AVT3011	Laboratory Animal Science & Technology	3	5
<u>Aquaculture</u>			
AVT3012	Aquaculture Product Quality & Safety	3	4
AVT3013	Aquaculture Technology	3	5

Subject Synopses

ABC1011 Fundamental Culinary Techniques
This subject covers knife skills, basic cooking techniques, operation of kitchen equipment, purchasing, receiving and storage of food. In addition, the fundamentals of ingredient application in various recipes and the scientific principles that underpin everyday cooking will be taught. Proper food hygiene practices and safety in the kitchen will be emphasised in the subject.

ABC1012 Fundamental Baking Techniques
This subject covers the basic baking techniques required for producing various bakery products which include breads, pastries and cakes. Knowledge of bakery equipment operation as well as the scientific principles that are related to ingredient selection and the production process will be taught. Appropriate hygiene practices and safety in the bakery will also be emphasised.

ABC2022 Heritage Cuisine
This subject covers the preparation, presentation and evaluation of local dishes from various ethnic groups in Singapore. The application of culinary skills in the preparation of stocks, soups, sauces, salads, fruits/ vegetables, grains, eggs, poultry, red meat, and seafood will be included.

ABC2023 Catering Technology
This subject covers various technologies used to support the efficient production of foods that are safe and with consistent quality in manpower-lean production environments. Applications of various modern technologies in baking and cooking, food packaging, and shelf-life extension will be highlighted.

ABC3010 Central Kitchen Operations
This subject is designed to provide the necessary practical training in high-volume food production for central kitchens. Topics include quantity food production, event catering and food safety and workplace safety. Fundamental baking and culinary skills will be reinforced and new skills in using commercial equipment for scaled-up production will be taught. Menu items from different cuisines common to fast casual dining will also be covered.

ABC3011 Productivity Management
This subject introduces students to essential concepts of productivity and how it might be used in central kitchen operations to improve performance and productivity. Topics covered include the factors that affect productivity improvement, approaches to productivity measurement and analysis, various practical techniques used in improving productivity as well as case studies.

ABM2014 Clinical Chemistry
This subject focuses on the pathophysiological changes in disease and the application of clinical chemistry concepts for diagnosis, prognosis, monitoring and screening of disease.

ABM2016 Biological Data Analysis
This subject covers the basics and applications of biological data analysis, including biostatistics and application of statistics in clinical and scientific cases. The topics include analysis of variance and t-test alternatives in parametric and non-parametric studies, and the use of survival data.

ABM2017 Histopathology
This subject introduces the basic knowledge of general and systemic pathology, as well as structural and functional abnormalities of organs and organ systems. Basic principles and skills related to histopathological diagnosis will also be covered.

ABT1001 Cell Biology
This subject covers the biology of cells of higher organisms, including structure-function relationships of cellular membranes and internal organelles, cell cycle and nuclear division, transport mechanisms and cell communication, cell motility and the cytoskeleton and cell death. Basic laboratory skills involving the study of cell structures with the use of cell staining techniques and microscopy will also be introduced in this subject.

ABT1003 Biomolecules
This subject introduces the fundamental principles of biochemistry as well as the essential biomolecules present in biological systems. The structures, properties and interactions of biomolecules will be covered. The basic concepts of bioenergetics will also be introduced to illustrate how these interactions lead to life processes.

ABT2013 Molecular Biology
This subject provides you with the basic theoretical and practical knowledge of Molecular Biology. Topics include the molecular biology techniques, gene regulation in eukaryotes, eukaryotic viruses, genetics and cancer.

ACE1002 Thermodynamics
This subject investigates the scientific principles and techniques which are the basic laws of chemical engineering thermodynamics. Further studies into the first and second law of thermodynamics, energy analysis, Gibbs free energy, phase equilibrium and chemical reaction equilibrium will be included.

ACE1003 Mass & Energy Balance
This subject examines the scientific principles and techniques involved in material and energy balances which are the fundamentals of chemical engineering. Topics include the understanding of units, dimensional analysis and material balance with emphasis on application. Ideal and non-ideal gas laws, gas mixtures and psychometrics will also be studied in relation to engineering applications.

ACE2002 Environmental Technology
This subject provides you with the basic scientific knowledge related to environmental problems and environmental control technology. Topics include water treatment, air pollution and pollution control technology, solid waste management, hazardous waste treatment technology, pollution control strategies and environmental monitoring in Singapore.

ACE2009 Occupational Safety & Health
This subject covers health issues and safety at the workplace. The section on health examines the causes of occupational diseases and their respective controls (heat stress/ strain, ventilation, noise and industrial lighting). The section on safety explores topics like machinery safety, electrical safety, hazards of fire and explosion, housekeeping and material handling, personal protection equipment and legislation concerning occupational safety and health.

ACE2011 Unit Operations 1
This subject is a development from basic engineering principles and covers both Newtonian and non-Newtonian flows, basic equations, fluid flow in pipes and fittings as well as fluidisation and filtration. It also covers the principles and operations of pumps, compressors and their performances. Practical are included to enhance understanding.

ACE2012 Unit Operations 2

This subject investigates the fundamental scientific principles and techniques in chemical engineering. Selected unit operations which involve diffusion and gas-liquid mass transfer (absorption and humidification), gas-liquid mass transfer (batch and continuous distillation) and liquid-liquid mass transfer (extraction) are discussed.

ACE2013 Chemical Reaction Engineering

This subject examines the scientific principles behind the kinetics of chemical reactions and techniques which are the basic principles of chemical engineering. Further studies into the characteristics of batch reactors, mixed-flow reactors and plug-flow reactors will be carried out. Differences in the behaviour of ideal and non-ideal reactors are also highlighted.

ACE2014 Productivity Improvement

This subject introduces the concepts and principles of productivity and how it can benefit organisations, in particular, the chemical, pharmaceutical and biologics industry.

ACE2015 Process Control & Instrumentation

This subject covers the basic concepts and principles of process control and instrumentation in chemical process industries. Current journals are used to highlight the latest advancement in process control and instrumentation technologies. Topics include process measuring instruments, basic concept of process control and open and closed-loop control systems. In addition, application of control systems in different aspects of chemical processes is covered.

ACE3004 Plant Safety & Loss Prevention

This subject examines plant and process safety. Emphasis will be on risk assessment, hazard analysis and the concept of loss prevention in the chemical plant.

ACE3012 Chemical & Material Testing

This subject provides key concepts of materials technology and their relevance to the chemical process industry. You will also be exposed to various groups of nano materials, their properties and potential applications. Topics include basic concepts of materials property, types of materials, materials corrosion and prevention, and nanotechnology. It also covers the chemistry of water, including acid/base, precipitation and adsorption.

ACE3013 Petrochemical Plant Processes

This subject covers the production of petrochemicals from various sources, the basic chemistry of petrochemicals, their usefulness and applications. You will also learn about raw materials and their building blocks and the various processes and unit operations involved in the production of petrochemicals. It also covers the classification of industrial wastewaters and the strategies for wastewater treatment to meet trade effluent standards and for resource recovery.

ACH1007 Organic & Biological Chemistry

This subject covers basic knowledge of organic chemistry, constituents of biological systems, their properties and significance to biological science. Topics covered include general organic chemistry, carbohydrates, proteins and enzymes, and lipids.

ACH1008 Principles of Organic Chemistry

This subject covers basic concepts in organic chemistry which correlate the structure of organic molecules with their properties of the functional groups. Topics covered are classification of organic compounds, structure and properties of alkanes, alkenes, alcohols, aldehydes and ketones, carboxylic acids, amines and stereochemistry. Emphasis will be placed on the applications of organic compounds and their derivatives, and their impact on chemical-related industries.

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.

ACH1010 Principles of Inorganic & Physical Chemistry 2

This subject covers theoretical and practical knowledge of inorganic and physical chemistry. Topics include ionic equilibria and calculations, chemical kinetics, chemistry of transition elements and electrochemistry.

ACH2004 Principles of Instrumental Analysis

This subject provides the basic knowledge of the principles and applications of some instruments commonly used in chemical industries. Topics include measurement uncertainty, sampling techniques, sample pre-treatment, ultraviolet-visible spectroscopy, gas chromatography, high performance liquid chromatography and atomic absorption spectroscopy.

ACH3005 Laboratory Analysis & Management

This subject covers the basic principles and applications of some specialised instruments used in analytical laboratories as well as applications of data analysis, method validation, and test method development. It also provides an introduction to laboratory management guidelines and systems, as well as the technical requirements of an accredited laboratory.

ACS1005 Communication & Information Literacy

In this subject, you will learn how to conduct research for relevant information and validate information sources. You will also learn to recognise and avoid plagiarism, and follow standard citation and referencing guidelines when presenting information. In the course of learning, you will be required to plan, prepare and present information appropriately in written and oral form. You will also be taught to consider the **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) when writing and delivering oral presentations.

ACS1006 Workplace Communication

In this subject, you will be taught how to conduct effective meetings while applying team communication strategies and the skills for documenting meeting notes. You will be required to write clear emails, using the appropriate format, language, tone and style for an audience. You will also be taught to communicate appropriately in and for an organisation when using various platforms. In all aspects, the principles of applying **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) will be covered.

ACS1007 Persuasive Communication

In this subject, you will be taught how to use persuasive language in written documents. You will be required to use information to your advantage to verbally communicate and convince an audience about your idea, product or service. Skills such as persuasive vocabulary, language features, graphical illustrations, tone and style would also be covered. The **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) will also be applied when engaging in verbal and written communication.

AFS1001 Food Chemistry

This subject covers the four major components in food, namely water, carbohydrates, fats and oils, and protein. You will investigate the chemical reactions, physical and functional properties of these components.

AFS2007 Food Additives

This subject covers the main additives commonly used in food manufacture. These include emulsifiers, stabilisers and sweeteners. Food regulations on the use of additives will also be covered.

AFS2009 Sensory Science
This subject covers topics such as sensory evaluation and statistical analysis of food products, experimental design and rheology.

AFS2010 Food Quality Assurance
This subject is an integration of food microbiology, food quality control, sampling techniques and quality management system; ensuring quality and safety for compliance with food standards and legislation. Physical, chemical and microbiological testing skills will be taught.

AFS2011 Food Preservation
This subject covers the causes of food spoilage, the use of hurdle technology and evaluation of shelf life. Appropriate food preservation methods and shelf life studies will be taught.

AFS2012 Food Safety Management
This subject covers important and current food safety aspects of the industry, which include Hazard Analysis Critical Control Point (HACCP), current Good Manufacturing Practices (cGMP), genetically modified foods/ingredients, cold chain management and food safety quality management systems.

AFS3008 Product Development & Marketing
This subject covers the fundamentals for developing new food products that fulfil the legislation through the use of suitable ingredients, processing methods and techniques in food preservation. Principles of marketing and product commercialisation will also be covered.

AFS3009 Food Packaging Technology
This subject covers technology development in food packaging. Topics include plastics, metal, glass and paper packaging materials, packaging machineries used in the food industry, packaging techniques, printing methods, active and intelligent packaging.

AFS3010 Food Processing Technology
This subject covers the technology, processing conditions and equipment for selected foods that are produced commercially. Food categories include wheat products, dairy products, fruits and juices. Elements of food engineering, process control and novel processing methods are also introduced.

AGS1002 Global Studies
This subject provides essential skills and knowledge to prepare you for an overseas experience. You will examine the elements of culture and learn the key principles of cross-cultural communication. In addition, you will gain an appreciation and awareness of the political, economic, technological and social landscape to function effectively in a global environment.

AGS1003 Managing Diversity at Work
This subject explores the concepts of identity, diversity and inclusion at the workplace. It examines the relationship between identity and diversity, the benefits and challenges of diversity and the strategies that promote inclusion and inspire collaboration in a diverse workplace. Examples of the elements of diversity covered in this subject include nationality, generation, ethnicity and gender. A one week residential stay is mandatory for this subject.

AGS1004 Global Citizenship & Community Development
Students will examine the meaning and responsibilities of being a Global Citizen, in order to contribute towards a more equitable and sustainable world. In addition, students will learn how sustainable solutions can support community development, and, execute and critique a community action plan that addresses the needs of a specific community/cause.

AGS1005 Expressions of Culture
This subject provides a platform for an understanding of culture and heritage through modes of expression. Students will be introduced to global and local cultures via everyday objects, places and human behaviour seen through time and space. Students will explore issues and challenges in culture and heritage sustainability in community, national and global contexts.

AIN1001 Innovation & Entrepreneurship
The Innovation & Entrepreneurship subject is designed for learners from all disciplines to embrace innovation in either their specialised fields or beyond. You will first learn the Design Thinking framework, where you will develop problem statements and ideate solutions. Next, you will discover the tools for prototyping and innovation, such as 3D printing and laser cutting, at TP's Makerspace+ facility. Finally, you will acquire commercial awareness through the LEAN Startup framework of idea crystallisation, prototype building, customer testing and validation, refinement of business model canvas, and crowdfunding or crowdsourcing avenues.

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

AMA1006 Engineering Mathematics 1
This subject enhances your knowledge of the basic concepts of mathematics and applications in an engineering environment by adopting the problem-solving approach. Topics covered include the types of basic functions, composite and inverse functions, quadratic equations, remainder and factor theorems, partial fractions and basic Calculus.

AMA1007 Applied Mathematics
This subject equips you with the basic applied mathematical concepts and techniques that are essential for your course of study. Topics include the application of statistics and mechanics. The section on statistics covers investigations into basic statistics, sampling distribution, hypothesis testing and analysis of variances. The section on mechanics includes investigations into statistics, kinematics, Newton's Laws of Motion, circular motion and impulses.

AMA2002 Engineering Mathematics 2
This subject, a continuation of Engineering Mathematics 1, equips you with the advanced concepts of engineering mathematics that can be applied to an engineering environment using a problem-solving approach. Topics include types of arithmetic and geometric series, convergence, matrices and transformations, trigonometry and differential equations.

AMB1002 Human Anatomy & Physiology
This subject provides you with a basic understanding of human anatomy and physiology. The topics include anatomy of the organs and organ systems and their functions. It also introduces common terms, concepts, fundamental procedures and applications used in physiology.

AMB1004 Basic Microbiology
This subject investigates the important fundamentals of microbiology and its relevance to the food, biomedical, pharmaceutical and biotechnology industries. It covers the types of microorganisms, their cultivation and growth.

AMB2007 Pharmaceutical Microbiology
This subject covers the applications of microbiology in the pharmaceutical industry and focuses on the microbiological testing of pharmaceutical products and equips students with the skills to perform aseptic dispensing techniques.

AMB2008 Clinical Microbiology
This subject covers the host-microbe interactions with emphasis on infectious diseases in humans. It includes various modes of transmission, diagnosis, prevention and control of infectious diseases caused by bacteria, viruses, fungi and parasites.

AMP3008 Major Project (Chemical Engineering)
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, investigative studies, analysis, interpretation of results, written report and presentation.

AMP3011 Major Project (Veterinary Technology)
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, investigative studies, analysis, interpretation of results, written report and presentation.

AMP3012 Major Project (Pharmaceutical Science)
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, investigative studies, analysis, interpretation of results, written report and presentation.

AMP3016 Major Project (Food, Nutrition & Culinary Science)
This subject covers the essentials required in completing a project through the process of writing a project proposal, performing investigative studies and data analysis, interpretation of results and reporting of outcomes via written report and project presentation.

AMP3017 Major Project (Medical Biotechnology)
This subject covers the essentials required in completing a project through the process of writing a project proposal, performing investigative studies and data analysis, interpretation of results and reporting of outcomes via written report and project presentation.

AMT1001 Biochemistry
This subject introduces the fundamentals of organic chemistry and the essential biomolecules present in biological systems. The structures and properties of biomolecules, as well as the basic concepts of bioenergetics will also be introduced to illustrate how these interactions lead to metabolism.

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.

AMT1003 Molecular Biology
The subject covers the fundamentals of deoxyribonucleic acid (DNA), flow of genetic information, ribonucleic acid (RNA), as well as how processes like replication, transcription and translation operate in prokaryotes and eukaryotes. Basic practical knowledge and molecular laboratory techniques will be introduced.

AMT2001 BioAnalytical Technology
This subject focuses on the applications of immunological, analytical and separation techniques in the field of medical biotechnology. Basic concepts and techniques for extraction, purification and analysis of biomolecules will be covered. An introduction to good manufacturing practice (GMP) is included.

AMT2002 Molecular Diagnostic Technology
This subject covers molecular techniques in analysing DNA, RNA and proteins, as well as diagnostic platforms and instrumentation, which includes assay development, assay criteria and assay validation. It also addresses the regulatory requirements for diagnostic assays and the pathways to commercialisation.

AMT2003 BioApplication
This subject will cover the practices of good documentation and laboratory management, laboratory reagent preparation and research skills. This subject will provide opportunities for conceptualisation of medical biotechnology related project, experimental design and project implementation.

AMT3001 Blood Banking
This subject covers the theoretical, practical and clinical aspects of blood transfusion. Emphasis is given on the application of immunologic principles as applied to blood grouping, antibody screening, identification and compatibility testing. It also stresses on the importance of laboratory quality control and clinical considerations in transfusion practices.

AMT3002 Haematology
This subject covers the theoretical foundation and practical skills in haematology. It includes development of blood cells, diseases and disorders related to blood as well as the bone marrow. It focuses on screening, diagnosis, prognosis and monitoring of haematological diseases and disorders.

AMT3003 Translational Medical Science
This subject equips students with knowledge and skills in conducting translational medical research projects. It covers designing, planning, experimenting, and touble shooting skills for translational medical research projects. It also introduces various data analysis and reporting skills.

ANT1002 Basic Nutrition & Food
Topics covered in this subject include the roles and importance of macro- and micronutrients, energy balance, the nutritive value of food and recent advances in the field of nutrition. You will be provided with basic understanding and application of human nutrition, food and dietary practices in relation to health.

ANT1004 Basic Anatomy & Physiology
This subject covers the structure and functions of important organ systems such as the digestive, endocrine, circulatory, urinary and musculo-skeletal systems. Introductory concepts of enzymology, metabolism and transportation across the biological membrane are also included.

ANT2009 Community Health & Nutrition
This subject focuses on the main public health and nutrition concerns in various community, the risk factors involved and the importance of prevention. It covers the steps involved in the planning and delivery of a health and nutrition promotion program. The methods used to assess the health and nutrition status of a community and the appropriate intervention strategies are also discussed. Research methodology, behavioural change models relating to program design and the delivery of health and nutrition messages in the public setting will be included.

ANT2010 Principles of Biochemistry & Physiology for Nutrition

This subject focuses on basic biochemistry and human physiology concepts. The regulation of the integrative metabolic pathways involving glucose, lipid and protein, and their link to adenosine triphosphate (ATP) synthesis is covered in detail. Principles of enzymatic reactions, function and disorders of the immune system are covered as well.

ANT2011 Nutrition Across the Life Span

This subject focuses on the physiological basis of nutritional requirements and concerns during the life span. Methods for conducting nutrition assessment and interpretation of data using age, gender and population-specific references are covered. Planning meals and evaluating dietary intakes based on nutrition principles, guidelines and standards are also covered.

ANT3004 Practical Sports Nutrition

This subject focuses on the importance of nutrition for optimal sports performance. It covers nutrition requirements pre-, during and post-exercise for various sports. The roles of macro- and micronutrients in sports performance and recovery will be explained. The efficacy and safety of popular dietary supplements and ergogenic aids available in the market will also be considered.

ANT3005 Clinical Nutrition & Dietetic Practice

This subject focuses on the medical nutrition therapy (MNT) of diet-related diseases. It covers the pathophysiology, causes, risk factors, diagnostic criteria and symptoms of obesity and diabetes as well as cardiovascular, renal and gastrointestinal diseases. Evidence-based dietary principles, integrated into the four step nutrition care process (NCP) is the approach used in formulating individualised nutrition care plans for the dietary management of the diseases above. Basic principles of nutrition support are also covered.

APH1001 Principles of Pharmacology

This subject covers the basic principles and knowledge of pharmacology and toxicology. Topics include overview of the drug developmental process, pharmacodynamics, pharmacokinetics, and an overview of toxicology.

APH1002 Basic Pathology & Immunology

This subject introduces general and systemic pathology and the understanding of basic clinical chemistry for screening and monitoring of diseases. Topics include disease mechanisms, structure and functional abnormalities and common clinical chemistry tests.

APH1003 Introduction to Pharmacy Practice

This subject introduces the services provided by pharmacy technicians at hospital and community pharmacies. Topics include drug information resources, good dispensing practice and management of common conditions in therapeutic areas such as nutrition, ophthalmology, otolaryngology and respiratory.

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.

APH2009 Pharmacy Practice 1

This subject equips students with the knowledge and practices on handling clinical enquiries, making appropriate clinical recommendations, processing prescriptions and patient counselling in the therapeutic areas such as dermatology, gastroenterology, endocrinology and infectious diseases.

APH2010 Pharmacy Practice 2

This subject equips students with the knowledge and practices on handling clinical enquiries, making appropriate clinical recommendations, processing prescriptions and patient counselling in the therapeutic areas such as cardiovascular, musculoskeletal, neurology and psychiatry.

APH2011 Bioprocess Technology & Analysis

This subject aims to equip students with the basic knowledge and technical skills to perform mammalian cell culture for upstream biopharmaceutical processes. The subject also covers the molecular and analytical techniques used in the biopharmaceutical industry to measure the quantity and quality of biological products.

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.

APH2013 Pharmaceutical Unit Operations

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.

APH3004 Pharmaceutical Manufacturing Technology

This subject equips you with the fundamental knowledge of pharmaceutical downstream manufacturing processes. Topics covered include industrial aspects of drug production, manufacturing techniques and packaging technologies. It also covers solid, liquid and gaseous dosage formulation design and characterisation. The importance of cGMP and the associated regulatory aspects are also covered.

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.

APH3012 Pharmaceutical Analysis 2

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 optimisation for various applications such as stability testing of pharmaceuticals. Students will perform test samples analysis, interpretation of test results and data analysis.

APH3013 Health Management in Patient Care

This subject focuses on the knowledge, communication and facilitation skills to promote medication adherence, use of health screening and monitoring devices, as well as lifestyle modifications for health and disease management. Students will also be introduced to complementary health approaches and trends in healthcare delivery.

APH3014 Good Manufacturing Practices in Pharmaceuticals/Biologics

This subject provides the fundamental knowledge and applications of cGMP in the pharmaceutical and biologics manufacturing industries. An overview of cGMP, quality systems, documentation and record keeping, laboratory controls, validation and self-inspection are among the topics that will be covered.

APH3015 Biopharmaceutical Processing

This subject provides an overview of the biopharmaceutical processing, with emphasis on the unique separation and purification processes applied in the biopharmaceutical industry. Examples of such unit operations include chromatography, membrane chromatography and cross flow filtration. It also covers the fundamental knowledge, applications and legislative requirement of biosafety, biosecurity and risk assessment relating to management of biological and other hazards.

APM2001 Stem Cells & Tissue Engineering

This subject covers an overview of the concepts of tissue engineering, stem cells, biomaterials and extracellular matrix, followed by topics on cell-cell and cell-matrix interactions. It also provides hands-on opportunities to obtain stem cell-derived secretome for applications in regenerative medicine.

APM2002 Synthetic Biology

This subject provides the fundamentals of DNA assembly and regulation of gene expression, as well as basic engineering principles to design biological systems and biofactories. It covers the laboratory techniques on genome editing, sequence analysis, as well as the potential applications of synthetic biology in medical biotechnology.

APM2003 Systems Biology

This subject provides an overview of genomes, transcriptomes, proteomes, metabolomes and other omics information to profiling of health and disease. Genome sequencing techniques, as well as bioinformatics and computational analysis will be introduced.

ASI3028 Student Internship Programme (Chemical Engineering)

This programme involves a compulsory attachment at a chemical or chemical-related company. It will enable you to apply knowledge and skills to solve practical problems and develop studies or product formulations. Emphasis will be placed on the development of skills such as teamwork, safety awareness, written and oral communication skills.

ASI3029 Student Internship Programme (Pharmaceutical Science)

This programme involves attachment at companies related to your course of study in the pharmacy, pharmaceutical and biopharmaceutical industries. You are expected to undertake various activities discussed with and assigned by the participating host organisations. The programme enables you to apply knowledge and skills acquired in the course of your study to solve practical problems in the real workplace. Emphasis is also placed on training of transferable skills such as teamwork, interpersonal, written and oral communication skills.

ASI3030 Student Internship Programme (Veterinary Technology)

This programme involves attachment at industries related to your course of study. You are expected to undertake various activities discussed with and assigned by the participating host organisations. The programme enables you to apply knowledge and skills acquired in the course of your study to address practical problems in the real workplace. Emphasis is also placed on training of process skills and professional conduct such as teamwork, time management, and interpersonal, written and oral communication skills.

ASI3031 Student Internship Programme (Food, Nutrition & Culinary Science)

For a period of 20 weeks, students are attached to industries related to their course of study – for example, food manufacturing, foodservice or healthcare. Each student is required to undertake various tasks and activities as discussed with, and agreed upon, by the participating organisations. Besides training in technical knowledge and skills, emphasis is placed on training in desired professional conduct in areas such as communications – both oral and written, team-work, problem-solving and self-management.

ASI3032 Student Internship Programme (Medical Biotechnology)

For a period of 20 weeks, students are attached to industries related to their course of study – for example, hospital and private laboratories, allied clinical services and life science industries. Each student is required to undertake various tasks and activities as discussed with, and agreed upon, by the participating organisations. Besides training in technical knowledge and skills, emphasis is placed on training in desired professional conduct in areas such as communications – both oral and written, team-work, problem-solving and self-management.

AVT1004 Wildlife Ecology & Conservation

This subject covers the principles of ecology as well as ecosystems and the study of plant and animal distributions including their interactions with one another and their environment. Theoretical and practical skills used in the study of conservation biology in relation to nature and marine conservation would also be covered.

AVT1006 Animal Anatomy & Physiology

This subject covers an introduction to veterinary anatomy related to systematic, applied and comparative anatomy. It also covers veterinary physiology in relation to anatomy, using the basic principle of form and function, to explain the functions of the various organ systems.

AVT1007 Animal Nutrition, Feed & Feeding

This subject focuses on concepts and principles of nutritional requirements for both aquatic and selected domestic animals. Students would also learn formulation techniques, principle of feed processing technology, feed ingredients and feed additives for application in growth and development, health, physical performance and appearance.

AVT1008 Developmental Biology

This subject covers embryology and organogenesis with emphasis on the fundamental developmental processes shared by vertebrate embryos. Topics covered include gametogenesis, meiosis and fertilisation, embryonic stages of development and/ or mechanism of differentiation that encompass cleavage, germ layer formation, neurulation, axonal specificity and organ formation, embryonic and adult stem cells, sex determination, metamorphosis and ageing.

AVT1009 Animal Care, Husbandry & Behaviour

This subject focuses on animal welfare and care of companion animals and selected animals. Care for the young and senior animals would be covered. Handling techniques with basic understanding of animal behaviour under normal conditions and stress would also be emphasised as part of animal care and behavioural management.

AVT2006 Veterinary Immunology

This subject covers immunology of animals including fish. Topics covered include an overview of the immune system across species, organs involved, structure and function of immunoglobulins, and cell mediators of immunity, normal immunity in animals, as well as dysfunction of the immune system. The major histocompatibility complex (MHC), antigen processing and presentation, cell signalling molecules (cytokines), complement system, immune responses to infection and immunopathologies (hypersensitive reactions), serological testing, biology of B-cells and T-cells, antigen-antibody interactions, transplantation and tumour immunology.

AVT2009 Veterinary Pharmacology & Toxicology

This subject covers the basic principles and knowledge of pharmacology and toxicology. Topics include an introduction to pharmacology, pharmacodynamics, pharmacokinetics and toxicology.

AVT2012 Molecular & Cell Technology

This subject is designed to provide theoretical and practical knowledge in the areas of molecular biology and cell culture technology. It covers techniques and applications used to assess and manipulate deoxyribonucleic acids (DNA), ribonucleic acids (RNA) and proteins in veterinary medicine and aquaculture, with an emphasis on diagnostic and transgenic technology. The subject also introduces you to basic cell culture techniques as well as its potential applications in developing in vitro-grown tissue and organs for veterinary medicine. You will also be exposed to recent advances and future trends in molecular biology and cell culture technology such as the use of CRISPR/Cas9 in the development of transgenic/knockout animals.

AVT2016 Animal Diseases & Clinical Pathology

This subject covers an introduction to animal diseases of veterinary significance. Topics include pathogenic agents, their modes of action, and the observed symptoms. It also covers principles of pathology including etiology, cause and termination of disease other than fundamental knowledge on general and systemic pathology.

AVT2017 Aquatic Care, Health & Diseases

This subject covers knowledge and skill training in care and husbandry, disease detection, identification and prevention for common freshwater and marine aquatic species.

AVT2018 Clinical Diagnostic Techniques

This subject covers knowledge and skill training on various types of veterinary diagnostic procedures. Topics include clinical chemistry and haematology, skin examination, faecal analysis, urinalysis, cytology and other techniques of relevance to working veterinary clinics and animal hospitals. Techniques on basic necropsy or post-mortem procedure, histochemical and histological techniques will also be covered.

AVT2019 Clinical Practicum

This subject will enable students acquire and perform a variety of medical procedures in small animal practice setting. Students will perform skills in anaesthesia, surgical assisting, veterinary practice management, radiography, sample collection and laboratory analysis, reception, patient assessment and treatment administration. Students will be attached on and off site veterinary clinics or hospitals.

AVT2020 Surgery, Anaesthesia & Veterinary Practices

This subject covers the principles of surgery and anaesthetic management for laboratory and selected companion animals. Topics covered include anaesthetic administration, monitoring and recovery from anaesthesia, basic suturing skills, preoperative preparations and postoperative care of animals. Fundamentals on good dispensing practice, simple patient counselling skills, record keeping and veterinary reception would also be covered.

AVT2021 Molecular Genetics & Genomics

This subject is designed to provide basic theoretical and practical knowledge of molecular genetics and genomics. It covers fundamental concepts of the molecular composition and structure of deoxyribonucleic acids (DNA), ribonucleic acids (RNA) and the gene. You will be introduced to the concept of the central dogma of biology, DNA replication and gene expression. The subject will also introduce you to techniques of DNA sequencing and use of basic bioinformatics tools for DNA analysis. You will also be introduced to whole genome sequencing and its application in personalised veterinary medicine. The subject also includes studies on the potential applications, present use and future trends in molecular genetics and genomics.

AVT3010 Animal Breeding & Reproduction

This subject covers animal breeding programmes, reproduction fundamentals and techniques. You will also be introduced to analysis and experimental design in animal breeding.

AVT3011 Laboratory Animal Science & Technology

This subject focuses on care, animal behaviour, handling and husbandry requirements of small and large animals often used as animal models for study. You will also acquire experiential learning through husbandry rotations at animal facilities. Techniques used in animal model study will also be introduced.

AVT3012 Aquaculture Product Quality & Safety

This subject provides students with knowledge and skill-based training in harvest and post-harvest processes and food product quality and safety. The importance of good culture environment and postharvest technology on fishery product quality and safety will be emphasised. Innovative technology for enhancing aquatic health and better quality produce will be covered.

AVT3013 Aquaculture Technology

This subject focuses on good aquaculture practices and management, culture systems, breeding, reproduction and technology important for sustainable aquaculture. Topics covered include water quality management, feed and feeding management, hatchery, larviculture, grow-out and broodstock, breeding and reproduction. Basic engineering principles and system design applicable for aquaculture will also be emphasised. Students will receive hands-on training in farm operation and management.

GCC1001 Current Issues & Critical Thinking

This subject presents you with a panoramic view of current local and global issues, which may have long term implications for Singapore. You will learn to apply critical thinking tools to examine current issues, support your views with relevant research and up-to-date data, articulate an informed opinion and mature as civic-minded individuals.

LEA1011/1012/1013 Leadership: Essential Attributes & Practice (LEAP)

LEAP 1, 2 and 3 are three fundamental subjects that seek to cultivate in you, the attitude, skills and knowledge for the development of your leadership competencies. This character-based leadership programme enables you to develop your life-skills through establishing personal core values, which will become the foundation for your leadership credibility and influence.

LSW1002 Sports & Wellness

This subject will help you develop both the physical and technical skills in your chosen sports or fitness activities. Through a structured curriculum that facilitates group participation, practice sessions and mini competitions, you will learn to build lifelong skills such as resilience, leadership, communication and teamwork. Physical activity sessions will be supplemented by health-related topics to provide you with a holistic approach to healthy living.

MCR1001/MCR1002/MCR1003 Career Readiness

This Career Readiness programme comprises three core subjects – Personal Management, Career Preparation and Career Management. It seeks to help you understand your career interests, values, personality and skills for career success. It also equips you with the necessary skills for seeking and securing jobs, and to develop professional work ethics.

TGL1001 Guided Learning

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.