School of Applied Science

Contents

The School offers seven 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, F&B, healthcare, chemical and life sciences industries, as well as further studies. Our ability-driven curriculum strives to develop in you 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 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 (frozen desserts factory, animal clinic and food outlets), 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), Communication Skills, and Cross-Disciplinary Subjects, 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 Excellence

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.

Centre for Aquaculture & Veterinary Science

The new Centre for Aquaculture and Veterinary Science (CAVS) 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 of Innovation for Complementary Health Products

The recently established Centre of Innovation (COI) for Complementary Health Products (CHP), is supported by SPRING Singapore under its Capability Development Scheme (Technology Innovation) - Infrastructure. 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.

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 Renewable Resources

The School's Renewable Resources Technology capability is broadly divided into three capabilities: Green Materials, Water Technology and Biofuels. Through industry and joint research projects, the Centre for Renewable Resources aims to help companies reduce the cost of disposal or treatment of their solid waste or wastewater. At the same time, a valuable and usable product may be created in the process. This is particularly important in Singapore where resources are scarce and cost of disposal is extremely high.

Centre for Molecular Diagnostics

The Centre for Molecular Diagnostics (CMD) is a "makerspace" serving the *Surge Research and Education (SuRE) Programme*, Biological Testing Domain & Biosensor Domain. 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).

Glycemic Index Research Unit

This facility is Singapore's first Glycemic Index Research Unit (GIRU) and is equipped to conduct in-vivo analysis of the glycemic index (GI), insulinemic index (II), and glycemic response of various foods. The facility also offers consultancy services in the area of nutrition research, GI testing and has also the capacity to conduct nutrition intervention studies.

KoolWerkz Learning Enterprise

An off-campus training factory for ice cream production, KoolWerkz provides a hands-on training approach for entrepreneurship development. Together with TP's Entrepreneurship Centre, it offers learning opportunities to all TP students in technical or business-related fields. Here, students learn about ice cream processing, inventory management, Hazard Analysis and Critical Control Point (HACCP), quality control and assurance, logistics and marketing functions as in real business scenarios.

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.

The Village Café Learning Enterprise

Situated at the Glocal Connect Village, this alternative F&B training ground allows students to practise productivity in a real F&B business model through the use of technology, innovative product design, and effective cost control. This café provides a cool and cosy ambience that serves quality food incorporating elements of different cultures.

Applied Food Science & Nutrition

What's in your favourite snack of crisps or instant noodles? Why do food manufacturers add chemicals to our packaged food? Can food really help us feel and look good?

Study this course if you want the answers to these questions. Step into the world of food science and nutrition, and appreciate the science behind food and how its components react with each other and impact our health. With there being such a huge variety of food around us, understand the role food plays in our well-being, and how it impacts our nation's health status too.

With rising concerns about the impact of our diet on our health in later years, there is a big demand for tasty yet healthier foods. Applying the scientific knowledge of both food science and nutrition, and receiving the practice-oriented training, you will gain the necessary competence to embark on a career in the food, nutrition and the healthcare industries.

The food science and technology subjects will equip you 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 you with the knowledge and skills to create and evaluate healthier meals for different population groups, assess their nutritional status, develop nutrition education programmes, and understand the management of diet-related diseases.

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

Career Opportunities

Our graduates can embark on a career in the food, nutrition and healthcare industries. You may be employed as a nutrition executive, dietetic technologist, nutrition educator, food laboratory analyst, R&D executive, QA/QC executive, food microbiologist, or food hygiene officer in food operations.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 25 credit units
Diploma Subjects	
Core Subjects	: 78 credit units
Elective Subjects	: min 17 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 129 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”.

Minimum Entry Requirements

English Language (EL1) *	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
One of the following Science subjects: Biology, Biotechnology, Chemistry, Combined Science, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry)	Grades 1 - 6
Any two other subjects, excluding CCA	-

** 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).*

Note: Applicants who do not meet the Science requirement but with Food & Nutrition/ Human & Social Biology may apply through Direct Admissions Exercise (DAE).

Course Structure

TP CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACS1003	Effective Communication	1	3
ACS1004	Scientific Communication	1	3
LEA1001	Leadership: Essential Attributes & Practice 1 (LEAP1)	1	1
LEA1002	Leadership: Essential Attributes & Practice 2 (LEAP2)	1	1
LEA1003	Leadership: Essential Attributes & Practice 3 (LEAP3)	1	1
ACS2002	Career Communication	2	2
ASI3012	Student Internship Programme	3	14

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACH1002	Organic & Biological Chemistry	1	5
ACH1005	Principles of Inorganic & Physical Chemistry 1	1	5
AFS1001	Food Chemistry	1	5
AMA1003	Mathematics for Applied Science	1	3
AMA1004	Statistics for Applied Science	1	3
AMB1002	Human Anatomy & Physiology	1	5
AMB1003	Basic Microbiology	1	5
ANT1001	Science in Food Preparation	1	4
ANT1002	Basic Nutrition & Food	1	4
AFS2002	Food Preservation & Quality Assurance	2	4
AFS2003	Food Preservation & Quality Assurance Project	2	5
AFS2007	Food Additives	2	4
AFS2009	Sensory Science	2	4
ANT2001	Nutrition Across the Life Span	2	5
ANT2004	Principles of Biochemistry & Physiology for Nutrition	2	5
ANT2009	Community Health & Nutrition	2	4
AMP3014	Major Project	3	8

DIPLOMA SUBJECTS – ELECTIVE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABC2013	Food Service Operations	2	5
ABC2017	Food Service Technology Application	2	4
ACH2004	Principles of Instrumental Analysis	2	4
AFS3005	Food Processing & Packaging	3	5
ANT3001	Nutrition in Disease	3	5
ANT3004	Practical Sports Nutrition	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
Food Safety in Product Development			
AFS2008	Applied Food Sanitation	2	3
AFS3006	Product Development & Marketing	3	3
AFS3007	Food Safety	3	3

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Baking & Culinary Science

Future Master Chefs, take note! If you dream of creating the perfect dish, sweet or dessert, stop dreaming and let science help you. Take the guesswork out of baking and culinary work and uncover the science behind the recipes and techniques that you do: from tempering chocolate, reducing sauces to roasting the perfect duck. With your scientific knowhow, you'll be able to create innovative dishes as well as mouth-watering desserts for the food and beverage industry.

This course will teach you to scientifically evaluate the sensory and food quality aspects of the dishes you prepare. Right from your first year, comprehensive hands-on training on culinary and baking sets your foundation before moving on to an intensive yet interactive second year with more advanced techniques and skill-based experiences that are coupled with the explained science. The curriculum encompasses chemistry, microbiology, food safety, product development, as well as baking and culinary technology. Part of the uniqueness of this course is that you will undergo a truly Asian culinary experience with a touch of your local heritage too.

During the third year, you will apply your acquired knowledge and skills to manage and operate various real-life F&B Learning Enterprises on campus, as well as undergo a 20-week internship to gain and further develop your career-specific skills in the diverse food and beverage (F&B) industry or food ingredient companies. The course also hones your entrepreneurial skills to help you embark on your own business ventures.

Great training is the foundation of professionalism, and TP culinary students exemplify what it means to be the product of a great educational programme. With a higher standard of professionalism, culinary knowledge and technical skills development, these students bring a unique combination of confidence, dedication and ability to the job, making them an invaluable asset to any culinary team.

Chef Toni Robertson
Executive Chef
Mandarin Oriental, Singapore

Career Opportunities

Our graduates are well-positioned to join the F&B industry as junior chefs, baking technologists or food product R&D executives. They can also choose to work in the baking, food service and food consultancy industries as well as in other supporting industries dealing with food ingredients. Graduates with a strong desire to pursue higher degrees may move on to universities that offer culinary science, as well as food service or culinary arts management courses.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 31 credit units
Diploma Subjects	
Core Subjects	: 83 credit units
Elective Subjects	: min 9 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 126 credit units

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results, as well as directly through the Early Admissions Exercise (EAE). Candidates who are shortlisted through the EAE will be required to undergo an interview to which they should bring portfolios of their work in culinary as evidence of their passion and creativity. The process seeks to determine the aptitude and attitude such as commitment and enthusiasm of the candidate for the culinary arts. 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".

Minimum Entry Requirements

English Language (EL1) *	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
One of the following Science subjects: Biology, Biotechnology, Chemistry, Combined Science, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry)	Grades 1 - 6
Any two other subjects, excluding CCA	-

** 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).*

Note:

- *Students are required to work in non-halal certified kitchens and facilities, as well as handle various ingredients such as meats (including pork and their by-products); emulsifiers and gelling agents of animal origin; as well as alcohol-based products. Students may not necessarily consume these ingredients but will be required to evaluate and assess their physical/ chemical properties.*
- *Students must be prepared to work in a fast-paced and warm environment of the various commercial grade kitchens. To ensure compliance on food and workplace safety, applicants with any medical conditions including physical disabilities should make a declaration and obtain pre-enrolment medical clearance.*
- *Students are also required to purchase uniform sets, safety shoes, bakery and knife sets and textbooks. These are not included in the tuition fees.*

Course Structure

TP CORE SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACS1003	Effective Communication	1	3
ACS1004	Scientific Communication	1	3
LEA1001	Leadership: Essential Attributes & Practice 1	1	1
LEA1002	Leadership: Essential Attributes & Practice 2	1	1
LEA1003	Leadership: Essential Attributes & Practice 3	1	1
ACS2002	Career Communication	2	2
ASI3013	Student Internship Programme	3	14

DIPLOMA SUBJECTS – CORE SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABC1001	Food & Culture	1	3
ABC1006	Fundamental Culinary Skills	1	5
ABC1008	Principles of Culinary Science	1	3
ABC1009	Fundamental Baking Skills	1	3
ACH1002	Organic & Biological Chemistry	1	5
AFS1001	Food Chemistry	1	5
AMA1004	Statistics for Applied Science	1	3
AMB1003	Basic Microbiology	1	5
ANT1002	Basic Nutrition & Food	1	4
ABC2014	Baking & Confectionery Science	2	4
ABC2015	Baking & Pastry Practicum	2	6
ABC2016	Food Service Revenue Management	2	2
ABC2017	Food Service Technology Application	2	4
ABC2018	Asian Cuisines Practicum	2	7
ABC2019	Food Safety Application	2	3
ABC2020	Western Cuisines Practicum	2	5
AFS2007	Food Additives	2	4
ABC3008	Product Development in Food Service	3	4
AMP3015	Major Project	3	8

DIPLOMA SUBJECTS – ELECTIVE CLUSTER SUBJECTS

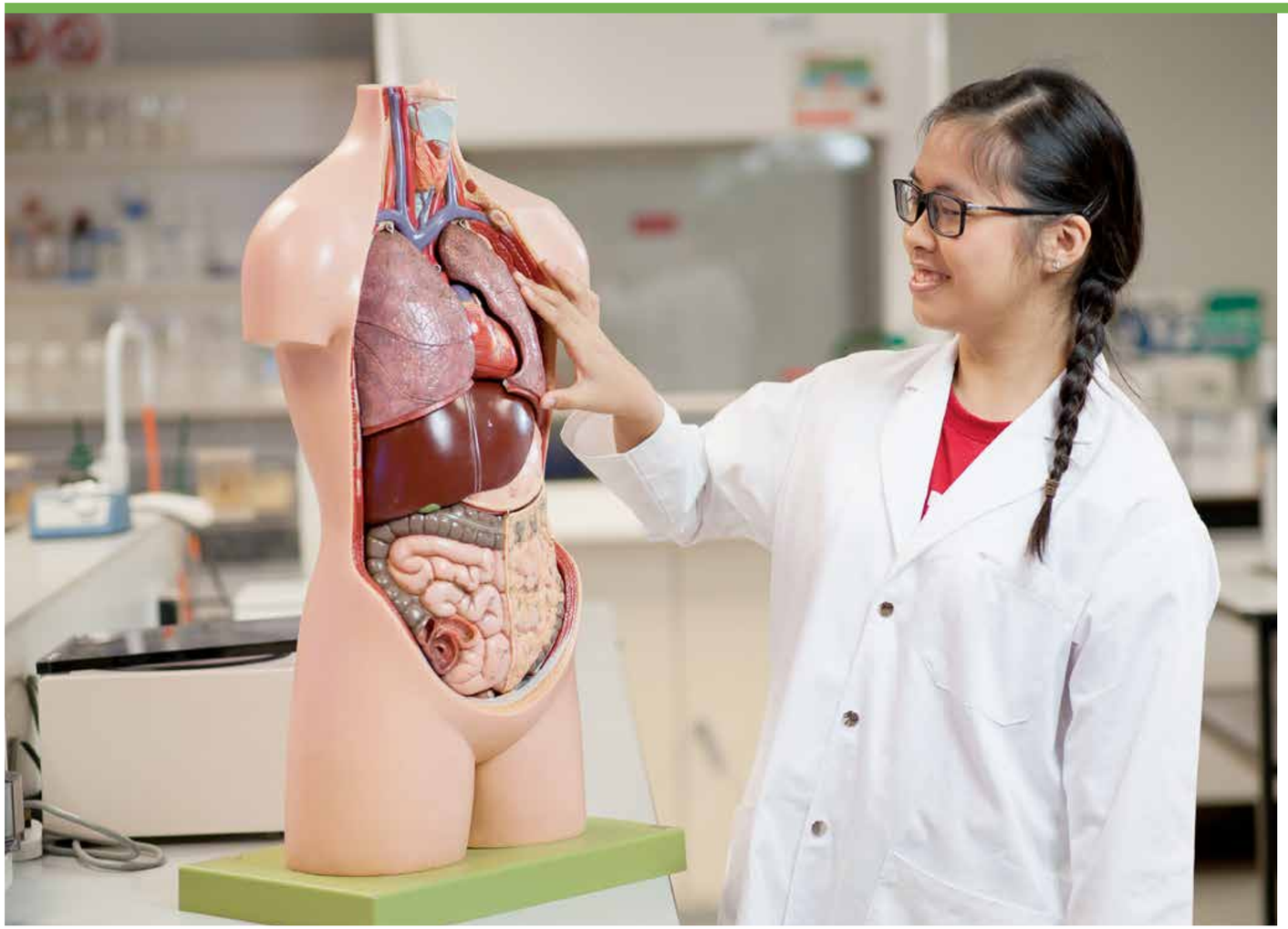
Students will be required to read an Elective Cluster offered by the School and complete a minimum of 9 credit units. The Elective Cluster to be offered by the course, and the subjects under this Cluster, are summarised below.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
F&B Enterprise			
ABC3006	Baking & Culinary Operations	3	7
ABC3007	Food Service Principles of Management	3	3

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Biomedical Science



Play a part in the research and development of new methods for the diagnosis, treatment and prevention of diseases. Study Biomedical Science and you will understand how the human body functions, how diseases occur, and how we can cure and prevent them.

Singapore is poised to be a global hub for biomedical and clinical sciences. The local biomedical sciences sector is growing rapidly with increasing foreign direct investment that boosts job opportunities in clinical laboratory testing, clinical trials as well as research and development. Singapore's thrust to be the region's medical hub with world-class healthcare services emphasises the need for quality trained technologists in clinical laboratories and clinical research. This course puts you in demand!

You begin by learning the foundational sciences to understand the biology and chemistry of health sciences. You will study, among other things, the inner workings of living cells, the biological processes involving proteins and enzymes, the structure, parts and functions of the human body, and the world of bacteria, viruses and other microorganisms. You will progress to learn the nature, causes and progression of human diseases, our biological responses and defences, and diagnosis so that appropriate treatment can be provided. You will ultimately build your strength in the testing, diagnosis, management and prevention of diseases.

This course emphasises learning through established collaborative training with industry/research institutions/hospitals, taught by experienced teaching/ research staff and industry practitioners. The compulsory structured internship carried out concurrently with major projects helps you to experience working life and allows you to apply theory to practice. Interns are involved in real industry projects, evaluating new clinical laboratory equipment or diagnostic test kits. They may also assist doctors in carrying out clinical trials or clinical research studies to verify the efficacy of medications, devices, diagnostic products and treatment regimens.

We are impressed by the quality of TP's students who are attached to SGH pathology laboratories annually. They demonstrate enthusiasm, commitment, diligence and a positive attitude throughout the period of their attachments. The skills that they have acquired in the laboratories will put them in good stead to commence work almost immediately as laboratory or medical technologists in hospitals and clinical laboratories upon graduation. With more hospitals being developed and a rapidly ageing population, there is a very strong demand for graduates embarking on such careers.

Dr Alvin Lim Soon Tiong
Assistant Director, Department of Pathology, SGH
Director of Allied Health Education, SingHealth Duke-NUS Pathology Academic Clinical Programme
Adjunct Associate Professor, Duke-NUS Graduate Medical School Singapore
Adjunct Associate Professor, School of Biological Sciences, NTU

Career Opportunities

Our graduates can work as medical technologists or laboratory technologists in hospital/clinical laboratories, medical research centres, and central testing laboratories. They can also work as assistant clinical research co-ordinators at clinical research organisations. Those who enjoy being at the forefront of technology can work as product application specialists, or sales and marketing executives of medical/diagnostic products and devices.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 25 credit units
Diploma Subjects	
Core Subjects	: 84 credit units
Elective Subjects	: min 9 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 127 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".

Minimum Entry Requirements

English Language (EL1) *	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
One of the following Science subjects: Biology, Biotechnology, Chemistry, Combined Science, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry)	Grades 1 - 6
Any two other subjects, excluding CCA	-

** 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).*

Note: Applicants with partial or complete colour appreciation deficiency are not eligible to apply.

Course Structure

TP CORE SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACS1003	Effective Communication	1	3
ACS1004	Scientific Communication	1	3
LEA1001	Leadership: Essential Attributes & Practice 1 (LEAP1)	1	1
LEA1002	Leadership: Essential Attributes & Practice 2 (LEAP2)	1	1
LEA1003	Leadership: Essential Attributes & Practice 3 (LEAP3)	1	1
ACS2002	Career Communication	2	2
ASI3015	Student Internship Programme	3	14

DIPLOMA SUBJECTS – CORE SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABM1003	Applied Human Physiology	1	3
ABT1001	Cell Biology	1	4
ABT1002	Biomolecules	1	4
ACH1003	Organic Chemistry 1	1	5
ACH1005	Principles of Inorganic & Physical Chemistry 1	1	5
AMA1003	Mathematics for Applied Science	1	3
AMA1004	Statistics for Applied Science	1	3
AMB1002	Human Anatomy & Physiology	1	5
AMB1003	Basic Microbiology	1	5
ABM2008	Histological Techniques	2	3
ABM2009	Fundamentals of Pathology	2	4
ABM2012	Biostatistics	2	3
ABM2013	Immunology	2	4
ABM2014	Clinical Chemistry	2	5
ABT2007	Molecular Genetics	2	5
ABT2013	Molecular Biology	2	4
ABT2015	Mammalian Cell Technology	2	3
ACH2004	Principles of Instrumental Analysis	2	4
AMB2006	Medical Microbiology	2	4
AMP3006	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
Laboratory Medicine			
ABM2011	Haematology	2	4
ABM3004	Laboratory Management & Quality Assurance	3	4
ABM3006	Blood Banking	3	3
Clinical Research			
ABM2015	Patient Recruitment & Management	2	4
ABM3007	Research Methods & Bioethics	3	4
ABM3008	Quality Management & Legislation	3	3

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Biotechnology

Genes, molecular biology, cloning, cell technology, immunology, drug discovery, diagnostic development, biochemical analysis, health and disease research – do these terms excite you? Do you want to acquire life science skills that will make you globally competitive? Do you want a career that involves new biological discoveries and novel applications of knowledge? If so, this course is for you!

This course trains you to be a research technologist supporting the growing life science industry. The Singapore Government has targeted the life science industry to be our fourth pillar of economic growth, and has invested heavily to make Singapore the regional life sciences hub. As a result, research technologists are increasingly in demand in disease biology, diagnostics and therapeutics. At the same time, more manpower is also needed for research activities on economically important plants and animals so as to increase our food yield.

In your first year, you will develop a solid foundation in basic biology and chemistry. The second year trains you in the diploma specialisation subjects through a well-integrated sequence of modules on cellular and molecular biotechnology. A hands-on approach forms the core basis of training, during which you will acquire a repertoire of research skills in the areas of molecular biology, mammalian cell technology, biochemistry, microbiology, immunology, genomics, proteomics, plant biotechnology, immunology and other key supporting technology essential for biomedical and scientific research. 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 biomedical research or forensics and bioanalytics.

You will eventually develop a solid broad-based foundation in life sciences that will maximise your career and future educational options. To further hone your technical skills, you will undergo a six-month attachment either locally or overseas in the biotechnology and biomedical industries.

I am impressed by the diligence and inquisitive nature of students from this course and would gladly accept them without any qualms for any suitable projects in future.

Dr Yang Yuansheng
Research Scientist
Bioprocess Technology Institute,
A*STAR

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 laboratory technologist assisting in pre-clinical trials at contract research organisations, or in laboratory operations and maintenance at research and teaching institutions, or even hospitals. Graduates interested to be technical support officers can also work in aquaculture and agro-technology parks and farms. 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 research skills and knowledge gained by our graduates are applicable worldwide.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 25 credit units
Diploma Subjects	
Core Subjects	: 87 credit units
Elective Subjects	: min 9 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 130 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”.

Minimum Entry Requirements

English Language (EL1) *	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
One of the following Science subjects: Biology, Biotechnology, Chemistry, Combined Science, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry)	Grades 1 - 6
Any two other subjects, excluding CCA	-

** 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).*

Course Structure

TP CORE SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACS1003	Effective Communication	1	3
ACS1004	Scientific Communication	1	3
LEA1001	Leadership: Essential Attributes & Practice 1 (LEAP1)	1	1
LEA1002	Leadership: Essential Attributes & Practice 2 (LEAP2)	1	1
LEA1003	Leadership: Essential Attributes & Practice 3 (LEAP3)	1	1
ACS2002	Career Communication	2	2
ASI3011	Student Internship Programme	3	14

DIPLOMA SUBJECTS – CORE SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABM1003	Applied Human Physiology	1	3
ABT1001	Cell Biology	1	4
ABT1002	Biomolecules	1	4
ACH1003	Organic Chemistry 1	1	5
ACH1005	Principles of Inorganic & Physical Chemistry 1	1	5
AMA1003	Mathematics for Applied Science	1	3
AMA1004	Statistics for Applied Science	1	3
AMB1002	Human Anatomy & Physiology	1	5
AMB1003	Basic Microbiology	1	5
ABM2009	Fundamentals of Pathology	2	4
ABM2012	Biostatistics	2	3
ABM2013	Immunology	2	4
ABT2006	Analytical Biochemistry	2	5
ABT2007	Molecular Genetics	2	5
ABT2009	Plant Cell Technology	2	5
ABT2013	Molecular Biology	2	4
ABT2014	Metabolic Biochemistry	2	4
ABT2015	Mammalian Cell Technology	2	3
AMB2001	Applied Microbiology	2	5
AMP3013	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
Translational Biomedical Research			
ABT3017	Molecular Diagnostic Development	3	4
ABT3018	OMICs & Recombinant Technology	3	4
ABT3019	Stem Cells & Tissue Engineering	3	3
Forensics and Bioanalytics			
AFR2001	Forensic Toxicology	2	3
APH2008	Biosafety	2	3
AFR3001	Forensic Biological, Chemical & Physical Analysis	3	5
BioInformatics			
ABT3023	Sequence Analysis	3	3
ABT3024	Structural Bioinformatics	3	3
ABT2016	Scripting in Bioinformatics	2	4
BioEnterprise			
ABT3020	BioEnterprise Communications	3	3
ABT3021	Contemporary Issues in BioEnterprise Operation	3	4
ABT3022	Life Science Industry Funding and Regulations	3	3
Free Electives			
APH2006	Basic Pharmacology	2	4
ABM3003	Drug Development & Clinical Trials	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

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 daily products that we use every day.

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

Students and graduates from this course are responsible and inquisitive. They have a good understanding of process engineering and are able to perform their task well with minimum supervision.

Lim Kiah Siang
Training Manager
Petrochemical Corporation of Singapore (Pte) Ltd

Career Opportunities

Trained to be versatile, you can conduct research or testing in laboratories, or involve in production and technical sales in a broad range of companies in various industries. Specifically, you can embark on a career in the chemical industry, the best-paying manufacturing industry in Singapore. Alternatively, you can consider a career in the prestigious pharmaceutical industry, which produces all kinds of medicines used by doctors worldwide to save lives.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 25 credit units
Diploma Subjects	
Core Subjects	: 85 credit units
Elective Subjects	: min 9 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 128 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”.

Minimum Entry Requirements

English Language (EL1) *	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
One of the following Science subjects: Biology, Biotechnology, Chemistry, Combined Science, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry)	Grades 1 - 6
Any two other subjects, excluding CCA	-

** 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).*

Course Structure

TP CORE SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACS1003	Effective Communication	1	3
ACS1004	Scientific Communication	1	3
LEA1001	Leadership: Essential Attributes & Practice 1	1	1
LEA1002	Leadership: Essential Attributes & Practice 2	1	1
LEA1003	Leadership: Essential Attributes & Practice 3	1	1
ACS2002	Career Communication	2	2
ASI3016	Student Internship Programme	3	14

DIPLOMA SUBJECTS – CORE SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACE1001	Mass & Energy Balance	1	5
ACE1002	Thermodynamics	1	4
ACH1003	Organic Chemistry 1	1	5
ACH1004	Organic Chemistry 2	1	4
ACH1005	Principles of Inorganic & Physical Chemistry 1	1	5
ACH1006	Principles of Inorganic & Physical Chemistry 2	1	5
AMA1001	Applied Mathematics	1	4
AMA1002	Engineering Mathematics 1	1	5
ACE2002	Environmental Technology	2	4
ACE2007	Unit Operations 1	2	5
ACE2008	Unit Operations 2	2	5
ACE2009	Occupational Safety & Health	2	4
ACE2010	Process Control & Instrumentation	2	5
ACH2004	Principles of Instrumental Analysis	2	4
AMA2001	Engineering Mathematics 2	2	5
AMB2005	Introduction to Biochemistry & Microbiology	2	4
ACE3002	Chemical Reaction Engineering	3	4
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			
ACE3010	Materials & Nanotechnology	3	4
ACE3011	Water Chemistry	3	3
ACH3003	Applications of Instrumental Analysis	3	4
Chemical Processing			
ACE3004	Plant Safety & Loss Prevention	3	4
ACE3006	Petrochemical Technology	3	3
AEW3002	Industrial Wastewater Treatment	3	4
Pharmaceutical & Biologics Technology			
APH2008	Biosafety	2	3
APH3008	Biopharmaceutical Unit Operations	3	4
APH3010	Current Good Manufacturing Practice	3	3

DIPLOMA SUBJECTS – ELECTIVE SUBJECTS

Students can also opt to take the following elective subject when offered.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
APH3004	Pharmaceutical Manufacturing Technology	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Pharmaceutical Science

Why are some medicines labelled as ''poison''? How do they work to cure diseases? Join this field and learn about the effects of drugs on the human body. Gain the knowledge and skills required to design, analyse, manufacture and market new therapies for diseases.

Pharmaceuticals accounted for 85 percent of the biomedical science industry output for Singapore in 2010, which grew by another 10 percent for the whole year, hitting a total output of $19.7 billion. Biopharmaceutical manufacturing, with six new plants announced to be set up in Singapore worth $2.1 billion, is poised to be the next leading driver of the industry.

The course will train you to join the various sectors of the pharmaceutical and healthcare industries, and lay the foundation for you to become a specialist investigator in criminal forensics. You will learn specialised subjects related to disease, pharmaceutical legislation and marketing, drug action, chemical and biological analysis, and pharmaceutical manufacturing.

Furthermore, if you have an inclination towards analytical work, or have a passion for a career in forensics, you will have the opportunity to select elective subjects in our Forensics & Bioanalytics specialisation.

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. In 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.

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

Career Opportunities

Graduates can work as pharmacy technicians in hospitals or community/ retail pharmacies, QA/QC technologists to conduct quality checks or process technologists to manufacture the drugs in the pharmaceutical industry. For the research-inclined, you can also join one of the research institutes or pharmaceutical companies to assist in research work on drug development and clinical trials, or conduct analytical work. You can also embark on a career in technical sales and marketing for pharmaceutical/ health products, or in forensics as an investigator or a laboratory technologist.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 25 credit units
Diploma Subjects	
Core Subjects	: 84 credit units
Elective Subjects	: min 9 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 127 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”.

Minimum Entry Requirements

English Language (EL1) *	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
One of the following Science subjects: Biology, Biotechnology, Chemistry, Combined Science, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry)	Grades 1 - 6
Any two other subjects, excluding CCA	-

** 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).*

Course Structure

TP CORE SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACS1003	Effective Communication	1	3
ACS1004	Scientific Communication	1	3
LEA1001	Leadership: Essential Attributes & Practice 1	1	1
LEA1002	Leadership: Essential Attributes & Practice 2	1	1
LEA1003	Leadership: Essential Attributes & Practice 3	1	1
ACS2002	Career Communication	2	2
ASI3014	Student Internship Programme	3	14

DIPLOMA SUBJECTS – CORE SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACH1003	Organic Chemistry 1	1	5
ACH1004	Organic Chemistry 2	1	4
ACH1005	Principles of Inorganic & Physical Chemistry 1	1	5
AMA1003	Mathematics for Applied Science	1	3
AMA1004	Statistics for Applied Science	1	3
AMB1002	Human Anatomy & Physiology	1	5
AMB1003	Basic Microbiology	1	5
ABT1001	Cell Biology	1	4
ABT1002	Biomolecules	1	4
ABM1003	Applied Human Physiology	1	3
ABM2009	Fundamentals of Pathology	2	4
ACH2004	Principles of Instrumental Analysis	2	4
AMB2003	Pharmaceutical Microbiology	2	4
APH2005	Introduction to Pharmacotherapeutics	2	5
APH2006	Basic Pharmacology	2	4
APH2007	Pharmaceutical Legislation	2	3
APH3002	Current Good Manufacturing Practice	3	3
APH3004	Pharmaceutical Manufacturing Technology	3	4
APH3007	Pharmaceutical Analysis	3	4
AMP3012	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
Pharmacy Practice			
ABM3003	Drug Development & Clinical Trials	3	4
APH3006	Good Dispensing Practice & Pharmacotherapy	3	4
APH3009	Pharmaceutical Marketing & Management	3	3
Pharmaceuticals and Biologics			
ACE2006	Pharmaceutical Unit Operations	2	4
APH2008	Biosafety	2	3
APH3008	Biopharmaceutical Unit Operations	3	4
Forensics and Bioanalytics			
AFR2001	Forensic Toxicology	2	3
APH2008	Biosafety	2	3
AFR3001	Forensic Biological, Chemical & Physical Analysis	3	5

DIPLOMA SUBJECTS – ELECTIVE SUBJECTS

Students can also opt to take the following elective subjects when offered.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACH1006	Principles of Inorganic and Physical Chemistry 2	1	5
BRM1002	Principles of Retail Management	1	4
ABT2014	Metabolic Biochemistry	2	4
ACE2010	Process Control and Instrumentation	2	5
ABT2015	Mammalian Cell Technology	2	3
APH2002	Pharmaceutical Chemistry	2	4
ACE2009	Occupational Safety and Health	2	4
BRM2006	Store Management	2	4
APH3005	Bioprocess Technology	3	5
BMK3007	Principles of Entrepreneurship	3	4
BMK3012	Sales & Account Management	3	4
ACH3004	Laboratory Accreditation and Automation	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

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 or animal technologist.

In our pursuit to find cures for human and animal diseases, animal models are used in research and pre-clinical trials. All these make responsible and humane animal care and use extremely important. 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.

This course focuses on establishing a solid foundation in the basic and applied animal sciences for meeting the needs of the veterinary, scientific research, wildlife conservation, aquaculture and pet retail industries. The practice-oriented programme equips you with specialised skill sets that will prepare you well as responsible and competent veterinary/ animal technologists.

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. Your technical competency is further honed through a minimum five-month internship either locally or overseas in animal facilities and research institutions, animal or conservation parks, veterinary hospitals/ clinics and other animal-related organisations.

We are very happy with students from your course as they have better attitude towards learning and working compared to all the others whom we have had before.

Dr Lisa Park
Chief Scientific Officer
PWG Genetics Pte Ltd

Career Opportunities

Our graduates can work in scientific research, wildlife and marine conservation, 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, Agri-Food and Veterinary Authority of Singapore, animal quarantine centres and pet shops. You can also work as a biologist, veterinary technician, animal management officer or aquarist at River Safari, Wildlife Reserves Singapore, Underwater World in Sentosa and Marine Life Park in Resorts World Sentosa.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 25 credit units
Diploma Subjects	
Core Subjects	: 91 credit units
Elective Subjects	: min 9 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 134 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”.

Minimum Entry Requirements

English Language (EL1) *	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
One of the following Science subjects: Biology, Biotechnology, Chemistry, Combined Science, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry)	Grades 1 - 6
Any two other subjects, excluding CCA	-

** 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).*

Course Structure

TP CORE SUBJECTS			
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ACS1003	Effective Communication	1	3
ACS1004	Scientific Communication	1	3
LEA1001	Leadership: Essential Attributes & Practice 1	1	1
LEA1002	Leadership: Essential Attributes & Practice 2	1	1
LEA1003	Leadership: Essential Attributes & Practice 3	1	1
ACS2002	Career Communication	2	2
ASI3013	Student Internship Programme	3	14

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ABT1002	Biomolecules	1	4
ACH1003	Organic Chemistry 1	1	5
ACH1005	Principles of Inorganic & Physical Chemistry 1	1	5
AMA1004	Statistics for Applied Science	1	3
AMB1003	Basic Microbiology	1	5
AVT1001	Animal Anatomy & Physiology	1	5
AVT1002	Animal Nutrition, Care & Behaviour	1	4
AVT1003	Aquatic Nutrition, Feed & Formulation	1	3
AVT1004	Wildlife Ecology & Conservation	1	2
AVT1005	Developmental Biology	1	4
ABT2007	Molecular Genetics	2	5
ABT2014	Metabolic Biochemistry	2	4
AVT2006	Veterinary Immunology	2	3
AVT2007	Clinical Chemistry & Haematology	2	3
AVT2008	Animal Diseases & Diagnostics	2	5
AVT2009	Veterinary Pharmacology & Toxicology	2	3
AVT2010	Aquatic Care, Health & Diseases	2	4
AVT2011	Surgery, Anaesthesia & Veterinary Practices	2	5
AVT2012	Molecular and Cell Technology	2	4
AVT2013	Rehabilitative & Emergency Critical Care	2	3
AVT2014	Veterinary Pathology & Histological Techniques	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
Veterinary			
AVT3004	Large Animal Science & Technology	3	3
AVT3005	Animal Breeding & Reproduction	3	3
AVT3009	Small Animal Science & Technology	3	4
Aquaculture			
AVT3006	Aquaculture Practices & Farm Management	3	4
AVT3007	Aquaculture Production, Systems & Engineering	3	4
AVT3008	Aquaculture Health & Product Quality	3	3

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Subject Synopses

ABC1001 Food & Culture

This subject equips you with the necessary knowledge of the different types of cuisines in selected countries, the ingredients used, and the foods and alcoholic beverages used in major festivals and celebrations in these countries. It also provides an understanding of the important roles of food in culture such as its association with religious beliefs, collective identities, symbolism, and the arts. This subject provides the cultural backdrop to enhance the understanding of food use and is relevant to other subjects in the course.

ABC1006 Fundamental Culinary Skills

This subject covers various cooking techniques such as sautéing, broiling, poaching, simmering, pan-frying, and deep-fat frying. Knife skills, operation of equipment, purchasing, receiving and storage of food will also be covered. In addition, the fundamentals of ingredients applications in various recipes and proper food hygiene practices will be taught.

ABC1008 Principles of Culinary Science

This subject illustrates the principles of food science in culinary application, emphasising the functional and structural properties of food constituents and their behaviour during food preparation. This subject will also discuss concepts that underpin everyday cooking.

ABC1009 Fundamental Baking Skills

The subject will cover the fundamental skills for baking and pastry. A variety of baked products will be covered that includes bread, cakes and pastries. Knowledge of equipment and ingredients selection, as well as safety in a baking kitchen will be emphasised.

ABC2013 Food Service Operations

This subject covers the fundamental knowledge and skills on managing a catering operation. Topics include menu planning, cost management, and purchasing, receiving and storage of food. Other topics include operating kitchen equipment, quantity food production planning and implementation of quality control measures. Kitchen safety and proper food hygiene practices will be emphasised throughout the practicals.

ABC2014 Baking & Confectionery Science

This subject will cover the fundamentals of baking and confectionery science. The topics include flour milling, analytical tests used to evaluate flour quality, functions of ingredients used in various baked and confectionery products and processing methods for various confectionery products.

ABC2015 Baking & Pastry Practicum

The subject aims to develop a repertoire of baking and pastry skills with emphasis on the preparation of specialty baked products with the use of commercial baking equipment or specialty ingredients. This subject will also include more advanced technical skills in pastry and confectionery.

ABC2016 Food Service Revenue Management

This subject provides the essential knowledge to maximise food service revenue. Topics covered in cost management include purchasing, receiving, menu planning and menu engineering. Financial planning, assessing financial performances and yield management in food service will also be covered.

ABC2017 Food Service Technology Application

This subject is designed to provide the knowledge and skills necessary to produce foods using various technologies to support production efficiency in the food service. Engineering concepts in relation to catering technology will also be highlighted.

ABC2018 Asian Cuisines Practicum

This subject aims to provide practice in the preparation, presentation and evaluation of common dishes from various Asian regions with focus on Chinese and South East Asia. It will also require the demonstration of culinary skills during kitchen practicum on the preparation of stocks, sauces, soups, salads, fruits/vegetables, grains, eggs, poultry, red meat, and seafood. Knowledge on equipment selection and kitchen safety will be emphasised.

ABC2018 Asian Cuisines Practicum

This subject aims to provide practice in the preparation, presentation and evaluation of common dishes from various Asian regions with focus on Chinese and South East Asia. It will also require the demonstration of culinary skills during kitchen practicum on the preparation of stocks, sauces, soups, salads, fruits/vegetables, grains, eggs, poultry, red meat, and seafood. Knowledge on equipment selection and kitchen safety will be emphasised.

ABC2019 Food Safety Application

This subject introduces the potential sources of foodborne hazards from farm to table. It also covers personal hygiene, hygiene aspects of food premises design, cleaning and sanitation, pest control in the food service environment, food hygiene legislation and standard operating procedures that will lead to food safety management system, Hazard Analysis and Critical Control Points (HACCP).

ABC2020 Western Cuisines Practicum

This subject aims to provide practice in the preparation, presentation and evaluation of common dishes from various Western regions with focus on French and Italian. This subject will also require the demonstration of culinary skills during kitchen practicum on the preparation of stocks, sauces, soups, salads, fruits/vegetables, grains, eggs, poultry, red meat, and seafood. Knowledge on equipment selection and kitchen safety will be emphasised.

ABC3006 Baking & Culinary Operations

This subject provides the necessary practical training in quantity food production for a food service operation. You will be required to manage catering processes and/or technologies to scale menu items whilst ensuring food quality and safety.

ABC3007 Food Service Principles of Management

This subject focuses on the strategies and tools in managing a food service. It provides the management and operational knowledge in facilities planning and design, production planning, marketing, distribution and their applications in food services. Topics will also include operational and strategic management, human resource and financial management.

ABC3008 Product Development in Food Service

This subject provides opportunities to develop new food products in the food service environment. Idea generation techniques, applications of knowledge in food science and nutrition, functionality and selection of food ingredients, food safety, and sensory evaluation are demonstrated through product development projects.

ABM1003 Applied Human Physiology

This subject covers the knowledge of human physiology. It introduces common terms, concepts, fundamental procedures and applications used in physiology. Topics include circulatory, respiratory, hepatic, renal and endocrine physiology, and neurophysiology.

ABM2008 Histological Techniques

This subject covers the basic knowledge, principles and skills of histotechnology which include fixation, decalcification, tissue processing, microtomy, frozen sections and staining. It also covers basic diagnostic cytopathology.

ABM2009 Fundamentals of Pathology

This subject introduces the fundamental knowledge of general and systemic pathology. You will learn the nature and cause of diseases, disease mechanisms as well as structural and functional abnormalities of diseased organs and organ systems.

ABM2011 Haematology

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

ABM2012 Biostatistics

This subject covers the basics of biostatistics to apply statistics into clinical practice by converting clinical and laboratory experiences into quantitative statements. The topics covered include statistical tools to summarise data, test for differences between test groups, analyse rates and proportions, establish or validate confidence intervals, and test for trends. It also covers the application of biostatistics into different clinical cases.

ABM2013 Immunology

The subject covers the basic concepts of immunology from components of the immune system to specific and non-specific immune responses to infections as well as aberrant immune activities like autoimmunity and hypersensitivity. It also deals with the use of immune cells and mediators for prophylaxis and treatment of diseases, as well as immunological techniques that are used for diagnosis of diseases and research.

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.

ABM2015 Patient Recruitment & Management

This subject covers the recruitment procedures and management of participants including children, healthy individuals, critically ill and elderly patients into clinical research projects or clinical trials. The topics covered include the recruitment procedures and protocols, effective communication skills and methods to obtain informed consent from patients or immediate family members. The management of these participants and proper conduct during the clinical research or trials will also be covered.

ABM3003 Drug Development & Clinical Trials

This subject introduces a comprehensive overview of drug discovery, drug development and clinical trial. It includes different approaches to drug design and discovery such as rational drug design and computer aided drug design, etc. This subject also incorporates studies involved in the drug development process such as pharmacological and toxicological studies etc. Different phases of clinical trial are also covered. An outline of the roles of GLP, GMP and GCP from the time of drug discovery to the time it enters the market is also provided.

ABM3004 Laboratory Management & Quality Assurance

This subject covers laboratory management, quality assurance, laboratory automation, statistical methods and safety regulations practised in laboratories. The role of different quality systems monitoring the quality assurance is also included.

ABM3006 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 the importance of laboratory quality control and clinical considerations in transfusion practices.

ABM3007 Research Methods & Bioethics

This subject covers the different aspects required in performing clinical research or clinical trials using case-studies. The topics covered include research governance, monitoring, audit and inspection process in clinical research, the awareness and use of Singapore Guideline for Good Clinical Practice, apply the techniques of obtaining informed consent when required, methods for safekeeping of documents required in clinical trials and writing a research protocol for grant application. Basic ethical issues involved in conducting clinical research will also be covered. Other topics covered include roles of regulatory bodies in Singapore (HSA and MOH) and Institutional Review Board (IRB), purpose of adherence to ethical guidelines and procedures, and principles of research ethics.

ABM3008 Quality Management & Legislation

This subject covers the research quality management in clinical trials and an overview of the legal framework and regulatory requirements. The topics covered include the roles and responsibilities for the members in Institutional Review Boards to ensure quality assurance in clinical research, responsibilities of all members in the team to conduct quality clinical research, patients' rights protection, maintenance of patients' confidentiality, and ethical issues involving the sharing of information between research groups. Legislation such as Data Protection Act and Singapore Guidelines for Good Clinical Practice (SG-GCP) 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.

ABT1002 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.

ABT2006 Analytical Biochemistry

This subject focuses on the applications of analytical and separation techniques in the field of biotechnology. Basic concepts and techniques for extraction, purification and analysis of biomolecules will be covered.

ABT2007 Molecular Genetics

This subject teaches both the theoretical knowledge and practical techniques of molecular genetics using the E. coli system as a model. Topics covered include DNA structure, replication, transcription, translation, mutations, and regulation of gene expression in prokaryotes.

ABT2009 Plant Cell Technology

This subject covers the theoretical and practical aspects of plant cell technology. Topics covered include micropropagation techniques, callus induction, organogenesis, somatic embryogenesis protoplast isolation and secondary metabolites production.

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.

ABT2014 Metabolic Biochemistry

This subject focuses on the principles of Biochemistry by building on concepts learnt from Organic Chemistry 1 and Biomolecules. You will be introduced to the basics of bioenergetics before progressing to studying energy metabolism pathways and their regulation. The individual pathways will then be integrated together to give you a holistic view of energy metabolism.

ABT2015 Mammalian Cell Technology

This subject provides basic theoretical and practical knowledge of mammalian cell culture. Topics covered include cell culture techniques, prevention and contamination control, working in a tissue culture laboratory and applications of animal cell culture in biotechnology such as hybridoma generation.

ABT2016 Scripting in Bioinformatics

This subject introduces scripting techniques and uses a scripting language to obtain information from bioinformatics databases and analyse large amounts of biological data. Data privacy acts and IT policies at the workplace will also be covered.

ABT3017 Molecular Diagnostic Development

This subject covers diagnostic platforms, techniques and instrumentation as well as assay development, assay criteria (e.g. sensitivity, specificity, limits of detection etc.) and assay validation. It also addresses the regulatory requirements for diagnostic assays and the pathways to commercialisation. An introduction to regulatory and good manufacturing practice (GMP) is included to complete the cycle of lab to market.

ABT3018 OMICs & Recombinant Technology

This subject covers the theory and practice of techniques used to evaluate and manipulate deoxyribonucleic acid (DNA), ribonucleic acid (RNA) and protein. It includes studies on the potential applications, present use and future trends in molecular biotechnology, genomics, transcriptomics and proteomics.

ABT3019 Stem Cells & Tissue Engineering

This subject covers an overview of the concepts of tissue engineering, stem cells, biomaterials and a review on extracellular matrix, followed by topics on cell-cell and cell-matrix interactions at both the theoretical and experimental levels.

ABT 3020 BioEnterprise Communications

This subject covers inter-personal communication and behavioural skills used in enhancing people-to-people relationship in a bioenterprise. Topics include professional personality profiling, fostering strong partnership with stakeholders, dealing with challenging personalities and team motivation.

ABT 3021 Contemporary Issues in BioEnterprise Operation

This subject addresses the day-to-day challenges in operating a bioenterprise, and provides an overview of the challenges when commercialising an idea in the life science space. Topics include technopreneurship, challenges in start-up companies, overview of exit strategies, and understanding product life cycle in a biotenterprise.

ABT 3022 Life Science Industry Funding and Regulations

The subject covers biotech product regulations and project management for life science industry funding. Topics include funding schemes and sources, regulations on pharmaceuticals, health supplements and medical devices.

ABT3023 Sequence Analysis

This subject covers the use of computational tools to mine for biological meaning in genomic DNA. The methods include sequence alignment, motif finding, sequence comparison and gene expression analysis.

ABT3024 Structural Bioinformatics

This subject covers the use of computational tools to analyse protein sequence and 3D structure so as to predict their biological functions and model interactions with other molecules.

ACE1001 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.

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.

ACE2002 Environmental Technology

This subject provides 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.

ACE2003 Industrial Chemical Processes

This subject covers selected chemical processes and operations. Topics include the making of petrochemical raw materials from various sources and studies on the manufacture and uses of industrial gases, adhesives, plastics and pharmaceutical products.

ACE2006 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.

ACE2007 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. Practicals are included to enhance understanding.

ACE2008 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.

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.

ACE2010 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.

ACE3002 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.

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.

ACE3005 Membrane Separation

This subject covers the fundamental principles of membrane separation operation and maintenance of membrane equipment and its applications for water treatment and wastewater reclamation. Topics include membrane separation principles, membrane types and system configurations, membrane fouling and control, and advanced membrane processes such as diffusion dialysis, electrodialysis and continuous deionisation, etc.

ACE3006 Petrochemical Technology

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.

ACE3010 Materials & Nanotechnology

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.

ACE3011 Water Chemistry

This subject covers the chemistry of water, including acid/base, precipitation and adsorption. Studying the chemistry of water helps students to understand and improve wastewater and water treatment systems to better protect the natural aquatic environment.

ACH1002 Organic & Biological Chemistry

This subject provides the basic concepts in organic chemistry as well as the constituents of biological systems and their properties and significance to biological science. Topics covered include organic chemistry, proteins and enzymes, carbohydrates and lipids.

ACH1003 Organic Chemistry 1

This subject provides the 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 on the applications of organic compounds and their derivatives, and their impact on the chemical related industries.

ACH1004 Organic Chemistry 2

This subject provides the additional concepts in organic chemistry with emphasis placed on reaction mechanisms. Topics covered include nucleophilic substitution and dehydrohalogenation of alkyl halides, structure and properties of derivatives of carboxylic acids, condensation reactions in carbonyl compounds, electrophilic aromatic substitution in aromatic hydrocarbons, phenol and aniline.

ACH1005 Principles of Inorganic & Physical Chemistry 1

This subject provides the basic theory and practical knowledge of inorganic and physical chemistry. Topics include fundamentals of chemistry, gas laws, atomic structure, chemical bonding, periodic table and periodicity, nomenclature, stoichiometry and equilibria concepts of a chemical reaction.

ACH1006 Principles of Inorganic & Physical Chemistry 2

This subject provides the additional theory and practical knowledge of inorganic and physical chemistry. Topics include ionic equilibria and calculations, chemical kinetics, chemistry of transition elements, electrochemistry and phase equilibria and phase diagrams.

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.

ACH3003 Applications of Instrumental Analysis

This subject provides the additional knowledge of the principles and applications of some specialised instruments used in the analytical laboratory. Topics include atomic and molecular spectroscopic methods, sampling, data analysis, test method development, test method validation and technique development.

ACS1003 Effective Communication

This subject is intended to prepare students to communicate effectively and persuasively in the workplace. They will acquire skills to manage their communication for cohesive interpersonal and work-related relationships, and learn how to deliver effective presentations. The topics include interpersonal and team skills, meeting skills, and oral presentation skills.

ACS1004 Scientific Communication

This subject is intended to prepare students to communicate scientific information through writing. The topics include information literacy and research, proposal/ report writing, and poster production.

ACS2002 Career Communication

This subject is intended to prepare students with effective job search skills such as writing resumes and cover letters, grooming and deportment and interview techniques. It also includes relevant business correspondence skills in the context of the applied science workplace.

AEW3001 Industrial Utilities

This subject covers the operation and maintenance of common utilities found in the manufacturing industries. Topics include ultrapure water production systems, boiler systems, industrial chillers and cooling towers.

AEW3002 Industrial Wastewater Treatment

This subject covers the classification of industrial wastewaters and the strategies for wastewater treatment to meet trade effluent standards and for resource recovery. Case studies on the unique characteristics and treatment methodology for industries like chemical, semiconductor, pharmaceutical, metal-plating, etc, will be covered.

AEW3003 Environmental Management System

This subject covers an integrated approach to environmental management through the consideration of the potential impact of human activities on the physical and biological environment. Topics include environmental impact assessment, ISO 14001 and environmental resource management.

AFR2001 Forensic Toxicology

This subject discusses the basic principles behind forensic toxicology analysis in relation to forensic drug testing, post-mortem and human performance toxicology. It addresses the practices and methods used for forensic toxicology. It also covers the proper collection, handling and preparation of specimens for forensic analysis.

AFR3001 Forensic Biological, Chemical & Physical Analysis

This subject covers the application of bioanalytical, chemical and physical analytical techniques in forensics investigation. Topics include the evaluation of evidences, biological fluids, biomolecules produced by the body and skeletal remains with an emphasis on DNA profiling, finger-printing and blood, semen and saliva stains analysis. It also focuses on the use of instrumental techniques such as optical microscopy, microspectroscopy, molecular spectroscopy, chromatography, mass spectrometry and capillary electrophoresis in the analysis of alcohols, illicit drugs and poisons, glass, paints, fibres, explosions and firearms.

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.

AFS2002 Food Preservation & Quality Assurance

This subject is an integration of three areas: food quality control, food preservation and food microbiology. It covers basic concepts of food preservation and quality assurance to produce products that comply with standards and legislations with respect to the microbiological, chemical and physical aspects.

AFS2003 Food Preservation & Quality Assurance Project

This is a problem-based learning subject, integrating three content areas: food quality control, food preservation and food microbiology.

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.

AFS2008 Applied Food Sanitation

This subject focuses on the sanitation aspects associated with food establishments. Topics covered include hygienic aspects of food premise design and equipment, water sanitation and the appropriate use of cleaning and sanitising chemicals.

AFS2009 Sensory Science

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

AFS3005 Food Processing & Packaging

This subject provides a general overview of the current food processing methods used in the food industry. In addition, the processing conditions and equipment for selected food commodities are discussed. This subject also provides an insight into food packaging technology and a brief introduction to process control.

AFS3006 Product Development & Marketing

This subject covers the fundamentals for developing new food products. You will develop 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.

AFS3007 Food Safety

This subject covers important and current food safety aspects of the industry, which include food regulations and legislations, genetically modified foods/ ingredients and cold chain management.

AMA1001 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.

AMA1002 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.

AMA1003 Mathematics for Applied Science

This subject equips you with the basic mathematical techniques that are essential for your course of study. Algebra, differentiation, integration, linear regression and their applications are some topics that are covered.

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.

AMA2001 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. Topics include anatomy of human organs and organ systems and their functions.

AMB1003 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.

AMB2001 Applied Microbiology

This subject has a theoretical and practical/ laboratory focus that allows you to build on the basic concepts in microbiology to its application in the fields of food, industry, medicine and environment.

AMB2003 Pharmaceutical Microbiology

This subject covers the importance of microorganisms in the manufacture of pharmaceutical products. It includes the applications of antimicrobial agents, sterilisation methods, aseptic dispensing and microbiological testing in the pharmaceutical industry. Laboratory skills for assessing product quality and safety, and the practice of quality assurance, current Good Manufacturing Practice (cGMP) and Good Laboratory Practice (GLP) are also emphasised.

AMB2005 Introduction to Biochemistry & Microbiology

This subject investigates the importance of fundamentals of biochemistry and microbiology. Topics covered for biochemistry include the classes of biomolecules, enzymes and major biochemical pathways like the krebs Cycle and glycolysis. Topics on microbiology include classification of microorganisms, laboratory microbial techniques and microbial nutrition.

AMB2006 Medical 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.

AMP3006 Major Project (Biomedical 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.

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.

AMP3013 Major Project (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.

AMP3014 Major Project (Applied Food Science & Nutrition)

This subject provides a framework for you to solve practical and/ or technical problems, conduct research work and/or develop studies through a self-managed project. The scope of the subject includes project proposal, investigative studies, data analysis, interpretation of results, written report and presentation.

AMP3015 Major Project (Baking & Culinary Science)

This subject provides a framework for you to solve practical and/ or technical problems, conduct product development work and/ or develop studies through a self-managed project. The scope of the subject includes project proposal, investigative studies, data analysis, interpretation of results, written report and presentation.

ANT1001 Science in Food Preparation

This subject illustrates the principles of food science and food preparation, emphasising the functional and structural properties of food constituents, their inter-relationships and their behaviour during food preparation. This subject also integrates the science of cooking with the selection, storage and preparation of fresh and processed foods.

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.

ANT2001 Nutrition Across the Life Span

This subject covers the nutritional requirements of man during his life span. Topics covered include nutrition in pregnancy and lactation, nutrition for the growing years, adults and elderly.

ANT2004 Principles of Biochemistry & Physiology for Nutrition

This subject focuses on basic biochemistry and human physiology concepts in relation to nutrition. It covers the principles of enzymatic reactions, transportation across the biological membrane and the workings of the immune system. The regulation of the integrative metabolic pathways involving glucose, lipid and protein, as well as their link to adenosine triphosphate (ATP) synthesis are covered in detail.

ANT2009 Community Health & Nutrition

This subject focuses on the main public health and nutrition concerns in various community groups, 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 and activities are also discussed.

ANT3001 Nutrition in Disease

This subject focuses on the medical nutrition therapy of diet-related diseases. It covers the pathophysiology, causes, risk factors, diagnostic criteria and symptoms of obesity, diabetes and dysphagia as well as cardiovascular, renal, liver and gastrointestinal diseases. Basic principles of nutrition support are also included.

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.

APH2002 Pharmaceutical Chemistry

This subject examines the important functional group chemistry of pharmaceutical compounds and their structure-activity relationships. Concepts relevant to drug action and biological systems, and theories of drug-receptor interaction and receptor characterisation will be examined. An introduction to drug discovery and development will also be covered.

APH2005 Introduction to Pharmacotherapeutics

This subject covers the pharmacotherapeutic approaches in the management of ailments, with emphasis on basic pathophysiology and the role of medications and/or retail products and their use. It also covers basic over-the-counter dispensing and counselling practices and an appreciation of complementary medicine.

APH2006 Basic Pharmacology

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

APH2007 Pharmaceutical Legislation

This subject covers the legislations affecting the pharmaceutical industry and also the ethical issues on drug management in the pharmacy. Topics include Poisons Act, Misuse of Drugs Act, Medicine Act, Sale of Drugs Act, SAPI code of marketing practice and legal status of Traditional Chinese Medicine, as well as Code of Ethics.

APH2008 Biosafety

This subject covers the principles and practices of biosafety in the biopharmaceutical industry, hospitals, research and clinical laboratories. Students will learn good biosafety practices, and the management of hazards, risks, and threats associated with the handling of infected and non-infected organisms, microbes, biological materials and their derivatives.

APH3002 Current Good Manufacturing Practice

This subject provides the fundamental knowledge and applications of cGMP in the pharmaceutical 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.

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.

APH3005 Bioprocess Technology

This subject provides the fundamental principles of bioprocess technology and its relevance to the biotechnology industry. Topics include an overview of industrial bioprocesses, with an emphasis on fermentation and enzymes application, operations involved at various bioprocess stages, beginning from raw materials to finished products, basic concepts of bioprocess engineering, process control and instrumentation, bioreactor designs for culturing microorganisms, animal cells and plant cells.

APH3006 Good Dispensing Practice & Pharmacotherapy

This subject covers the fundamentals of good dispensing practice to enable you to read and interpret prescriptions, to prepare and pack medicine in accordance with prescriptions within the legal requirements of pharmacy law. It also covers the theory of common diseases and the use of drugs to treat these diseases. Patient counselling and OTC product counselling will also be taught.

APH3007 Pharmaceutical Analysis

This subject introduces the principles and applications of pharmacopeial analytical methods. It emphasises analytical instruments such as high performance liquid chromatography (HPLC), ultraviolet-visible spectrophotometry and infrared (IR) spectroscopy as well as their applications in the analysis of pharmaceuticals. Physical analytical methods such as particle size analysis, dissolution, disintegration and friability tests will also be included. Method development will be elaborated in relation to the optimisation of chromatographic performance.

APH3008 Biopharmaceutical Unit Operations

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. Consideration is also given to both analytical and process validation issues that are critical to successful manufacturing.

ASI3006 Student Internship Programme (Biomedical Science)

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 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.

ASI3010 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.

ASI3011 Student Internship Programme (Biotechnology)

For a period of 19-21 weeks, students are attached to industries related to their course of study, for example, biotechnological, biomedical, pharmaceutical and bioenterprise-related 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 communication (both oral and written), team-work, problem-solving and self-management.

ASI3012 Student Internship Programme (Applied Food Science & Nutrition)

You will be attached to industries related to your course of study – companies in the food, healthcare or catering industries. You will be required to undertake various tasks and activities as discussed with, and agreed by the participating organisations. Besides training in technical knowledge and skills, emphasis is placed on training in desired professional conduct in areas such as communication (both oral and written), teamwork, problem-solving and self-management.

ASI3013 Student Internship Programme (Baking & Culinary Science)

You will be attached to industries related to your course of study – companies in the food industry or food and beverage establishments. You are 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 communication (both oral and written), teamwork, problem-solving and self-management.

ASI3014 Student Internship Programme (Pharmaceutical Science)

This programme involves attachment at companies related to your course of study in the pharmacy, forensics, 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.

ASI3016 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 consciousness and written and oral presentation skills. Prior to the programme, students are required to undergo a six-week training programme at the Chemical Process Technology Centre.

AVT1001 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.

AVT1002 Animal Nutrition, Care & Behaviour

This subject focuses on animal welfare and care as well as nutritional requirements 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.

AVT1003 Aquatic Nutrition, Feed & Formulation

This subject focuses on concepts and principles of aquatic nutrition, live and dry feeds, feed formulation techniques and principle of feed processing technology. Students would also learn about feed ingredients and feed additives for application in growth and development, health, physical performance and appearance. Nutrition for larviculture, grow-out and broodstock would also be covered.

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.

AVT1005 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.

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.

AVT2007 Clinical Chemistry & Haematology

This subject covers clinical chemistry and haematology in relation to veterinary applications. Topics include the processes and principles used to evaluate pancreatic and liver functions, kidney function and electrolytes, haematology and making of blood smears.

AVT2008 Animal Diseases & Diagnostics

This subject covers an introduction to animal diseases of veterinary significance. Topics include pathogenic agents, their modes of action, and the observed symptoms as well as veterinary microbiology. You will also acquire clinic diagnostic techniques such as skin scraping, faecal flotation and other techniques of relevance to working in veterinary clinics and animal hospitals.

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.

AVT2010 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.

AVT2011 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.

AVT2012 Molecular & Cell Technology

This subject focuses on molecular biology and cell culture techniques applicable for aquaculture and animal model research. Cell culture techniques important for in vitro diagnostic assays will also be covered.

AVT2013 Rehabilitative & Emergency Critical Care

This subject covers principles of animal physiotherapy and its applications including acupressure and hydrotherapy. Skills and knowledge in animal care and handling in emergency and rescue situations as well as veterinary nursing for animal patients in intensive care will also be covered.

AVT2014 Veterinary Pathology & Histological Techniques

This subject covers principles of pathology including etiology, cause and termination of disease other than fundamental knowledge on general and systemic pathology. You will also learn about structure and functional abnormalities of diseased organs and organ systems. Techniques on basic necropsy or post-mortem procedure, histochemical and histological techniques will be covered.

AVT3004 Large Animal Science & Technology

This subject focuses on care, animal behaviour, handling and husbandry requirements of large animals such as pigs, macaques and other 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.

AVT3005 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.

AVT3006 Aquaculture Practices & Farm Management

This subject focuses on good aquaculture practices and technology important for sustainable aquaculture. Water quality management, feed and feeding management, handling and care for hatchery, larviculture, grow-out and broodstock will be emphasised. You will receive hands-on training in farm operation and management.

AVT3007 Aquaculture Production, Systems & Engineering

This subject focuses on breeding strategies, reproduction fundamentals and techniques, different indoor and outdoor culture systems including recirculating aquaculture systems for the production of finfish, molluscs and crustaceans. You will learn basic engineering principles and system design applicable for aquaculture including biofiltration technology. Intensive and integrated aquaculture systems for sustainable aquaculture will also be covered in this hands-on and industry focused subject.

AVT3008 Aquaculture Health & Product Quality

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

AVT3009 Small Animal Science & Technology

This subject provides you with knowledge and skill training in small animal care and handling, husbandry and laboratory techniques performed in research on small animal models such as rodents and rabbits as well as fish.

LEA1001/1002/1003 Leadership: Essential Attributes & Practice (LEAP)

This is a Leadership & Character Education programme that comprises three core subjects - LEAP 1, 2 and 3. It seeks to cultivate in students the dispositions (i.e. attitude, skills and knowledge) towards the development of their leadership competencies. It is a leadership programme that enables students to develop leadership life-skills that embrace character as the core foundation for their leadership credibility and influence.