

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 or laboratory 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, genomics, proteomics, plant biotechnology, immunology and other key supporting technology essential for biomedical and scientific laboratory and industry. 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 bioinformatics.

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 laboratory skills and knowledge gained by our graduates are applicable worldwide.

Graduation Requirements

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

Application

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

Minimum Entry Requirements

English Language (EL1) *	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
One of the following subjects:	Grades 1 - 6
Biology, Biotechnology, Chemistry, Combined Science, Food & Nutrition, Physical Science, Physics/ Engineering Science, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry)	
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 FUNDAMENTALS (TPFun) SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ACS1005	Communication & Information Literacy (IComm)	1	2	
ACS1006	Workplace Communication (WkComm)	1	2	
ACS1007	Persuasive Communication (PComm)	1	2	
GCC1001	Current Issues & Critical Thinking	1	2	
IED1001	Innovation & Entrepreneurship	1	2	
LEA1011	Leadership: Essential Attributes & Practice 1	1	1	
LEA1012	Leadership: Essential Attributes & Practice 2	1	1	
LEA1013	Leadership: Essential Attributes & Practice 3	1	1	
LSW1002	Sports & Wellness	1	2	
MCR1001	Career Readiness 1	1	1	
MCR1002	Career Readiness 2	1	1	
MCR1003	Career Readiness 3	1	1	
TFS1002	Global Studies	1	3	
TFS1003	Managing Diversity at Work*	1	3	
TFS1004	Global Citizenship & Community Development*	1	3	
TFS1005	Expressions of Culture*	1	3	
TFS1006	Guided Learning	1	3	
ASI3027	Student Internship Programme	3	16	

* Students must choose to take either one of these three subjects or TFS1006 Guided Learning.

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL		CREDIT UNITS
ABT1001	Cell Biology	1	4	
ABT1003	Biomolecules	1	5	
ABT1004	Molecular Genetics	1	5	
ACH1009	Principles of Inorganic & Physical Chemistry 1	1	4	
AMA1003	Mathematics for Applied Science	1	3	
AMB1002	Human Anatomy & Physiology	1	5	
AMB1004	Basic Microbiology	1	3	
ABM2013	Immunology	2	4	
ABM2016	Biological Data Analysis	2	5	
ABT2006	Analytical Biochemistry	2	5	
ABT2009	Plant Cell Technology	2	5	
ABT2013	Molecular Biology	2	4	
ABT2014	Metabolic Biochemistry	2	4	
ABT2015	Mammalian Cell Technology	2	3	
AMB2006	Medical Microbiology	2	4	
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
<u>Translational Biomedical Research</u>			
ABT3019	Stem Cells & Tissue Engineering	3	3
ABT3026	Molecular Diagnostic Development	3	3
ABT3027	OMICs & Recombinant Technology	3	3
<u>Bioinformatics</u>			
ABT2017	Scripting in Bioinformatics	2	3
ABT3023	Sequence Analysis	3	3
ABT3024	Structural Bioinformatics	3	3
<u>Free Electives</u>			
APH3004	Pharmaceutical Manufacturing Technology	3	4
APH3011	Current Good Manufacturing Practice & Process Improvement	3	4