DIPLOMA IN ARCHITECTURAL TECHNOLOGY & BUILDING SERVICES (T29)

Course Overview

We've all heard about climate change, but did you know that a building's design can play a part to combat it? With the Diploma in Architectural Technology and Building Services, you can help build an environment that's safe for our planet.

As the first polytechnic course that is designed based on interdisciplinary and multidisciplinary learning, learn how technology and digitalisation are used to design smart and sustainable buildings for the future. Using innovative Building Information Modelling (BIM) tools, this course will teach you how to use design strategies to help reduce a building's energy consumption, assess the economic viability of improving energy performance and even equip you with skills to select sustainable materials for green buildings. With this robust knowledge and skills, you can create a greener and sustainable built environment to help combat climate change.

Upon graduation, this course ensures that you are on the right track to excel, whether you choose to seek a career in the sustainable design-engineering industry or further your studies in a local or foreign university. As Singapore progresses towards developing more eco-friendly districts and buildings, you can look forward to rewarding career opportunities in the energy conservation, sustainable design or building design industries.

Come and build a more sustainable future with us!

To download a copy of our 4-page course brochure, click here.

Get the opportunity to attain the below certification(s) throughout the course of your study:

- Fire Safety Manager certification from SCDF
- Digital Delivery Management Certification- Tier 4 (Provisional) from Building Smart Singapore

DIGITAL ARCHITECTURE
Develop specialised software skills in virtual design such as Building Information Modelling (BIM) and bioclimatic simulations to conceptualise designs by predicting building performance.

SUSTAINABILITY
In line with the Singapore Green Plan 2030, envision buildings that address issues on the nation's sustainable development agenda, such as climate change, carbon emissions and environmental degradation.

ENERGY MANAGEMENT
Equip yourself with skill-sets in Mechanical and Electrical (M&E) systems coupled with automation technologies for energy efficiency in our dedicated Integrative Built Environment Centre (IBEC).

Entry Requirements

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

Subject	Grade
English Language (EL1)*	1-7
Mathematics (E or A)	1-6
Any one of the listed subjects^	1-6
Any two other subjects, excluding CCA	-
2023 Planned Intake	**100**
Net ELR2B2 aggregate range (2023 JAE)	**5 - 23**

Note: *Applicants should not be suffering from severe vision impairment.*

* SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.

^ List of acceptable subjects: Biology, Biotechnology, Chemistry, Combined Science, Computing/Computer Studies, Design & Technology, Electronics/Fundamentals of Electronics, Physics/Engineering Science, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry)/Physical Science.

What You'll Learn

YEAR 1 | YEAR 2 | YEAR 3 | TPFUN

Get an insightful and exciting experience of various aspects of the built environment through field trips to green buildings, overseas study trips and hands-on lab sessions. You will get a concrete understanding of basic design and engineering concepts.

Core Subjects

Subject Code	Subject	Credit Units
EEE1001	**Circuit Analysis** This subject provides a good foundation in DC and AC network analysis. You will learn the basic principles of electric circuitry and how to apply circuit theorems to analyse DC and AC networks.	6
ESE1006	**Computer Programming for Problem Solving** This subject covers the process of decomposing a problem into a sequence of smaller abstractions. The abstractions are implemented in software in a structured top-down approach. Software implementation includes the process of designing, writing, testing, and debugging program code.	4
EBD1005	**Digital Modelling For Architecture 1** The module introduces the principles of architectural drawing and visualisation using relevant building information modelling (BIM) tools for representation. You will learn to apply these tools to develop schematic building designs based on local building regulations, construct 3D-BIM models with architectural elements and prepare documentation for planning submissions.	4
EBD1006	**Eco-Architecture Design 1** This module will introduce “climate-	3

	responsive" building design including the adoption of passive design strategies such as building orientation and space layout to facilitate natural ventilation and daylighting, as well as vernacular architecture strategies, innovative bioclimatic architecture strategies and sustainable material selection.		
EBT2009	**Electrical Design & Installation** This subject covers basic electrical design. It includes the principles and design of low-voltage electrical systems in compliance with the relevant local statutory requirements, as well as good engineering practices. It also covers the different types of electrical installation methods and indoor artificial lighting design for buildings.	**4**	^
EMA1003	**Engineering Mathematics 1** This subject teaches pre-calculus techniques required for an engineering course. It trains you in engineering problem-solving approaches using the appropriate mathematical tools. Topics such as simultaneous equations, matrices, trigonometric, exponential and logarithmic functions, complex numbers and vectors will be covered.	**4**	^
EMA1002	**Engineering Mathematics 2** This subject introduces the basic concepts of calculus and statistical method to test a hypothesis. Basic concepts in calculus include limits, derivatives and integrals. Applications of the derivative and integrals in engineering will be discussed. Basic statistical method in hypothesis testing includes normal distribution, confidence interval of population mean and procedure to test hypothesis for a claim made about a population mean.	**4**	^
ESC1004	**Engineering Physics** This subject covers a spectrum of fundamental physics laws and	**3**	^

	concepts applicable to the scope of engineering physics. It covers a few core areas including Mechanics, Energy, Thermal Physics, Electromagnetism, Waves & Optics and Materials. This subject provides a foundation for a further in depth study of the various engineering disciplines.	
EGB1001	**Introduction to Built Environment** This subject covers the fundamentals of the built environment, focusing specifically on the local building sector. Topics covered include building components, building services commonly found in a building, basics of space planning and the Green Mark scheme that governs the environmental design and performance of buildings.	**4**

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

Be trained by our lecturers who are professional architects, engineers or energy and facility managers to develop design and technical competence. You can also engage in realistic projects involving Sustainability @TP and get to use our dedicated Integrative Built Environment Centre (IBEC).

Core Subjects

Subject Code	Subject	Credit Units
EGB2002	**Air Conditioning & Mechanical Ventilation** The Air Conditioning and Mechanical Ventilation (ACMV) system is one of the most important systems of a building and represents a significant portion of its total energy consumption. Hence, an understanding of the operating principles of a typical ACMV system is critical to maximizing the overall energy efficiency of a building.	**4**
EBM2006	**Building Management System** This subject covers the fundamental knowledge required in the design and	**4**

	operation of a Building Management System (BMS). The concept of controls and monitoring with sensors and Direct Digital Controllers (DDC) will be introduced. Control strategies for air-conditioning, BMS software features for facility management and energy management will also be covered.		
EBD3006	**Building Performance Modelling** This module covers the basics concepts of energy modelling methodology using an energy modelling software. It will help you to understand how various building design strategies help to reduce the building's energy consumption. Submission requirements for the "Green Mark" certification for both passive and active building design, as well as an evaluation and analysis of a building's performance, will also be covered.	**4**	^
EBT2008	**Building Systems Modelling** Building Information Modelling (BIM) is an intelligent 3D model-based process that allows collaboration among building professionals so that they can efficiently plan, design, construct, and manage buildings and infrastructure. This subject equips you with the practical BIM modelling skills for creating the virtual models of mechanical, electrical and plumbing systems. In addition, essential knowledge about these systems, such as its working principles, system diagrams interpretation and the energy optimisation techniques will also be covered.	**4**	^
EBD2010	**Digital Modelling For Architecture 2** This module advances the use of building information modelling (BIM) tools in building design and project coordination. You will apply your knowledge in the design development stage of your design project according	**4**	^

	stage of your design project according to the local code of practice, and prepare documentation of drawings for the purpose of project coordination.		
EGB2005	**Eco-Architecture Design 2** This subject provides in-depth knowledge about modelling and simulation concepts in green buildings. Starting with climate analysis and the passive design aspects of a green building, you will be taken through hands-on stage-by-stage simulation tasks to demonstrate the impact of solar geometry on a building's façade and its indoor spaces. The simulation includes site analysis, solar radiation analysis, shading design, overshadowing, airflow and the envelope thermal transmittance value (ETTV) of a building's facade. You will also study about ventilation using the computational fluid dynamics (CFD) software.	**4**	^
EBM3005	**Energy Management & Audit** This subject covers two main areas: energy management and energy audit. For the former, the subject illustrates the intrinsic value and concept of energy management and the implementation consideration and steps involved. On Energy Audit, the emphasis is on energy audit methodology and procedures; and methods used to evaluate energy performance of buildings and its sub-systems. These will include use of energy performance benchmarks and comparison with acceptable practices and prevailing codes and regulations. Finally, the subject discusses the application of life cycle cost concept to evaluate the economic viability of proposals on improving energy performance.	**4**	^
EGB3004	**Integrated Design Studio** This is a project-based subject in	**5**	^

	which you will learn about the integration of architectural design and various building engineering systems throughout the lifecycle of a building – from conceptualisation, design development and construction, to the operation of the building. You will also learn about the compliance with the different building codes, the "Green Building" rating systems and estimated project cost. This module will give you an understanding of how to link the different aspects of a project together and to communicate with the different role players, thereby giving you a clear perspective of both theory and practice in the built environment industry.

Graduate as an all-rounded professional with relevant management skills. You can also boost your portfolio and resume by specialising in an area of interest and showcase your skill-sets through projects, competitions and practical industry immersion.

Core Subjects —

Subject Code	Subject	Credit Units
EMP3002	**Major Project** In this subject, you will work in teams to integrate and apply your skills and knowledge to implement your projects in a practical work-and-learn environment. Besides research, design, analytics, project management, communication and problem solving skills, the emphasis will also be on innovation, teamwork and self-learning.	**8**
ESE1008	**Data Visualisation & Analytics** This subject covers the data analytics lifecycle, including gathering, cleaning, processing and visualising of data. Exploratory data analysis methods, descriptive and predictive analytics, and the presentation of insights, will also be covered.	**3**

Subject Code	Subject	Credit Units
EBM2005	**Fire & Life Safety Management** This subject introduces the roles and responsibilities of a Fire Safety Manager for both commercial buildings and industrial premises. You will be exposed to the procedure adopted in running a fire command centre, the use of detection, protection and control systems, fire investigation and formulation of a fire emergency plan.	4

Special Electives

Students can opt to take Special Electives when offered. These optional subjects aim to stretch the students' potential to enable them to meet their aspirations.

Special Electives

Subject Code	Subject	Credit Units
EED3009	**Special Project 1** The focus of this subject is on the application of students' existing domain knowledge to develop a deliverable. The subject will introduce new skills and knowledge specific to the project, as and when required.	2
EED3010	**Special Project 2** This subject provides opportunities for students to apply the acquired knowledge and skills, along with their fundamental and in-depth knowledge from different subjects to designing, developing, and implementing a well-engineered project solution.	2
EED3011	**Higher Engineering Skills 1** Higher Engineering Skills 1 and 2 aim to impart some special design and hands-on skills that allow you to acquire knowledge and skills that are not normally incorporated into a diploma programme. These Special Elective subjects will equip you with the skills and knowledge to participate in competitions and enable you to tackle real challenges.	2

EED3012	**Higher Engineering Skills 2** Higher Engineering Skills 1 and 2 aim to impart some special design and hands-on skills that allow you to acquire knowledge and skills that are not normally incorporated into a diploma programme. These Special Elective subjects will equip you with the skills and knowledge to participate in competitions and enable you to tackle real challenges.	**2**

YEAR 1 YEAR 2 YEAR 3 **TPFUN**

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

TP Fundamentals (TPFun) Subjects

Subject Code	Subject	Credit Units
ESI3001	**Student Internship Programme** This structured programme is designed to link your learning with the real work environment. You will be placed in organisation(s) with opportunities to apply the concepts and skills acquired in the course of your study. Besides reinforcing technical concepts and mastering of skills in areas that you have been trained, the practical training will enable you to build important skills such as problem-solving, communication, teamwork, and to cultivate good attitude and a strong work ethic.	**12**
ETX1001	**Effective Communication** This subject introduces the fundamentals of effective communication. It also covers how to communicate with and convince an audience through writing and speaking tasks. The skills in this subject will include the application of strategies for	**3**

	communication, appropriate vocabulary, language features, visual aids, tone and style. The **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) framework will also be applied when planning and engaging in written and verbal communication. There will be opportunities to communicate and collaborate through active learning activities, apply digital and information literacy skills and build competence through self-directed learning.		
ETX1002	**Professional Communication** This subject covers professional communication skills for the workplace and employability skills in the areas of career preparation. It covers communication and interpersonal skills, including effective virtual communication etiquette, and conducting oneself professionally in the workplace. In addition, essential career preparation skills such as resume writing and interview skills, needed to seek and secure work would be included. The **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) framework would also be applied when engaging in written and verbal communication. There will be opportunities to communicate and collaborate through active learning activities, apply digital and information literacy skills and build competence through self-directed learning.	**3**	
GTP1301	**Current Issues & Critical Thinking** This subject covers current issues, including diverse local and global concerns, that will impact lives and may have critical implications for Singapore. There will be opportunities to build competence through self-directed learning, communicate and collaborate in active discussions and objectively analyse issues using digital and information literacy skills and critical thinking scaffolds.	**3**	

GTP1201	**Career Readiness** This subject focuses on personal management skills. It develops an understanding of one's career interests, values, personality and skills for career success. It covers the necessary knowledge, skills and attitudes needed to succeed in the workplace and achieve professional goals. There will be exposure to apply digital and information literacy skills, build competence through self-directed learning methods, and acquire the skills of being a lifelong learner.	**1**
GTP1202	**Career Management** This subject focuses on career management skills. It covers the importance of workplace readiness skills to adapt and respond to the changing job market environment. Career ownership and continuous learning for lifelong employability will be emphasised. There will be exposure to apply digital and information literacy skills, build competence through self-directed learning, and acquire the skills of being a lifelong learner.	**1**
EGS1002	**Global Studies** This subject provides essential skills and knowledge to prepare students for an overseas experience. They will examine the elements of culture and learn the key principles of cross-cultural communication. In addition, they will gain an appreciation and awareness of the political, economic, technological and social landscape to function effectively in a global environment. The subject prepares students to be responsible global citizens and leaders who can contribute to the global community through effective communication and collaboration.	**3**

GTP1302	**Guided Learning***	**3**	^
	The subject introduces students to the concepts and process of self-directed learning in a chosen area of inquiry. The process focusses on four stages: planning, performing, monitoring and reflecting. Students get to plan their individual learning project, refine and execute the learning plan, as well as monitor and reflect on their learning progress and project. The learning will be captured and showcased through a curated portfolio. The self-directed learning project will broaden and/or deepen a student's knowledge and skills. Students will enhance their problem solving and digital literacy skills through this subject.		
EIN1001	**Innovation & Entrepreneurship**	**2**	^
	The subject is designed for learners from all disciplines to embrace innovation in either their specialised field or beyond. Learners will be taught to apply the Design Thinking framework to develop problem statements, ideate and identify feasible solutions. Learners will be exposed to several tools for prototyping. In addition, commercial awareness will be imbued in learners through various innovation and entrepreneurship concepts or tools. This subject also prepares students to be self-directed lifelong learners who are digital and information literate. It nurtures communicative and collaborative citizens who can use objective analysis in problem-solving.		
GTP1101	**Leadership Fundamentals**	**2**	^
	This subject focuses on self-leadership based on the values of integrity, respect, and responsibility. Increasing awareness of self and others will lay the foundations for personal and relationship		

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

TGS1001	**Sustainability & Climate Action***	**3**	^
	This subject prepares students to be responsible global citizens and future leaders who can contribute to the global community. It introduces the topics of sustainability and explores how human societies can act to build a sustainable future. This subject focuses on the impact of climate change, potential solutions to climate change, and the future of the green economy from global and local perspectives.		

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

GRADUATION REQUIREMENTS

Grade Point Average	min 1.0
TP Fundamental Subjects	36 credit units
Diploma Core Subjects	84 credit units
Total Credit Units Completed	120 credit units