Course Synopsis for Part-time Diploma Courses (2H2017)

Notes

You will be conferred a Diploma qualification from Ngee Ann Polytechnic upon completion of FIVE Modular Certificates (MCs) within a five-year validity period.

Ngee Ann Polytechnic reserves the right to revise the course structure without prior notice.

Some lessons in the modules may be conducted via online learning where participants will be able to learn at their own pace anywhere and/or anytime.

DIPLOMA IN ENGINEERING (AEROSPACE)

MODULAR CERTIFICATE IN AVIATION FUNDAMENTALS

Modules	Synopsis
Aerospace Fundamentals*	Aims to equip participants with an appreciation of the basic aerodynamics and flight principles and the airworthiness legislations requirement for the aviation industry, specifically in Singapore.
Flight Mechanics	Provides an understanding of the aerodynamics principles of aircraft flight in regime ranging from subsonic to supersonic flow. Focuses on practical problems that involve aerodynamic characteristics and performance of aircraft.
Aerospace Maintenance Practices	Introduces basic knowledge and practical skills in aerospace manufacturing processes and maintenance practices through practical projects and hands-on practice.

MODULAR CERTIFICATE IN AIRCRAFT ELECTRICAL & AVIONICS SYSTEM

Modules	Synopsis
Basic Electricity and Electronics	Introduces basic electrical, electronic and digital fundamentals with knowledge and skills in solving DC and AC networks by using Ohm's Law and Kirchhoff's Law.
Aircraft Electrical Systems	Provides fundamental knowledge and operations of generators and motors devices used in aircraft systems and aircraft lighting systems.
Avionics Theory & Systems	Introduces the zero-visibility flying, the cockpit instruments, flight environmental systems, sensing and electrical systems used in aircraft.

MODULAR CERTIFICATE IN AEROSPACE DESIGN & PROCESSES

Modules	Synopsis
Aerospace Materials and Processes	Provides knowledge of common aerospace materials and manufacturing processes. Introduces importance of structure-property-processing-performance relationship and understand the effects of fatigue, creep and corrosion in aircraft components.
Airworthiness Legislation and Quality Systems	Provides basic knowledge of key aviation regulations and airworthiness requirements governing the aerospace industry. Enables participants to apply quality management techniques and principles.
Aerospace Computer Aided Design	This practice-oriented module enables participants to acquire computer-aided design skills and a good understanding of aerospace design process.

MODULAR CERTIFICATE IN AIRCRAFT PROPULSION SYSTEMS

Modules	Synopsis
Mechanics of Fluid	Provides an understanding of basic laws governing the behaviour of fluids under the influence of energy transfer.
Propulsion Fundamentals	Introduces thermodynamics and applications of the First and Second Laws of thermodynamics, with emphasis on engineering problem solving.
Aircraft Propulsion Systems*	Equips participants with basic principles of aircraft propulsion systems and an understanding of the design features of some of the components and sub-systems.

MODULAR CERTIFICATE IN AIRCRAFT STRUCTURES & SYSTEMS

Modules	Synopsis
Aircraft Structures and Mechanics	Introduces the characteristics and design features of aircraft structures and the structural requirements imposed by the various aircraft systems.
Aircraft Systems	Covers the operation of aircraft fluid power systems, namely the hydraulic systems and the pneumatic system, landing gear and fuel supply system

Aircraft Environment & Auxiliary Systems	Introduces aircraft environmental control systems and auxiliary systems, and application analysis of air-conditioning system

*Module exemption available under Recognition of Prior Learning.

DIPLOMA IN ENGINEERING (BUILDING SERVICES & FIRE SAFETY)

MODULAR CERTIFICATE IN BUILDING DESIGN & MANAGEMENT

Modules	Synopsis
BIM (MEP)	Prepare building information modeling MEP design for construction industry.
Project Management	Introduces the rudiments of building and engineering project management.
Sustainable Building Construction	Gain knowledge and skills in building construction with green building design features.

MODULAR CERTIFICATE IN BUILDING SERVICES (MECHANICAL)

Modules	Synopsis
Basic Air-Conditioning	Provides knowledge on the basic principles of refrigeration cycles and air distribution systems.
Air-Conditioning & Mechanical Ventilation Systems	Introduces the theories, design, equipment selection, installation, operation and maintenance of Air-conditioning and Mechanical Ventilation systems in buildings.
Water, Sanitary & Gas Services	Equips participants with the knowledge in the design, installation and operational and maintenance of pipe services such as the water, sanitary and gas supply systems in buildings.

MODULAR CERTIFICATE IN BUILDING SERVICES (ELECTRICAL)

Modules	Synopsis
Principles of Electrical Engineering	Aims to provide basic knowledge in electricity technology and the concepts and theory in direct and alternating current circuits transmitted and consumed.
Building Electrical Systems & Design	Provides an understanding of the theories behind the design, construction, operation and maintenance of electrical services installation in residential, commercial and industrial buildings.
Intelligent Buildings	Imparts knowledge in the design, applications, installation and operation of intelligent building systems.

MODULAR CERTIFICATE IN FIRE SAFETY

Modules	Synopsis
Fire Operation & Investigation	Provides basic understanding of the firefighting strategy, techniques & capabilities of fire safety requirement.
Fire Safety Legislation & Regulations	Aims to familiarise participants with the provisions in the Singapore Fire Safety Act & Regulations, Fire Code and the relevant Singapore Standards and Codes of Practice to understand the principles behind the passive and active fire safety measures required in Singapore buildings.
Fire Safety Management	Provides skills and knowledge required for the roles of Fire Safety Managers. Includes use of case studies.

MODULAR CERTIFICATE IN FIRE PROTECTION SYSTEMS

Modules	Synopsis
Fire Science	Imparts the fundamentals of fire science and fire behaviour of building materials and products affecting the development of fire in compartments and fire hazards of smoke in enclosed buildings.
Fire Engineering	Equips participants with the skill and knowledge to design, install and maintain fire protection systems in buildings.
Performance Based Design	In this module, students are introduced to the regulations and theories of performance-based fire safety design. It also equips students with the knowledge and skills to use the various types of computational tools for evaluation, simulation and prediction of fire situations.

DIPLOMA IN ENGINEERING (CIVIL & STRUCTURAL)

Modular Certificate 1: Construction Fundamentals

Modules	Module Synopsis
Surveying	This is the science and technology of gathering, analysing, distributing and using geographic data. Students learn to use instruments (Level and Total Station) to gather data with basic surveying techniques. They also learn to interpret, distribute and integrate data collected with IT/IoT for urban development projects.
Soil Mechanics & Foundation Engineering	Students will study the behaviour of soil under structural loading. The properties of common types of soil, soil compaction, and soil permeability, shear strength of soil, earth pressure and stability of slopes are covered in detail. Student will also be introduce to various type of Earth Retaining Stabilizing Structures (ERSS).
Infrastructure and Building Works	In this module, students will study the basic principles and methods of construction in buildings and infrastructure engineering works as part of urban development. It also covers reinforced concrete construction, precast and pre-stressed construction, and structural steelwork. Excavation works, excavation supports, ground water control, road works and pipeline construction and various type of common construction equipment and tools are also included.

Modular Certificate 2: Environmental Sustainability

Modules	Synopsis
Water & Reclaim Water Technology	This module provides the knowledge the technologies and design of water collection systems, treatment processes, and transmission and distribution systems. Students will also learn the design and operation of recycling technologies applied in water reclamation plants with the approach to integrate it into the urban water cycle.
Environmental Fluid Mechanics & Hydrology	This module provides the knowledge of hydrology, hydrostatics and hydrodynamics. Students will learn about fluid properties to design pipelines and open channels to convey storm water and the design of other sustainable water-resource projects.
Sustainable Construction & Design	This module provides students the fundamental knowledge to create a socially, ecologically and economically sustainable city in global and Singapore context. Students will learn the various design concepts in green buildings to comply with Building Control (Environmental Sustainability) Regulations in Singapore. Use of materials such as Mass Engineered Timber, self-compacting concrete, steel and other materials recycled from construction demolition, such as steel will also be taught.

Modular Certificate 3: Structural Design

Modules	Synopsis
Structural Mechanics & Analysis	Strength and stability are important aspects of structural elements that make up buildings and other infrastructures. This module explores the fundamentals of statics, moments, reactions, stresses and strains in structural elements, analyses and compute forces, deflections, shear forces and bending moments developed in structured members due to different loading criteria.
Reinforced Concrete Design	This module equips students with the basic concepts and principles of reinforced concreted design and detailing. Students will learn to apply reinforced concreted design principles and standards in accordance with Eurocode 2 to design simple reinforced concrete members.

Steel Design	This module equips students the basic concepts and principles of structural steel design and detailing. Students will learn to apply steel design principles and standards in accordance with Eurocode 3 to design simple steel members.

Modular Certificate 4: Construction IT

Modules	Synopsis
Structural Modelling	This module introduces students to BIM processes and applications. The students will be equipped with the practical 3D BIM structural modelling skills and technical knowledge to initiate projects using BIM. It also enables students to learn how to apply the e-submission guidelines and to understand the mandatory format for regulatory approval.
Digital Construction	This module looks at the cutting-edge like Unmanned Aerial Vehicles (UAVs, sometimes referred to as 'drones') for site scanning or inspections, 3D and 4D printing, robotics or artificial intelligence (AI), Virtual and Augmented Reality in Construction**.** Students will also learn to process data collected from IoT sensors in a digitised work space to create seamless information flow that eliminate downtime/ideal time and increase production output.
Quantity Surveying	This module covers the principles of taking-off and measurement of quantities from construction drawings for urban development works. It is used for preparing cost estimates and budgeting. Topics covered include the measurement of quantities for earthworks, brickworks, concrete works, reinforcements, road pavements, pipelines, sewer lines and drainage. Students will be using BIM for taking-off and costing.

Modular Certificate 5: Site Management

Modules	Synopsis
Design for Manufacturing and Assembly	Students will be taught the methodologies of DfMA, a component of Lean Manufacturing where design processes are aimed to identify, quantify and eliminate waste or inefficiency in design. Prefabricated Prefinished Volumetric Construction (PPVC) and the element of quality control in DfMA will be also taught.
Project Management	This module covers the principles of project management at various stages of building, execution of construction work on-site and off-site. It includes the knowledge to manage contract design specification, contractual agreement, competitive tendering, construction economics, claims and even disputes during the design, tender and construction phrases of a project. There will be an introduction to collaborative contracts and productivity indicators, namely value add productivity and work output productivity, Leadership and Motivation.
Workplace Safety & Health	The module covers the relevant legislation and standards pertaining to workplace safety & health relating to civil and building works. Students will be taught to identify the various types of industry hazards and the means of protection against these hazards. Topics include design for safety, safety as integral part of work execution, risk management and control, safety management system, accident reporting and investigation, safe use of hand and power tools, safe handling of materials and machinery, electrical safety

*Common module for Module Certificate in Power Electronics & Drives and Certificate in Electrical System Design & Protection.

DIPLOMA IN ENGINEERING (ELECTRICAL)

MODULAR CERTIFICATE IN FUNDAMENTALS OF ELECTRICAL & ELECTRONIC ENGINEERING

Modules	Synopsis
DC Technology & Applications	Provides knowledge and skills in solving DC network by using Ohm's Law, Kirchhoff's Law and Thevenin Theorem.
AC Technology & Applications	Provides the fundamental knowledge and skills to understand the principles and operations of AC systems and devices in the industry.
Basic Electronics & Applications	Covers the basics of electronic devices and some common applications. Equips participants with the ability to analyze and calculate the electrical parameters of diode and transistor circuits.

MODULAR CERTIFICATE IN ELECTRONIC DEVICES & APPLICATIONS

Modules	Synopsis
Digital Electronics & Applications	This hands-on intensive module enables the participants to design and build application projects based on digital electronics. It covers the fundamentals of digital electronics, the basic principles and techniques of digital system design.
Analog Electronics & Applications	Provides knowledge of the operating principles, the design characteristics and applications of commonly used analogue devices and circuits.
Microcontroller Programming	Introduces the fundamentals of microcontroller architecture as well as basic programming to interface with various external input and output devices.

MODULAR CERTIFICATE IN POWER ELECTRONICS & DRIVES

Modules	Synopsis
Electrical Circuit Analysis *	Provides the concepts for analysing three-phase electrical circuits, applying the relevant theories and techniques to solve and troubleshoot three-phase electrical circuit problems and system designs.
Electrical Machinery	Provides basic concepts and working principles of common type of electrical machines and drives used in the industry.
Power Electronics & Applications	Provides broad-based understanding and hands-on practical experience on power electronics converters and some of their applications.

MODULAR CERTIFICATE IN INSTRUMENTATION & CONTROL

Modules	Synopsis
Industrial Control & Automation	Provides trainings in the design and wiring of electrical control systems. It uses programmable logic controllers, control devices and relevant Windows-based programming control software.
Control System Formulation & Analysis	Introduces fundamentals of feedback control principles, automatic control concepts, control systems hardware, analytical tools and stability analysis of systems.
Sensors & Instrumentation System	Imparts the fundamental concepts of measurements, sensors and transducers, signal conditioning and data acquisition. Provides hands-on practice on sensors characterisation, build and test sensor circuits and data acquisition using LabVIEW, a virtual instrumentation software.

MODULAR CERTIFICATE IN ELECTRICAL SYSTEM DESIGN & PROTECTION

Modules	Synopsis
Electrical Circuit Analysis*	Provides the concepts for analysing three-phase electrical circuits, applying the relevant theories and techniques to solve and troubleshoot three-phase electrical circuit problems and system designs.
Distribution System Design	Focuses on electrical installation design for residential, commercial and industrial premises to understand the elements of the electrical distribution in Singapore and the techniques used in the design.

Distribution System & Protection	Provides practical knowledge of high voltage (HV) distribution system (up to 22 kV), the electrical equipment used, the protection and safety schemes/devices implemented for the protection of both the equipment and working personnel.

*Common module for Module Certificate in Power Electronics & Drives and Certificate in Electrical System Design & Protection.

DIPLOMA IN ENGINEERING (ELECTRONICS)

MODULAR CERTIFICATE IN FUNDAMENTALS OF ELECTRICAL & ELECTRONIC ENGINEERING

Modules	Synopsis
DC Technology & Applications	Provides knowledge and skills in solving dc network by using Ohm's Law, Kirchhoff's Law and Thevenin Theorem.
AC Technology & Applications	Provides participants with the fundamental knowledge and skills to understand the principles and operations of ac systems and devices in the industry.
Basic Electronics & Applications	Covers the basics of electronic devices and some common applications. Equips participant with the ability to analyze and calculate the electrical parameters of diode and transistor circuits.

MODULAR CERTIFICATE IN CONTROL SYSTEMS

Modules	Synopsis
Practical Electronics with Application to Control Systems	A highly practical oriented module devoted to hands-on activities. It covers the analysis, design and assembly of an electronic feedback control system. The module enables participants to apply control theory in the real world.
Analog Electronics & Applications	Provides knowledge of the operating principles, the design characteristics and applications of commonly used analogue devices and circuits.
Control System Formulation & Analysis	Introduces fundamentals of feedback control principles and basic concepts of automatic control, control systems hardware, simple analytical tools and stability analysis of systems.

MODULAR CERTIFICATE IN INTERNETWORKING

Modules	Synopsis
Internetworking Essentials	Provides the fundamental networking concepts and emphasizes theoretical concepts and practical application, while providing participants with skills and hands-on experience needed to support networks in small-to-medium businesses.
Basic Routing & Switching	Aims to equip participants with the ability to configure and troubleshoot routers and switches and resolve common issues in networks.

MODULAR CERTIFICATE IN DIGITAL ELECTRONICS

Modules	Synopsis
Digital Electronics & Applications	This is a hands-on intensive module designed to help the students to design and build application projects based on digital electronics. It covers the fundamentals of digital electronics, the basic principles and techniques of digital system design. The main topics covered are Number systems, Boolean Algebra, Combinational logic circuits, Flip-flops and multivibrators, IC Counters, and Data handling devices.
Microcontroller Programming & Applications	Introduces the fundamentals of microcontroller architecture as well as basic programming to interface with various external input and output devices.

MODULAR CERTIFICATE IN COMMUNICATION SYSTEMS

Modules	Synopsis
Photonics	Provides foundation in wave and geometric optics, lasers, photo-detectors, fibre optic theory and its application in the telecommunication system.
Digital Signal Processing & Applications	Introduces the principle and knowledge of digital signal processing and its applications in digital areas like communications and medical engineering.
Communication Systems	Introduces fundamentals of analog communication systems, concepts of linear and nonlinear systems, analog modulation, demodulation techniques and AM/FM receivers.

DIPLOMA IN ENGINEERING (MARINE)

MODULAR CERTIFICATE IN NAVAL ARCHITECTURE

Modules	Synopsis
Fundamentals of Naval Architecture Analysis	Introduces the important branches of Naval Architecture and basic principles relating to shipbuilding, including basic ship terminology and ship geometry.
Fundamentals of Hydrostatics	Aims to provide participants with an in-depth understanding and application of marine hydrostatics. Also covers stability issues in launching, tonnage measurement and load line.
Marine Design*	Provides an overview of the ship and marine design process through the application of the 2-D and 3-D Computer-Aided Design concepts and processes.

MODULAR CERTIFICATE IN MARINE OFFSHORE SYSTEMS

Modules	Synopsis
Marine Engineering Systems	Provides an understanding of marine engineering systems such as marine propulsion and auxiliary systems and learn how they are applied in common marine system design and operations.
Offshore Production Technology	Provides an overview of the offshore oil and gas industry in the ASEAN region and other parts of the world. Covers the engineering principles and concepts in topside and subsea production systems.
Offshore Drilling and Structures	Provides engineering principles and operations of offshore drilling and offshore structures. Participants are exposed to the latest engineering concepts and practices in offshore design, construction and installation.

MODULAR CERTIFICATE IN MARINE PRODUCTION MANAGEMENT

Modules	Synopsis
Engineering Materials	Provides fundamental knowledge of common engineering materials and metal structures and how they affect the properties and performances of engineering materials.
Marine Production Technology	Provides knowledge on processes and operations found in shipbuilding, ship repair and conversion in typical marine production yards.
Marine Project Management	Introduces fundamental concepts of successful marine project management such as scheduling, resource planning, management and use of software to plan, organize and control typical marine projects.

MODULAR CERTIFICATE IN MECHANICS

Modules	Synopsis
Engineering Mechanics	Equips participants with the skills to analyze the forces acting on rigid bodies by drawing free-body diagrams and applying the conditions of equilibrium, as well as analyzing problems of rigid bodies in motion.
Strength of Materials	Introduces foundational knowledge of strength of materials including stress analysis and interpretation of practical design criteria.
Mechanics of Machines	Provides the application of theories and laws covered, into practical engineering applications through laboratory sessions to give participants a good understanding of the practical aspects of stress analysis and machine systems.

MODULAR CERTIFICATE IN THERMOFLUID ENGINEERING

Modules	Synopsis
Fluid Mechanics	Provides understanding of the fundamental principles of Fluid Mechanics. Includes laboratory practicals that use visualisation and experimentation.
Thermodynamics	Introduces the different forms of energy and various processes by which energy is transformed from one form to another. Focuses on applications of basic thermodynamic principles to actual engineering problems.

Piping Design	Equips participants with the basic knowledge in all major topics to the detailed engineering/layout of piping system, mechanical design, hydraulic design and basic stress analysis of process piping system.

*Module exemption available under Recognition of Prior Learning

DIPLOMA IN ENGINEERING (MECHANICAL)

MODULAR CERTIFICATE IN ENGINEERING DESIGN

Modules	Synopsis
Computer Aided Engineering Drafting	Provides fundamental training in the principles and practices of the international graphic language for engineering that is based on the International Standard Organization (ISO) and the Singapore Standards (SS) guidelines.
Computer Aided 3D Design	Trains participants in the application of the drafting concepts and modeling techniques for development of product models in the design process. Covers the principles and capabilities of CAD through three dimensional (3D) solid modeling of engineering components and assembly.
Mechanical Design	Provides knowledge on how to design, analyse and select mechanical systems components used in machine and system design.

MODULAR CERTIFICATE IN MECHANICS

Modules	Synopsis
Engineering Mechanics	Equips participants with the skills to analyze the forces acting on rigid bodies by drawing free-body diagrams and applying the conditions of equilibrium, as well as analyzing problems of rigid bodies in motion.
Strength of Materials	Introduces foundational knowledge of strength of materials including stress analysis and interpretation of practical design criteria.
Mechanics of Machines	Provides the application of theories and laws covered, into practical engineering applications through laboratory sessions to give participants a good understanding of the practical aspects of stress analysis and machine systems.

MODULAR CERTIFICATE IN MATERIALS & MANUFACTURING

Modules	Synopsis
Engineering Materials	Provides fundamental knowledge of common engineering materials and metal structures and how they affect the properties and performances of engineering materials such as alloys, polymers, plain carbon steels and non-ferrous materials. Interactive remote learning is ~~also~~ used to ~~help students~~ visualize and experience the use, properties and applications of materials.
Manufacturing Processes	Introduces the basic knowledge on conventional processes used to support manufacturing industries, including principles and applications on conventional machining process.
Advanced Manufacturing Systems & Management	Introduces the fundamental concepts of manufacturing systems, high value-added production and examining different types of production systems using critical comparisons in relation to the advantages and limitations of mass, flexible batch and custom manufacturing.

MODULAR CERTIFICATE IN THERMOFLUID ENGINEERING

Modules	Synopsis
Fluid Mechanics	Provides understanding of the fundamental principles of Fluid Mechanics. Includes laboratory practicals that use visualisation and experimentation.
Thermodynamics	Introduces the different forms of energy and various processes by which energy is transformed from one form to another. Focuses on applications of basic thermodynamic principles to actual engineering problems.
Piping Design	Equips participants with the basic knowledge in all major topics to the detailed engineering/layout of piping system, mechanical design, hydraulic design and basic stress analysis of process piping system.

Select one of the following Modular Certificates:

MODULAR CERTIFICATE IN AUTOMATION & CONTROL

Modules	Synopsis

Power Hydraulics	Imparts the fundamental concepts of industrial hydraulic applications to be implemented in automation and process industries. Includes simulation, hands-on circuit construction and implementation.
Industrial Automation	Equips participants with the basic knowledge of general electronic devices as well as hard-wired and programmable types of automation solutions. Their applications in sequential control systems and low-cost automation will be covered.
Instrumentation & Control	Provides the essential knowledge on the various types of control components, the operation of feedback control systems, effects of controller setting on system performance and stability.

DIPLOMA IN ENGINEERING (MECHATRONICS)

MODULAR CERTIFICATE IN ELECTRICAL & ELECTRONICS FUNDAMENTALS

Modules	Synopsis
Electrical Technology	Provides foundation in electrical knowledge for specialized subjects. Deals with the concepts and the methods used to analyze the electrical circuits. Understand the fundamental laws of network theorems and electrical components of the electrical circuit.
Analog Electronics & Applications	Provides knowledge of the operating principles and the design characteristics of analogue devices and circuits. It also illustrates their applications in practical circuits.
Digital Electronics & Applications	This hands-on intensive module will help participants to design and build application projects based on digital electronics. It covers the fundamentals of digital electronics, the basic principles and techniques of digital system design.

MODULAR CERTIFICATE IN MECHANICS OF MECHATRONIC SYSTEMS

Modules	Synopsis
Engineering Mechanics	Equips participants with the skills to analyze the two-dimensional forces acting on rigid bodies by drawing free-body diagrams and applying the conditions of equilibrium, as well as analyzing problems of rigid bodies in motion.
Strength of Materials	Introduces foundational knowledge of strength of materials including stress and strain analysis and interpretation of practical design criteria.
Mechanical Aspects of Mechatronic Systems	Builds on the module Engineering Mechanics and provides necessary knowledge and skills to apply mechanics principles to the analysis of mechanical aspects of mechatronic systems.

MODULAR CERTIFICATE IN MICROCONTROLLER APPLICATIONS

Modules	Synopsis
Computer Programming	This practical-oriented module covers knowledge and skills in computer programming using 'C' language.
Basic Microcontroller Programming	Introduces fundamentals of microcontroller architecture as well as basic programming to interface with various external input and output devices. C programming language is used to illustrate the operation of the microcontroller.
Microcontroller Interfacing & Applications	This module provides general microcontroller interfacing circuits, and example programs for input/output devices used within microcontroller circuits.

MODULAR CERTIFICATE IN AUTOMATION & CONTROL

Modules	Synopsis
Power Hydraulics	Imparts the fundamental concepts of industrial hydraulic applications to be implemented in automation and process industries. Core competencies in the module will include the understanding of the typical component blocks that make up industrial hydraulic systems for various applications.
Industrial Automation	Equips participants with the knowledge of general electronic devices as well as hard-wired and programmable types of automation solutions. Their applications in sequential control systems and low-cost automation will be covered. Major topics include electro-pneumatics technology and programmable logic control.
Instrumentation & Control	Provides participants knowledge on the types of control components, the operation of feedback control systems, effects of controller setting on system performance and stability. The application of cascade and ratio control strategies will be covered.

Select one of the following Modular Certificates:

MODULAR CERTIFICATE IN ENGINEERING DRAFTING & DESIGN

Modules	Synopsis

Computer-Aided 3D Design	Application of the drafting concepts and modeling techniques for development of product models in the design process.
Electrical & Electronic Drawing & CAD	Introduces the techniques of designing printed circuit board (PCB) layout using computer based package. The focus is on complete hands-on practice starting from schematic capture through to PCB layout post-processing and library parts creation.
Mechanical Design	Aims to provide participants with the knowledge on how to design, analyze and select mechanical systems components used in machine and system design.

MODULAR CERTIFICATE IN INDUSTRIAL SYSTEMS

Modules	Synopsis
Communication and Vision Systems	Understand network communication standards and protocols and computer vision technology used in real-world industrial systems.
Industrial Drive Systems	Equips students with knowledge of both electrical and mechanical drive system which are the core manipulating and actuating systems of all machines.
Unmanned Systems	Introduces the system architecture of unmanned systems and practical insight on both the hardware and software aspects of unmanned systems

DIPLOMA IN EARLY CHILDHOOD CARE & EDUCATION - TEACHING

MODULAR CERTIFICATE IN INTRODUCTION TO EARLY CARE AND EDUCATION

Modules	Synopsis
The Developing Child (I)	Examines the nature of children's development from birth to eight years old. Introduces observation techniques, applications of theory to help participants understand how children learn.
Principles and Practices in Early Childhood Education	Participants will study early education from the historical, cultural and contemporary perspectives. Provides overview of early education in Singapore and its desired outcomes.
Children's Health and Socio-emotional Well-being	Introduces theories, practices, and requirements for establishing and maintaining a safe and healthy learning environment for children in the early childhood settings.

MODULAR CERTIFICATE IN EARLY YEARS THEORY AND PRACTICE

Modules	Synopsis
The Developing Child (II)	Presents theories, perspectives, and practices on the social-emotional development of children. Focuses on practical implications of the related behavioural and emotional issues often found among young children.
Language and Literacy	Introduces theories on children's language and literacy development. Also covers the importance of choice of materials, preparation and organisation of a literacy-rich environment that helps facilitate language development in young children.
The Early Educator as a Professional	Explores multiple roles of teachers in working with children, families, other professionals and agencies in the community, study how to handle issues that challenge ethical principles. Develops participants' speech and presentation skills for teaching and learning.
Practicum (I)	Aims to extend participants' competence in relation to practical aspects of working with young children in early childhood settings. The practicum supports participants' learning in the area of physical and cognitive development of children, principles of early childhood education and good practices.

MODULAR CERTIFICATE IN EARLY YEARS LEARNING ENVIRONMENTS

Modules	Synopsis
Learning Environment and Classroom Management	Introduces a range of factors to consider in designing the learning environment and conditions that influence children's behaviour in the early childhood settings.
Infant and Toddler Learning Environment	Builds understanding of what contributes to this vital stage of human development and how it has a long term influence on the life and experiences of the growing child. Focuses on the principles of infant and toddler growth and development Examines how physical and social environment can facilitate developmentally appropriate practices and experiences for infants and toddlers
Working with the Exceptional Child	Provides an overview of special needs, and its place in our current educational system. It equips the participant with knowledge of more common disabilities seen in young children.
Practicum (II)	Equips participants with the understanding of children's abilities, interest and needs to enhance and challenge children's growing language abilities. Participants will also engage in reflective writing on their roles as a professional early educator.

MODULAR CERTIFICATE IN EARLY YEARS CURRICULUM

Modules	Synopsis
The Child and the Creative Curriculum	Introduces the expressive arts for young children and understanding of the rationale for arts-based integrated approaches to learning for young children.
Early Mathematics	Introduces the knowledge and skills required to plan, implement and evaluate mathematical experiences in early childhood settings. Participants adopt teaching strategies that nurture children's thinking, helping them to become problem solvers and abstract thinkers.
Environment and Social Awareness in Children	Emphasises the importance of instilling a sense of curiosity and wonder in children to explore and discover their physical and social environment. Develops knowledge, skills and disposition to empower young children.

Practicum (III)	Trains participants in the planning and implementation of structured and unstructured learning experiences in order to enhance and challenge children's desire to explore and discover in an environment that supports the holistic development of the child..

MODULAR CERTIFICATE IN EARLY YEARS PROFESSIONAL PRACTICE

Modules	Synopsis
Curriculum Planning and Design	Focuses on planning and designing of curriculum based on curriculum theory, learning principles, the philosophical and theoretical underpinnings of various curriculum models and approaches associated with the early childhood field.
Working with the Family and Communities	Equips participants with the knowledge and skills needed for working with diverse families and communities. Includes exploring, the role of the community and its support system.
Practicum (IV)	Trains participants in the planning and implementation of learning experiences in order to enhance and challenge children's desire to explore and discover in an environment that supports creative arts, numeracy, environment and social awareness.

DIPLOMA IN BUSINESS PRACTICE (INTERNATIONAL SUPPLY CHAIN MANAGEMENT)

MODULAR CERTIFICATE IN LOGISTICS MANAGEMENT

Modules	Synopsis
Fundamentals of Operations and Logistics	Imparts skills in the use of logistics simulation software and review of local logistics industry.
Warehousing and Materials Handling	Gives an understanding of warehousing and storage management in the overall logistics management of a business organization.
Inventory Planning and Control	Introduces participants to techniques for maintaining minimum stocks in industries and commercial enterprises, at minimum cost.

MODULAR CERTIFICATE IN MATERIALS MANAGEMENT

Modules	Synopsis
Productivity & Performance	This module relates the importance of productivity, innovation and continuous improvement to performance and business strategies. Students will learn the business process framework, and progress from conceptual design through to detailed action plans. It also introduces students to the tools of optimisation and simulation in operational decision-making.
International Purchasing Management	Equips participants with purchasing and supply chain analysis and type of tools and techniques. Imparts knowledge on worldwide sourcing which provides them the global perspective.
Supply Chain Management	Introduces the critical concerns involved in the design, control, operation and management of supply chain systems. Equips participants with simple techniques that can be used to analyze various aspects of the supply chain.

MODULAR CERTIFICATE IN INTERNATIONAL TRADE OPERATIONS

Modules	Synopsis
International Business Environment	Provides in-depth coverage of the role of carriers, types of vessels, containers and cargo gears, preparation of sea way bill of landing, maritime security and law, international sea transport conventions, including Hague-Visby Rules, and the major ports of call around the world.
International Trade Management	Students will learn how the social, cultural and legal environments of a foreign country affect its business environment. This helps students to understand the role and impact of international trade agreements. Students will also discuss how contemporary world affairs, such as the impact of globalisation, terrorism and emergence of economic powers in Asia, affect businesses.
Distribution & Transportation Services	Provides an understanding of the aspects of distribution and transportation of goods and services.

MODULAR CERTIFICATE IN SPECIALISED LOGISTICS

Modules	Synopsis
Cold Chain Logistics	Emphasises the understanding of local and international regulatory requirements, standards and practices of handling, storage and transportation of different food and pharmaceutical products.
Pharmaceutical Logistics	This module is designed to provide students the fundamental concepts of managing cold-chain risks in pharmaceutical logistics. Students will gain an understanding of regulatory requirements, basic cold-chain concepts, and transportation practices throughout the pharmaceutical supply chain to better anticipate and reduce associated risks to product quality, regulatory compliance, cost, and patient safety.
Chemical Logistics	Equips participants with the knowledge of logistics practices in the chemical industry, and the transportation, handling and storage of dangerous goods.

Select one of the following Modular Certificates:

MODULAR CERTIFICATE IN BUSINESS MANAGEMENT

Modules	Synopsis
Business Communications	This module introduces students to the fundamentals of both written and oral business communication skills. It will provide practice in the writing of business e-mails, letters and reports.

	This helps students to gain an understanding of the layout, convention and style of these different types of business writing. Effective business presentations will also be taught through role play.
Business Management	This module provides students with an understanding of the basic management principles and practices to enable them to function effectively in an organisation. They will learn the four management functions of planning, organising, leading and controlling, and how organisational performance and the manager's work are affected by group dynamics, innovation, creativity and the external environment.
Human Capital Management	In this module, students will develop human resource management skills needed to ensure that their organisations attract and retain employees to meet organisational goals. Topics include human resource planning, recruitment, selection, compensation and benefits administration, performance appraisal, career development and training, as well as industrial relations and globalisation trends..

MODULAR CERTIFICATE IN BUSINESS APPLICATIONS

Modules	Synopsis
Accounting & Finance	This module provides students with basic accounting and finance knowledge. Students will be taught how to interpret and use financial accounting information for decision-making. This module will also cover budgeting, financing strategies, working capital management as well as capital investment analysis.
Business Analytics	The module aims to introduce students to the fundamental concepts of business analytics to develop efficient analysis and reporting solutions. It explores the use of both business and technical topics that support the manager in the analysis of data for business decision and strategy making. Students will learn the analysis tools to make better use of data to set goals, measure progress, effectively communicate ideas, and make fast and correct decisions.
Service Operations Management	This module introduces students to the operations of service organisations and management techniques for designing, planning, organising and controlling resources for the delivery of goods and services to meet customers' needs and organisational objectives. Concepts covered include service facility, managing capacity, managing waiting lines, forecasting demand, process improvement, project management, inventory management, supply chain management and service quality..

DIPLOMA IN BUSINESS PRACTICE (ADMINISTRATION & MANAGEMENT)

MODULAR CERTIFICATE IN BUSINESS MANAGEMENT

Modules	Synopsis
Business Communications	Introduces the fundamentals of both written and oral business communication skills. Consists of ample opportunities to practise presentation skills through role-plays.
Business Management	Provides an understanding of the basic management principles and practices to enable them to function effectively in an organization. Introduces roles and functions of managers, with particular emphasis on the management functions.
Human Capital Management	Equips participants with human resource management (HRM) skills to ensure that their organisations attract and retain the optimum number and quality of employees to meet organisational goals.

MODULAR CERTIFICATE IN BUSINESS ANALYSIS

Modules	Synopsis
Cost and Managerial Accounting	Provides knowledge of cost accounting principles and enables use of managerial accounting techniques to provide information for decision-making in production, marketing and investment.
Business Statistics	Introduces basic concepts of statistics and will focus on basic statistical tools and models. Imparts skills to organize, analyse, interpret and present data results with MS EXCEL.
Decision Support Applications	Provides knowledge of spreadsheets within a business environment. Equips participants to use spreadsheets for data analysis and business intelligence.

MODULAR CERTIFICATE IN BUSINESS PRINCIPLES

Modules	Synopsis
Principles of Economics	Provides an understanding of the basic principles of economics and their use and application in microeconomics and macroeconomics. Explains how the government's fiscal and monetary policies can help to improve the economy.
Principles of Business Law	Provides an understanding of the basic knowledge of the law and its application in a business environment.
Principles of Marketing	Enables participants to better understand and evaluate the marketing system in which products and services are planned, priced, promoted and distributed.

MODULAR CERTIFICATE IN BUSINESS APPLICATIONS

Modules	Synopsis
Accounting & Finance	Provides basic accounting and finance knowledge for decision-making. Also covers budgeting, financing strategies, working capital management and investment analysis.
Business Analytics	Introduces the fundamentals concepts of business analytics to develop efficient analysis and reporting solutions for business decisions and strategy planning.
Service Operations Management	Introduces operations of service organisations and management techniques for the delivery of goods and services to meet customers' needs and organisational objectives.

Select one of the following Modular Certificates:

MODULAR CERTIFICATE IN BUSINESS ENTERPRISE

Modules	Synopsis
Business Planning & Administration	Equips participants with application skills through research based projects relevant to the industry of interest to them and present their findings to integrate or improve the different functional areas of the organisation.

Business Innovation & Strategy	Provides an overview of various aspects, business issues and success factors inherent in organisations and organizational competitiveness. Introduces how technology, innovation, operations, marketing and human resource are used together to create a synergized service management system.
Customer Relationship Management	Introduces Customer Relationship Management (CRM) and how it can affect the businesses' bottom-line. Includes front office operations and backend customer information management to develop and equip participants with the right service attributes and the required customer service skills.

MODULAR CERTIFICATE IN LOGISTICS MANAGEMENT

Modules	Synopsis
Fundamentals of Operations and Logistics	Imparts skills in the use of logistics simulation software and review of local logistics industry.
Warehousing and Materials Handling	Gives an understanding of warehousing and storage management in the overall logistics management of a business organization.
Inventory Planning and Control	Introduces participants to techniques for maintaining minimum stocks in industries and commercial enterprises, at minimum cost.

MODULAR CERTIFICATE IN SOCIAL MEDIA MANAGEMENT

Modules	Synopsis
Social Media Strategies	Introduces the functions and strategies of social media for the purposes of stakeholder engagement, business expansion and brand-building.
Social Media Marketing & Communications	Gives an understanding of marketing principles and communication theories on social media platforms and trains participants on how to create and optimise comprehensive digital marketing plans.
Social Media – Metrics & Analytics	Focuses on basic concepts and principles of web analytics, digital and web campaign types, measurement, optimisation and testing on various social media platforms.

DIPLOMA IN CARE AND PROGRAMME (STUDENT SERVICES & COACHING)

MODULAR CERTIFICATE 1: INTRODUCTION TO STUDENT SERVICES

Modules	Synopsis
Understanding Student Services*	Participants will gain an overview of the roles and responsibilities of working with children. They will be introduced to major theories in child development and their implications on general student care practices and programme implementation. Participants will also be equipped with basic measures to ensure the safety and well-being of their students.
Understanding Children's Behaviour	Participants will gain an understanding of the various stages of a child's physical, cognitive, social and emotional development and learn how to apply this knowledge to guide and manage their students' behaviour.
Managing Classroom Behaviour	Participants will learn effective classroom management techniques to provide an orderly and conducive learning environment for their students.

MODULAR CERTIFICATE 2: STUDENT MANAGEMENT

Modules	Synopsis
Managing Challenging Behaviour**	Participants will gain an understanding of the various developmental issues faced by school-going children (including special needs) and examine the causes of challenging behaviour. Participants will learn how to develop and implement basic behavioural strategies based on this understanding.
Effective Facilitation of Group Activities	Participants will be introduced to Group Theory and Group Dynamics Theory and learn facilitation skills to effectively conduct and manage group activities.
Communicating with Students Effectively	Participants will be equipped with a range of communication strategies that will enable them to engage in meaningful and purposeful interactions with their students.

MODULAR CERTIFICATE 3: PROGRAMME MANAGEMENT

Modules	Synopsis
Conducting Needs Assessment & Evaluation in Programme Development	Participants will learn the importance of conducting needs assessment prior to any programme implementation. They will learn techniques to conduct needs assessment and evaluate the programme's effectiveness.
Developing Programmes for Social Emotional Learning	Participants will be guided through a systematic framework of developing programmes that will help to enhance their students' Social Emotional Learning (SEL). They will gain an understanding of how SEL affects the students' learning outcomes and learn how to set up a learning environment that is conducive to the students' SEL development.
Planning Effective Curriculum	Participants will be equipped with the knowledge and skills to plan developmentally appropriate curriculum their students. Participants will take reference from a programme development framework on the various stages of planning

MODULAR CERTIFICATE 4: CENTRE MANAGEMENT

Modules	Synopsis
Implementing Efficient Processes in Student Services	Participants will examine the rationales and effectiveness of the current student services and identify ways, including the use of technology and job re-design, to develop processes to improve the centre's overall efficiency.
Managing Stakeholders: Engaging the community	Participants will gain an understanding of the importance of engaging families and community stakeholders to promote the overall holistic development of students; and be equipped with strategies on how to engage these key stakeholders.
Understanding Legal and Ethical Behavior	Participants will be exposed to the range of legal and ethical considerations in student care practices. They will learn to reflect on how personal, cultural identity, attitudes and values can potentially influence one's professional behavior.

MODULAR CERTIFICATE 5: MANAGING & LEADING STAFF

Modules	Synopsis
Coaching & Supervising Staff	Participants will be equipped with a range of supervisory skills to manage staff in a student service context. They will learn ways to motivate behaviour, delegate, assign work tasks, monitor progress and engage in crucial conversations with staff to improve overall job satisfaction.
Facilitating Effective Teams	Participants will be exposed to a range of leadership styles and techniques, including rewards and engagement strategies, that they can adopt to maximize team performance. Strategies for creating a learning culture within the team will also be introduced.
Enhancing the Professional & Personal Development for Staff	Participants will be introduced to a systematic framework to evaluate their staff's learning and training needs. They will learn techniques to conduct a mentoring conversation with their staff and ways to help their staff craft personal development plans and chart their career path.