

DIPLOMA IN AUDIO-VISUAL TECHNOLOGY (AVT)

(3-YEAR COURSE)

SCHOOL OF ENGINEERING



To support super-sized world-class facilities like the integrated resorts at Marina Bay and Sentosa, and the healthy demand for modern gadgets and systems, it is critical that Singapore has a pool of qualified audio-visual technologists. The **Diploma in Audio-visual Technology (AVT)** is designed to meet the growing demand for audio-visual technologists and audio-video engineering professionals in the Meetings, Incentive, Conventions, and Exhibitions (MICE), arts and entertainment, consumer electronics, broadcasting and multimedia industries.

AVT focuses on multimedia communication technology such as video conferencing and streaming, live performance system integration and management, stage lighting and live sound control, and digital media applications. The course equips students with a strong foundation in electrical, electronic and computer engineering. Students benefit from hands-on industry exposure to leading players like Esplanade and MediaCorp from the first year of study.

In the final year, students can opt to work on a full-time project or take up an industrial attachment programme. Both programmes strongly promote creativity and innovative thinking, inculcate adaptability, and enhance independent learning.

Besides Esplanade and MediaCorp, the Singapore Association of Convention & Exhibition Organisers & Suppliers, Audio Acoustics Society and Philips are other companies that have demonstrated strong support for this exciting course.

ENTRY REQUIREMENTS

To be eligible for consideration, candidates must have the following GCE 'O' Level examinations (or equivalent) results:

Subject	'O' Level Grade
English	1-7**
Mathematics (Elementary/Additional)	1-6
Science (with Physics or Chemistry or Biology component) or Design & Technology	1-6

The aggregate computation for selection is based on grades obtained for English, Mathematics, Science or Design & Technology and two other subjects.

** Candidates with English as a second language (EL2) must have attained a minimum grade of 6.

Candidates with hearing deficiency or severe vision deficiency should not apply for the course. Those with colour appreciation deficiency may be considered, subject to an in-house test.

CAREER PROSPECTS

AVT graduates are empowered to be audio-visual technologists and audio-video engineering professionals in the MICE, arts and entertainment, consumer electronics, broadcasting and multimedia industries.

They can also be employed in sectors such as hotels and resorts, audio-video equipment supply, audio-visual consultancy services, and businesses such as advertising, education and theme parks.

ACCREDITATION FOR FURTHER STUDIES

AVT graduates receive rigorous training that allows them to gain admission to degree programmes related to audio-visual, broadcast or digital media technology in local and overseas universities. As the course is supported by studies in electrical, electronic and computer engineering, graduates may also gain admission to degree courses in these disciplines.

COURSE STRUCTURE

FIRST-YEAR MODULES

Level 1.1	Level 1.2
<ul style="list-style-type: none">Electrical TechnologyEngineering MechanicsEngineering Mathematics 1Multimedia AuthoringComputer ProgrammingSports & Wellness[^]Creativity & Applied Thinking Skills[^]	<ul style="list-style-type: none">Analogue ElectronicsDigital Electronics & PracticeEngineering Mathematics 2Acoustics & Music TechnologyComputer-Aided DrawingAudio Electronics & Electrical Practical SkillsIndividual & the Community[^]Communication Toolkit[^]

SECOND-YEAR MODULES

Level 2.1	Level 2.2
<ul style="list-style-type: none">Audio TechnologyEngineering Mathematics 3APC NetworkingMusic & Music ProductionDigital Sound ProcessingAny two Interdisciplinary Studies (IS) modules[^]	<ul style="list-style-type: none">Video TechnologyMedia Transmission SystemsDigital Photography & GraphicsDigital Media Player TechnologyAudio Video Mini ProjectsOne electiveInnovation & Enterprise in Action[^]
	Electives
	<ul style="list-style-type: none">Introduction to Technical TheatreIntroduction to Performing Arts

FINAL-YEAR MODULES

Level 3.1	Level 3.2
<ul style="list-style-type: none">Stage LightingVideo Conferencing & Streaming TechnologyLive Sound TechnologyOne ElectiveWorld Issues: A Singapore Perspective[^]Any 1 Interdisciplinary Studies (IS) module[^]	<ul style="list-style-type: none">Six-Month Industrial Attachment Programme OR Design Project
Electives	
<ul style="list-style-type: none">Audio Effect ProcessingStage Management	

ACROSS-LEVEL MODULES (LEVEL 1.2 ONWARDS)

- Any 2 School of Engineering (SoE) elective modules[°]

[^] For more details on Interdisciplinary Studies (IS) modules, please log on to www.np.edu.sg/is/

[°] Students take two elective modules to complete their diploma. Electives are chosen and customised from a wide range of clusters under the Engineering and Non-Engineering categories.

COURSE MODULES

LEVEL 1.1

Electrical Technology

This module provides students with the necessary foundation for electrical circuit analysis. Students will learn electrical theorems and techniques for analysing and solving direct and alternating current circuit problems. Hands-on activities in laboratories will equip them with basic electrical measurement skills and reinforce concepts learnt in lectures and tutorials.

Engineering Mechanics

This module focuses on the study of external forces in two dimensions and their effects on particles and rigid bodies at rest. Students will learn to analyse forces acting on rigid bodies by drawing free-body diagrams and applying the conditions of static equilibrium. The module also covers linear and rotational motion of particles and rigid bodies. Topics include forces and resultants, moments and couples, equilibrium, plane friction, kinematics, and kinetics of linear and rotational motions.

Engineering Mathematics 1

This module is designed to provide students with the fundamental skills in mathematics required to solve basic engineering problems. Topics are introduced in an order that is intended to keep abreast of the application requirements in engineering modules. The emphasis in each topic is on simple applications and problem solving. Topics include algebra, trigonometry, logarithms, matrices and complex numbers.

Multimedia Authoring

This is a workshop-based module that provides students with hands-on training in the editing of animated pictures, audio and video; and the authoring of a multimedia package using computer technology such as digital cameras and recorders, soundcards, video cards, and DVD recorders. Authoring software used include Apple Final Cut and Garageband. The module also enables students to gain experience in simple post-audio productions for different multimedia movies or animations. At the end of the module, students will be able to produce short DVD movies with sound, video, simple online text and narration effects.

Computer Programming

This practice-oriented module equips students with the basic knowledge and skills in computer programming using C language. The main topics include basic computing concepts, fundamentals of C, branching, loops, and C functions. Upon completion of the module, students will be able to explain and write C programs for simple engineering applications.

LEVEL 1.2

Analogue Electronics

This module expounds the fundamental concepts of analogue electronic devices and circuits. It covers semiconductor physics as well as the device characteristics, operating principles and common applications of diodes and transistors. The module will equip students with a thorough understanding of DC biasing and AC operation of transistor amplifier circuits. This will be achieved through worked examples, tutorials, laboratory sessions and e-learning materials.

Digital Electronics & Practice

This module aims to provide students the basic knowledge and fundamental principles in digital electronics. Topics include Number Systems and Codes, Logic Gates and Boolean Algebra, Combinational Logic Circuits, Counters, Flip-Flop and Data Handling Circuits. Students will be able to explain and analyse the workings of digital circuits through hands-on experiments in the laboratory.

Engineering Mathematics 2

This module is designed to provide students with advanced skills in mathematics required to solve basic engineering problems. Topics are introduced in an order that is intended to keep abreast of the application requirements in engineering modules. Topics include trigonometry, coordinate geometry, differentiation and integration with applications.

Acoustics and Music Technology

This workshop-based module introduces students to the principles of acoustics, synthesized music (midi) and audio recording techniques. Students will learn about the nature of sound, the human hearing process, psychoacoustics, and audio measurement terms and concepts. Basic specifications of sound reproduction equipment, source and load impedances, power output, loudness levels, sound pressure levels and distortion will also be discussed. Students will attend practical sessions on acoustic measurement of ambience that includes microphone positioning, frequency response, direct and reverberant sound, precedence effects and high frequency attenuation. Students will also be given the opportunity to create and record their own music using synthesizers and multi-track recorders.

Computer-Aided Drawing

With the use of powerful drawing software, this workshop-based module enables students to learn about the construction of basic lines and shapes, dimensioning, editing and drawing manipulation. Advanced topics such as 3-D and electrical schematic drawings, customisation of symbols, and audio and video system layout plans are also included in this module.

Audio Electronics & Electrical Practical Skills

This workshop-based module equips students with relevant practical skills such as electronic component identification, understanding correct wiring methods, and the building and testing of audio electronic circuits on breadboards and printed circuit boards. Students will learn to use various test and measurement equipment such as the digital multi-meter, oscilloscope and function generator. Students will also receive hands-on practice in basic electrical wiring, installation and relay control systems.

LEVEL 2.1

Audio Technology

This module introduces students to the principles of sound and hearing, audio signal analysis, audio processing and sound spectrum. Students will learn the structure and electronic principles of microphones, amplifiers, sound reproduction systems such as loud speakers, headphones, crossovers, wires and cables, dedicated amplifiers using low noise op-amps, solid state devices and thermionic valves, noise reduction techniques, signal enhancers and equalisers, and signal processors. Also covered are digital audio, analogue-to-digital, and digital-to-analogue conversions for audio signals.

Engineering Mathematics 3A

An extension of the Engineering Mathematics 2 module, topics in this module include Integration Techniques and Applications, First Order Differential Equation, Fourier series and Laplace Transform.

PC Networking

Computer networks are essential to organisations. In this module, students will study PC Networking (PCN) with a focus on data networking knowledge. The Open System Interconnection (OSI) reference model and Transmission Control Protocol/Internet Protocol (TCP/IP) model will be used to explain important networking concepts. Standards and products associated with each OSI layer, and data flow in networking devices will be discussed. Premises structured cabling systems standards, media types and performance criteria, system design and installation recommendations are also covered.

Music & Music Production

This module gives an introduction to basic music theory, hearing techniques, reading of notes and chords, and understanding of reverb, treble, mid-tone and bass. Students will acquire hands-on experience in a recording studio, and learn about the aesthetic aspects of music recording, as well as the techniques involved in setting up recording devices for various musical instruments such as the guitar, acoustic guitar, organ, piano, and trumpet. Students will also learn about the functions and connections of the mixer, midi set-up, and the placement of mono and stereo microphones and music sensors.

Digital Sound Processing

This workshop-based module equips students with practical knowledge and skills in sound effects and filtering techniques. These include adding special audio effects, combining sounds in a mix-down system and generating the recording on a stereo-track recorder. The audio effects and reverberations are artificially generated using various signal processing circuits and devices. Students will learn how to use processing techniques such as delay, multiple echo, reverberation, flanging and equalising to produce hall, stadium, open air and disco effects, and other simulated sound-enhanced effects such as vocal suppression, rock and roll, classical and heavy metal.

LEVEL 2.2

Video Technology

In this module, students learn the characteristics of human vision, vision wavelength, video signals, saturation, luminance, display device standards, and colorimetric computer display. Electron gun deflection, fly-back, colour sub-carrier, NTSC and PAL TV system will also be discussed. For digital video and computer visual systems, the principles of pixels, display format (RGB) and HDTV will be covered. The module also teaches the operating principles of the LCD display and plasma TV, and video camera technologies like charge-coupled devices (CCD) and CMOS sensors and imagers. Applications such as camera network and video editing software will also be included.

Media Transmission Systems

This module allows students to learn about media data communication, analogue and digital transmission systems that include AM, FM, cable TV, satellite TV, DAB and DVB. For data communication, students will gain an understanding of the base-band concept, data encoder and decoder, error detection and correction, routing information, reconstruction and lock synchronisation. For wireless systems, students will study system configurations, transmitters and receivers, error performance, path loss, signal processing, bandwidth, data rate, relative complexity, advantages and disadvantages, and transmission standards.

Digital Photography & Graphics

This workshop-based module encompasses practical training on using digital cameras to shoot creative and artistic photos, including portrait, dawn, party and night scenes, and moving objects. Students will cover the use of digital imaging software including Flash; as well as how to use photographic effects, filter, hue control, advertisement, poster, movie flash and flyer design to create digital arts beyond the imagination.

Digital Media Player Technology

This is a workshop-based module that enables students to learn about downloadable audio (MP2, MP3, MP4), downloadable video (Flash video, Real Media, Windows Media, CD, VCD, SVCD, DVD standards), streaming formats (Real streams, Windows Media streams), TV standards (PAL, SECAM, NTSC), and the various H standards including H.323 (an ITU standard for computers, equipment, and services for multimedia communication over networks). Audio and video recording standards, transmission media, storage media and cables will also be covered in this module, including a brief discussion of safety and legal issues concerning audio-video equipment and media content.

Audio Video Mini Projects

This workshop-based module provides students with extensive hands-on practice in building and troubleshooting audio and video circuits. Mini projects include the audio amplifier, audio mixer, video preamplifier, audio/video switch, video modulator, VGA-to-video converter, and video-to-VGA converter. Students will learn to build and test audio and video circuits on breadboard and printed circuit board, and to use test and measurement equipment such as the distortion meter, function generator, oscilloscope, waveform monitor and pattern generator.

LEVEL 2 (ELECTIVES)

Introduction to Technical Theatre

The module will provide students with brief knowledge of the following topics – lighting, makeup, production, scene setting, sound for stage, theatrical property and introduction to costume. Students will study the effect of lighting for theatre productions the size, intensity, shape, and colour of light for a given scene. They also learn how to use makeup that accentuates an actor's features. The production process will be discussed briefly. Scenery includes set construction, scenic painting, soft goods (drapes and stage curtains), and special effects and sound, include musical underscoring, vocal and instrument mixing as well as theatrical sound effects are described. Finally, the module will study briefly theatrical property, or props, which includes furnishings, set dressings, hand props, and actors' costumes.

Introduction to Live Performing Arts

The performing arts include theatre, motion pictures, drama, comedy, music, dance, opera, magic and the marching arts. In this module, students will learn to identify, analyse and appreciate the different types of performing arts. Topics include staging, ambience, audio reinforcement, genre of music, costumes, background and storyline.

LEVEL 3.1

Stage Lighting

This module enables students to learn the technical and creative aspects of stage lighting. Topics include basic design, colour and exposure theory, types of lighting instruments, power distribution, control, safety, proper hanging, connection, focus, and control of instruments. Upon completion of this module, students will be able to perform creative lighting layout, install concert lighting, explain colour theory, integrate lighting control instrumentation, and set up a variety of motion lighting instruments.

Video Conferencing & Streaming Technology

This module provides training in streaming technologies that include local networks, Internet audio and video streaming technology, web-casting and voice over IP (VoIP). Students will acquire knowledge of hardware configurations, transmitters and receivers, quality of service, routing, re-sequence, signal processing and streaming standards. The module also includes an overview of the MPEG-4 data compression mechanism; and issues related to shooting video for streaming, editing, quality control, and the formatting of streaming audio and video to fit various applications such as video conferencing, web-casting, pod-casting and mobile entertainment systems.

Live Sound Technology

This hands-on module provides students with the concepts and technical skills required for live event sound reinforcement. Topics include the operation of a basic sound system using interconnected components such as consoles, amplifiers, speakers, processors and microphones. Upon completion of this module, students will be able to apply the concepts of live sound reinforcement to set up and operate a small-to medium-scale sound system for a live event, and to customise a recording setup based on the ambience and multimedia requirements.

LEVEL 3 (ELECTIVES)

Audio Effect Processing

This workshop-based module offers intensive hands-on sessions where students learn to create, edit and mix music and special sound effects onto multiple audio tracks. It also provides theoretical and practical training on digital audio effects techniques that convert a two-channel stereo audio track to 5.1 surround-sound tracks, the professional use of AC-3, redirection to speakers through digital Dolby and surround sound decoders, and spatial enhancement in theatre and audio entertainment application.

Stage Management

This workshop-based module enables students to learn the roles and responsibilities of the stage manager. Students learn the techniques of successfully managing the numerous aspects of a production, both on stage and backstage, in the pre-rehearsal, rehearsal, performance, and post-performance phases. This module includes the planning of a master calendar and prompt script; aspects of coordination with production designers; using light, sound and costume plots effectively; coordinating the efforts of the cast to stay on scripts; performing checks on safety, legal issues, lighting and sets; and the smooth coordination of technical and dress rehearsals.

LEVEL 3.2

Six-Month Industrial Attachment Programme

In this module, students will have the opportunity to apply the skills and knowledge acquired in the classroom in a real-time environment. Students are given on-the-job training in actual companies to develop skills in problem-solving, interpersonal communications, project planning and implementation, industrial liaisons and character building. Participating companies will also have the opportunity to assess prospective employees and secure the services of these students in advance.

Design Project

The module will promote essential traits like leadership, team spirit, positive work attitudes, independence and an innovative spirit. This module also aims to help students develop their project management abilities through effective project planning, scheduling, group discussions, project load balancing, and planning project milestones using the Gantt chart. Students will also be able to polish their oral and written communication skills by submitting reports and making presentations.

ACROSS-LEVEL MODULES (LEVEL 1.2 ONWARDS)

School of Engineering Elective Modules and the Diploma Plus Programme

Students take two modules from a wide range of clusters under the engineering and non-engineering categories to complete their diploma. Furthermore, students can qualify for a diploma plus by simply topping up with two additional modules from the same cluster as one of the electives. The Diploma Plus Certificate helps students if they wish to pursue a university degree or increase their employability in discipline-specific areas. Students can choose electives from the range listed below.

Engineering Category

- Advanced Engineering Mathematics Cluster*
- Applied Physics Cluster*
- Biomedical Engineering Cluster
- Electrical Control & Measurement Cluster
- Industrial Control Cluster
- Industrial Electronics Cluster
- Information Technology Cluster
- Mechanical Technology Cluster
- Stage Management & Technology Cluster
- Telecommunication Distribution Technology Cluster

Non-Engineering Category

- Economics & Financial Applications Cluster
- Green Development Cluster
- Leisure & Retail Management Cluster

Other Available Diploma Plus Certificates

- Business
- Innovation Management
- Languages (Japanese)

*Designed in collaboration with the Department of Electrical and Computer Engineering, National University of Singapore (NUS). The syllabus is based on the first-year engineering mathematics and science curricula of NUS.

For detailed module descriptions under each cluster, please refer to page 182.

COURSE CURRICULUM

Module No.	Module Name	Credit Units
YEAR 1		
Level 1.1 (27 hours per week)		
1.	Electrical Technology	6
2.	Engineering Mechanics	5
3.	Engineering Mathematics 1	5
4.	Multimedia Authoring	3
5.	Computer Programming	4
6.	Sports & Wellness [^]	2
7.	Creativity & Applied Thinking Skills [^]	2
Level 1.2 (26 hours per week)		
8.	Analogue Electronics	5
9.	Digital Electronics and Practices	2
10.	Engineering Mathematics 2	5
11.	Acoustics & Music Technology	4
12.	Computer-Aided Drawing	2
13.	Audio Electronics & Electrical Practical Skills	4
14.	Individual & the Community [^]	2
15.	Communication Toolkit [^]	2
YEAR 2		
Level 2.1 (24 hours per week)		
16.	Audio Technology	6
17.	Engineering Mathematics 3A	4
18.	PC Networking	3
19.	Music & Music Production	4
20.	Digital Sound Processing	3
21.	Interdisciplinary Studies (IS) module [^]	2
22.	Interdisciplinary Studies (IS) module [^]	2
Level 2.2 (24 hours per week)		
23.	Video Technology	5
24.	Media Transmission Systems	5
25.	Digital Photography & Graphics	3
26.	Digital Media Player Technology	3
27.	Audio Video Mini Projects	4
28.	Innovation & Enterprise in Action [^]	4
Electives		
29.	Introduction to Technical Theatre	3
30.	Introduction to Performing Arts	3
YEAR 3		
Level 3.1 (18 hours per week)		
31.	Stage Lighting	5
32.	Video Conferencing & Streaming Technology	4
33.	Live Sound Technology	5
34.	World Issues: A Singapore Perspective [^]	2
35.	Interdisciplinary Studies (IS) module [^]	2

Module No.	Module Name	Credit Units
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Electives (Choose 1)

36.	Audio Effect Processing	3
37.	Stage Management	3

Level 3.2 (25 hours per week)

38.	Six-Month Industrial Attachment Programme or Design Project	25
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Across-Level Modules (Level 1.2 onwards) (6 hours per week)

39.	School of Engineering (SoE) elective module [°]	3
40.	School of Engineering (SoE) elective module [°]	3

Notes:

[^] For more details on Interdisciplinary Studies (IS) modules, please log on to www.np.edu.sg/is/

[°] For more details on School of Engineering elective modules, please refer to page 182.

IS Modules

The School of Interdisciplinary Studies (IS) delivers the interdisciplinary curriculum, which nurtures a new generation of professionals with multidisciplinary skills and an innovative and entrepreneurial spirit to meet the challenges of a knowledge-based economy. IS modules challenge boundaries and offer insights into Communication, Entrepreneurship, Life Skills, Media & the Arts, and Science & Technology.

School of Engineering (SoE) Elective Modules

The SoE elective modules fall under a wide range of clusters under both Engineering and Non-Engineering categories. The aim is to provide students with the opportunity to broaden their knowledge and deepen their discipline-specific areas. Each cluster comprises a minimum of three 3-hour modules. Students are required to take two modules in order to satisfy the minimum graduating requirement.

DIPLOMA IN ELECTRICAL ENGINEERING (EE) (3-YEAR COURSE)

SCHOOL OF ENGINEERING



Be it aerospace, biomedical, communications, computer, media, entertainment, resorts and offices or financial services, reliable power systems and sophisticated electronic and computer systems are key to making them possible. To prepare students for exciting careers in any of these and other high-tech industries, we offer the broad-based and flexible **Diploma in Electrical Engineering (EE)**.

In the first and second year, students pick up technical skills in the core fields of electrical, electronic and computer engineering, and related skills in business management, entrepreneurship, communication, innovation and more. In the final year, students specialise in an area.

In response to Singapore's development as a clean energy hub, particularly in solar energy technology, a new specialisation in Solar Technology has been launched. The timing could not have been more perfect as the world's largest solar plant will be set up in Singapore by 2010, creating 3,000 jobs in the process. The \$6.3 billion plant will put the country firmly on the world map for clean energy. Non-engineering options have also been introduced to cater for diverse student interests. The list of options is as follows:

- Power Engineering
- Data and Network Systems
- Engineering Management
- Electronics
- Solar Technology **NEW!**
- Business Management **NEW!**
- Marketing and Entrepreneurship **NEW!**

To make learning more interesting and challenging, students can choose to work on a full-time project or take up a local or overseas attachment programme in their final year. Local attachments are with leading companies such as PowerGrid Ltd and Singapore Technologies Aerospace, while overseas attachments are with companies and institutions of higher learning in countries such as China, Thailand, Malaysia, Australia and Germany.

The full-time project enables students to acquire research and product-development skills. It also provides an avenue for enterprising students to come up with their very own products and patents. Students are also given ample opportunities to participate in competitions to showcase their talents and innovativeness.

Strategic industrial collaborations have spawned many specialist-training areas. The Electrical Engineering (EE) Division boasts a host of excellent facilities, including the only High Voltage Training Centre in Singapore, Power Quality Centre, Instrumentation & Control Centre and Solar Technology Centre.

EE also forges strong industrial partnerships with many leading companies such as National Instruments, Fluke Networks, Tyco Electronics Singapore and Omron Asia Pacific. EE is, therefore, constantly aligned with ever-changing technologies. Students enjoy the benefits of learning the latest technologies and working with the most advanced facilities and equipment.

ENTRY REQUIREMENTS

To be eligible for consideration, candidates must have the following GCE 'O' Level examinations (or equivalent) results:

Subject	'O' Level Grade
English	1-7**
Mathematics (Elementary/Additional)	1-6
Science (with Physics or Chemistry or Biology component) or Design & Technology	1-6

The aggregate computation for selection is based on grades obtained for English, Mathematics, Science or Design & Technology and two other subjects.

** Candidates with English as a second language (EL2) must have attained a minimum grade of 6.

Candidates with severe vision deficiency should not apply for the course. Those with colour appreciation deficiency may be considered, subject to an in-house test.

CAREER PROSPECTS

EE graduates have an excellent track record of securing employment soon after graduation. Many graduates have also moved up the corporate ladder to managerial positions, and a number have started their own businesses.

Graduates can look forward to a wide range of challenging and rewarding careers in numerous industries, like electrical consultancy and contracting, electronics, aerospace, biomedical, communications, process control, high-tech manufacturing, computer networking, and world-class resorts, just to name a few.

When applying for the Electrical Technician License, a Diploma in Electrical Engineering is required. The license is an asset if they intend to start an electrical contracting business or work in one.

ACCREDITATION FOR FURTHER STUDIES

EE graduates are accepted into top local and overseas universities for further studies. They enjoy direct entry into the second year for related engineering courses in NTU and NUS. They can also apply for other degree programmes like business, accountancy, and arts and sciences.

The University of Manchester, Imperial College, University of Sheffield, University of New South Wales and Queensland University of Technology are just some of the overseas universities that accept EE graduates, who may be granted credit exemptions or direct entry into the second or third year in leading universities in Australia, Canada, the United Kingdom and the United States.

COURSE STRUCTURE

FIRST-YEAR MODULES

Level 1.1	Level 1.2
<ul style="list-style-type: none"> Electrical Technology Engineering Mathematics 1 Engineering Mechanics Computer Programming Engineering: A Creative Profession Creativity & Applied Thinking Skills[^] Sports & Wellness[^] 	<ul style="list-style-type: none"> Analogue Electronics Engineering Mathematics 2 Computer-Aided Drawing Electrical & Electronic Practical Skills AC Circuits Digital Electronics & Practice Individual & the Community[^] Communication Toolkit[^]

SECOND-YEAR MODULES

Level 2.1	Level 2.2
<ul style="list-style-type: none"> Electrical Circuit Analysis & Measurement Electrical Machines & Drives PC Networking Industrial Automation Sensors & Instrumentation Any two Interdisciplinary Studies (IS) modules[^] 	<ul style="list-style-type: none"> Electronic Devices & Circuits Engineering Mathematics 3A Power Devices & Applications Microcontroller Applications Innovation & Enterprise in Action[^] One elective
	<p>Electives</p> <ul style="list-style-type: none"> PC Internetworking Technology Programmable Logic Devices

FINAL-YEAR MODULES

Level 3.1	Level 3.2
<ul style="list-style-type: none"> Modules from an Option World Issues: A Singapore Perspective[^] Any 1 Interdisciplinary Studies (IS) module[^] 	<ul style="list-style-type: none"> Six-Month Industrial Attachment Programme OR Design Project

ACROSS-LEVEL MODULES (LEVEL 1.2 ONWARDS)

- Any 2 School of Engineering (SoE) elective modules[°]

[^] For more details on Interdisciplinary Studies (IS) modules, please log on to www.np.edu.sg/is/

[°] Students take two elective modules to complete their diploma. Electives are chosen and customised from a wide range of clusters under the Engineering and Non-Engineering categories.

LIST OF OPTIONS

<p>Power Engineering Option</p> <ul style="list-style-type: none"> Control & Automation Power Distribution & Protection Electrical Installation Design 	<p>Data & Network Systems Option</p> <ul style="list-style-type: none"> Internetworking Wireless LAN Technologies Distributed Control Systems
<p>Engineering Management Option</p> <ul style="list-style-type: none"> Engineering Contract & Project Management Power System Economics & Energy Market Electrical Installation Design 	<p>Electronics Option</p> <ul style="list-style-type: none"> Electronics Systems Design Power Electronics Embedded System Design
<p>Solar Technology Option NEW!</p> <ul style="list-style-type: none"> Solar Cell Technology Photovoltaic Technology Design & Operation of Photovoltaic Systems 	<p>Business Management Option NEW!</p> <ul style="list-style-type: none"> Customer Relationship Management E-commerce Service Operation Management 1 module from Marketing & Entrepreneurship Option
<p>Marketing & Entrepreneurship Option NEW!</p> <ul style="list-style-type: none"> Business Creation Enterprise Development Product Design and Marketing 1 module from Business Management Option 	

COURSE MODULES

LEVEL 1.1

Electrical Technology

This module provides students with the necessary foundation for electrical circuit analysis. Students will learn electrical theorems and techniques for analysing and solving direct and alternating current circuit problems. Laboratory work will equip them with basic electrical measurement skills and reinforce concepts learnt in lectures and tutorials.

Engineering Mathematics 1

This module is designed to equip students, with any level of mathematical ability, with the fundamental skills required to solve engineering problems. Topics are introduced in an order that is intended to keep pace with the application requirements in engineering modules. The emphasis is on applications and problem-solving. Areas covered include algebra, trigonometry, logarithms, matrices and complex numbers.

Engineering Mechanics

This module focuses on the study of external forces in two dimensions and their effects on particles and rigid bodies at rest. Students will learn to analyse forces acting on rigid bodies by drawing free-body diagrams and applying the conditions of static equilibrium. The module also covers linear and rotational motion of particles and rigid bodies. Topics include forces and resultants, moments and couples, equilibrium, plane friction, kinematics, and kinetics of linear and rotational motions.

Computer Programming

This practice-oriented module equips students with the basic knowledge and skills in computer programming using C language. The main topics include basic computing concepts, fundamentals of C, branching, loops, and C functions. Upon completion of the module, students will be able to explain and write C programmes for engineering applications.

Engineering: A Creative Profession

This activity-driven module introduces students to the vocabulary, skills, applications and sheer inspiration that drive the engineering discipline. Through case studies and projects, students enjoy their first exposure to techniques in analysis, design and problem solving. The module offers students an exciting glimpse of what to expect later in the course, and provides a foundation of the essential tools needed to succeed in this dynamic profession.

LEVEL 1.2

Analogue Electronics

This module expounds the fundamental concepts of analogue electronic devices and circuits. It covers semiconductor physics as well as the device characteristics, operating principles and common applications of diodes and transistors. The module will equip students with a thorough understanding of DC biasing and AC operation of transistor amplifier circuits. This will be achieved through worked examples, tutorials, laboratory sessions and e-learning materials.

Engineering Mathematics 2

This module provides students with further mathematical skills to solve engineering problems. Topics include trigonometry, coordinate geometry, differentiation and integration with applications.

Computer-Aided Drawing

With the use of powerful drawing software, this workshop-based module enables students to learn about the construction of basic lines and shapes, dimensioning, editing and drawing manipulation. Advanced topics such as 3-D and electrical schematic drawings, customisation of symbols, and electrical single-line and layout diagrams are also included in this module.

Electrical & Electronic Practical Skills

This module aims to equip students with the basic skills and knowledge of electrical and electronic theories. The Electrical segment provides students with hands-on practices in domestic electrical wiring, industrial control using relays and timers, and the application of electrical and electronic sensors. The Electronics segment also teaches students to assemble and test electronic circuits on breadboard and printed circuit board. It emphasises hands-on skills in soldering, mini project assembly and using of test & measurement equipment such as oscilloscope, function generator and digital multi-meter.

AC Circuits

Students will learn the basic principles of electrostatics, capacitance, the transient behaviour of a R-C circuit, the basic principles of electromagnetic inductance, and the transient behaviour of a R-L circuit. Students will also be introduced to the basic principle of alternating current voltage generation, the characteristics of an AC sine wave and its mathematical representation. They will learn the basic theory of alternating current applied to R, L and C series, parallel and series-parallel circuits, and how to use phasor diagrams and complex number notation to solve problems in AC circuit theory as well as determine average power and power factor in AC circuits. Concepts on apparent power, real power and reactive power, power triangle and power factor correction using capacitors will also be discussed.

Digital Electronics & Practice

This module provides students the basic knowledge and fundamental principles of digital electronics. Topics include Number Systems and Codes, Logic Gates and Boolean Algebra, Combinational Logic Circuits, Counters, Flip-Flop and Data Handling Circuits. Students will be able to explain and analyse the workings of digital circuits through hands-on experiments in the laboratory.

LEVEL 2.1

Electric Circuit Analysis & Measurement

This module covers the concepts, theorems and measurement techniques needed in electrical engineering. The topics include three phase system analysis, power measurement and power factor correction, harmonics, transient and steady-state analysis, and measurement procedures and techniques. The knowledge gained will enable students to analyse electrical circuits, solve and troubleshoot circuit and measurement problems, and aid in the design of electrical systems.

Electrical Machines & Drives

This module provides students with the basic concepts and working principles of common types of electrical machines and motor drives. They will be introduced to the construction, working principles, performance characteristics of transformers, DC motors, induction motors, synchronous generators and stepper motors, and their applications in the industry. Students will also be introduced to motor drive systems and their applications.

PC Networking

Computer networks are essential to organisations. In this module, students will study PC Networking (PCN) that focuses on data networking knowledge. The Open System Interconnection (OSI) reference model and Transmission Control Protocol/Internet Protocol (TCP/IP) model will be used to explain important networking concepts. Standards and products associated with each OSI layer and data flow in networking devices will be discussed. Premises structured cabling systems standards, media types and performance criteria, system design and installation recommendations are also covered.

Industrial Automation

This module will train students in electrical control systems, which cover sequential motor control circuits, direct-on-line and star-delta motor starter circuits. This module also introduces them to programmable logic controllers, control devices and the relevant Window-based programming software. Students will learn to design ladder diagrams for programming the Programmable Logic Controller (PLC) and perform exercises relevant to its industrial applications.

Sensors & Instrumentation

The module provides students with the skills in graphical programming and the knowledge to develop virtual instrumentation systems. Students will be introduced to the concept of virtual instrumentation, sensor technologies, data acquisition devices, and computer interfaces such as RS232, GPIB and USB. LabVIEW, a graphical programming software that is widely used for creating virtual instrumentation, will also be taught.

LEVEL 2.2

Electronic Devices & Circuits

This module aims to provide students with a general understanding of some commonly used analogue and digital electronic devices. The module covers the operating principles, characteristics and applications of operational amplifiers, digital-to-analog and analog-to-digital converters, integrated-circuit logic families and memory devices.

Engineering Mathematics 3A

This module is an extension of the Engineering Mathematics 2 module. Topics include Integration Techniques & Applications, First Order Differential Equation, Fourier series and Laplace Transform.

Power Devices & Applications

This module trains students in the use of power semi-conductor devices in the area of electrical power control. Students will learn about the characteristics and application techniques of devices. They will also have the opportunity to construct controllers made from these devices to operate motors, solar power supply, voltage regulators and lighting control circuits. The hands-on sessions will also hone students' skills in the use of electronic workbench instruments and trouble-shooting techniques.

Microcontroller & Applications

This practice-oriented module is designed to equip students with an understanding of the conceptual and operational aspects of a micro-controller embedded system. Students will learn about the hardware and software design of a general-purpose computer system, the fundamental concepts of microcontrollers and the interfacing with external applications. Intel's 8051 microcontroller series will be used as a reference example. Assembly and C language will be used in project-based exercises. Students will also learn to use microcontrollers for engineering applications.

ELECTIVES

PC Internetworking Technology

In today's networked community, Local Area Networks (LAN) are interconnected for central control and distribution of information. The important devices that make the network so dominant are the routers and switches that interconnect all local networks and provide a path to the Internet community. In this module, students will focus on the concepts of routing, Inter-network Operating System (IOS), and routing protocols. They will also develop hands-on skills in router configuration, IOS software management, routing protocol configuration, router troubleshooting, and the creation and placement of Access Control Lists for controlling networking traffic.

Programmable Logic Devices

Students will focus on digital systems design and Programmable Logic Devices (PLD), combining them into an entity useful for designers in the areas of digital systems and rapid system prototyping. All major design description (entry) tools are introduced, including schematic entry tools and hardware description languages. The complete design procedure, which includes design entry, processing and verification, is shown as an example of a simple digital system. Other topics include the introduction to VHDL, a tool used increasingly in digital system prototyping and design.

LEVEL 3.1 (POWER ENGINEERING OPTION)

Control & Automation

This module examines the characteristics and designs of the industrial automation process. Two main areas will be covered – continuous feedback control and discrete sequential control. Topics in continuous feedback control include system concept and applications, process characteristics, control strategies, system performance, design of controllers/compensators and modern digital control systems. Topics in discrete sequential control include system concept and applications, and design tools.

Power Distribution & Protection

In this module, students will gain a basic knowledge of high voltage and low voltage distribution systems, related equipment and protection devices. Topics include fault calculation, principles of operation of switching devices, switchboards, transformers and cables, and the economical aspects of power distribution systems. Laboratory sessions include the testing of protection devices, operation of electrical equipment, and familiarisation with the safety requirements and precautions to be taken in the operation and maintenance of electrical apparatus.

Electrical Installation Design

Students will learn how to design electrical systems for residential, commercial and industrial installations. Topics include the design of artificial lighting systems, selection of protective devices for various distribution networks, sizing of cables and circuit protective conductors, and estimation of load requirements for large buildings. Upon completion of the module, students will be able to design electrical distribution systems in compliance with statutory requirements.

LEVEL 3.1 (DATA & NETWORK SYSTEMS OPTION)

Internetworking

This module is the third of four courses preparing students for the Cisco Certified Network Associate (CCNA) certification. The topics covered follow the Cisco Networking Academy CCNA3 course on Switching Basics and Intermediate Routing very closely.

Wireless LAN Technologies

This module provides students with classroom and laboratory experience in current and emerging wireless LAN technologies. The module focuses on the design, planning, implementation, operation and troubleshooting of Wireless LANs. It covers a comprehensive overview of technologies; security, and design best practices with particular emphasis on hands-on skills in wireless LAN setup and 802.11 (a, b, and g) technologies, products troubleshooting; and solutions; resilient WLANradio technologies; WLAN applications and site surveys; WLAN products, design, installation, configuration and troubleshooting; security; vendor interoperability strategies; and emerging wireless technologies.

Distributed Control Systems

This module instils the fundamental knowledge of control networking in Distributed Control Systems (DCS). This module gives an insight into the technologies of different kinds of control systems like centralised, hierarchical, fieldbus, distributed control network and other essential theories like field device node, Input/Output (IO), communication, control network-to-IP interfacing, network management and design.

LEVEL 3.1 (ENGINEERING MANAGEMENT OPTION)

Engineering Contract & Project Management

This module provides students with an understanding of the various aspects of electrical contracting and management procedures. Upon completion of this module, they will be able to prepare competitive bids for submission of tenders for projects pertaining to electrical services. They will also be able to apply the knowledge gained in project/contract management. Topics covered include contract arrangements and condition of contracts, cost planning, tendering procedures, specification writing, interim certificates and payments, completion and final payment, as well as variations and their valuation.

Power System Economics & Energy Market

This module aims to equip students with a basic understanding of the economic principles underlying the introduction of competition in the electricity industry. Students will explore the structure, operation and regulations of Singapore's electricity market, which promotes the efficient supply of competitively priced electricity and open up the wholesale and retail market for full competition.

Electrical Installation Design

Students will learn how to design electrical systems for residential, commercial and industrial installations. Topics include the design of artificial lighting systems, selection of protective devices for various distribution networks, sizing of cables and circuit protective conductors, and estimation of load requirements for large buildings. On completion of the module, students will be able to design electrical distribution systems in compliance with statutory requirements.

LEVEL 3.1 (ELECTRONICS OPTION)

Electronic System Design

In this module, students will acquire knowledge of how to design a basic electronic system in the control of electrical equipment and drive systems. The practical considerations will be emphasised through design examples and case studies. The topics covered include the selection of a wide range of electronic devices for specific applications and the interpretation of manufacturers' datasheets. There will be hands-on laboratory work and the introduction of software design aids to carry out the electronic design tasks. Topics include passive and active discrete devices, operational amplifiers for specific applications, power supply systems, and electromagnetic compatibility.

Power Electronics

This module deals mainly with the applications of power semiconductor devices for the control and conversion of electric power. The objective is to provide students with a broad understanding of the various power conversion circuits and their industrial applications. The principles of operation and analysis of power conversion circuits such as AC to DC converters, DC to DC converters, DC to AC converters, and AC power controllers are studied in detail together with their applications.

Embedded System Design

This module focuses on the fundamentals of embedded system design and will give students hands-on experience in both hardware and firmware. Students will be taught to use modern microcontroller technologies to implement real-time control strategies, as well as techniques to interface between the embedded system and the real world. Various components of embedded systems will be introduced together with data acquisition concepts, and serial interface using the I2C bus.

LEVEL 3.1 (SOLAR TECHNOLOGY OPTION)

Solar Cell Technology

The Solar Cell Technology module will focus on silicon bulk processes for the fabrication of photovoltaic devices. It aims to give students an understanding of how a solar cell functions, and fabrication. The module provides students with hands-on training in the Ngee Ann Polytechnic cleanroom.

Photovoltaic Technology

This module aims to provide students with fundamental knowledge of the characteristics of solar radiation, the operation principles and behaviour of solar cells, PV cells interconnection and module fabrication. Students will also be introduced to the concept of using concentrators to increase the efficiency of the solar cells.

Design & Operation of Photovoltaic Systems

This module aims to provide students with basic information needed to understand the principles of photovoltaic (PV) system operation, to identify appropriate PV applications in power systems, and to undertake simple PV system design. Students will be introduced to the concept of PV stand-alone system, PV on-grid connected system, and the power condition issues associated with the two PV systems.

LEVEL 3.1 (BUSINESS MANAGEMENT OPTION)

Customer Relationship Management

The module aims at providing students with an understanding of the concepts and principles of excellent customer service. Practical service skills for service interaction, building customer satisfaction and exceeding customer expectation are also covered. On completion of the module, the student should be able to understand the basics of fostering positive quality attitude, use techniques and behaviour to win customer loyalty, get others to give quality service and apply winning telephone and website techniques.

E-Commerce

This course is designed to provide students with an insight to the role of Electronic Commerce in the e-business world. It links the e-Commerce to e-Business. In line with this, the module aims to provide students with an understanding of the e-Supply Chain Management with synchronisation of the supply chain through e-Marketplaces. It discusses value creation in e-Supply Chain and the various e-business trends. Major topics covered in this module include an introduction to Electronic Commerce, the linkage of e-Commerce to e-Business, value chain concept and competition, e-Procurement and strategic sourcing, e-Fulfillment in B2B and B2C e-Commerce, Customer Relationship Management, Enterprise Resource Planning, and Internet applications and collaborative tools with hands-on practical sessions using Movie Maker and Dreamweaver software.

Service Operation Management

Students will be introduced to concepts and techniques related to all aspects of the management and operation of services. The module is designed to develop students' skills in both strategic and operational issues pertaining to services. Topics cover both qualitative and quantitative aspects of service management, and also the balanced scorecard and Six Sigma so as to give students wide-ranging techniques for ensuring quality and evaluating long-term strategy planning. Students will be able to apply this knowledge in service innovations and management.

LEVEL 3.1 (MARKETING & ENTREPRENEURSHIP OPTION)

Business Creation

This module focuses on mindset change of technologists into entrepreneurial mindset that enables them to create their own business. It discusses entrepreneur traits and what it takes to become a successful entrepreneur through case studies and discussions, youths entrepreneur networks, and personal experiences and close encounter with entrepreneurial mentors. This module also gives an introduction to the essential elements in starting and running a business.

Enterprise Development

The module focuses on enterprise development. It introduces and discusses the types and sources of funds necessary for enterprise development, and strategies for sustainability and growth in the era of rapid technological developments.

Product Design & Marketing

This module focuses on the importance of product design from marketing perspectives. The product design and development process focuses on what it takes to sell the products based on consumers' needs and wants rather than product features alone. This module also focuses on marketing principles, concepts and strategies. Students are also given opportunities to develop their own business plan for their product.

LEVEL 3.2

Six-month Industrial Attachment Programme

In this module, students will have the opportunity to apply the skills and knowledge acquired in the classroom in a real-life environment. Students are given on-the-job training in actual companies to develop skills in problem-solving, interpersonal communications, project planning and implementation, industrial liaisons and character building. Participating companies will have the opportunity to assess prospective employees and secure the services of these students in advance.

Design Project

While working on a design project, students will acquire essential traits like leadership, team spirit, a positive work attitude, independence, good presentation and management skills, and an innovative spirit. The module also promotes project management capabilities through project planning, scheduling, group discussions, project load balancing and planning project milestones using the Gantt chart. Students will also get to polish their oral and written communication skills by submitting reports and making presentations.

ACROSS-LEVEL MODULES (LEVEL 1.2 ONWARDS)

School of Engineering Elective Modules and the Diploma Plus Programme

Students take two modules from a wide range of clusters under the engineering and non-engineering categories to complete their diploma. Furthermore, students can qualify for a diploma plus by simply topping up with two additional modules from the same cluster as one of the electives. The Diploma Plus Certificate helps students if they wish to pursue a university degree or increase their employability in discipline-specific areas. Students can choose electives from the range listed below.

Engineering Category

- Advanced Engineering Mathematics Cluster*
- Applied Physics Cluster*
- Biomedical Engineering Cluster
- Electrical Control & Measurement Cluster
- Industrial Control Cluster
- Industrial Electronics Cluster
- Information Technology Cluster
- Mechanical Technology Cluster
- Stage Management and Technology Cluster
- Telecommunication Distribution Technology Cluster

Non-Engineering Category

- Economics & Financial Applications Cluster
- Green Development Cluster
- Leisure & Retail Management Cluster

Other Available Diploma Plus Certificates

- Business
- Innovation Management
- Languages (Japanese)

* Designed in collaboration with the Department of Electrical and Computer Engineering, National University of Singapore (NUS). The syllabus is based on the first-year engineering mathematics and science curricula of NUS.

For detailed module descriptions under each cluster, please refer to page 182.

COURSE CURRICULUM

Module No.	Module Name	Credit Units
YEAR 1		
Level 1.1 (27 hours per week)		
1.	Electrical Technology	6
2.	Engineering Mathematics 1	5
3.	Engineering Mechanics	5
4.	Computer Programming	4
5.	Engineering : A Creative Profession	3
6.	Creativity & Applied Thinking Skills [^]	2
7.	Sports & Wellness [^]	2
Level 1.2 (25 hours per week)		
8.	Analogue Electronics	5
9.	Engineering Mathematics 2	5
10.	Computer-Aided Drawing	2
11.	Electrical & Electronic Practical Skills	3
12.	AC Circuits	4
13.	Digital Electronics & Practice	2
14.	Individual & the Community [^]	2
15.	Communication Toolkit [^]	2
YEAR 2		
Level 2.1 (25 hours per week)		
16.	Electric Circuit Analysis & Measurement	6
17.	Electrical Machines & Drives	6
18.	PC Networking	3
19.	Industrial Automation	3
20.	Sensors & Instrumentation	3
21.	Interdisciplinary Studies (IS) module [^]	2
22.	Interdisciplinary Studies (IS) module [^]	2
Level 2.2 (23 hours per week)		
23.	Electronic Devices & Circuits	6
24.	Engineering Mathematics 3A	4
25.	Power Devices & Applications	3
26.	Microcontroller & Applications	3
27.	Innovation & Enterprise in Action [^]	4
28.	One Elective (from 29-30)	3

Module No.	Module Name	Credit Units
YEAR 2		
Electives		
29.	PC Internetworking Technology	3
30.	Programmable Logic Devices	3
YEAR 3		
Level 3.1 (19 hours per week)		
31.	Modules from one Option	15
32.	World Issues: A Singapore Perspective [^]	2
33.	Interdisciplinary Studies (IS) module [^]	2
Level 3.2		
34.	Six-Month Industrial Attachment Programme or Design Project	25
Across-Level Modules (Level 1.2 onwards) (6 hours per week)		
35.	School of Engineering (SoE) elective module [°]	3
36.	School of Engineering (SoE) elective module [°]	3

Notes:

[^] For more details on Interdisciplinary Studies (IS) modules, please log on to www.np.edu.sg/is/

[°] For more details on School of Engineering elective modules, please refer to page 182.

IS Modules

The School of Interdisciplinary Studies (IS) delivers the interdisciplinary curriculum, which nurtures a new generation of professionals with multidisciplinary skills and an innovative and entrepreneurial spirit to meet the challenges of a knowledge-based economy. IS modules challenge boundaries and offer insights into Communication, Entrepreneurship, Life Skills, Media & the Arts, and Science & Technology.

School of Engineering (SoE) Elective Modules

The SoE elective modules fall under a wide range of clusters under both Engineering and Non-Engineering categories. The aim is to provide students with the opportunity to broaden their knowledge and deepen their discipline-specific areas. Each cluster comprises a minimum of three 3-hour modules. Students are required to take two modules in order to satisfy the minimum graduating requirement.

LIST OF LEVEL 3.1 OPTIONS

Module No.	Module Name	Credit Units
Power Engineering Option		
1.	Power Distribution & Protection	5
2.	Electrical Installation Design	5
3.	Control & Automation	5
Data & Network Systems Option		
4.	Internetworking	4
5.	Wireless LAN Technologies	5
6.	Distributed Control Systems	6
Engineering Management Option		
7.	Engineering Contract & Project Management	5
8.	Power System Economics & Energy Market	5
9.	Electrical Installation Design	5
Electronics Option		
10.	Electronic System Design	5
11.	Power Electronics	5
12.	Embedded System Design	5
Solar Technology Option		
13.	Solar Cell Technology	5
14.	Photovoltaic Technology	5
15.	Design & Operation of Photovoltaic Systems	5
Business Management Option		
16.	Customer Relationship Management	3
17.	E-Commerce	4
18.	Service Operation Management	4
19.	1 module from Marketing & Entrepreneurship Option	4
(Marketing & Entrepreneurship Option)		
20.	Business Creation	4
21.	Enterprise Development	3
22.	Product Design & Marketing	4
23.	1 module from Business Management Option	4

DIPLOMA IN TECHNOLOGY (ELECTRICAL) (3-YEAR PART-TIME COURSE)

SCHOOL OF ENGINEERING

The **Diploma in Technology (Electrical)** is a six-stage, part-time evening course. The course is structured in a modular form based on a module-credit system. To qualify for the award of the Diploma, students are required to complete core modules in all the six stages. Each of the core modules has 4 credit units. In addition, students are also required to complete another 24 credit units of elective modules.

COURSE STRUCTURE

Stage 1:

- Principles of DC Circuits (PDC)
- Basic Electronics and Devices (BED)
- Engineering Mathematics A (EMA)

Stage 2:

- Principles of AC Circuits (PAC)
- Principles of Digital Electronics (PDE)
- Engineering Mathematics B (EMB)

Stage 3:

- Electrical Circuit Analysis (ECA)
- Analog Circuits and Applications (ACA)

Stage 4:

- Electric Machinery (EMAC)
- Principles of Control Systems (PCS)

Stage 5:

- Distribution System Design (DSD)
- Distribution System & Protection (DSP)

Stage 6:

- Electrical Metrology & Practice (EMP)
- Power Electronics & Applications (PEA)

This diploma is administered by the Centre for Professional Development (CPD). For more information about this course, please log on to www.np.edu.sg/cpd/ or contact the CPD at 64606353.