

## HIGHER NITEC IN BROADCAST & MEDIA TECHNOLOGY

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Handle incoming materials for broadcast.
- Maintain media assets library.
- Manage play-out system and operations.
- Manage master control room functions.
- Support broadcasting technical infrastructure.
- Performing editing on broadcast-quality media.

### JOB OPPORTUNITIES

*Higher Nitec* in Broadcast & Media Technology graduates are employed by the major broadcasting organizations, content aggregators and post-production companies. Some of the job titles held by graduates include Broadcast and Media Technical Specialist, Broadcast Operation Executive/ Specialist, Media Ingestion/Contents Operator, Master Control Operators and Network Transmission Assistant.

### CERTIFICATION

Credits required for certification:

Core Modules	:	50
Life Skills Modules	:	9
Elective Modules	:	4
<b>Total</b>	:	<b>63</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
Broadcast Media Ingestion	7
Media Assets Management	7
Media Processing and Application	7
Broadcast Distribution Services	7
Digital Media Technology	7
Broadcast Systems Technology	7
Industry Attachment	8
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Apple OS Administration	2
Apple Hardware Repair	2
Digital Media Marketing	2
<b>ELECTIVES (INTER-DISCIPLINARY)</b>	
Project Management	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 277-278	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### Broadcast Media Ingestion

On completion of the module, students should be able to ingest media materials complying with video compression standards for broadcast and media distribution. This module covers the principles of television, fundamentals of digital signal processing, analogue-to-digital conversion and video compression standards.

#### Media Assets Management

On completion of the module, students should be able to maintain media assets library and support file-based workflow through storage, retrieval and cataloguing of shared media resources. This module covers information technology, server fundamentals and media assets management tools.

#### Media Processing and Application

On completion of the module, students should be able to edit broadcast-quality media and convert it to various file formats for multi-platform delivery. This module covers audio and video processing techniques and conversion of contents into multi-formats.

#### Broadcast Distribution Services

On completion of the module, students should be able to support play-out system operations in monitoring scheduled programmes and handling live feeds. This module covers the broadcast distribution services, standards and components of digital video broadcasting system and automatic play-out system.

#### Digital Media Technology

On completion of the module, students should be able to implement various file-based workflows from acquisition stage, archive and retrieval to multi-platform delivery. This module covers the development of digital transmission and distribution system, automatic quality control (QC) of media asset and distribution of digital media contents via the Internet.

#### Broadcast Systems Technology

On completion of the module, students should be able to operate and configure broadcast ancillary equipment. They should also be able to perform preventive maintenance of broadcast equipment and its supporting systems.

#### Industry Attachment

On completion of the module, students should be able to apply and integrate the skills and knowledge that they have acquired at ITE College and develop competencies in other areas not covered in the curriculum, at the workplace.

#### Electives (Course Specific)

##### Apple OS Administration

On completion of the module, students should be able to perform software maintenance and troubleshooting on Macintosh Operating Systems.

##### Apple Hardware Repair

On completion of the module, students should be able to troubleshoot and rectify Apple computer hardware.

##### Digital Media Marketing

On completion of the module, students should be able to develop the necessary technical competencies to develop digital assets to support marketing and branding initiatives.

#### Electives (Inter-disciplinary)

##### Project Management

On completion of the module, students should be able to plan, track and monitor projects using project management software.

#### Electives (General)

As reflected on pages 277-278.

#### Life Skills Modules

As reflected on page 281.

## HIGHER NITEC IN BUSINESS INFORMATION SYSTEMS

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Manage computer systems and devices.
- Provide 1st level remote helpdesk support.
- Manage computer network.
- Support networked servers.
- Assist to manage virtualization infrastructure.
- Install and maintain database management system.
- Assist in business application development.
- Support and implement enterprise solutions.

### JOB OPPORTUNITIES

*Higher Nitec* in Business Information Systems graduates may be employed by government departments, private sector companies and Independent Software Vendors (ISVs). There are opportunities for career advancement to supervisory positions and beyond. Graduates with good grades may progress to the diploma courses being offered in local polytechnics. Some of the job titles held by graduates include Business Information Systems Specialist and IT Technical Support Specialist.

### CERTIFICATION

Credits required for certification:

Core Modules	:	48
Life Skills Modules	:	9
Elective Modules	:	4
<b>Total</b>	<b>:</b>	<b>61</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
Computer Maintenance and Operating Systems	7
Enterprise Networking	7
System Administration	7
Virtualization	6
Database and Applications Development	6
Business Enterprise Systems	7
Industry Attachment	8
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Data Visualisation for Business	2
<b>ELECTIVES (INTER-DISCIPLINARY)</b>	
Internet and Network Security	2
<b>ELECTIVES (JOINT ITE-INDUSTRY)</b>	
Essentials of Java Programming	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 277-278	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### Computer Maintenance and Operating Systems

On completion of the module, students should be able to perform installation and configuration of operating system and application software on end user computing devices. In addition, they should be able to install and configure peripherals, perform PC maintenance and troubleshooting of hardware and software problems.

#### Enterprise Networking

On completion of the module, students should be able to apply the fundamentals of networking in relation to the OSI model. They should also be able to set up and configure wired and wireless local area network (LAN) including IP address calculation, switching, routing and network segmentation with Virtual LANs (VLANs). In addition, students will be able to set up wide area network (WAN), implement access control lists, troubleshoot common network issues and problems as well as monitor network performance.

#### System Administration

On completion of the module, students should be able to install and set up server operating systems and perform system administration tasks such as user management, resource sharing, security management, preventive maintenance, and performance tuning on these systems. Student will then proceed to perform value-added features such as implementing server security and high-availability systems.

#### Virtualization

On completion of the module, students should be able to set up a hypervisor, virtual machines (VMs) and configure clients' access to VMs and connectivity. They should also be able to perform backup and recovery of VMs, monitor resource utilization on the hypervisor, troubleshoot performance and connectivity issues as well as assisting in securing virtualized infrastructure. They will be introduced to commercially available cloud services and be able to utilize them.

#### Database and Applications Development

On completion of the module, students should be able to understand a relational database architecture and the interactions among its components. Students are trained to create an operational database and manage the various structures including performance monitoring, database security, user management and backup/recovery techniques. They will also be taught to use Structured Query Language (SQL) to manipulate and retrieve data for business applications reporting.

#### Business Enterprise Systems

On completion of the module, students should be able to install, configure and administer basic application functionalities and business processes in an enterprise solution.

#### Industry Attachment

On completion of the modules, students should be able to integrate and apply a cluster of key technical, social and methodological competencies related to their field of study.

#### Electives (Course Specific)

##### Data Visualisation for Business

On completion, the students should be able to create a dashboard consisting of visual representation of data interactively and to present meaningful patterns for the business.

#### Electives (Inter-disciplinary)

##### Internet and Network Security

On completion of the module, students should be able to identify network and internet security risks and to advise users on counter-measures or preventive actions. They should also be able to participate in a Security Life Cycle project discussion.

#### Electives (Joint ITE-Industry)

##### Essentials of Java Programming

On completion of the module, students should be able to understand Java Technology, the Java Programming Language and Product Life Cycle.

#### Electives (General)

As reflected on pages 277-278.

#### Life Skills Modules

As reflected on page 281.

## HIGHER NITEC IN CYBER & NETWORK SECURITY

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Manage end-user computer systems and devices.
- Provide 1st level remote helpdesk support.
- Support networked servers.
- Assist to manage virtualization infrastructure.
- Manage security infrastructure.
- Perform vulnerability assessment.
- Perform cyber security operations.

### JOB OPPORTUNITIES

*Higher Nitec* in Cyber & Network Security graduates are employed in all public and private sector organisations to provide technical support for networks, systems and storage with an emphasis on IT security for business continuity in an enterprise IT cloud environment. Some of the job titles held by the graduates include Cyber Security Associate, Associate Security Administrator, Associate Security Engineer, Information Security Analyst, Information Security Associate, Information Security Officer and IT Security Specialist.

There are excellent opportunities for career advancement to supervisory positions and beyond.

### CERTIFICATION

Credits required for certification:

Core Modules	:	48
Life Skills Modules	:	9
Elective Modules	:	4
<b>Total</b>	<b>:</b>	<b>61</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
Computer Maintenance and Operating Systems	7
Enterprise Networking	7
System Administration	7
Virtualization	6
IT Security	7
Security Operations	6
Industry Attachment	8
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Green IT Fundamentals	2
Linux Essentials	2
Essentials of Cyber Defence	2
<b>ELECTIVES (JOINT ITE-INDUSTRY)</b>	
Essentials of Java Programming	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 277-278	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### Computer Maintenance and Operating Systems

On completion of the module, students should be able to perform installation and configuration of operating system and application software on end user computing devices. In addition, they should be able to install and configure peripherals, perform PC maintenance and troubleshooting of hardware and software problems.

#### Enterprise Networking

On completion of the module, students should be able to apply the fundamentals of networking in relation to the OSI model. They should also be able to set up and configure wired and wireless local area network (LAN) including IP address calculation, switching, routing and network segmentation with Virtual LANs (VLANs). In addition, students will be able to set up wide area network (WAN), implement access control lists, troubleshoot common network issues and problems as well as monitor network performance.

#### System Administration

On completion of the module, students should be able to install and setup server operating systems and perform system administration tasks such as user management, resource sharing, security management, preventive maintenance, and performance tuning on these systems. Student will then proceed to perform value-added features such as implementing server security and high-availability systems.

#### Virtualization

On completion of the module, students should be able to set up a hypervisor, virtual machines (VMs) and configure clients' access to VMs and connectivity. They should also be able to perform backup and recovery of VMs, monitor resource utilization on the hypervisor, troubleshoot performance and connectivity issues as well as assisting in securing virtualized infrastructure. They will be introduced to commercially available cloud services and be able to utilize them.

#### IT Security

On completion of the module, students should be able to carry out network intrusion detection, prevention and mitigation through the implementation of intrusion detection system (IDS), firewalls, application gateways, and data encryption technologies. They should also be able to implement appropriate technologies to protect against security attacks such as spams, spyware, worms/viruses, phishing and address spoofing.

#### Security Operations

On completion of the module, students should be able to comply with the prevalent cyber security laws. They should be able to take up tasks in a Security Operations Centre (SOC) environment including the configuration of Security Information and Event Management (SIEM) systems, monitoring and identifying security risks, analysing and classifying security alerts, preparing for and conducting vulnerability scanning, documenting identified vulnerabilities, and applying appropriate counter measures to mitigate identified threat.

#### Industry Attachment

On completion of the modules, students should be able to integrate and apply a cluster of key technical, social and methodological competencies related to their field of study.

#### Electives (Course Specific)

##### Green IT Fundamentals

On completion of the module, students should be able to explain basic issues around green information technology (IT) and demonstrate ways and tools to find more efficient and environmentally responsible ways to meet IT business goals and to leverage IT to move entire organization to greener direction.

##### Linux Essentials

On completion of the module, students should be able to install, upgrade and migrate to Linux client. Students will then proceed to configure Linux as a client or server.

##### Essentials of Cyber Defence

On completion of the module, students should be able to carry out a comprehensive security assessment of a typical SME IT environment, testing for OS vulnerabilities, weaknesses in network & web services. Students will learn the Computer Misuse & Cybersecurity Act (2013) Chapter 50A, how to prepare for a penetration test, reconnaissance & enumeration, and vulnerability assessment. Students will also be taught the necessary countermeasures to mitigate risks of exploitation.

##### Electives (Joint ITE-Industry)

##### Essentials of Java Programming

On completion of the module, students should be able to understand Java Technology, the Java Programming Language and Product Life Cycle.

##### Electives (General)

As reflected on pages 277-278.

##### Life Skills Modules

As reflected on page 281.

## HIGHER NITEC IN ELECTRONICS ENGINEERING

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Repair, troubleshoot, test and maintain common analogue and digital electronics equipment.
- Use and maintain common electronic measuring instruments and equipment.
- Analyse and interpret electronic schematic and assembly drawings.
- Use computer-aided printed circuit board (PCB) design tools.
- Write and execute application programs for microprocessor-based systems.

### JOB OPPORTUNITIES

*Higher Nitec* in Electronics Engineering graduates are employed by organisations and companies in the electronics industry, such as those that:

- Manufacture or assemble electronic equipment and components.
- Design and construct special electronics projects.

*Higher Nitec* in Electronics Engineering graduates are also employed by other manufacturing sectors that use electronically-controlled production machines. Some of the job titles held by graduates include Computer Systems Technician, Communication Equipment Technician, Electronics Engineering Technician, Engineering Assistant, Production Supervisor and Telecommunications Technician. There are excellent opportunities for career advancement to supervisory positions and beyond.

### CERTIFICATION

Credits required for certification:

Core Modules	:	27
Specialisation Modules	:	23
Life Skills Modules	:	10
Elective Modules	:	4
<b>Total</b>	<b>:</b>	<b>64</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
Analogue Principles and Applications	7
Digital Principles and Applications	7
Communications and Networking	7
Microcontroller Applications	6
<b>SPECIALISATION MODULES</b>	
<b>Group A (Audio Visual Systems)</b>	
Audio Visual System Integration	7
Audio Visual Information Technology	6
Applied Audio Visual Technology	6
Industry Attachment	4
<b>OR</b>	
<b>Group B (Marine Electronics)</b>	
Marine Automation System	5
Marine Communication System	5
Marine Navigation System	5
Industry Attachment	8
<b>OR</b>	
<b>Group C (IoT &amp; Communications)</b>	
Devices and Applications	7
IoT Integration	6
Advanced Applied Electronics	6
Industry Attachment	4
<b>ELECTIVES (INTER-DISCIPLINARY)</b>	
Sensor Technology	6
Apple OS Administration	4
Apple Hardware Repair	6
<b>ELECTIVES (JOINT ITE-INDUSTRY)</b>	
Robot Palletizing Operations and Programming	2

## COURSE STRUCTURE

Module Title	Credits
<b>ELECTIVES (GENERAL)</b> Refer to pages 277-278	
<b>LIFE SKILLS MODULES</b> Refer to page 281	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### Analogue Principles and Applications

On completion of the module, students should be able to interpret, construct, test and analyse various analogue circuits and devices.

#### Digital Principles and Applications

On completion of the module, students should be able to interpret, design, construct, test and troubleshoot electronic circuits and digital devices.

#### Communications and Networking

On completion of the module, students should be able to set up and maintain wired and wireless Local Area Network (LAN) and radio communication systems. They should be able to perform troubleshooting on networks and systems.

#### Microcontroller Applications

On completion of the module, students should be able to interpret system requirements, create algorithms and develop microcontroller program to control and monitor external devices.

### Specialisation Modules

#### Group A - Audio Visual Systems

##### Audio Visual System Integration

On completion of the module, students should be able to install, integrate, troubleshoot and maintain audio and video devices and systems.

#### Audio Visual Information Technology

On completion of the module, students should be able to install, integrate, service, configure, troubleshoot and maintain audio visual control and networking devices and systems; as well as setting up network streaming protocol on audio visual devices.

#### Applied Audio Visual Technology

On completion of the module, students should be able to set up and configure an AV system for real-life application.

#### Industry Attachment

Students will undergo a three-month industry attachment to reinforce the skills and knowledge acquired at the training institute and to develop competencies in other areas not covered in the curriculum.

#### Group B - Marine Electronics

##### Marine Automation System

On completion of the module, students should be able to set up, configure and troubleshoot marine automation system.

##### Marine Communication System

On completion of the module, students should be able to set up marine communication systems in voice, data and radio media. In addition, students should be able to test and troubleshoot radio and data systems.

##### Marine Navigation System

On completion of the module, students should be able to set up, test and maintain marine navigation system. In addition, students should be able to service, identify and isolate faults in marine navigation systems with the integration of its essential modules.

#### Industry Attachment

Students will undergo a six-month industry attachment to reinforce the skills and knowledge acquired at the training institute and to develop competencies in other areas not covered in the curriculum.



## **Group C - IoT & Communications**

### **Devices and Applications**

On completion of the module, students should be able to identify and apply the various types of sensors for different applications.

### **IoT Integration**

On completion of the module, students should be able to set up and integrate sensors/actuators with controllers; configure and test wired/wireless sensor networks to perform useful tasks. Students will also be able to deploy IoT in areas such as Healthcare, Logistics and Transport.

### **Advanced Applied Electronics**

On completion of the module, students should be able to apply and integrate the skills and knowledge in sensors and controllers, communications networks and their applications deployed in specific industry.

### **Industry Attachment**

On completion of the module, students should be able to integrate and apply a cluster of key technical, social and methodological competencies related to their field of study.

## **Electives (Inter-disciplinary)**

### **Sensor Technology**

On completion of the module, students should be able to understand the principles of operation, characteristics and applications of various sensors in industrial and electrical engineering works.

### **Apple OS Administration**

On completion of the module, students should be able to perform software, maintenance and troubleshooting on Macintosh Operating Systems.

### **Apple Hardware Repair**

On completion of the module, students should be able to troubleshoot and rectify Apple computer hardware.

## **Electives (Joint ITE-Industry)**

### **Robot Palletizing Operations and Programming**

On completion of the module, students should be able to operate the palletizing robot system, including editing and modifying programs for different palletizing operations.

## **Electives (General)**

As reflected on pages 277-278.

## **Life Skills Modules**

As reflected on page 281.

## HIGHER NITEC IN GAMES ART & DESIGN

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Create art assets.
- Animate art assets.
- Participate in the game design process.
- Support game packaging.
- Prepare game design documentation.

### JOB OPPORTUNITIES

Graduates of the *Higher Nitec* in Games Art & Design can be employed by companies as Design Conceptual Artist, Character Designer and Game Level Designer.

### CERTIFICATION

Credits required for certification:

Core Modules	:	51
Life Skills Modules	:	10
Elective Modules	:	4
<b>Total</b>	<b>:</b>	<b>65</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
Games Design Principles	7
Drawing Fundamentals	6
2D Games Asset Creation	7
3D Modeling and Texturing for Games	6
Games Level Design	7
3D Rigging and Animation for Games	7
Games Portfolio Development	7
Industry Attachment	4
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Special Effects for Games	2
Web Games Production	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 277-278	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the electives they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### Games Design Principles

On completion of the module, students should be able to create a complete game design or a technical design document following the industry requirements. He/she should also be able to manage the game development process from conceptualisation to the final release of the game.

#### Drawing Fundamentals

On completion of the module, students should be able to grasp the fundamentals skills of drawing, applying the concepts of composition and geometrical forms in still life, perspective and human drawings.

#### 2D Games Asset Creation

On completion of the module, students should be able to illustrate game play elements, process digital imaging and basic multimedia using 2D graphics technologies for developing casual computer games.

#### 3D Modeling and Texturing for Games

On completion of the module, students should be able to develop a thorough understanding of the 3D workflow, learning how to create, edit, and refine polygon models, add textures and apply UV maps across complex, inorganic environment models and organic game character models.

#### Games Level Design

On completion of the module, students should be able to design and edit game levels of different game genres for playability.

#### 3D Rigging and Animation for Games

On completion of the module, students should be able to create rigs for game models and then animate game models in seamless looping cycles based on the various game states of the 3D models.

#### Games Portfolio Development

On completion of the module, students should be able to apply design principles to develop a basic portfolio package comprising of resume, name card, portfolio pieces and portfolio demo reel for the various tracks in the game industry.

#### Industry Attachment

Students are provided with the opportunity to work in actual games design and development environment.

#### Electives (Course Specific)

##### Special Effects for Games

On completion of the module, students should be able to create various special effects used in games development using procedural generation technique. This module also equips students with the skills and knowledge to create, modify and apply special effects in games development in accordance to the game specifications.

##### Web Games Production

On completion of the module, students should be able to create and publish 2D games in web platform.

##### Electives (General)

As reflected on pages 277-278.

##### Life Skills Modules

As reflected on page 281.

## HIGHER NITEC IN GAMES PROGRAMMING & DEVELOPMENT

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Develop game program codes, related tools and utilities.
- Perform game integration and testing.
- Participate in the game design process.
- Evaluate game development tools and engines.
- Prepare technical documentation.

### JOB OPPORTUNITIES

Graduates of the *Higher Nitec* in Games Programming & Development course can be employed as Game Tester, Game Programmer, Games Content Developer and Games Software Engineer.

### CERTIFICATION

Credits required for certification:

Core Modules	:	51
Life Skills Modules	:	10
Elective Modules	:	4
<b>Total</b>	:	<b>65</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
Games Design Principles	7
Programming Fundamentals	7
Games Programming	7
Games Development Techniques	6
Mobile Games Development	7
Games Level Design	7
Games Integration and Testing	6
Industry Attachment	4
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Special Effects for Games	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 277-278	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the electives they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### Games Design Principles

On completion of the module, students should be able to create a complete game design or a technical design document following the industry requirements. He/she should also be able to manage the game development process from conceptualisation to the final release of the game.

#### Programming Fundamentals

On completion of the module, students should be able to apply object-oriented concepts and modular techniques to develop programme for computer applications.

#### Games Programming

On completion of the module, students should be able to design and develop 2D and 3D games using game development engines.

#### Games Development Techniques

On completion of the module, students should be able to develop 2D games using 2D game development tools and techniques.

#### Mobile Games Development

On completion of the module, students should be able to design, develop and deploy mobile games for mobile devices.

#### Games Level Design

On completion of the module, students should be able to design and edit game levels of different game genres for playability.

#### Games Integration and Testing

On completion of the module, students should be able to use appropriate tools to integrate game programs, perform integration test, conduct user acceptance test and create technical documentation.

#### Industry Attachment

Students are provided with the opportunity to work in actual games design and development environment.

#### Electives (Course Specific)

##### Special Effects for Games

On completion of the module, students should be able to create various special effects used in games development using procedural generation technique. This module also equips students with the skills and knowledge to create, modify and apply special effects in games development in accordance to the game specifications.

##### Electives (General)

As reflected on pages 277-278.

##### Life Skills Modules

As reflected on page 281.

## HIGHER NITEC IN IT APPLICATIONS DEVELOPMENT

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Develop and support web applications;
- Develop and support mobile applications;
- Create and maintain contents; and
- Perform software testing.

### JOB OPPORTUNITIES

*Higher Nitec* in IT Applications Development course equips students with skills and knowledge to develop web and mobile applications, as well as to create and maintain content for IT applications and services. Some of the job titles held by graduates include Application Programmer, Rich Internet Application (RIA) Developer, Application Support Analyst, Web Commerce Applications Developer, UI Programmer, IT Specialist (Mobile Programmer), Mobile Applications Developer Support, Web Developer Support and Test Engineer.

### CERTIFICATION

Credits required for certification:

Core Modules	:	50
Life Skills Modules	:	10
Elective Modules	:	4
<b>Total</b>	:	<b>64</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
User Experience Development	7
Programming Fundamentals	7
Interactive Applications Development	6
Web Content Management	7
Web Solutions Development	6
Mobile Applications Programming	7
Mobile Solutions Development	6
Industry Attachment	4
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Essentials in Android Applications Development	2
<b>ELECTIVES (JOINT ITE-INDUSTRY)</b>	
Essentials of Java Programming	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 277-278	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*Note: The offer of electives is subject to the 7 training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### User Experience Development

On completion of the module, students should be able to design, develop and maintain mobile and web interfaces that are easy to use. They will also be able to create and edit web graphics and develop user interfaces for web and mobile devices.

#### Programming Fundamentals

On completion of the module, students should be able to develop applications with programming concepts, such as variables, conditions, loops and expressions. They should also be able to write modular code and apply the concept of application testing and debugging.

#### Interactive Applications Development

On completion of the module, students should be able to apply the knowledge, techniques and skills to develop dynamic and interactive media applications.

#### Web Content Management

On completion of the module, students should be able to configure and publish websites, with online payment support and social media integration. Students will also learn to optimize websites and conduct web analysis.

#### Web Solutions Development

On completion of the module, students should be able to develop and deploy Web applications using server-side programming techniques with database integration and web services.

#### Mobile Applications Programming

On completion of the module, students should be able to design, develop, debug and deploy native mobile applications using Integrated Development Environment (IDE) on iOS devices.

#### Mobile Solutions Development

On completion of the module, students should be able to apply the knowledge, techniques and skills to integrate frameworks into native mobile applications.

#### Industry Attachment

In this module, students are exposed to actual work conditions and environment in specific disciplines in software development. This will allow them to experience actual applications of knowledge and skills acquired during the course.

#### Electives (Course Specific)

##### Essentials in Android Applications Development

On completion of the module, students should be able to develop Android applications for mobile devices.

#### Electives (Inter-disciplinary)

##### Essentials of Java Programming

On completion of the module, students should be able to understand Java Technology, the Java Programming Language and Product Life Cycle.

#### Electives (General)

As reflected on pages 277-278.

#### Life Skills Modules

As reflected on page 281.

## HIGHER NITEC IN IT SYSTEMS & NETWORKS

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Manage computer systems and devices.
- Provide 1st level remote helpdesk support.
- Manage computer network.
- Support networked servers.
- Assist to manage virtualization infrastructure.
- Implement wireless LAN.
- Implement network security.
- Support IT project development.

### JOB OPPORTUNITIES

*Higher Nitec* in IT Systems & Networks graduates can be employed by IT-users and supplier organisations. The IT users are organisations (public, private, MNCs and SMEs) using computer systems (networked or stand-alone) in their business operations. The IT suppliers are companies providing computer hardware/software and IT services.

Some of the job titles that can be held by graduates are IT Specialist, IT Technician, Network Support Technician, IT Technical Support Specialist, Associate System Administrator, Desktop Support Engineer and Network Traffic Engineer.

There are excellent opportunities for career advancement to supervisory positions and beyond.

### CERTIFICATION

Credits required for certification:

Core Modules	:	50
Life Skills Modules	:	10
Elective Modules	:	4
<b>Total</b>	<b>:</b>	<b>64</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
Computer Maintenance and Operating Systems	7
Networking Technology	7
System Administration	7
Virtualization	6
Systems Programming	6
Wireless and Network Security	7
Advanced Networking	6
Industry Attachment	4
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Mobile Applications Programming	2
Digital Media Marketing	2
Apple OS Administration	2
Apple Hardware Repair	2
<b>ELECTIVES (INTER-DISCIPLINARY)</b>	
Green IT Fundamentals	2
Linux Essentials	2
<b>ELECTIVES (JOINT ITE-INDUSTRY)</b>	
Essentials of Java Programming	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 277-278	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	



## MODULE OBJECTIVES

### Core Modules

#### Computer Maintenance and Operating Systems

On completion of the module, students should be able to perform installation and configuration of operating system and application software on end user computing devices. In addition, they should be able to install and configure peripherals, perform PC maintenance and troubleshooting of hardware and software problems.

#### Networking Technology

On completion of the module, students should be able to apply the fundamentals of computer networking in relation to the OSI model. They should also be able to set up and configure wired and wireless local area network (LAN) including IP address calculation, switching, routing, routing protocols and virtual local area networks (VLANs).

#### System Administration

On completion of the module, students should be able to install and setup server operating systems and perform system administration tasks such as user management, resource sharing, security management, preventive maintenance, and performance tuning on these systems. Student will then proceed to perform value-added features such as implementing server security and high-availability systems.

#### Virtualization

On completion of the module, students should be able to set up a hypervisor, virtual machines (VMs) and configure clients' access to VMs and connectivity. They should also be able to perform backup and recovery of VMs, monitor resource utilization on the hypervisor, troubleshoot performance and connectivity issues as well as assisting in securing virtualized infrastructure. They will be introduced to commercially available cloud services and be able to utilize them.

#### Systems Programming

On completion of the module, students should be able to provide programming support to IT system automation project. They should also be able to develop and deploy basic system program for task automation.

#### Wireless and Network Security

On completion of the module, students should be to set up, configure and troubleshoot Wireless Local Area Networks (WLANs). In addition, they should be able to implement and manage a secured wireless and wired networking environment through the use of intrusion detection systems (IDS), firewalls, application gateways, virtual private networks, and data cryptography technologies. They should also be able to implement appropriate technologies to protect against security attacks such as spams, spyware, worms/viruses, phishing and address spoofing.

#### Advanced Networking

On completion of the module, students should be to configure advanced routing, switching and IP services, set up WAN links, implement network access control, monitor and administer a network and troubleshoot network connectivity.

#### Industry Attachment

On completion of the modules, students should be able to integrate and apply a cluster of key technical, social and methodological competencies related to their field of study.

### **Electives (Course Specific)**

#### **Mobile Applications Programming**

On completion of the module, students should be able to use a cross-platform Integrated Development Environment (IDE), understand mobile programming basics, and create a mobile phone application.

#### **Digital Media Marketing**

On completion of the module, students should be able to develop the necessary technical competencies to develop digital assets to support marketing and branding initiatives.

#### **Apple OS Administration**

On completion of the module, students should be able to perform software, maintenance and troubleshooting on Macintosh Operating Systems.

#### **Apple Hardware Repair**

On completion of the module, students should be able to troubleshoot and rectify Apple computer hardware.

### **Electives (Inter-disciplinary)**

#### **Green IT Fundamentals**

On completion of the module, students should be able to explain basic issues around green information technology (IT) and demonstrate ways and tools to find more efficient and environmentally responsible ways to meet IT business goals and to leverage IT to move entire organization to greener direction.

#### **Linux Essentials**

On completion of the module, students should be able to install, upgrade and migrate to Linux client. Students will then proceed to configure Linux as a client or server.

### **Electives (Joint ITE-Industry)**

#### **Essentials of Java Programming**

On completion of the module, students should be able to understand Java Technology, the Java Programming Language and Product Life Cycle.

### **Electives (General)**

As reflected on pages 277-278.

### **Life Skills Modules**

As reflected on page 281.

## HIGHER NITEC IN SECURITY SYSTEM INTEGRATION

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Set up wired and wireless networks to accommodate IP-ready security systems.
- Set up backend security network to support security systems.
- Troubleshoot and maintain security systems.
- Design and implement security system solutions to meet client's requirements.
- Oversee security system installation projects.
- Integrate and implement centralised security management system.

### JOB OPPORTUNITIES

With the strong support of the Security Systems Association of Singapore (SSAS) which represents more than 50 major security systems solution providers, *Higher Nitec* in Security System Integration graduates will be readily employed by SSAS members and security system integrators. Some of the job titles held by graduates include Technical Specialist, Security Systems Specialist and Senior Technician.

### CERTIFICATION

Credits required for certification:

Core Modules	:	50
Life Skills Modules	:	9
Elective Modules	:	4
<b>Total</b>	<b>:</b>	<b>63</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
System Administration and Storage	7
Network Technology	7
Intrusion and Access Control	7
Video Surveillance	7
Project Management	7
Integrated Security System Design	7
Industry Attachment	8
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Microcontroller Application Development-PSoC	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 277-278	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### System Administration and Storage

On completion of the module, students should be able to install, configure and perform administration tasks on Windows-based operating systems and storage systems.

#### Network Technology

On completion of the module, students should be able to plan, install, configure and troubleshoot computer network system for the wired and wireless LAN environment.

#### Intrusion and Access Control

On completion of the module, students should be able to design, maintain and troubleshoot intrusion and access control systems in various security environments.

#### Video Surveillance

On completion of the module, students should be able to design, maintain and troubleshoot video surveillance system in various security environments.

#### Project Management

On completion of the module, students should be able to plan and manage security systems projects.

#### Integrated Security System Design

On completion of the module, students should be able to design and integrate a security system solution to meet customers' needs and requirements.

#### Industry Attachment

On completion of the module, students should be able to apply and integrate the skills and knowledge that they have acquired at ITE College and develop competencies in other areas not covered in the curriculum, in the workplace.

#### Electives (Course Specific)

##### Microcontroller Application Development - PSoC

On completion of the module, students should be able to develop the mixed-signal microcontroller without the prerequisite of learning a programming language and able to build fully functional PSoC based projects.

#### Electives (General)

As reflected on pages 277-278.

#### Life Skills Modules

As reflected on page 281.

## NITEC IN ELECTRONICS, COMPUTER NETWORKING & COMMUNICATIONS

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Install, test, maintain and service electronic devices/systems.
- Set up and test wired and wireless computer networking systems.
- Write program to interface electronic devices (sensors and actuators) to controller.
- Test and maintain analogue, digital and optical communication systems.

### JOB OPPORTUNITIES

Nitec in Electronics, Computer Networking & Communications graduates are employed by organizations and companies that manufacture electronic and computer equipment. Some of the job titles held by graduates include Electronics Technician, Electronics Production Technician, Communication Equipment Technician, Test and Measurement Technician, Engineering Assistant and Electronics Specialist.

There are excellent opportunities for career advancement to supervisory positions and beyond.

### CERTIFICATION

Credits required for certification:

Core Modules	:	50
Life Skills Modules	:	10
Elective Modules	:	4
<b>Total</b>	<b>:</b>	<b>64</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
Electrical Principles and Measurements	7
Digital Electronics	7
Analogue Electronics	7
Computer Networking Principles	7
Electronic Control System	6
Electronic Communications System	6
Applied Electronics	6
Industry Attachment	4
<b>ELECTIVES (COURSE SPECIFIC)</b>	
C Programming	2
Web Development	2
<b>ELECTIVES (INTER-DISCIPLINARY)</b>	
Sensor Technology	2
Apple OS Administration	2
Apple Hardware Repair	2
Fundamentals of Applied Statistics	2
<b>ELECTIVES (JOINT ITE-INDUSTRY)</b>	
Robot Palletizing Operations and Programming	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 279-281	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### Electrical Principles and Measurements

On completion of the module, students should be able to apply the basic principles of electrical and electronics to connect and test electrical circuits. They should also be able to construct prototype electronic project on printed board.

#### Digital Electronics

On completion of the module, students should be able to interpret, construct, test and troubleshoot basic digital electronic circuits. They should also be able to construct prototype digital electronic circuits.

#### Analogue Electronics

On completion of the module, students should be able to interpret, construct, test and troubleshoot analogue electronic circuits. They should be able to construct prototype analogue electronic projects.

#### Computer Networking Principles

On completion of the module, students should be able to set up and test wired and wireless Local Area Network for resources sharing. They should also be able to identify the various network topologies and protocol; and troubleshoot network connectivity faults.

#### Electronic Control System

On completion of the module, students should be able to implement various industrial electronic devices and systems, such as stepper and servo motors, sensors, actuators; and controllers such as microcontrollers and Programmable Logic Controllers.

#### Electronic Communications System

On completion of the module, students should be able to apply the knowledge and skills on information transmission and reception in analogue, digital and optical communication for system performance testing and maintenance.

#### Applied Electronics

On completion of the module, students should be able to apply and integrate the skills and knowledge acquired in the course to set up, integrate and maintain electronic systems.

#### Industry Attachment

Students will undergo a 3-month on-the-job programme with electronic company to reinforce the skills and knowledge acquired at the training institute and to develop competencies in other areas not covered in the curriculum.

### Electives (Course Specific)

#### C Programming

On completion of the module, students should be able to apply the concepts of computer programming and write simple programs in 'C' language.

#### Web Development

On completion of the module, students should be able to develop World Wide Web applications or websites that are run over HTTP from a web server to a web browser.

### Electives (Inter-disciplinary)

#### Sensor Technology

On completion of the module, students should be able to explain the principles of operation, characteristics and applications of various sensors in industrial and electrical engineering works.

#### Apple OS Administration

On completion of the module, students should be able to perform software, maintenance and troubleshooting on Macintosh Operating Systems.

#### Apple Hardware Repair

On completion of the module, students should be able to troubleshoot and rectify Apple computer hardware.

#### Fundamentals of Applied Statistics

On completion of the module, students should be able to employ the fundamental principles of applied statistics to draw inferences, justify conclusions and make decisions; and to improve various product qualities and process using quality control tools.

### Electives (Joint ITE-Industry)

#### Robot Palletizing Operations and Programming

On completion of the module, students should be able to operate the palletizing robot system, including editing and modifying programs for different palletizing operations.

### Electives (General)

As reflected on pages 279-281.

### Life Skills Modules

As reflected on page 281.

## NITEC IN INFOCOMM TECHNOLOGY

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Manage computer systems and devices.
- Provide 1st level remote helpdesk support.
- Manage computer network.
- Support networked servers.
- Assist to manage virtualisation infrastructure.
- Support application maintenance and deployment.

### JOB OPPORTUNITIES

Nitec in Infocomm Technology graduates are employed by a wide range of private and public sector organisations in all industries, ranging from telecommunications, manufacturing, banking, retail, government, education and even health care and insurance. Some of the job titles held by graduates include Technical Support Associate, Infocomm Technician, Associate Systems Administrator and Computer Technician. There are excellent opportunities for career advancement to supervisory positions and beyond.

### CERTIFICATION

Credits required for certification:

Core Modules	:	50
Life Skills Modules	:	10
Elective Modules	:	4
<b>Total</b>	<b>:</b>	<b>64</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
IT Essentials and PC Support	7
Networking Essentials	7
Internetworking Technology	7
Server Essentials	7
Internet Applications	6
Virtualization Technology	6
Software Applications	6
Industry Attachment	4
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Fundamentals of HTML5	2
Industry Attachment II	4
<b>ELECTIVES (INTER-DISCIPLINARY)</b>	
Green IT Fundamentals	2
Apple OS Administration	2
Apple Hardware Repair	2
IT Technical Support and Operations	2
<b>ELECTIVES (JOINT ITE-INDUSTRY)</b>	
Oracle Database and SQL Technologies	2
Database and SQL Essentials	2
Essentials of Java Programming	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 279-281	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### IT Essentials and PC Support

On completion of the module, students should be able to set up, install and maintain computer hardware and operating system. They will learn to troubleshoot hardware and software problems.

#### Networking Essentials

On completion of the module, students should be able to set up, configure, maintain and troubleshoot network system, and build peer-to-peer and wireless network for small office environment. They should be able to provide network support and configure network devices such as switches, routers and wireless access points.

#### Internetworking Technology

On completion of the module, students should be able to configure and implement routing protocols used in Local Area Network (LAN) as well as troubleshoot basic routing issues.

#### Server Essentials

On completion of the module, students should be able to install, configure and manage administration of server operating systems, servers and services. They should also be able to perform backup and recovery of systems files and configurations as well as monitor system performance.

#### Internet Applications

On completion of the module, students should be able to install, configure and maintain web servers and browsers. They will learn to create simple web pages using authoring tools. They should also be able to assist in developing and deploying web applications.

#### Virtualization Technology

On completion of the module, students should be able to set up a hypervisor, virtual machines (VMs) and configure clients' access to VMs and connectivity. They should also be able to perform backup and recovery of VMs, monitor resource utilization as well as troubleshoot performance and connectivity issues.

#### Software Applications

On completion of the module, students should be able to support application maintenance and deployment including, software installation, software development, troubleshooting and monitoring of application programs. They should also be able to integrate database into the application programs.

#### Industry Attachment

On completion of the module, students should be able to integrate and apply a cluster of key technical, social and methodological competencies related to their field of study.

#### Electives (Course Specific)

##### Fundamentals of HTML5

On completion of the module, students should be able to create a website using HTML5 tags.

##### Industry Attachment II

On completion of the module, students should be able to gain experience and insights in the actual work environment.

#### Electives (Inter-disciplinary)

##### Green IT Fundamentals

On completion of the module, students should be able to explain basic issues around green information technology (IT) and demonstrate ways and tools to find more efficient and environmentally responsible ways to meet IT business goals and to leverage IT to move entire organization to greener direction.

##### Apple OS Administration

On completion of the module, students should be able to perform software, maintenance and troubleshooting on Macintosh Operating Systems.

##### Apple Hardware Repair

On completion of the module, students should be able to troubleshoot and rectify Apple computer hardware.

#### IT Technical Support and Operations

On completion of the module, students should be able to understand the operations and processes in an IT technical help desk environment. Students will learn to use contact centre equipment as well as perform basic contact centre call flow configuration. Students will also learn to use Customer Relationship Management software in supporting and escalation of customers.



## **Electives (Joint ITE-Industry)**

### **Oracle Database and SQL Technologies**

On completion of the module, students should be able to create indexes and constraints, altering existing schema objects. Students should also be able to create and query external tables and use the advanced features of SQL to query and manipulate data within the database. Students are also able to use the dictionary views to retrieve metadata and create reports about their schema objects.

### **Database and SQL Essentials**

On completion of the module, students should be able to write queries using SQL against single and multiple tables, manipulate data in tables, create database objects, and query metadata.

### **Essentials of Java Programming**

On completion of the module, students should be able to understand Java Technology, the Java Programming Language and Product Life Circle.

### **Electives (General)**

As reflected on pages 279-281.

### **Life Skills Modules**

As reflected on page 281.

## NITEC IN MICROELECTRONICS

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Perform wafer level parametric testing.
- Collect, organize and interpret production and product performance data.
- Monitor and improve process capability, cycle time, yield, cost and quality.
- Participate in process development and yield enhancement programmes.
- Summarise data and information in development programmes.
- Monitor process performance upon equipment modification.
- Document process development programmes.
- Assist in failure analysis.

### JOB OPPORTUNITIES

Nitec in Microelectronics graduates are employed by companies that manufacture micro-electronic components and integrated circuit chips. Some of the job titles held by graduates include Semiconductor Process Technician, Semiconductor Manufacturing Technician, Wafer Fabrication Process Technician and Wafer Fabrication Manufacturing Technician. There are excellent opportunities for career advancement to supervisory positions like Technical Specialist, Technologist and beyond.

### CERTIFICATION

Credits required for certification:

Core Modules	:	51
Life Skills Modules	:	10
Elective Modules	:	4
<b>Total</b>	<b>:</b>	<b>65</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
Electrical Principles and Measurement	7
Digital Electronics	7
Analogue Electronics	7
Computer Networking Principles	7
Semiconductor Fundamentals	6
Wafer Fabrication Processes	7
Applied Microelectronics	6
Industry Attachment	4
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Fundamentals of Applied Statistics	2
<b>ELECTIVES (INTER-DISCIPLINARY)</b>	
Sensor Technology	2
Apple OS Administration	2
Apple Hardware Repair	2
C Programming	2
Web Development	2
<b>ELECTIVES (JOINT ITE-INDUSTRY)</b>	
Robot Palletizing Operations and Programming	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 279-281	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### Electrical Principles and Measurement

On completion of the module, students should be able to apply the basic principles of electrical and electronics to connect and test electrical circuits. They should also be able to construct prototype electronic project on printed board.

#### Digital Electronics

On completion of the module, students should be able to interpret, construct, test and troubleshoot basic digital electronic circuits. They should also be able to construct prototype digital electronic circuits.

#### Analogue Electronics

On completion of the module, students should be able to interpret, construct, test and troubleshoot analogue electronic circuits. They should be able to construct prototype analogue electronic projects.

#### Computer Networking Principles

On completion of the module, students should be able to set up and test wired and wireless Local Area Network for resources sharing. They should also be able to identify the various network topologies and protocol; and troubleshoot network connectivity faults.

#### Semiconductor Fundamentals

On completion of the module, students should be able to perform cleanroom and safety protocol, and failure analysis, maintain vacuum system and prepare pass down documentation.

#### Wafer Fabrication Processes

On completion of the module, students should be able to perform automated wafer processes and semiconductor metrology measurements for fabrication of integrated circuits used in electronic devices.

#### Applied Microelectronics

On completion of the module, students should be able to apply and integrate the skills and knowledge acquired in the course to set up, integrate and maintain microelectronic process or equipment systems to fabricate microelectronic devices.

#### Industry Attachment

Students will undergo a 3-month on-the-job programme with semiconductor industries to reinforce the skills and knowledge acquired at the training institute and to develop competencies in other areas not covered in the curriculum.

### Electives (Course Specific)

#### Fundamentals of Applied Statistics

On completion of the module, students should be able to employ the fundamental principles of applied statistics to draw inferences, justify conclusions and make decisions; and to improve various product qualities and process using quality control tools.

### Electives (Inter-disciplinary)

#### Sensor Technology

On completion of the module, students should be able to explain the principles of operation, characteristics and applications of various sensors in industrial and electrical engineering works.

#### Apple OS Administration

On completion of the module, students should be able to perform software, maintenance and troubleshooting on Macintosh Operating Systems.

#### Apple Hardware Repair

On completion of the module, students should be able to troubleshoot and rectify Apple computer hardware.

#### C Programming

On completion of the module, students should be able to apply the concepts of computer programming and write simple programs in 'C' language.

#### Web Development

On completion of the module, students should be able to develop World Wide Web applications or websites that are run over HTTP from a web server to a web browser.

### Electives (Joint ITE-Industry)

#### Robot Palletizing Operations and Programming

On completion of the module, students should be able to operate the palletizing robot system, including editing and modifying programs for different palletizing operations.

### Electives (General)

As reflected on pages 279-281.

### Life Skills Modules

As reflected on page 281.

## NITEC IN SECURITY TECHNOLOGY

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Install, upgrade, configure and maintain surveillance systems.
- Install, upgrade, configure and maintain intruder detectors and control panels.
- Install, upgrade, configure and maintain access control systems.
- Perform troubleshooting on security equipment.
- Install and test cabling systems.
- Set up and maintain computer system.
- Set up wired and wireless local area networks.

### JOB OPPORTUNITIES

*Nitec* in Security Technology graduates are employed by companies that provide security systems solutions. Some of the job titles held by graduates include Security Systems Technician, Service Technician and Systems Technician. There are excellent opportunities for career advancement to supervisory positions and beyond.

### CERTIFICATION

Credits required for certification:

Core Modules	:	51
Life Skills Modules	:	10
Elective Modules	:	4
Total	:	65

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
Electronics Fundamentals	7
Computer Essentials	7
Cabling Technology	6
Wired and Wireless Network	7
Intrusion and Access Control Technology	7
Surveillance Technology	7
Computer Aided Design (CAD)	6
Industry Attachment	4
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 279-281	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### Electronics Fundamentals

On completion of the module, students should be able to explain basic principles of electricity and electronics, use electrical measuring instruments as well as to apply the operating principles of various electronics components to interpret the circuits used in security systems.

#### Computer Essentials

On completion of the module, students should be able to set up, install, maintain and troubleshoot computer and software system.

#### Cabling Technology

On completion of the module, students should be able to use cabling test equipment to perform testing and diagnosis and to certify the performance of network cables.

#### Wired and Wireless Network

On completion of the module, students should be able to install, configure and troubleshoot computer network system for the wired and wireless LAN environment.

#### Intrusion and Access Control Technology

On completion of the module, students should be able to design, maintain and troubleshoot intrusion and access control systems in various security environments.

#### Surveillance Technology

On completion of the module, students should be able to design, maintain and troubleshoot surveillance systems in various security environments.

#### Computer Aided Design (CAD)

On completion of the module, students should be able to create, update and interpret electrical and security installation drawings.

#### Industry Attachment

On completion of the module, students should be able to apply and integrate the skills and knowledge that they have acquired at ITE College and develop competencies in other areas not covered in the curriculum, at the workplace.

#### Electives (General)

As reflected on pages 279-281.

#### Life Skills Modules

As reflected on page 281.

## NITEC IN WEB APPLICATIONS

### COURSE SYNOPSIS

On completion of the course, students should be able to

- Maintain content management systems.
- Develop and maintain rich interactive applications.
- Develop and maintain web applications.
- Support media content project development.
- Design UI/UX.

### JOB OPPORTUNITIES

Nitec in Web Applications graduates are employed in information communication and digital media industry that create and use interactive web technology for customers, including design firms, advertising agencies, production companies, interactive developers, museums & galleries, government bodies, PR and marketing firms, financial and healthcare companies. Some of the job titles held by graduates include Web Developer, Web Programmer and Interactive Programmer.

### CERTIFICATION

Credits required for certification:

Core Modules	:	50
Life Skills Modules	:	10
Elective Modules	:	4
<b>Total</b>	<b>:</b>	<b>64</b>

### COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULE</b>	
IT Essentials and UI/UX	7
Web Development Fundamentals	7
Content Management System	7
Programming Essentials	7
Rich Interactive Applications	6
Website Development	6
Mobile Web Development	6
Industry Attachment	4
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Social Media for Marketing	2
Digital Publishing	2
<b>ELECTIVES (INTER-DISCIPLINARY)</b>	
Apple OS Administration	2
Apple Hardware Repair	2
<b>ELECTIVES (GENERAL)</b>	
Refer to pages 279-281	
<b>LIFE SKILLS MODULES</b>	
Refer to page 281	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### IT Essentials and UI/UX

On completion of the module, students should be able to set up, install and maintain computer hardware and operating system. They will also be able to create interface elements with focus on usability and user experience.

#### Web Development Fundamentals

On completion of the module, students should be able to develop web pages using HTML and CSS, and ensure that the web pages comply with W3C standards.

#### Content Management System

On completion of the module, students should be able to create, manage, and publish dynamic web content using Content Management System (CMS).

#### Programming Essentials

On completion of the module, students should be able to develop programs using programming concepts such as data types, operators, control structures and arrays.

#### Rich Interactive Applications

On completion of the module, students should be able to develop interactive animated applications on different platforms.

#### Website Development

On completion of the module, students should be able to develop web applications using server side scripting with database integration.

#### Mobile Web Development

On completion of the module, students should be able to develop and deploy responsive interactive mobile web applications.

#### Industry Attachment

In this module, students are exposed to actual work conditions and environment in specific areas in web development. This will allow them to experience actual applications of knowledge and skills acquired during the course.

### Electives (Course Specific)

#### Social Media for Marketing

On completion of the module, students should be able to conduct research for marketing campaign to identify target audience, develop an online marketing plan on social media platform and establish a marketing evaluation.

#### Digital Publishing

On completion of the module, students should be able to identify the best practices of an outstanding digital publication and the process of publishing digital content for mobile devices. Students should be able to design and create layout, user interface and interactivity for a cutting-edge digital publication.

### Electives (Inter-disciplinary)

#### Apple OS Administration

On completion of the module, students should be able to perform software, maintenance and troubleshooting on Macintosh Operating Systems.

#### Apple Hardware Repair

On completion of the module, students should be able to troubleshoot and rectify Apple computer hardware.

### Electives (General)

As reflected on pages 279-281.

### Life Skills Modules

As reflected on page 281.