DIPLOMA IN CYBERSECURITY & DIGITAL FORENSICS (T62)

Course Overview

This course places you at the forefront of Singapore's fight against cyber-crime and hackers.

Our curriculum will give you an insight into various types of cyber-attacks such as advanced persistent threats, ransomware, and denial of service attacks. You will learn about the dangers they present and acquire the skills to detect them effectively.

You'll also be equipped with digital forensic techniques that will enable you to uncover hidden evidence when piecing together a digital trail of events behind a cyber-crime. In your senior year, you can choose to take elective subjects in *Advanced Manufacturing, Enterprise Security or Digital Forensics*. These subjects help you deepen your knowledge and skills, giving you an edge when you seek employment opportunities. With organisations and governments becoming increasingly vulnerable to threats posed by hackers and cybercriminals, your unique and specialised skills set will be in high demand as you enter the workforce after your graduation.

Entry Requirements

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

Subject	Grade
English Language (EL1)*	1-7
Mathematics (E or A)	1-6
Any two other subjects	1-6
2021 Planned Intake	**150**
Net ELR2B2 aggregate range (2021 JAE)	**6 - 13**

To be eligible for selection, applicants must also have sat for one of the following subjects: Additional Combined Science, Additional Science, Biology, Biotechnology, Chemistry, Combined Science, Computer Studies, Creative 3-D Animation, Design & Technology, Engineering Science, Food & Nutrition,Fundamentals of Electronics, General Science, Human & Social Biology, Integrated Science, Physics, Physical Science, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry), Science (Physics, Chemistry, Biology).

Note: *Applicants with complete colour vision deficiency are not eligible to apply for this course.*

See also the minimum entry requirements for:

- ITE Certificate Holders
- International Students

What You'll Learn

YEAR 1

Strong Foundation Skills
Learn to develop your own mobile and web applications with the coding and user interface skills you acquire. Also, learn the fundamentals of networking, and discover how to create your own analytics dashboard.

TP Fundamentals (TPFun) Subjects —

	Subject Code	Subject	Credit Units	
⌄	**LEA1011**	**Leadership: Essential Attributes & Practice 1**	**1**	⌄
		LEAP 1, 2 and 3 are three fundamental subjects that seek to cultivate in you, the attitude, skills and knowledge for the development of your leadership competencies. This character-based leadership programme enables you to develop your life-skills through establishing personal core values, which will become the foundation for your leadership credibility and influence.		
⌄	**MCR1001**	**Career Readiness 1**	**1**	⌄
		This Career Readiness programme comprises three core subjects - Personal Management, Career Preparation and Career Management. It seeks to help you understand your career interests, values, personality and skills for career success. It also equips you with the necessary skills for seeking and securing jobs, and to develop professional work ethics.		
⌄	**CCS1006**	**Communication & Information Literacy**	**2**	⌄
		In this subject, you will learn how to conduct research for relevant information and validate information sources.. You will also learn to recognise and avoid plagiarism, and follow standard citation and referencing guidelines when presenting information. In the course of learning, you will be required to plan, prepare and present information appropriately in written and oral form. You will also be taught to consider the **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) when writing and delivering oral presentations.		

	LSW1002	**Sports & Wellness**	2	

This subject will help you develop both the physical and technical skills in your chosen sports or fitness activities. Through a structured curriculum that facilitates group participation, practice sessions and mini competitions, you will learn to build lifelong skills such as resilience, leadership, communication and teamwork. Physical activity sessions will be supplemented by health-related topics to provide you with a holistic approach to healthy living.

	CCS1008	**Persuasive Communication**	2	

In this subject, you will be taught how to use persuasive language in written documents. You will be required to use information to your advantage to verbally communicate and convince an audience about your idea, product or service. Skills such as persuasive vocabulary, language features, graphical illustrations, tone and style would also be covered. The **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) will also be applied when engaging in verbal and written communication.

	GCC1001	**Current Issues & Critical Thinking**	2	

This subject presents you with a panoramic view of current local and global issues, which may have long term implications for Singapore. You will learn to apply critical thinking tools to examine current issues, support your views with relevant research and up-to-date data, articulate an informed opinion and mature as civic-minded individuals.

	CGS1002	**Global Studies**	3	

This subject provides essential skills and knowledge to prepare you for an overseas experience. You will examine the elements of culture and learn the key principles of cross-cultural communication. In addition, you will gain an appreciation and awareness of the political, economic, technological and social landscape to function effectively in a global environment.

Diploma Subjects - Core Subjects

	Subject Code	Subject	Credit Units	
	CIA1C07	**Logic and Mathematics**	3	

This subject covers logic, sets, functions, recursion and graphs. It covers mathematical processes for developing algorithms in computing and other real-life applications. Topics covered include the fundamental mathematical concepts needed for computing.

	CIT1C19	**User Experience and Interface Design**	**3**	⌃
⌃		This subject introduces the concept of Human-Centered Design, and its practice to create useful digital products and interfaces that offer an enriching user experience (UX). The topics covered include deisgning interfaces, need findings, sketching and prototyping for interactive experiences, and usability testing.		
⌃	**CIT1C18**	**Computational Thinking**	**4**	⌃
		This subject introduces students to the fundamentals of computational thinking and their application in developing programming solutions for problems. Topics covered include programming concepts, simple data structures and programming techniques.		
⌃	**CIT1C20**	**Coding and Development Project**	**4**	⌃
		This subject introduces students to coding principles and practices using an object-oriented approach. The subject also introduces the development of an IT application using the latest technologies. Topics covered include object and classes, composition, simple data structures, application architecture, design and development.		
⌃	**CIA1C11**	**Data Visualisation and Analytics**	**4**	⌃
		This subject covers the data analytics lifecycle, including gathering, cleaning, processing and visualising of data. Exploratory data analysis methods, descriptive and predictive analytics and the presentation of insights will also be covered.		
⌃	**CIA1C06**	**Database Application Development**	**4**	⌃
		This subject introduces the fundamental concepts of relational database systems, the design methods specific to relational database, database manipulation using a database query language, and the techniques of implementing relational databases. It will also cover implementation of simple applications to access relational database.		
⌃	**CIT1C14**	**Data Structures and Algorithms**	**4**	⌃
		This subject introduces students to the fundamentals of recursion and data structures in solving problems using a programming language. Topics covered include stacks, queues, linked lists and trees. Searching techniques and sorting algorithms will also be covered.		
⌃	**CCF1C02**	**IT Systems Security Essentials**	**4**	⌃
		This subject introduces students to the key principles of information security namely confidentiality, integrity and availability and their application in various real world scenarios. Topics covered include IT law, international standards, security policies, procedures, processes to protect IT systems against cyber-attacks and information breaches and the architecture and organisation of the digital components of a computer system.		

	CMC1C08	Network Technology	4	∧

This subject covers the theoretical and practical aspects of networking and its related technologies. Topics covered include network protocols and communications, Ethernet networks, TCP/IP networking model, IP addressing, virtual local area networks (VLANs), routing and switching concepts and static and dynamic routing.

YEAR 2

Defend Cyber Space

Acquire industry-specific cyber security and forensics competencies such as networking security, file system forensics, malware analysis and ethical hacking. Receive hands-on training in state-of-the art facilities. Learn about malware and how to conduct vulnerability assessments, use ethical hacking tools and implement intrusion prevention solutions.

TP Fundamentals (TPFun) Subjects ━

	Subject Code	Subject	Credit Units	
∧	MCR1002	**Career Readiness 2**	1	∧

This Career Readiness programme comprises three core subjects – Personal Management, Career Preparation and Career Management. It seeks to help you understand your career interests, values, personality and skills for career success. It also equips you with the necessary skills for seeking and securing jobs, and to develop professional work ethics.

	LEA1012	**Leadership: Essential Attributes & Practice 2**	1	∧

LEAP 1, 2 and 3 are three fundamental subjects that seek to cultivate in you, the attitude, skills and knowledge for the development of your leadership competencies. This character-based leadership programme enables you to develop your life-skills through establishing personal core values, which will become the foundation for your leadership credibility and influence.

	LEA1013	**Leadership: Essential Attributes & Practice 3**	1	∧

LEAP 1, 2 and 3 are three fundamental subjects that seek to cultivate in you, the attitude, skills and knowledge for the development of your leadership competencies. This character-based leadership programme enables you to develop your life-skills through establishing personal core values, which will become the foundation for your leadership credibility and influence.

| ∧ | **CCS1007** | **Workplace Communication** | **2** | ∧ |

In this subject, you will be taught how to conduct effective meetings while applying team communication strategies and the skills for documenting meeting notes. You will be required to write clear emails, using the appropriate format, language, tone and style for an audience. You will also be taught to communicate appropriately in and for an organisation while using various platforms. In all aspects, the principles of applying **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) will be covered.

| ∧ | **CGS1003** | **Managing Diversity at Work*** | **3** | ∧ |

This subject explores the concepts of identity, diversity and inclusion at the workplace. It examines the relationship between identity and diversity, the benefits and challenges of diversity and the strategies that promote inclusion and inspire collaboration in a diverse workplace. Examples of the elements of diversity covered in this subject include nationality, generation, ethnicity and gender. A one week residential stay is mandatory for this subject.

| ∧ | **CGS1004** | **Global Citizenship & Community Development*** | **3** | ∧ |

Students will examine the meaning and responsibilities of being a Global Citizen, in order to contribute towards a more equitable and sustainable world. In addition, students will learn how sustainable solutions can support community development, and, execute and critique a community action plan that addresses the needs of a specific community/cause.

| ∧ | **CGS1005** | **Expressions of Culture*** | **3** | ∧ |

This subject provides a platform for an understanding of culture and heritage through modes of expression. Students will be introduced to global and local cultures via everyday objects, places and human behaviour seen through time and space. Students will explore issues and challenges in culture and heritage sustainabiltiy in community, national and global contexts.

| ∧ | **TGL1001** | **Guided Learning** | **3** | ∧ |

The subject introduces students to the concepts and process of self-directed learning in a chosen area of inquiry. The process focusses on four stages: planning, performing, monitoring and reflecting. Students get to plan their individual learning project, refine and execute the learning plan, as well as monitor and reflect on their learning progress and project. The learning will be captured and showcased through a curated portfolio. The self-directed learning project will broaden and/or deepen a student's knowledge and skills.

	CIN1001	Innovation & Entrepreneurship	2	⌄

The Innovation & Entrepreneurship subject is designed for learners from all disciplines to embrace innovation in either their specialised fields or beyond. You will first learn the Design Thinking framework, where you will develop problem statements and ideate solutions. Next, you will discover the tools for prototyping and innovation, such as 3D printing and laser cutting, at TP's Makerspace+ facility. Finally, you will acquire commercial awareness through the LEAN Startup framework of idea crystallisation, prototype building, customer testing and validation, refinement of business model canvas, and crowdfunding or crowdsourcing avenues.

* Students must choose to take either one of these subjects or TGL1001 Guided Learning

Diploma Subjects - Core Subjects —

	Subject Code	Subject	Credit Units	
⌄	CCD2C03	Ethical Hacking & Intrusion Prevention	4	⌄

This subject discusses threats on the Internet and provides an understanding of how a cyber-attacker will penetrate a network. It equips you with the principles and practices of preventing such attacks, discussing threats such as malicious codes, website defacing and hacking, illegal access to unauthorised information, privacy violations, distributed denial of services and cyber terrorism. You will acquire knowledge of potential threats, various penetration strategies and methods, and the respective counter measures. You will also learn the principles of creating a secure network design.

	CCD2C04	Forensics in Digital Security	4	⌄

This subject covers the concept and techniques required to discover and investigate evidence from various digital storage devices. Topics include using common tools and commercial toolsets for extraction and analysis of digital evidence. Network traﬃc capture and analysis will also be discussed and investigated for the tracing of speciﬁc information and source of attacks.

	CCD2C06	Servers Administration & Security	4	⌄

This subject covers the concept and techniques required to configure and administer a typical networked server using common operating systems in the industry. Topics include installation of a server system, configuration of devices, disks and file systems with security configuration of Local Area Network (LAN) and Wide Area Network (WAN) environments. Administering of key server services, using various tools and system scripting to monitor and analyse its performance and security will be discussed and applied. The subject also covers the concepts of encryption methodology, Public Key Infrastructure, key distribution and authentication.

	CCD2C05	IT Security Management & Audit	4	^
		This subject aims to familiarise you with the various IT security policies processes and procedures, as well as best practices in industry and government. You will learn about the associated standards for risk management and the management of IT security. You will also learn how to plan, execute, report and follow up on an information security management system audit.		
^	CCF2C01	Network Security	4	^
		This subject introduces internetworking security technologies, including configuring network-based access control lists, managing network firewalls, configuring logging and remote management. The subject also covers the configuration of authentication, authorisation and accounting on network devices, customising privilege levels and views.		
^	CCD2C08	Secure Web Applications	4	^
		This subject focuses on secure web application design and development. It discusses the inherent threats and vulnerabilities of web applications and the corresponding countermeasures. In addition, it includes industry best practices such as OWASP (Open Web Application Security Project) Top Ten Web Application Vulnerabilites.		
^	CDF3C01	Incident Response & Management	4	^
		This subject covers the policies, plans and procedures for computer security incident response of events such as denial or service, malicious code and authorisation access. It establishes proper processes for assessing the impact of incident on business and implements effective methods of collection, analysis and reporting of data.		

YEAR 3

Apply Skills in Complex Projects

Acquire more advanced skills in cybersecurity and digital forensics. Learn to infuse AI into cybersecurity. Undertake internships in local and/or overseas cybersecurity and digital forensics companies where you will apply your knowledge and skills in real-life situations and for advanced level projects.

TP Fundamentals (TPFun) Subjects   —

	Subject Code	Subject	Credit Units	
^	MCR1003	Career Readiness 3	1	^
		This Career Readiness programme comprises three core subjects – Personal Management, Career Preparation and Career Management. It seeks to help you understand your career interests, values, personality and skills for career success. It also equips you with the necessary skills for seeking and securing jobs, and to develop professional work ethics.		

	CSI3004	**Student Internship Programme**	16	
		This structured programme is designed to link your learning with the real work environment. You will be placed in organisation(s) with opportunities to apply the concepts and skills acquired in the course of your study. Besides reinforcing technical concepts and mastering of skills in areas that you have been trained, the practical training will enable you to build important skills such as problem-solving, communication, teamwork, and to cultivate good attitude and a strong work ethic.		

Diploma Subjects - Core Subjects —

	Subject Code	Subject	Credit Units	
	CMP3602	**Major Project**	10	
		Through this subject, you learn to integrate and apply the knowledge and skills learnt from other subjects in the Cybersecurity & Digital Forensics curriculum. The subject provides an opportunity for the practical application of both technical and soft skills such as project management, presentation and problem solving.		

Diploma Subjects - Elective Cluster Subjects

Digital Forensics —

	Subject Code	Subject	Credit Units	
	CCF2C03	**Malware Analysis**	4	
		This subject covers how an analysis of computer malware should be conducted. It introduces the vulnerabilities in common operating systems and networking equipment and equip students with the skills to conduct a malware analysis on common applications running in a computer system.		
	CCF2C04	**Mobile Device Forensics**	4	
		This subject covers skills in how to uncover deleted or hidden data from mobile devices. Students will be taught to apply the underlying technologies behind various tools to present scientifically valid information as evidence. The subject will also cover how to forensically acquire, preserve and examine data from commonly used mobile devices.		

Enterprise Security

	Subject Code	Subject	Credit Units	
∧	**CCD3C01**	**Security Technology & Innovation**	**4**	∧
		This subject covers topics such as security trends and technologies in the industry, the types of innovation, key elements of innovation and innovation skills required to move progressively from idea to impact. It discusses topics on security innovation relating to the methods, ideas, production, market needs, effective processes, impact and needs of customers.		
∧	**CCF2C05**	**Cloud Security**	**4**	∧
		This subject covers skills in building a basic set of IT infrastructure using cloud computing technology. An understanding of how to identify security risks arising from using cloud computing technologies and the means to mitigate these risks will also be covered.		

Advanced Manufacturing Technology

	Subject Code	Subject	Credit Units	
∧	**BLO2010**	**Distribution Centre Management**	**4**	∧
		This subject provides an overview of the role of a Distribution Centre (DC) in the supply chain. It also covers the various activities performed within a DC and the significance of these activities on customer service and total logistics costs. It focuses on the major resources to be applied in a DC and explains how they interact with one another in contributing to the DC's effectiveness and efficiency. It will also cover the significance of providing DC services to the Third-Party Logistics industry.		
∧	**ECC2014**	**Industrial IoT Analytics**	**4**	∧
		This subject covers the essential concepts and skills needed for implementing digital transformation in smart manufacturing plants. It covers the application of industrial software platforms to wirelessly interconnect sensors, Internet of Things (IoT) devices and equipment. Students will learn to develop dashboard for acquiring, analysing and displaying data that is commonly found in Advanced Manufacturing. Modern approaches in activation of hardware and software responses when interventions are required for process improvement or corrective actions are also covered in detail.		