DIPLOMA IN CYBERSECURITY & DIGITAL FORENSICS (T62)

Course Overview

In an increasingly digitised world, any one of us can become the target of hackers who attempt to access our computer systems to steal account details, demand money through ransomware and plant malware and viruses that compromise our systems.

Learn to protect, secure and defend computing and information systems, applications and networks. Should a cybersecurity breach occur, you will be able to retrieve and reconstruct the evidence, investigate the cause, and advise how to prevent further attacks.

You will also gain hands-on training at the Temasek Advanced Learning, Nurturing & Testing Lab, a cyber-range set up in collaboration with the Ministry of Home Affairs and get the opportunity to investigate live malware samples in our new Malware Analysis Centre.

Join us in the fight to protect our information and computing systems from cyber-villains today!

EXCLUSIVE ACCESS TO MALWARE ANALYSIS CENTRE
Gain exclusive access to a first-of-its kind Malware Analysis Centre in the ASEAN region and obtain in-demand skills today!

RICH INDUSTRY PARTNERSHIPS
Eager to learn and obtain scholarships from major players in the industry? Our strong industry partnerships with ST Engineering, Palo Alto Networks and CrowdStrike will help you do just that!

EXPERIENTIAL LEARNING
Experience what it's like to work on real-life cybersecurity projects, go on overseas study trips and conferences to beef up your skills and knowledge, in preparation for an exciting career ahead.

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
2022 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.*

What You'll Learn

YEAR 1 | YEAR 2 | YEAR 3 | TPFUN

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.

Diploma Subjects - Core Subjects

Subject Code	Subject	Credit Units
CIA1C07	**Logic and Mathematics** 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.	3
CIT1C19	**User Experience and Interface Design** 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.	3
CIT1C18	**Computational Thinking** 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.	4
CIT1C20	**Coding and Development Project** 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.	4

CIA1C11	**Data Visualisation and Analytics** This subject covers the data analytics lifecycle, including gathering, cleaning, processing and visualising of data. Exploratory data analysis methods, descriptive and predictive analytics and the presentation of insights will also be covered.	**4**
CIA1C06	**Database Application Development** 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.	**4**
CIT1C14	**Data Structures and Algorithms** 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.	**4**
CCF1C02	**IT Systems Security Essentials** 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.	**4**
CMC1C08	**Network Technology** 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.	**4**

YEAR 1 **YEAR 2** YEAR 3 TPFUN

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.

Diploma Subjects - Core Subjects

Subject Code	Subject	Credit Units
CCD2C03	**Ethical Hacking & Intrusion Prevention** 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.	**4**
CCD2C04	**Forensics in Digital Security** 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.	**4**
CCD2C06	**Servers Administration & Security** 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	**4**

	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** 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.	**4**
CCF2C01	**Network Security** 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.	**4**
CCD2C08	**Secure Web Applications** 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.	**4**
CDF3C01	**Incident Response & Management** 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.	**4**

YEAR 1 YEAR 2 **YEAR 3** TPFUN

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.

Diploma Subjects - Core Subjects

Subject Code	Subject	Credit Units
CMP3602	**Major Project** 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.	**10**

Diploma Subjects - Elective Cluster Subjects

Digital Forensics

Subject Code	Subject	Credit Units
CCF2C03	**Malware Analysis** 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.	**4**
CCF2C04	**Mobile Device Forensics** 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.	**4**

Enterprise Security

Subject Code	Subject	Credit Units
CCD3C01	**Security Technology & Innovation** 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.	4
CCF2C05	**Cloud Security** 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.	4

Advanced Manufacturing Technology

Subject Code	Subject	Credit Units
BLO2010	**Distribution Centre Management** 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.	4
ECC2014	**Industrial IoT Analytics** 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.	4

YEAR 1 YEAR 2 YEAR 3 **TPFUN**

You will also undergo TP Fundamentals (TPFun) – a set of subjects that equips you with the crucial life skills you need to navigate the modern world as an agile and forward-thinking individual, and team player.

TP Fundamentals (TPFun) Subjects

Subject Code	Subject	Credit Units
GTP1301	**Current Issues & Critical Thinking** This subject covers current issues, including diverse local and global concerns, that will impact lives and may have critical implications for Singapore. There will be opportunities to build competence through self-directed learning, communicate and collaborate in active discussions and objectively analyse issues using digital and information literacy skills and critical thinking scaffolds. This subject aims to provide students with the knowledge and skills to: • apply critical thinking tools to examine current issues. • effectively search for relevant information from a variety of sources. • evaluate research information. • cite sources to support their views. • articulate an informed opinion about current issues.	3
CTX1001	**Effective Communication**	3

This subject introduces the fundamentals of effective communication. It also covers how to communicate with and convince an audience through writing and speaking tasks. The skills in this subject will include the application of strategies for communication, appropriate vocabulary, language features, visual aids, tone and style. The **M**essage, **A**udience, **P**urpose and **S**trategy (**MAPS**) framework will also be applied when planning and engaging in written and verbal communication. There will be opportunities to communicate and collaborate through active learning activities, apply digital and information literacy skills and build competence through self-directed learning.

This subject aims to equip students with the knowledge and skills to:

- apply the factors that influence effective communication.
- structure a compelling point of view through a writing task.
- express their ideas convincingly to an audience in an oral presentation.

CTX1002 **Professional Communication** **3**

This subject covers professional communication skills for the workplace and employability skills in the areas of career preparation. It covers communication and interpersonal skills, including effective virtual communication etiquette, and conducting oneself professionally in the workplace. In addition, essential career preparation skills such as resume writing and interview skills, needed to seek and secure work would be included. The **M**essage, **A**udience, **P**urpose and **S**trategy (**MAPS**) framework would also be applied when engaging in written and verbal communication. There will be opportunities to communicate and collaborate through active learning activities, apply digital and information literacy skills and build competence through self-directed learning.

The subject aims to equip students with the knowledge and skills to:

- communicate effectively in the workplace using principles of effective written communication and interpersonal skills.
- apply effective job search and interview skills in their career preparation.

GTP1101 **Leadership Fundamentals** **2**

This subject focuses on self-leadership based on the values of integrity, respect, and responsibility. Increasing awareness of self and others will lay the foundations for personal and relationship effectiveness. Consequential thinking, clear articulation of personal values and visions, emphatic listening, and collaboration in serving others are some of the essential skills covered in this leadership journey. There will be opportunities to build and to apply the concepts of being a values-centred leader.

The aim of this subject is to guide students to:

- design a personal growth plan based on strengths, values and purpose.
- apply the attributes of logical and emotional intelligence to improve team effectiveness.
- identify the key messages of respect in relationships.
- apply the principles of effective personal financial management.

GTP1102 **Leadership in Action** **1**

This subject focuses on Service Learning as an experiential platform to apply the tenets of Self and Team Leadership. Service Learning will be the capstone project for this subject, which will require an analysis of the diverse needs of the community, collaboration with community partners and demonstration of learning, including key elements of empathy. There will be opportunities to build and to apply the concepts of being a values-centred leader.

This subject aims to equip students with the knowledge and skills to:

- plan and carry out a project to demonstrate empathy towards people in a diverse community.
- apply diploma core knowledge and skills through the Service Learning platform to address community needs.
- reflect on the Service Learning experience when working in teams and with community partners.

GTP1201 **Career Readiness CARE1** **1**

This subject focuses on personal management skills. It develops an understanding of one's career interests, values, personality and skills for career success. It covers the necessary knowledge, skills and attitudes needed to succeed in the workplace and achieve professional goals. There will be exposure to apply digital and information literacy skills, build competence through self-directed learning methods and acquire the skills of being a lifelong learner.

This subject aims to equip students with the knowledge and skills to:

- analyse personal characteristics that can contribute positively to achieving personal, educational and career goals.

- make career decisions that are aligned with their interests, skills and values.

GTP1202	**Career Readiness CARE2** This subject focuses on career management skills. It covers the importance of workplace readiness skills to adapt and respond to the changing job market environment. Career ownership and continuous learning for lifelong employability will be emphasised. There will be exposure to apply digital and information literacy skills, build competence through self-directed learning, and acquire the skills of being a lifelong learner. This subject aims to equip students with the knowledge and skills to: • identify their work profiles to help them in their career choices in a changing job market environment. • take career ownership for continuous learning and lifelong employability.	**1**
LSW1002	**Sports & Wellness** The subject enables students to build a good foundation for healthy living. Students will have the opportunity to participate in hands-on practical sessions where they will experience and develop both physical and technical skills in their chosen sports or fitness activities. Through a structured curriculum that facilitates group participation, practice sessions and mini competitions, students will be able to build lifelong skills such as resilience, leadership, communication and teamwork. Physical activity sessions will also be supplemented by health-related topics that span the dimensions of health, such as diet, nutrition, stress and weight management, to provide students with a holistic approach to healthy living. This subject also prepares students to be self-directed and accountable for lifelong learning for good health.	**2**
CIN1001	**Innovation & Entrepreneurship** The subject is designed for learners from all disciplines to embrace innovation in either their specialised field or beyond. Learners will be taught to apply the Design Thinking framework to develop problem statements, ideate and identify feasible solutions. Learners will be exposed to several tools for prototyping. In addition, commercial awareness will be imbued in learners through various innovation and entrepreneurship concepts or tools. This subject also prepares students to be self-directed lifelong learners who are digital and information literate. It nurtures communicative and collaborative citizens who can use objective analysis in problem-solving.	**2**
CGS1002	**Global Studies** This subject provides essential skills and knowledge to prepare students for an overseas experience. They will examine the elements of culture and learn the key principles of cross-cultural communication. In addition, they will gain an appreciation and awareness of the political, economic, technological and social landscape to function effectively in a global environment. The subject prepares students to be responsible citizens and leaders who can contribute to the global community through effective communication and collaboration.	**3**
CGS1003	**Managing Diversity at Work*** 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. The subject prepares students to be responsible citizens and leaders who can contribute to the global community through effective communication and collaboration.	**3**
CGS1004	**Global Citizenship & Community Development*** 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. The subject prepares students to be responsible citizens and leaders who can contribute to the global community through effective communication and collaboration.	**3**
CGS1005	**Expressions of Culture*** 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 sustainability in community, national and global contexts. The subject	**3**

	prepares students to be responsible citizens and leaders who can contribute to the global community through effective communication and collaboration.	
GTP1302	**Guided Learning** The subject introduces students to the concepts and process of self-directed learning in a chosen area of inquiry. The process focusses on four stages: planning, performing, monitoring and reflecting. Students get to plan their individual learning project, refine and execute the learning plan, as well as monitor and reflect on their learning progress and project. The learning will be captured and showcased through a curated portfolio. The self-directed learning project will broaden and/or deepen a student's knowledge and skills. Students will enhance their problem solving and digital literacy skills through this subject.	**3**
CSI3004	**Student Internship Programme** This structured programme is designed to link your learning with the real work environment. You will be placed in organisation(s) with opportunities to apply the concepts and skills acquired in the course of your study. Besides reinforcing technical concepts and mastering of skills in areas that you have been trained, the practical training will enable you to build important skills such as problem-solving, communication, teamwork, and to cultivate good attitude and a strong work ethic.	**16**

*Students must choose one of these three electives under the 'Global Studies 2' subject, or take 'Guided Learning'