NETWORK SYSTEMS & SECURITY COURSE MODULES

With the recent news of the Singapore government rolling out Internet segregation plans, you can't deny the growing need to secure our computer networks. If you look forward to fighting cyber threats like hacking and Internet hoaxes, enrol in the Diploma in Network Systems & Security [NSS] to arm yourself for battle.

Thanks to our strong partnerships with Cisco Systems [USA]. NSS uses the latest technology to give you topnotch infocomm training in areas such as design, implementation, security and maintenance of network infrastructure. You will also get the chance to install and manage physical and virtual servers in data centres that support cloud computing in our Cloud Computing Centre. What's more, you will be well prepared to obtain world-recognised certifications such as CCNA, CCNP, CCNA Security, 1Pv6 Forum Certified Network Engineer and EC Council Certifications.

This course will teach you the technology on the workings of a secured IT network. You will learn all about implementing wired and wireless network solutions and securing networking devices. In your first year, you will acquire a strong foundation in network fundamentals including basic routing and switching, servers, IT service management and basic computer programming. In your second year, you will get to choose a specialisation option - either network & cloud architecture or data security & forensics. To prepare you for internship, you will also be taught how to manage an IT project.

In your final year, you will hone your skills through a six-month internship with national organisations such as Centre for Strategic Infocomm Technologies [CSIT]. Home Team, A*STAR, DSD National Laboratories and InterPol or industry heavyweights such as IBM, Singtel, MyRepub lic, Robert Bosch, Global Cloud Xchange, Westcon Group and SuperInternet. You also stand a good chance to receive attractive scholarships from reputable organisations such as IMDA, DSD, CSIT and SingTel.

LEVEL 1.1

Career & Professional Preparation I

This module helps to give students a foundational introduction to their three-year diploma course curriculum and how it prepares them for industry. It will help them to embark on their three-year course with the end in mind, through guided reflection of their personal characteristics, and producing an overall game plan for their future education and career goals. The module aims to deepen students' commitment to the sector that the course prepares them for.

Programming

This practice-oriented module equips students with basic knowledge and skills in computer programming using C language. The main topics include basic computer programming concepts, fundamentals of C programming including branching, loops, and functions.

Engineering Mathematics 1

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

IT Service Management

This module is intended to provide comprehensive best practices in managing IT services. It covers the organisation resources to deliver business value, documenting the process, function and roles of an IT service provider with respect to the five phases of IT service life cycles. At the end of this module, students should be able to identify and manage the core activities at each phase of the IT life cycles. Key topics covered in this module include Service Strategy, Service Design, Service Transition, Service Operation and Continual Service Improvement. The assessment modes / performance tasks are Common Test, examination, quizzes, team project and tutorials.

Network Fundamentals

This module introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.

Linux Servers

This module covers the basics of the Linux operating system and server. Concepts include the use of Linux commands to access and manage directories, files, setting of file security and access rights, usage of key Linux tools and commands, management of users, processes and software in the system, and basic implementation of servers such as LAMP, DNS and DHCP, in a network. With lab-based and project-based learning as its signature pedagogies, the hands-on practical sessions and tests coupled with project work will assess students on their technical knowledge, problem-solving/troubleshooting skills, project management, documentation, presentation and teamwork.

Innovation Made Possible (IS Module)

This module aims to help students discover and hone their innate ability to think creatively and come up with innovations to tackle problems close to their hearts. Underpinned by the Design Thinking framework, students will be sensitized to the process of user-centric problem solving. They will be introduced to concepts such as empathy, problem-definition, ideation, prototyping and testing through a practical approach featuring engaging out-of-classroom activities, just-in-time master-classes and a hands-on, "learning by doing" delivery format. Ultimately, the module will help students recognize that innovation is attainable and fun and develop creative confidence to explore new ideas in their studies and beyond.

LEVEL 1.2

Applications Programming

This module is intended to equip students with the fundamental skills required to develop Windows Form applications. The students will develop conceptual understanding to design and develop applications to solve business and engineering problems. Key topics include Windows Control classes, branching & looping, array, data files accessing and methods.

Basic Routing & Switching

This module introduces the architecture, components, and operations of routers and switches in medium-size network networks. It also provides extensive coverage of networking topics, from fundamentals to advanced IP applications and services. Students would acquire knowledge and skills in configuring LAN switches and IP routers, identifying basic security threats, virtual LAN (VLAN) and inter-VLAN routing operations, dynamic & static routing concepts, configuring OSPF in both IPv4 and IPv6, understanding and configuring Access Control List (ACL), configuration and troubleshooting DHCP & network address translation (NAT) operations.

Digital Fundamentals

This module introduces the basic principles of digital systems. It covers combinational and sequential logics circuits, multiplexers/demultiplexers and decoders. Flip-flops and their application in counters and registers will also be discussed. This basic knowledge is essential for students to be able to analyse, troubleshoot and design basic digital circuit system.

Engineering Mathematics 2

This module is designed to provide students with the fundamental skills in mathematics required to solve basic engineering problems. Topics are introduced in an order that is intended to keep abreast of the application requirements in engineering modules. The emphasis in each topic is on simple applications and problem solving. Throughout the module, there is appropriate use of a Computer Algebra System. Topics include trigonometry, differentiation and simple integration with applications.

Windows Servers

This module is intended to provide students with classroom and laboratory experience in current and emerging Windows Server technology. Students get hands-on instruction and practice installing, configuring and maintaining Windows Servers, obtain the skills and knowledge necessary to implement a core Windows Servers infrastructure in an existing enterprise environment.

Sports and Wellness (IS Module)

This module helps you to learn a sport as a recreational activity to keep you fit and healthy. Team-building and collaboration skills are developed as you network with other students. There is a total of 19 sports electives to choose from: Aerobics, Badminton, Basketball, Cheerleading, Dance Movement, Dancesport, Flag Football, Hip Hop, Life Saving / Swimming, Netball, Orienteering, Street Soccer, Soccer, Softball, Tennis, Touch Rugby, Volleyball, Wellness Programme and Yoga. Outstanding students are awarded a Pass with Merit.

Communication Essentials (IS Module)

This module aims to develop written and spoken communicative competence in students by exposing them to a range of contemporary issues. Through researching on and discussing different topics from different disciplinary perspectives, students acquire lexis and syntax through critical reading and writing while developing awareness of self in society. The integration of critical thinking and analysis will enable students to articulate their thoughts and perspectives through oral presentations and written texts. The module will also develop an awareness of cultural intelligence with global viewpoints.

COURSE CURRICULUM

Module Name	Credit Units
YEAR 1	
Level 1.1 (26 hours per week)	
Career & Professional Preparation I	2
Programming	4
Engineering Mathematics 1	4
IT Service Management	3
Linux Servers	4
Network Fundamentals@	6
Innovation Made Possible ^	3
Level 1.2 (27 hours per week)	
Applications Programming	4
Basic Routing & Switching@	6
Digital Fundamentals	4
Engineering Mathematics 2	4
Windows Servers	4
Communication Essential ^	3
Sports & Wellness ^	2

Notes:

@ Network Fundamentals, Basic Routing & Switching, Intermediate Routing & Switching & Wide Area Networks will help students prepare for CCNA Routing & Switching certification and Network Security for CCNA Security Certification (provided by external test centres).

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

IS Modules

The School of Interdisciplinary Studies (IS) delivers a broad-based curriculum, which nurtures a new generation of professionals with multidisciplinary skills and an innovative and entrepreneurial spirit to meet the challenges of a knowledge economy. IS offers both prescribed modules and electives to challenge boundaries. Prescribed modules develop students' competencies in core areas such as Communication, Innovation and Enterprise, Culture and Communication, and Personal Mastery and Development, while elective modules provide insights into Arts and Humanities, Business, Design, and Science and Technology.