

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, MyRepublic, 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 2.1

Engineering Mathematics 3A

This module is designed to provide students with further mathematical skills to solve basic engineering related problems. The topics are introduced in an order that is intended to keep abreast of the application requirements in their other engineering modules. Topics included in this module are integration with applications, differential equations, Laplace Transform and Fourier Series.

Information Security

This module covers management and administration of Information Security. Concepts include security threats, security incidents, risk assessment and mitigation, information security policy, procedures, guidelines and standards, security administration, physical security and configurations and administrations of current OS systems. Relevant Singapore IT Law and governance issues will also be covered.

Intermediate Routing & Switching

This module covers the architecture, components and operations of routers and switches in larger and more complex networks. Students learn how to configure routers and switches for advanced functionality. By the end of this module, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, STP and HSRP in both IPv4 and IPv6 networks.

Object Oriented Programming

The aim of this module is to build on the foundation of Application Programming and introduce the concepts of Object Oriented Programming to the students. It covers the area from the fundamental concepts of Object Oriented Programming to Web forms design and application using database.

Project Management

This module uses case studies to teach project management principles, strategies & tools, planning a project, estimating project costs, developing the project schedule, executing the project, justifying project costs, managing project quality, managing project risk, software configuration management, interacting with project stakeholders and outsourcing the project.

Interdisciplinary Elective Module (IS Module)

Students embark on a general module from categories ranging from Communication, Life Skills, Entrepreneurship, Media & the Arts to Science & Technology.

LEVEL 2.2

Career & Professional Preparation II

This module helps students with skills necessary to seek and secure work. They will also be equipped to communicate their personal brand in a positive way. As students sharpen their communication skills, they will also learn how to market themselves effectively.

Cloud Computing & Data Centres

This module provides students with the required technology essential across all domains- including server, storage, and networking - to help develop data centres awareness. A strong knowledge and skills in cloud computing technologies and services are developed. Key topics covered in this module include public cloud deployment, service models, infrastructure on high availability and resilient design. The assessment modes / performance tasks are hands-on practical, written tests and exam.

Network Security

This module teaches core security concepts and how to develop and implement security policies to mitigate risks. It enables students to acquire skills needed to configure, monitor, and troubleshoot routers, switches and firewalls to implement network security.

Wide Area Networks

This module aims to equip students with the knowledge and skills on the WAN technologies and network services required by converged applications in a complex network. Students will be able to connect remote networks using appropriate devices and technologies based on the selection criteria. Knowledge and skills in configuring and troubleshooting network devices, resolving common issues with data link protocols and implementing virtual private network (VPN) operations in a complex network will also be covered.

World Issues: A Singapore Perspective (IS Module)

This module takes a global approach to significant current and historical events. The aim is to enhance students' understanding of such events and issues in the context of Singapore, as well as challenge students to think critically about choices and decision-making vis-à-vis the nation state.

NETWORK & CLOUD ARCHITECTURE OPTION

Internet of Everything

This module intended to provide students with experience in the current and emerging Internet of Things (IoT) technology. Students will be equipped with the knowledge and skills to implement IoT communication such as sending and receiving data between IoT devices, servers and web browsers. Real sensors, gateway and other peripherals or simulators will be used in the implementation.

DATA SECURITY & FORENSICS OPTION

Server Administration & Security

This module covers the concepts of both server system administration and security. The topics include setting up package manager, web server, file server, DNS server, DHCP server, Linux Firewall, mail server, security policies and hardening of the server. With lab-based and lecture-based learning as its signature pedagogies, the hands-on practical sessions and tests coupled with some case studies will assess students on their technical knowledge, problem-solving/troubleshooting skills, project management, documentation, presentation and teamwork, while the written common test and examination will assess them on their knowledge and application of the relevant theories.

COURSE CURRICULUM

Module Name	Credit Units
YEAR 2	
Level 2.1 (23 hours per week)	
Engineering Mathematics 3A	4
Information Security	4
Intermediate Routing & Switching [@]	5
Object Oriented Programming	5
Project Management	3
Interdisciplinary Studies (IS) elective [^]	2
Level 2.2 (24 hours per week)	
Career & Professional Preparation II	2
Cloud Computing & Data Centres	5
Network Security [@]	5
Wide Area Networks [@]	5
World Issues: A Singapore Perspective [^]	2
NETWORK & CLOUD ARCHITECTURE OPTION	
Internet of Everything	5
DATA SECURITY & FORENSICS OPTION	
Server Administration & Security	5

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.