



**NUS**  
National University  
of Singapore



Build  
**Software  
Systems  
& Platforms**  
for an  
**AI-Powered  
Economy**

Master of Technology in  
**Software Engineering**

Available as Stackable Graduate Certificate Programme in Smart Systems & Platforms

# Master of Technology in **Software Engineering**

The NUS Master of Technology in Software Engineering (MTech SE) is designed to meet the industry's demand for software engineers who can play pivotal roles in digitalisation and business transformation by building robust, reliable, scalable, secure, and AI-enabled software systems.

This programme is ideal for individuals with working experience in software engineering roles who seek to enhance their knowledge and skills in architecting scalable, secure, and AI-enabled software systems that are robust and reliable.

The MTech SE programme focuses on developing the skills necessary for architecting software systems and platforms with the aforementioned characteristics. It will also delve into utilising software technologies, methodologies, management techniques, and AI tools and techniques. The program aims to construct software systems practically and systematically, employing innovative and state-of-the-art techniques.

By the end of the programme, you will gain the essential knowledge and practical experience to architect, design, build, and manage the delivery of the aforementioned software systems for your organization and customers.

## Recognition

- Best student is awarded the Accenture Medal and Prize
- Best Project Award
- A coveted Master's degree from the top university in Asia

## Who Should Apply

- Individuals who have working experience in software engineering roles and are looking to further enhance their knowledge and skills in architecting scalable, secure, and AI-enabled software systems and platforms.
- Professionals who are currently in or are looking to enter the careers in the following areas:

Software Architecture

Software Engineering

Data Architecture

Product Management

## Grants & Subsidy

The NUS-ISS MTech Study Award will be given to qualifying Singapore Citizens and Singapore Permanent Residents matriculated from AY2023 / 2024 Semester 2 onwards for the unfunded courses of MTech EBAC, MTech AIS and MTech SE degrees.

The quantum for the Study Award will be (up to) S\$16,250 for Singapore Citizens and (up to) S\$8,125 for Singapore Permanent Residents, subject to terms & conditions.

NUS-ISS will also extend a 20% subsidy for NUS Alumni, including International students, and no other subsidy shall apply concurrently.

## Admission Criteria

- Bachelor's degree preferably in Science or Engineering and a grade point average of at least B
- Demonstrate proficiency in the English Language (written and spoken)
- An acceptable GRE score (overseas applicants) or pass NUS-ISS Entrance Test
- A favourable assessment at admissions interview conducted by NUS-ISS
- Preferably two years of relevant working experience
- The NUS-ISS Entrance Test or GRE and interview requirements will be waived for applicants with relevant Bachelor's degrees from NUS, NTU, SMU and SUTD with Second Upper or above Honours.
- NUS-ISS Graduate Diploma in Systems Analysis alumni who wish to apply to NUS-ISS Master of Technology programmes may be waived of Entrance Test / GRE and interview requirement if they meet the GPA requirements.\*
- Admission is on a competitive basis; eligible students will be offered admissions on a first-come first-served basis.

\*Students who obtain admission into the MTech Software Engineering may request to be exempted from the Software Analysis and Design and Essential Practices for Agile Teams courses in the Designing Modern Software Systems Graduate Certificate. If the request is granted, the net applicable fees for the MTech programme will be reduced to exclude the fees of the exempted courses and subsidies will also be given commensurate with the net applicable fees for the programme.

## WORK EXPERIENCE

- Preferably two years relevant working experience as a software engineer (e.g. programmer, designer, technical team lead).

- Preferable proficiency in the following areas:

Software development lifecycle, including Agile software development methods such as Scrum.

Software development using one or more contemporary programming languages, software design including the use of design patterns, software testing and test-driven development.

## ENGLISH LANGUAGE PROFICIENCY

- Applicants who graduated from universities where English is not the medium of instruction is required to submit TOEFL (Test of English as a Foreign Language) or IELTS (International English Language Testing System) score as evidence of their proficiency in the English language.

### TOEFL

- Paper-based test (580)
- Computer-based test (237)

### IELTS

Result of 6.0

- Institution code of NUS-ISS for TOEFL is 2432
- TOEFL and IELTS are only valid for two (2) years and five (5) years respectively after the test and the validity should not expire before the beginning of the application period for the coursework programme.

## GRE/NUS-ISS ENTRANCE TEST

- International applicants residing overseas are required to submit GRE as evidence to demonstrate their academic capability:

A minimum GRE score of **320** (verbal & quantitative) and **3.5** (analytical) is recommended, within 5 years validity. (GRE institution code: 0677)

Applicants who have significant work experience relevant to their intended area of study may be considered for admission even if they do not meet the recommended GRE scores on a case-by-case basis. Please note that school projects, internships and enrichment programmes do not count as work experience.

- Applicants residing in Singapore will be required to pass an Entrance Test administered face-to-face in NUS-ISS

Local applicants may opt to submit GREs instead of taking the Entrance Test in which case the same conditions apply as above

## How to Apply

All applicants are required to apply online via the Graduate Admission System (Coursework). Find out more about the MTech programmes at our info sessions.

Visit [www.iss.nus.edu.sg/graduate-programmes](http://www.iss.nus.edu.sg/graduate-programmes) for more details. We conduct in-country entrance tests and interviews in selected countries.



MTech SE students must successfully complete **2 mandatory Fundamental Graduate Certificates, 2 of 4 Specialist Graduate Certificates** as well as complete an Internship Project (Full-time students) / Capstone Project (Part-time students). Students are evaluated through a combination of course work, project work and examinations.

## Programme Schedule

| Full-time<br>(1 year)  | Semester 1                          |                               | Semester 2                                    |                         |
|------------------------|-------------------------------------|-------------------------------|-----------------------------------------------|-------------------------|
|                        | Designing Modern Software Solutions | Architecting Scalable Systems | Securing Ubiquitous Systems                   | Engineering Big Data    |
|                        |                                     |                               | Designing and Managing Products and Platforms | Architecting AI Systems |
|                        | Internship Project (5 months)       |                               |                                               |                         |
| Part-time<br>(2 years) | Semester 1                          | Semester 2                    | Semester 3                                    | Semester 4              |
|                        | Designing Modern Software Solutions | Architecting Scalable Systems | Securing Ubiquitous Systems                   | Engineering Big Data    |
|                        |                                     |                               | Designing and Managing Products and Platforms | Architecting AI Systems |
|                        | Capstone Project (7 – 12 months)    |                               |                                               |                         |

### Practice Module

All MTech students are required to complete a Practice Module to attain a Graduate Certificate. This module aims to expose participants to real world problems and enable them to demonstrate their proficiency across all skills that they have learned in the course modules.

## Stackable Graduate Certificate Programme in Smart Systems and Platforms

The Stackable Graduate Certificate Programme in Smart Systems and Platforms also leads to the Master of Technology in Software Engineering. This stackable pathway allows Professionals, Managers, and Executives (PMEs) to build up to the MTech degree through attaining a series of NUS-ISS graduate certificates followed by a capstone project. The pathway allows five years to attain the required graduate certificates and two years to complete the capstone, though most stackable participants will finish faster. They have the flexibility to study at their own pace by selecting modular courses that comprise the graduate certificates to meet their individual needs. PMEs who opt not to pursue the graduate certificate, diploma, or degree can continue attending individual modular courses, enabling them to acquire the skills required to enhance their career prospects.

Visit [www.iss.nus.edu.sg/stackable-programme](http://www.iss.nus.edu.sg/stackable-programme) to find out more.



# Fundamental Graduate Certificates

## GRADUATE CERTIFICATE IN DESIGNING MODERN SOFTWARE SOLUTIONS

Essential Practices for Agile Teams

Software Analysis & Design

Software Design Patterns

DevSecOps Engineering and Automation

### Practice Module

#### Learning Outcomes

- Design and develop software systems by leveraging on best practices for agile teams.
- Analyse and design robust software systems for implementation on target technology platforms.
- Design reusable, maintainable and extensible software systems by applying expert solutions from existing design patterns.
- Engineer and automate DevSecOps pipelines for agile continuous delivery.

#### Job Roles

Software Engineer, Software Designer, Software Architect, DevSecOps Engineer

## GRADUATE CERTIFICATE IN ARCHITECTING SCALABLE SYSTEMS

Architecting Software Solutions

Platform Engineering

Cloud Native Solution Design

### Practice Module

#### Learning Outcomes

- Architect scalable, robust integrated systems.
- Architect systems as Cloud Native solution with best practices and patterns.
- Architect platforms and frameworks for building extensible systems and exposing platform functionality to other systems and platforms.

#### Job Roles

Solution Architect

# Specialist Graduate Certificates

## GRADUATE CERTIFICATE IN SECURING UBIQUITOUS SYSTEMS

ISC2 CISSP CBK Training Seminar

Secure Software Development Lifecycle for Agile

Design Secure Mobile Architecture

Platform Security

### Practice Module

#### Learning Outcomes

- Understand and apply the basics and concepts of cybersecurity required to incorporate security into systems.
- Understand and apply key concepts in securing mobile platforms, mobile apps and integration to enterprise, as well as for designing mobile security architecture.
- Design a secure application platform with servers that provide services to edge devices, systems and those on the cloud.
- Design systems using "Secure by Design" practices in an agile software development lifecycle.

#### Job Roles

Information Security Architect, Security Solution Architect

## GRADUATE CERTIFICATE IN ENGINEERING BIG DATA

Information Architecture for Data-Driven Insights

Big Data Engineering for Analytics

Architecting Systems for Real-Time Data Processing

### Practice Module

#### Learning Outcomes

- Design and implement Enterprise Data Lake. Integrate multiple large-scale data sources to derive data-driven insights.
- Architect scalable, polyglot and intelligent data-driven systems that are responsive to changing business requirements.
- Architect stream processing systems for a ubiquitously-instrumented world.

#### Job Roles

Data Architect, Data Engineer, Big Data Engineer

## GRADUATE CERTIFICATE IN DESIGNING AND MANAGING PRODUCTS AND PLATFORMS

Service Design

Managing Digital Products

Digital Product Strategy

Architecting Platforms as a Business

### Practice Module

#### Learning Outcomes

- Apply a product management framework for planning and launching products.
- Understand and apply the central concepts of design thinking to innovative products.
- Perform market research, identify the competition, and converse with potential customers to formulate sustainable market positioning and suitable product business model.
- Identify, design, instrument and instantiate the variable features of software product lines and platforms.

#### Job Roles

Product Manager / Director, Platform / Product Owner, Platform / Product Architect

## ARCHITECTING AI SYSTEMS

Explainable and Responsible Artificial Intelligence

AI and Cybersecurity

Architecting Agentic AI Solutions

Integrating and Deploying AI Solutions

### Practice Module

#### Learning Outcomes

- Apply essential practices in Explainable and Responsible AI, AI-specific cybersecurity, Agentic AI design patterns, advanced software architecture skills and MLSecOps/LLMSecOps to design, architect, implement and deploy AI systems that are robust, highly available, reusable, maintainable, and extensible along with the development of relevant project artifacts.

#### Job Roles

- Solution Architect (AI Systems)
- AI Solution Architect

## INTERNSHIP/CAPSTONE PROJECT

Student projects for MTech SE students include 5 months with companies for full-time students. For part-time students, the capstone project will be for 7 – 12 months. Students are required to conduct their projects as a team-based internship / capstone. The expected commitment for the project is 45 man days per student.

#### Learning Outcomes

- Manage a software development project following a formal approach.
- Engineer software systems using appropriate software engineering methods and construction technologies.
- Apply project and quality management techniques to deliver a robust solution that meets user requirements.

“ MTEch SE allows me to stay relevant in the tech industry and continuously improve. The concepts taught as part of the programme were very useful to my work and the flexible stackable programme allowed me to juggle work and studies.

**Melcolm Lee**  
Senior Engineer  
Defence Science and Technology Agency (DSTA)

“ The MTEch SE programme enabled me to choose the right specialist graduate certificates which empowered me to make more informed decisions in software engineering, with a constant focus on scalability, maintainability, and extensibility.

**Matthew Yap**  
Senior Software Engineer, Backend (Security)  
Grab

“ The MTEch SE programme has empowered me to guide my company into the future with a technology-aware approach, fostering a lifelong learning mindset. The completion of a Capstone Project, utilising the latest technologies, was a significant achievement, providing valuable experience and knowledge application.

**Robert Taro Otani Wetzler**  
Managing Director  
Otani Trading Pte Ltd

“ The MTEch SE programme has greatly improved my creative thinking abilities and fostered a deeper understanding of dynamic product requirements. The programme's emphasis on industry relevance and staying informed about trends has positioned me to be future-ready for the evolving landscape of technology innovation.

**Huang Luohua**  
Assistant Engineering Manager  
Shopee

## Other Graduate Programmes

Master of Technology in  
**Artificial Intelligence Systems**

Available as  
**Stackable Graduate Certificate Programme in Artificial Intelligence**

Master of Technology in  
**Digital Leadership**

Available as  
**Professional Certificate Programme in Digital Leadership**

Master of Technology in  
**Enterprise Business Analytics**

Available as  
**Stackable Graduate Certificate Programme in Data Science**

Graduate Diploma in  
**Systems Analysis**

Available as  
**Stackable Graduate Certificate Programme in Digital Solutions Development**

## About NUS-ISS

Established in 1981, NUS-ISS nurtures digital talent for the industry through graduate education, executive education programmes, consultancy, applied research, and career services. NUS-ISS guides individuals and organisations to bridge future opportunities through a unique portfolio of multiple learning pathways such as blended learning and stackable programmes, leading the way in shaping the next curve of digital excellence. It offers a wide spectrum of programmes in critical industry disciplines, such as digital leadership, software development, data science, artificial intelligence, cybersecurity, product management, digital health, digital innovation and digital sustainability.

To date, over 200,000 digital leaders and professionals, 9,647 corporate client organisations, and 8,277 graduate programmes alumni have benefitted from NUS-ISS' suite of services. Its programmes are delivered by NUS-ISS staff with an average of more than 20 years of industry experience and supported by a strong network of partners. NUS-ISS also works with industry partners and associations locally and globally to co-create a digital learning ecosystem that inspires and shapes solutions for the digital economy.

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