The NUS Master of Technology in Software Engineering programme has been more than fulfilling – the curriculum is up-to-date and it provided me with many opportunities to enhance my knowledge and experience in software engineering. As I attended the part-time programme, most of my course mates were also working professionals and interacting with them greatly expanded my perspective of the industry and opened my eyes to the technologies that other companies are using.

Andrew Chong, Singapore
Senior Software Engineer, DSO National Laboratories
Master of Technology in Software Engineering (MTech SE), Class of 2017

Other Graduate Programmes by NUS-ISS

Master of Technology in Enterprise Business Analytics
Available as Stackable Certificate Programme in Business Analytics

Master of Technology in Intelligent Systems
Available as Stackable Certificate Programme in Intelligent Systems

Graduate Diploma in Systems Analysis
Available as Stackable Certificate Programme in Digital Solutions Development

About the Institute of Systems Science (NUS-ISS)

Established in 1981, the Institute of Systems Science at the National University of Singapore (NUS-ISS) develops digital talent for the industry through graduate education, professional development programmes, consultancy, applied research and career services. NUS-ISS is widely recognized as a champion of the national SkillsFuture movement, enabling a digital economy that is always learning and always leading.

NUS-ISS has implemented a unique portfolio of multiple learning pathways, with a wide spectrum of programmes in critical industry disciplines such as software development, data science, artificial intelligence, cybersecurity, smart health, digital government and digital innovation.

To date, over 120,000 infocomm & business professionals, 6,800 corporate customers and 5,500 post-graduate alumni members have benefitted from NUS-ISS’s suite of services. Its programmes are delivered by ISS staff with an average of more than 20 years of industry experience.
Build smart software systems and platforms for a smart nation

MASTER OF TECHNOLOGY IN SOFTWARE ENGINEERING

Available as Stackable Certificate Programme in Software Engineering

Leading to the Master of Technology in Software Engineering
The NUS Master of Technology in Software Engineering programme emphasises the skills required for architecting scalable, secure and smart systems and platforms. The focus will also be exploitation of software technologies, methodologies and management techniques. It focuses on the practical and systematic construction of software systems, using innovative and state-of-the-art techniques.

The programme will equip you with the essential knowledge and practical experience to architect, design, build and manage the delivery of robust software systems for your organisation and customers.

**Programme Delivery**

MTech SE candidates must successfully complete the mandatory certificate from the fundamental area, any 2 of the 4 certificates from the specialist areas as well as complete a capstone project. Students are evaluated through a combination of course work, project work and examinations for each of the 3 certificates (one fundamental and 2 specialist).

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
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<tbody>
<tr>
<td><strong>Fundamental Area</strong></td>
<td><strong>Specialist Area</strong></td>
</tr>
<tr>
<td>Architecting Scalable Systems</td>
<td>Designing and Managing Products and Platforms</td>
</tr>
<tr>
<td>NICF – Architecting Software Solutions</td>
<td>NICF – Strategic Product Manager™</td>
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<tr>
<td>Cloud Native Solution Design</td>
<td>NICF – Service Design</td>
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<tr>
<td>DevOps Engineering and Automation</td>
<td>NICF – Digital Product Strategy</td>
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<tr>
<td>Platform Engineering</td>
<td>Software Product Lines and Platforms</td>
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<tr>
<td><strong>Graduate Certificate in Architecting Scalable Systems</strong></td>
<td><strong>Graduate Certificate in Designing and Managing Products and Platforms</strong></td>
</tr>
</tbody>
</table>

**Learning Outcomes**

**Architecting Scalable Systems**
- Architect scalable, robust integrated systems
- Architect systems as Cloud Native solution with best practices and patterns
- Engineer and automate DevOps pipelines for Agile Continuous Delivery
- Architect platforms and frameworks for building extensible systems and exposing platform functionality to other systems and platforms

**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 models
- Identify, design, instrument and instantiate the variable features of software product lines and platforms

**Job Roles**
- Solution Architect
- Platform Architect
- Cloud Architect
- DevOps Engineer

**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**
- Security Architect
- Cybersecurity Specialist

**Capstone Project for Software Engineering**

Student projects for MTech SE students include 3 months of full-time engagement with the industry for full-time students, and 6-12 months for part-time students. The expected commitment for the project is 45 man-days per student.

**Learning outcomes:**
- Become software architects capable of architecting and designing systems that exploits major contemporary software platforms, technologies and methodologies
- Become software architects capable of architecting and designing smart and secure systems
- Become data architects equipped with data engineering skills to engineer big data from a variety of sources
Who Should Apply

- Individuals who have a few years of experience in software engineering roles and are looking to further enhance their knowledge and skills in architecting scalable, secure and smart systems and platforms.
- Professionals who are currently in or are looking to enter the careers in the following areas:
  - Software Architecture (general, smart systems, data)
  - Data Architecture
  - Software Engineering
  - Product Management

Admission Criteria

- Bachelor’s degree preferably in Science or Engineering and a grade point average of at least B
- Proficiency in the English Language (written and spoken)*
- Have passed an entrance test
- Has received a favourable assessment at admissions interview conducted by NUS-ISS
- Preferably 3-4 years relevant working experience
- Candidates who have less than four years’ relevant experience with good practical software engineering knowledge, gained either through course work, course projects or work experience, may be considered
- Equivalent knowledge and skills imparted in the NICF-NUS-ISS Certificate in Software Architecture –Foundations

* Applicants whose native tongue and medium of university instruction is not in English should submit your TOEFL or IELTS score as evidence of your proficiency in English

<table>
<thead>
<tr>
<th>TOEFL</th>
<th>IELTS</th>
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<tbody>
<tr>
<td>Paper-based test (580)</td>
<td>Result of 6.0</td>
</tr>
<tr>
<td>Computer-based test (237)</td>
<td>Result of 6.0</td>
</tr>
<tr>
<td>Internet-based test (85)</td>
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How to apply?

All applicants are required to apply online via the Graduate Admission System (Coursework). Come and 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.

### Semester 3

#### Engineering Big Data
- Information Architecture for Data-Driven Insights
- NICF – Big Data Engineering for Analytics
- Architecting Systems for Real-Time Data Processing

#### Architecting Smart Systems
- NICF – Architecting IoT Solutions
- Designing Intelligent Edge Computing
- Humanizing Smart Systems

Graduate Certificate in Engineering Big Data
Graduate Certificate in Architecting Smart Systems

### Semester 2

#### Capstone Project
- Full-time
- 3 months

#### Capstone Project (Part-time, 6 - 12 months)

### Learning Outcomes

#### Engineering Big Data
- 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

#### Architecting Smart Systems
- Architect smart, scalable and end-to-end platforms for IoT
- Develop, design and integrate systems that perform sense-making from a variety of sensors, edge devices and other systems
- Build smart systems that collaborates or cooperates intelligently with humans

### Job Roles

#### Engineering Big Data
- Data Architect
- Data Engineer

#### Architecting Smart Systems
- IoT Solution Architect
- Wearable Systems Engineer
- Smart Medical Device Engineer

Stackable Graduate Certificate Programme in Software Engineering

Stackable Certificate Programme in Software Engineering enables Professionals, Managers and Executives (PMEs) to attain a series of NUS-ISS graduate certificates over a period of five years without disrupting your careers. You will have the flexibility of studying at your own pace by taking the required modular courses that make up the certificates to meet your needs. PMEs who do not wish to attain a certificate, graduate diploma or degree can continue to attend individual modular courses thus allowing you to gain the skills to meet your career needs.

Participants who wish to continue their learning journey towards the Master of Technology in Software Engineering degree will have to complete one graduate certificate (fundamental), any two of four graduate certificates (specialist) and a capstone project in Software Engineering.

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