

COMPUTING @ SMU

# WHY STUDY AT SMU SCHOOL OF INFORMATION SYSTEMS?



"We offer four undergraduate computing programmes that target different job roles demanded by employers. A common thread through these programmes is our emphasis on designing and building solutions for realistic scenarios, and partnering industry to impart relevant skills to our students."

Professor Pang Hwee Hwa  
Dean, School of Information Systems

Undergraduate

## DEAN'S MESSAGE

Companies and public agencies are employing digital technology to transform their business models and processes. At the School of Information Systems (SIS), we seek to create computing knowledge for this digital transformation, and to apply the knowledge in training IT professionals who innovate solutions that create value to business and society.

We offer four undergraduate computing programmes that target different job roles demanded by employers. A common thread through these programmes is our emphasis on designing and building solutions for realistic scenarios, and partnering industry to impart relevant skills to our students.

Our BSc (Information Systems) Information Systems major teaches students to identify emerging technologies and market trends, exploit opportunities to digitally transform an organisation, and develop applications that harmonise with the overall IT infrastructure.

Our BSc (Information Systems) Smart-City Management and Technology major is a unique interdisciplinary programme that trains professionals in blending social, economic, business, environmental and technology concerns to develop smart city solutions.

Our BSc (Computer Science) degree emphasises strong technical skills in translating scientific principles to usable computing technologies and solutions, as well as the management skills needed to navigate complex software development and system deployment concerns.

From 2020, we are partnering the SMU School of Law to offer a BSc (Computing & Law) degree. This degree equips students with the skillsets to protect technology innovation, comply with pertinent legal and regulatory requirements, as well as manage the technology and business risks posed by innovation.

I am confident that you will find the programmes as exciting as our students and employers do.

Join Computing @ SMU. Equip yourself to create our digital future.

**Professor Pang Hwee Hwa**  
Dean, School of Information Systems

## OUR STUDENTS ARE INDUSTRY-READY



**\$4,549**  
Gross average  
starting salary for  
SIS graduates\*



**77.7%**  
SIS graduates  
received offers  
before graduating



**97.8%**  
Overall  
employment rate  
as of February 2020

\*Source: Graduate Employment Survey 2019

### FUTURE-READY CAREER SKILLS



Be highly sought after in the job market. Our graduates, with their strong technology, business and people skills, receive multiple job offers before graduation.

### WORLD-CLASS FACULTY, LARGE-SCALE RESEARCH



Shape and explore the future of the world in our large-scale technology initiatives supported by substantial R&D grants from the industry and government.

## WHY SMU SCHOOL OF INFORMATION SYSTEMS?

### ALIGNMENT WITH NATIONAL INITIATIVES



Take advantage of our close linkages with national agencies and leading industry players for national initiatives such as the Digital Government Blueprint, Smart Nation, Artificial Intelligence, Consumer & Social Insights, Cybersecurity & Data Privacy, and Financial Services Technology. Ministry of Health, Ministry of Trade and Industry and Singapore Economic Development Board, amongst others.

### FAST-TRACK PROGRAMMES



Fast-track your learning and career with our integrated postgraduate programmes that allow you to pursue an SIS Bachelor's and an integrated Master's degree within a shorter period of time.

### HIGHLY COLLABORATIVE LEARNING CULTURE



Enjoy a strong sense of belonging in our school, created through our culture of 'learning-to-learn' and peer support.



## INDICATIVE GRADE PROFILES

Grade profiles of the 10th and 90th percentiles of Singapore-Cambridge GCE A-Level applicants offered places at SMU SIS in the 2019 University Admissions Exercise.

Degree	Indicative Grade Profile (3H2/1H1) of content-based subjects	
	10th Percentile	90th Percentile
<b>BSc (Information Systems)</b>	<b>BBC/B</b>	<b>AAA/A</b>
<b>BSc (Computer Science)</b>	<b>AAB/B</b>	<b>AAA/A</b>

Polytechnic GPAs of the 10th and 90th percentiles of polytechnic applicants offered places at SMU SIS in the 2019 University Admissions Exercise.

Degree	Indicative Grade Profile of content-based subjects	
	10th Percentile	90th Percentile
<b>BSc (Information Systems)</b>	<b>3.57</b>	<b>3.92</b>
<b>BSc (Computer Science)</b>	<b>3.75</b>	<b>3.96</b>





## INTEREST AREAS

### YOUR INTEREST AREAS ARE COVERED BY OUR PROGRAMMES



**ARTIFICIAL INTELLIGENCE**



**BUSINESS ANALYTICS**



**CYBERSECURITY**



**DATA SCIENCE**



**DIGITAL TRANSFORMATION**



**FINTECH**



**INTERNET-OF-THINGS**



**LAWTECH**



**SMART CITIES**



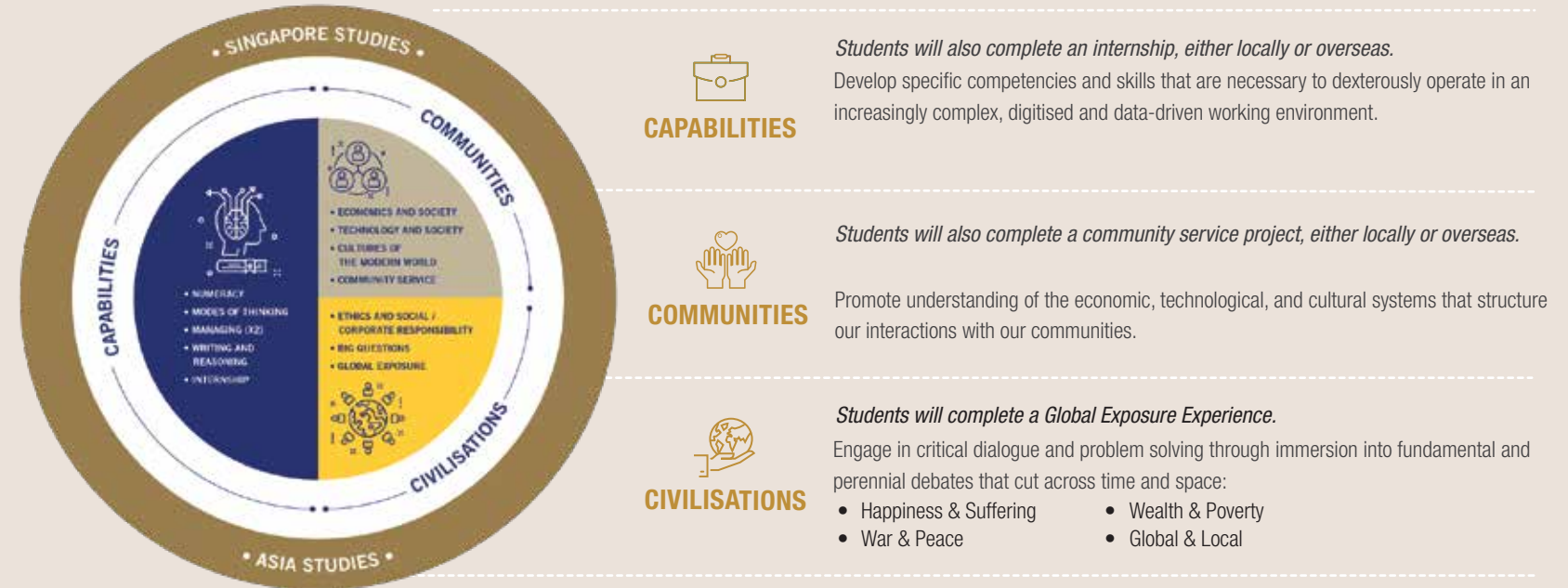
**SOFTWARE ENGINEERING**



**TECHNOPRENEURSHIP**

## THE SMU CORE CURRICULUM

The SMU Core Curriculum is a menu of twelve carefully selected course units (CUs) to initiate undergraduates into their journey to become holistic SMU graduates. The Core Curriculum also serves as a means for students across all disciplines to bond through a common intellectual experience. It stands on three pillars of learning, or inter-related paths of development: Capabilities, Communities and Civilisations.



## BEING ENGAGED IN LEARNING AND THE GLOBAL COMMUNITY

The vibrant student life at SMU offers a myriad of opportunities for students to develop both leadership and team player qualities. Students can accumulate real-world experiences from being actively involved in student activities, entrepreneurial pursuits, taking on prestigious competitions, and more.



**LOCAL & OVERSEAS INTERNSHIPS**

Broaden your perspectives and apply your skills and knowledge to real-world business operations.



**OVERSEAS STUDY MISSION**

Visit top companies around the world and network with industry leaders for future career opportunities.



**PROJECT & RESEARCH EXPERIENCE**

Engage with industry leaders and gain valuable hands-on experiences to tackle real-world challenges.



**SMU-X**

Stay ahead of innovative pedagogy by pushing the boundaries and venturing into new ways of bridging theory and practice.



**COMMUNITY SERVICE**

Gain exposure to diverse social, political and economic environments as you do your part to advance a humanitarian cause.

# NURTURING PROFESSIONALS FOR DIGITAL BUSINESS TRANSFORMATION

## BSc (INFORMATION SYSTEMS): INFORMATION SYSTEMS MAJOR



## INFORMATION SYSTEMS TRACKS



### BUSINESS ANALYTICS

There is an increasing use of data analytics to discover organisational issues and to drive strategies in digital transformation. This has created a rising demand for our graduates who understand how to use data analytics to solve real world problems. This track aims to provide students with the concepts, methods and best practices of data analytics through working on real world use cases and practicum.

#### EXAMPLES OF JOB ROLES

Business Analyst | Business Development Consultant | Business and Product Strategist



### FINANCIAL TECHNOLOGY

Singapore is one of the top 5 financial centres in the world, and financial technology professionals are in high demand in the traditional banking sector and in non-bank alternative FinTech companies. This track covers the foundations of enterprise architecture in banking and the functional domain areas such as retail and corporate banking, digital payments and innovations, and financial markets.

#### EXAMPLES OF JOB ROLES

Account Technology Strategist | Financial Application Developer | Systems Analyst



### DIGITAL BUSINESS SOLUTIONING

Technological disruption is challenging the future of business process designs and models. This has compelled organisations to take advantage of new technologies to innovate and seamlessly integrate the physical and digital world. This has created new job roles and opportunities. The Digital Business Solutioning track enables students to engineer IT solutions to enhance operational excellence, integrate information-processes-people and drive innovation.

#### EXAMPLES OF JOB ROLES

Enterprise Architect | Software Engineer | User Experience Designer

## CURRICULUM FOR ACADEMIC YEAR 2020-21 – INFORMATION SYSTEMS MAJOR

The Information Systems major equips you with the capabilities to create value for business and society by developing innovative IT solutions. It gives you the flexibility to acquire either deep technical skills or a healthy balance of technical and business skills. The programme offers three tracks in business analytics, digital business solutioning and financial technology.

**CORE CURRICULUM**  
12 Course Units



**INFORMATION SYSTEMS CORE**  
12 Course Units



**INFORMATION SYSTEMS ELECTIVES**  
6 Course Units



**FREE ELECTIVES**  
6 Course Units

## INFORMATION SYSTEMS CORE COURSES

### SOFTWARE DEVELOPMENT AND MANAGEMENT

Introduction to Programming

Web Application Development I

Web Application Development II

Software Project Management

### BUSINESS SOLUTIONING AND MANAGEMENT

Information Systems and Innovation

Business Processes Analysis and Solutioning

Enterprise Solution Management

Enterprise Solution Development

Digital Business Technology and Transformation

### INFORMATION MANAGEMENT

Data Management

Interaction Design and Prototyping

**INFORMATION SYSTEMS  
PROJECT EXPERIENCE**



**“The SIS journey is challenging but you will realise that the interdisciplinary curriculum coupled with rigorous coursework would put you in good stead to excel in your career in the years to come. You will learn to forge ahead with courage and with zeal, to break what seems to be big problems into bite-sized challenges to work on, just as you would in programming.**

**The close-knit community in which we call the SIS family will mould you into a valuable team player as well as a competent leader where you will thrive in your endeavours in spite of insurmountable odds. Your tenacity to overcome obstacles will instill in you the never-say-die attitude – to learn from adversity, to inspire others to exceed expectations, and to champion those who are committed to excellence.”**



**Ngoh Jun Dat**

Manager, Strategic Partnerships, Singtel StepUp  
Graduating Class of 2016



Scan for more details.



# NURTURING PROFESSIONALS FOR SMART LIVING

## BSc (INFORMATION SYSTEMS): SMART-CITY MANAGEMENT & TECHNOLOGY MAJOR



3 DISCIPLINES

● Technology ● Social Sciences ● Management

## 5 KEY SMART CITY DOMAINS

### BUSINESS & ECONOMY



Financial Technology



Sharing Economy



Smart Retail

### HEALTH & ENABLED AGEING



Ageing-in-Place With Technology



Collaborative Care System



Preventive Healthcare

### HOME & ENVIRONMENT



Data Driven Urban Planning



Intelligent Sustainable Solutions



Smart Building

### MOBILITY



Dynamic Crowd Management



Urban & Transportation Solutions



Sustainable Logistics

### PUBLIC SERVICES



Public Safety



Urban Community & Liveability



Social Sensing

### EXAMPLES OF JOB ROLES

Data Scientist | Digital Product Manager | Health Informatics Officer | IoT Solution Architect | Project Management Associate | Smart Systems Analyst | Smart City Partnership Strategist | Sustainable Solutions Designer | Technopreneur | Urban Planner

## CURRICULUM FOR ACADEMIC YEAR 2020-21 – SMART-CITY MANAGEMENT & TECHNOLOGY MAJOR

The Smart-City Management & Technology major equips you with interdisciplinary skills across Technology, Social Science and Management. The curriculum focuses on innovating intelligent applications while harnessing data to address business, social and environmental issues in the context of smart cities.

CORE CURRICULUM  
12 Course Units



SMART-CITY MANAGEMENT & TECHNOLOGY CORE  
12 Course Units



SMART-CITY MANAGEMENT & TECHNOLOGY ELECTIVES  
6 Course Units



FREE ELECTIVES  
6 Course Units

## SMART CITY INTERDISCIPLINARY CORE COURSES

### ANALYTICS WITH INTERDISCIPLINARY APPLICATION

Analytics Foundation



Analytics Applications for Smart Living



Data Management



Geospatial Analytics for Urban Planning



### TECHNOLOGY WITH INTERDISCIPLINARY APPLICATION

Interaction Design and Prototyping



Introduction to Programming



Smart City Systems and Management



Foundations of Cybersecurity



### SOCIAL SCIENCE WITH INFORMATION SYSTEMS MANAGEMENT

Information Systems and Innovation



Sustainable Digital Cities



Introduction to Public Policy



SMART CITY PROJECT EXPERIENCE



“Many countries including Singapore, China, India and Spain are developing smart cities rapidly. This development offers exciting opportunities for enterprising individuals who are able to harness technology to deliver innovative solutions and services to improve the lives of citizens. The BSc (IS): Smart-City Management & Technology is a timely programme which incorporates interdisciplinary knowledge and analytical skills that will produce professionals with the requisite knowledge of public policy & management, social models & psychology, in addition to a solid grounding in IT.”



**Robert Yap Min Choy**  
Dean's Fellow of Information Systems  
Chairman, Sunseap Group  
Chairman, Skylab Holding



Scan for more details.

# NURTURING PROFESSIONALS FOR TECHNOLOGICAL INNOVATION

## BSc (COMPUTER SCIENCE): IT SOLUTION DEVELOPMENT MAJOR



## COMPUTER SCIENCE TRACKS



### ARTIFICIAL INTELLIGENCE

Artificial Intelligence (AI) models aim to augment or substitute human intelligence by building systems that think for themselves and improve over time. This track equips students with core concepts and practical know-how to build innovative AI applications that impact business and society.

#### EXAMPLES OF JOB ROLES

Chatbot Engineer | Data and AI Solution Architect | Machine Learning Developer



### CYBERSECURITY

With the explosion of cyberspace threats, cybersecurity professionals are in high demand world-wide by both the public and private sectors. The Cybersecurity track equips students with cybersecurity theory and practice, covering aspects of security fundamentals in some areas like network, data and software.

#### EXAMPLES OF JOB ROLES

Cybersecurity Operations Engineer | Fraud Analyst | Infrastructure Technical Analyst



### CYBER-PHYSICAL SYSTEMS

Cyber-Physical Systems (CPS) are typically made up of embedded devices that are able to sense the physical environment, communicate with each other, as well as control physical processes. CPS are widely used in several application domains of smart cities – such as in transportation networks, smart grid systems, smart homes/buildings, healthcare, and manufacturing. This track aims to equip students with core concepts and practical knowledge on designing and implementing CPS for the society. These include topics such as distributed systems, Internet of Things (IoT), and pervasive computing.

#### EXAMPLES OF JOB ROLES

Consultant - Digital Strategy, Industry 4.0 | IoT Solution Architect | VR-AR Systems Engineer

## CURRICULUM FOR ACADEMIC YEAR 2020-21– IT SOLUTION DEVELOPMENT MAJOR

The Computer Science degree equips you with technical skills to build computing products and solutions to thrive in the marketplaces and society. This requires an understanding of the interplay between computing theory and practice and the essential links between them, as well as fundamental business innovation and IT solution development and management skills.

**CORE CURRICULUM**  
6 Course Units



**COMPUTER SCIENCE CORE**  
18 Course Units



**COMPUTER SCIENCE ELECTIVES**  
6 Course Units



**FREE ELECTIVES**  
6 Course Units

## COMPUTER SCIENCE COURSES

### SOFTWARE DEVELOPMENT

Programming Fundamentals I	1 CU
Programming Fundamentals II	1 CU
Collaborative Software Development	1 CU

### SOFTWARE DEVELOPMENT

Software Product Management	1 CU
IT Solution Architecture	1 CU
IT Solution Lifecycle Management	1 CU

### INFORMATION MANAGEMENT

Data Management	1 CU
Interaction Design and Prototyping	1 CU

### COMPUTER SYSTEMS AND ARCHITECTURE

Operating System Concepts with Android	1 CU
Interconnection of Cyber-Physical Systems	1 CU
Computer Hardware and Embedded Systems	1 CU

### DISCRETE STRUCTURES AND ALGORITHMS

Linear Algebra for Computing Applications	1 CU
Statistical Thinking for Data Science	1 CU
Mathematical Foundations of Computing	1 CU
Data Structures and Algorithms	1 CU
Design and Analysis of Algorithms	1 CU
<b>COMPUTER SCIENCE PROJECT EXPERIENCE</b>	2 CU

“In my role as Director of Data Science at Microsoft, I see an increasing demand for IT professionals who are adept at fundamental computer science principles, while also being attuned to industry trends. I am excited that the BSc (Computer Science) programme by SMU strives for a balance between technical rigor and business orientation. The awareness of product management as cultivated in the program will also provide a foundation for graduates to fill roles that are in high demand such as Product or Program Manager. In addition, students exposed to software engineering practices combined with artificial intelligence courses will be well prepared for the essential function that data science-related roles will play over the coming years.”



**Dr. Graham Williams**

Director of Data Science,  
Microsoft Asia Pacific, Singapore



Scan for more details.



# NURTURING PROFESSIONALS FOR DIGITAL LAW AND GOVERNANCE

## BSc (COMPUTING & LAW) DEGREE



With a BSc (Computing & Law) degree, graduates can look forward to careers in the following sectors:

### BUSINESS & PUBLIC SECTORS

Digital Transformation Consultant
Technology Innovator
Regulatory & Policy Advisor

### CONSULTING & FINANCE SECTORS

Technology Strategist
Compliance and IT Auditor
Risk Management Analyst

### LEGAL SECTOR

Legal Knowledge Engineer
Legal Tech / Project Manager
Legal Technologist

### Lawyers, Legal Advisors Practicing Technology Law

Only applicable to BSc (Computing & Law) with a Fast-Track to Juris Doctor – subject to students meeting the eligibility criteria for enrolment in the Juris Doctor programme offered by SMU School of Law

## CURRICULUM FOR ACADEMIC YEAR 2020-21

The Computing and Law degree equips you with skillsets in IT and business innovation, operating IT and business innovations within a legal framework, and employing IT in legal practice. Beyond a solid foundation in Computing and Law, you will specialise in advanced technology tracks to become future-ready for Business and Public Sectors, Consulting and Finance Sectors, as well as the Legal Sector.

CORE CURRICULUM  
7 Course Units

+

COMPUTING & LAW CORE  
18 Course Units

+

COMPUTING & LAW ELECTIVES  
8 Course Units

+

FREE ELECTIVES  
3 Course Units

## COMPUTING & LAW COURSES

### COMPUTING CORE COURSES

Statistical Thinking for Data Science	1 CU
Introduction to Programming	1 CU
Data Management	1 CU
Interaction Design and Prototyping	1 CU
Information Systems & Innovation	1 CU
Digital Business Technology & Transformation	1 CU

Business Process Analysis & Solutioning	1 CU
Software Product Management	1 CU

### LAW CORE COURSES

Contract Law 1	1 CU
Contract Law 2	1 CU
Law of Torts	1.5 CU

Criminal Law	1.5 CU
Company Law	1 CU
Intellectual Property Law	1 CU
Privacy and Data Protection Law	1 CU
Legal System and Analysis	1 CU
COMPUTING & LAW PROJECT EXPERIENCE	1 CU

"In the past years, what we can do with technology has advanced dramatically while the rules that govern us, as set out by international or domestic laws and regulations, continue to be in flux. This tension between borderless capability and jurisdictional compliance introduces many complexities into business and everyday life. As regional counsel of a global software communications company, I work with such complexities often and my background in information systems is a huge asset that complements my legal expertise. With maturing A.I., automation and advanced cloud technologies, you will want to have expertise in computing as well as law to prepare for that scary and exciting future."



### Ahmad Firdaus Daud

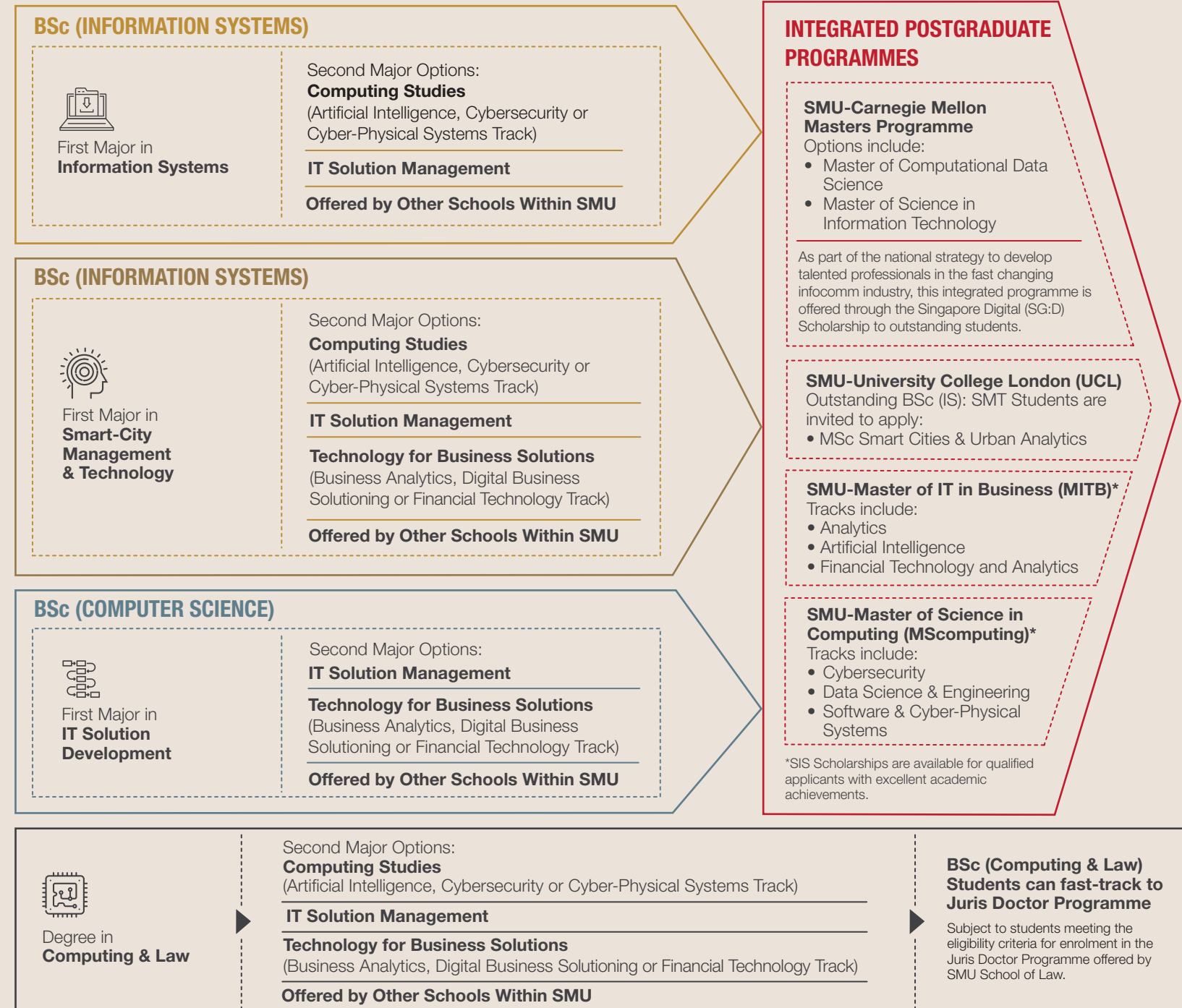
Regional General Counsel for ASEAN and Korea, Avaya Inc  
BSc (Information Systems Management), Graduating Class of 2008  
SMU Juris Doctor, Graduating Class of 2012



Scan for more details.

## VERSATILE PATHWAYS

The cross disciplinary natures of the SIS undergraduate programmes provide our graduates with a competitive edge in gaining admission into a wide range of top postgraduate programmes.







**School of Information Systems**

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