SiT SINGAPORE INSTITUTE OF TECHNOLOGY

BACHELOR OF ENGINEERING WITH HONOURS IN

INFORMATION AND COMMUNICATIONS TECHNOLOGY (SOFTWARE ENGINEERING)

PROGRAMME INFORMATION

The new SIT Information and Communications Technology (ICT) programme is a highly specialised programme that focusses on key areas in depth, rather than generic breadth. Software Engineering will be the first major offered in this ICT programme and covers the development of software, as well as design, operation, analysis, optimisation, security, maintenance and management of software in a holistic and systematic manner.

The main objective of this major is to produce best-in-class Software Engineers who can contribute seamlessly and effectively to the ICT sector upon graduation. To achieve this, highly qualified academics, as well as global and local ICT industry leaders will provide students with an industry-focussed and practice-oriented education. During their studies, students will be given ample opportunities to develop software across a range of devices and systems.

Students will build upon the practical software development skills they have obtained and learn essential software engineering knowledge, thereby allowing them to develop software systems of any scale attuned to the environments in which they operate. In addition, key subjects which are in high demand such as secured software development, mobile computing, cloud solution architecting and big data analytics will be covered. Translational and professional development have also been incorporated into the curriculum to support students' career advancement in the field of Software Engineering.

CURRICULUM STRUCTURE

YEAR 1

TRIMESTER 1 **ICT Foundations**
1. Introduction to ICT
2. Programming Fundamentals
3. Computer Organisation and Architecture
4. Web Systems and Technologies
5. Mathematics and Statistics for ICT

TRIMESTER 2 **ICT Foundations**
1. ICT in Organisations
2. Operating Systems
3. Data Structures and Algorithms
4. Object-Oriented Programming
5. Computer Networks

TRIMESTER 3 Break

YEAR 2

TRIMESTER 1 — **Specialisation Modules**
1. Introduction to Software Engineering
2. Human Computer Interaction
3. Information Management
4. Embedded Systems Programming
5. Career and Professional Development I

TRIMESTER 2 — **Specialisation Modules**
1. Mobile Application Development
2. Software Design
3. Distributed Systems Programming
4. Software Modelling and Analysis
5. Career and Professional Development II

TRIMESTER 3 — **Special Trimester**
1. Global/Regional Exposure to Advances in Technology (GREAT)
2. Industry Certification Module
3. Integrative Team Project

Break

YEAR 3

TRIMESTER 1 — **Specialisation Modules**
1. Software Verification and Validation
2. Performance Testing and Optimisation
3. Secure Software Development
4. Software Management
5. Self-Learning Module

TRIMESTER 2 — Break (Optional)

TRIMESTER 3 — **Integrated Work Study Programme (IWSP)**
1. Productivity Management (Flipped Classes)
2. Capstone Project
3. Work

YEAR 4

TRIMESTER 1 — **Integrated Work Study Programme (IWSP)**
1. Design Thinking (Flipped Classes)
2. Capstone Project
3. Work

TRIMESTER 2 — **Integrated Work Study Programme (IWSP)**
1. Change Management (Flipped Classes)
2. Capstone Project
3. Work

TRIMESTER 3 — GRADUATE

As ICT is a very dynamic field, the curriculum may be updated based on feedback from the industry.

To ensure the rigour of the programme, the curriculum has taken reference from internationally-recognised curriculum guidelines as follows:

1. "Curriculum guidelines for Undergraduate Degree Programs in Information Technology", Association for Computing Machinery (ACM), IEEE Computer Society, Nov 2008
2. "Computer Science Curriculum 2008: An Interim Revision of CS 2001", Association for Computing Machinery (ACM), IEEE Computer Society, Dec 2008
3. "Curriculum Guidelines for Undergraduate Degree Programs in Software Engineering", Association for Computing Machinery (ACM), IEEE Computer Society, Aug 2003
4. "Curriculum Guidelines for Graduate Degree Programs in Software Engineering", Version 1.0 Integrated Software and Systems Engineering Curriculum (iSSEc) Project, Sept 2009

PROGRAMME HIGHLIGHTS

Industry-focussed:

Partnerships are forged with key industry players to support the curriculum through the sharing of state-of-the-art technologies, expertise and resources. Students may have the opportunity to gain internationally recognised industry certifications as part of the programme during the special trimester.

Practice-oriented:

Emphasis will be placed on advancing academic knowledge through the use of practical hands-on training to solve problems. Students will participate in the Integrated Work Study Programme (IWSP) in their final year. This will be a structured year-long work placement that is integrated with flipped classroom teaching and an industry-focussed capstone project.

INTEGRATED WORK STUDY PROGRAMME (IWSP)

Students will embark on the Integrated Work Study Programme (IWSP) during their final year of study under the supervision of a faculty member.

For three trimesters, students will manage study followed by work at a host company every afternoon while developing their capstone project. The 12-month IWSP will allow students to be accorded more responsibilities on the job and deepen their understanding of the industry.

Modules applicable to the workplace such as 'Productivity Management' and 'Design Thinking' will be incorporated during IWSP to promote productivity and innovation. With the knowledge and work experience amassed, students will become invaluable assets to their host company and future employers.

GLOBAL/REGIONAL EXPOSURE TO ADVANCES IN TECHNOLOGY (GREAT)

ICT is an ever-evolving area where cutting-edge developments occur frequently. ICT professionals need to stay abreast of global trends and continuously advance their knowledge to solve industry problems. As such, this programme aims to expose students to the advances of software engineering through a series of activities, including an overseas study trip to one or more leading international software companies and institutions. This study trip will also enable students to broaden their horizons and gain valuable global/regional insights into software engineering practices in the industry.

ADMISSION REQUIREMENTS

Diploma holders from any of the five local polytechnics and A-level graduates are welcome to apply. Subject to approval, applicants may be granted exemptions of up to 10 modules based on the modules taken during their diploma. Exemptions may also be considered for relevant professional or industrial certifications.

CAREER OPPORTUNITIES

Based on a report by Infocomm Development Authority of Singapore in 2011, there were 11,900 ICT job openings for the year. A study conducted by Frost & Sullivan in July 2010 also estimated that some 1,300 new positions in the area of software design and development are created annually in Singapore.

In addition, according to an article published in *TODAY* on 21 November 2013, software professionals are ranked as one of the top 10 best-paying jobs in Singapore.

Software Engineers can expect to have good career prospects, given that they are in high demand. This degree programme will provide graduates with the knowledge and skills to take up these positions and many other job opportunities in the broad field of ICT.

INDUSTRY ADVISORY COMMITTEE

The Industry Advisory Committee members for this programme are:

Mr CHANG Yew Kong (Chairperson)
President, Software Systems Group
ST Electronics

Mr Aloysius CHEANG
Managing Director
Cloud Security Alliance APAC

Mr GAN Boon San
Former General Manager
APAC Public Sector, Microsoft

Mr Andrew KHAW
Senior Director (Productivity Growth through ICT)
Infocomm Development Authority of Singapore

Mr Kiren KUMAR
Director (Infocomms and Media)
Singapore Economic Development Board

Mr LOW Huan Ping
Executive Vice President, Technology
Singapore Press Holdings Ltd

Mr Peter MOORE
General Manager, Sales, Strategy and Operations
Amazon Web Services Global Public Sector – APAC

Dr TAN Geok Leng
Senior Fellow
Agency for Science, Technology and Research

For the most up-to-date information, please visit **SingaporeTech.edu.sg**.