PILLAR OVERVIEW

The Information Systems Technology and Design (ISTD) pillar focuses on “Information Technology” and its relationship with the world. It integrates the traditional disciplines of Computer Science, Computer Engineering and Information Systems. The aim of such integration is to offer you the flexibility to acquire knowledge and skills in areas of your choice and the ability to interact with other engineering disciplines in creative ways.

The mathematical grounding, algorithmic thinking and intense exposure to design in the context of interdisciplinary education empowers you to tackle challenging problems and develop solutions requiring computing as a core element. Most importantly, you will be able to continually adapt to the rapidly changing landscape of tools and techniques in computing.

All SUTD students will take foundational subjects in humanities and the sciences as part of their curriculum. You are immersed in a rigorous curriculum that is focused on design and a modern pedagogy where students learn how to solve complex problems in interdisciplinary teams.

ISTD pillar graduates will have the knowledge and skill sets to prepare them for leadership positions in areas such as:

- Software Design and Development
- Networks
- Data Analytics
- Game Design
- Consulting
- IT Security
- Academia

CORE SUBJECTS

The six ISTD core subjects that begin in Term 4 aim to equip you with basic computational and mathematical tools needed for problem solving using computers and to instil algorithmic thinking.

- Introduction to Information Systems and Programming
- Computation Structures
- Elements of Software Construction
- Introduction to Algorithms
- Computer System Engineering
- Introduction to Probability and Statistics

ELECTIVE REQUIREMENTS

- Four track subjects/electives
- One Technical Application Elective (TAE)
- Two subjects as free electives from the ASD, EPD, ESD or ISTD pillars

TECHNICAL APPLICATION ELECTIVES

All engineering pillars have a set of elective subjects associated with different applications streams, which gives greater focus and depth, and promotes inter-pillar interaction. You will be able to take technical application electives in focused areas such as Global Issues, Transportation, Manufacturing Systems, Information Systems and Enterprise Systems.

CAPSTONE

In Terms 7 and 8, the capstone is a culminating project that allows you to use the skills you have mastered in ISTD in a real world industry or research project. The capstone projects focus on interdisciplinary applications, solved by a team of students chosen appropriately from different pillars.

The following chart illustrates the ISTD curriculum structure. It depicts the typical sequence of subjects. Each major row indicates a calendar year with columns representing the Jan-Apr, May-Aug, and Sep-Dec terms ordered from left to right.

- Advanced Math I
- Advanced Math II
- Physics I
- Physics II
- Chemistry and Biology: Natural World
- Introduction to Design
- Introduction to Information Systems & Programming
- Computation Structures
- Introduction to Algorithms
- HASS
- Track Subject
- Track Subject
- Track Subject
- Track Subject
- Internship/Exchange/Vacation
- Internship/Exchange/Vacation
- HASS
- Track Subject/TAE
- Track Subject/TAE
- HASS
- HASS
- HASS
- HASS

*half-credit subject

Secure Water Treatment (SWaT) is a state-of-the-art testbed at SUTD for research in the area of cyber security.
The ISTD pillar offers specialisation in one or more tracks, which are designed in accordance with common industry requirements. You will also have the option of creating your own track by suitably mixing ISTD electives with those from other engineering pillars.

The following four tracks offer you the opportunity to focus on specific sub-areas of ISTD, that align with your interests and aspirations. Some tracks are interdisciplinary and require you to take subjects from outside the list of ISTD pillar subjects.

**BUSINESS ANALYTICS**

(INTERDISCIPLINARY TRACK WITH THE ESD PILLAR)

The Business Analytics (BA) track is a joint track between the ISTD and ESD (Engineering Systems and Design) pillar, and focuses on data-driven decision-making. You will take a selection of ISTD and ESD subjects to better understand the interaction between data, models and decisions.

The BA track includes aspects of computation and programming central to competencies for manipulation and analysis of large-scale data, which are increasingly required in financial services, supply chain and risk management, transportation and other business environments.

**TRACK SUBJECTS**

- Machine Learning
- Optimisation (ESD)
- The Analytics Edge (ESD)

**ISTD ELECTIVES**

- User Interface Design and Implementation
- Database
- Networks
- Graphics and Visualisation
- Artificial Intelligence
- Foundations of Game Design and Development
- Computational Fabrication (could be taken as a track elective or TAE)

**ESD ELECTIVES**

- Operations Management
- Statistics
- Decision Analysis

**COMPUTER ENGINEERING**

(INTERDISCIPLINARY TRACK WITH THE ESD PILLAR)

The Computer Engineering track is a joint track between the ISTD and Engineering Product Development (EPD) pillar. You will study subjects from the broad area of computer engineering, including hardware engineering, software engineering and information systems engineering.

The core subjects in the track are two hardware-related subjects from the EPD pillar, while the electives cover the whole range of ISTD electives and a few selected EPD ones.

**TRACK SUBJECTS**

- Machine Learning
- Artificial Intelligence

**ISTD ELECTIVES**

- User Interface Design and Implementation
- Database
- Networks
- Graphics and Visualisation
- Security
- Foundations of Game Design and Development
- Computational Fabrication (could be taken as a track elective or TAE)

**ESD ELECTIVES**

- Optimisation
- Simulation
- Network Modelling

**CUSTOM TRACK**

The Custom Track offers an opportunity to create a track to best realise your career objectives and to pursue your interests. With the flexibility to select subjects from ISTD as well as other pillars, you can customise an interdisciplinary curriculum which does not fall into other pre-defined tracks, but is firmly grounded in computing around a coherent technical theme.

**TRACK SUBJECTS**

- Entrepreneurship
- Wireless Communication
- Digital Integrated Circuits Design

**TRACK SUBJECTS**

- Network Modelling
- Security

**ELECTIVES**

- User Interface Design and Implementation
- Machine Learning
- Database
- Graphics and Visualisation
- Artificial Intelligence
- Foundations of Game Design and Development
- Computational Fabrication (could be taken as a track elective or TAE)

**ELECTIVES FROM OTHER PILARS**

- Digital Systems Lab [EPD]
- Microelectronic Circuits and Devices [EPD]
- Network Modelling [ESD]
- Simulation [ESD]

**ELECTIVES FROM OTHER PILARS**

- Artificial Intelligence
- Graphics and Visualisation
- Security
- Foundations of Game Design and Development
- Computational Fabrication (could be taken as a track elective or TAE)

**TRACK SUBJECTS**

- Machine Learning
- Artificial Intelligence

**ISTD ELECTIVES**

- User Interface Design and Implementation
- Database
- Networks
- Graphics and Visualisation
- Security
- Foundations of Game Design and Development
- Computational Fabrication (could be taken as a track elective or TAE)

**ESD ELECTIVES**

- Optimisation
- Simulation
- Network Modelling