



MISSION STATEMENT

ISTD prepares students to be leaders in software design, networks, data analytics, consultancy, cybersecurity, artificial intelligence and IT services.

OVERVIEW

ISTD is one of the five majors at SUTD. ISTD allows students to design their own future by integrating computer science, computer engineering, and information systems through systematic design and multi-disciplinary learning approaches. They will also possess the ability to collaborate with other engineering disciplines to work on real-life problems.

The mathematical grounding, algorithmic thinking and intense exposure to design in the context of interdisciplinary education will enable ISTD graduates to tackle challenging problems and develop solutions, with computing as a core element. Most importantly, they will be equipped to adapt with the rapidly changing landscape of tools and techniques in computing to design for the future.

CORE SUBJECTS

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

ISTD TRACKS

DATA ANALYTICS

The **Data Analytics** track revolves around three main activities: data capture, data analysis, and data exploitation. Data comes in all scales and forms and requires different capture, storage and access techniques. Students will gain the computing skills to develop systems that have the ability to infer meaning from data and allow stakeholders to make decisions based on that meaning. In this track, we will cover subjects that will prepare students for careers in a wide range of data-driven industries that are adopting data science and big data analytics.

Track subjects include:

- *Machine Learning / Statistical and Machine Learning*
- *Computational Data Science*
- *Database and Big Data*
- *Computer Vision*
- *Theory and Practice of Deep Learning*
- *Natural Language Processing*
- *The Analytics Edge (ESD)*

FINANCIAL TECHNOLOGY

The **Financial Technology** (Fintech) track is designed for students who are interested to understand the core challenges in finance and advanced computing technologies to drive the next generation of financial services. Fintech combines the technology from big data and analytics, mobile computing, and modern financial services. In this track, we will cover subjects that will prepare students for careers in financial industry.

Track subjects include:

- *Machine Learning / Statistical and Machine Learning*
- *Database and Big Data*
- *Computational Data Science*
- *User Interface Design and Implementation*
- *Blockchain Technology*
- *Natural Language Processing*
- *Derivative Pricing and Risk Management (ESD)*
- *Financial Systems Design (ESD)*
- *Fundamentals of Investing (ESD)*

ARTIFICIAL INTELLIGENCE

The **Artificial Intelligence** track focuses on the fundamental mechanisms that enable the construction of intelligent systems that can operate autonomously, learn from experience, plan their actions, and solve complex problems. Artificial intelligence is the science of giving computers human-like intelligence. In this track, we will particularly cover subjects on the contribution of computing to artificial intelligence and, as a result, it aims to give students all the computing skills needed for careers in a wide range of industries that are adopting artificial intelligence.

Track subjects include:

- *Machine Learning / Statistical and Machine Learning*
- *Theory and Practice of Deep Learning*
- *Artificial Intelligence*
- *Computational Data Science*
- *Computer Vision*
- *User Interface Design and Implementation*
- *Natural Language Processing*
- *Intelligent Robotics (EPD)*

IOT AND INTELLIGENT SYSTEMS

The **IoT and Intelligent Systems** track is introduced for students who wish to develop skills in building large-scale networked and distributed systems. The subjects in this track will prepare the students to gain the fundamental knowledge in making such systems effective, scalable and intelligent. The aim of this track is to train the students for careers in public and private sectors focused towards distributed data centers, automotive solutions, web services and E-commerce solutions among others.

Track subjects include:

- *Cloud Computing and IoT*
- *Networks*
- *Distributed Systems and Computing*
- *Artificial Intelligence*
- *Mobile Robotics*
- *Computational Data Science*
- *System Security*
- *Circuits and Electronics (EPD)*
- *Digital Signal Processing (EPD)*
- *Design of Intelligent Digital Integrated Circuits and Systems (EPD)*

SECURITY

The **Security** track is intended for students who wish to develop state-of-the-art knowledge of computer security, network security, and cybersecurity technologies. Rapid adoption of technologies like artificial intelligence, internet-of-things, blockchain, and mobile internet in different industries across the world has increased in a bid to strengthen security and privacy. In this track, we will cover subjects that will prepare students to develop leading-edge knowledge in security as well as to find information security and cybersecurity careers.

Track subjects include:

- *Foundations of Cybersecurity*
- *Network Security*
- *System Security*
- *Distributed Systems and Computing*
- *Blockchain Technology*

VISUAL ANALYTICS AND COMPUTING

The **Visual Analytics and Computing** track is introduced for students who wish to develop skills in developing systems to handle visual data, mainly images, videos, and shapes. The subjects in this track will prepare the students to gain the fundamental knowledge in acquiring, analysing, synthesising and rendering visual data by making use of computers. The aim of this track is to train the students for careers in a wide range of industries that are adopting visual data analytics and computing.

Track subjects include:

- *User Interface Design and Implementation*
- *Computer Vision*
- *Theory and Practice of Deep Learning*
- *Graphics and Visualisation*

