ENGINEERING PRODUCT DEVELOPMENT
The Engineering Product Development (EPD) pillar prepares you for leadership in the conception, design, implementation and operation of innovative technology-intensive products, with emphasis on products and systems whose development cuts across traditional disciplinary boundaries.

All SUTD students will take foundational subjects in the sciences, mathematics and humanities 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.

In Term 4, EPD pillar students are engaged in common foundation classes in both Mechanical and Electrical subjects, building a strong base. From Term 5 onwards, aside from EPD core subjects and track electives, you have a variety of Humanities, Arts and Social Sciences (HASS) electives and Technical Application Electives (TAE) to choose from.

In Terms 7 and 8, the capstone is a culminating project that allows you to use the skills you have mastered in EPD 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.

EPD pillar graduates will be prepared for a wide variety of engineering, design and management careers across multiple industries. The skills learnt would provide you with a deep understanding of the technical fundamentals, and with skills and capabilities for leading the development of new products, systems, processes or methodologies, in both the private and public sector, including:

- Technical Engineering Consultation
- Biomedical and Healthcare
- Consumer Products
- Electrical and Electronics
- Measurement, Automation and Robotics
- Finance and Real Estate
- Management Consultation
- Marine and Offshore Engineering
- Defence Systems
- Energy and Power

### CORE SUBJECTS

- Probability and Statistics
- Circuits and Electronics
- Structures and Materials
- Systems and Control
- Engineering Design Innovation
- Fluid Mechanics/Electromagnetic and Applications

### 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, Enterprise Systems and Machine Learning.
MECHANICAL ENGINEERING

Mechanical Engineering (ME) is the application of physical principles in the analysis, design, construction and operation of mechanical systems. The ME track provides you with solid knowledge of mechanical concepts, thermal fluid systems, materials science, principles of design and control, and applying them to creative solutions for modern mechanical systems.

The skill set developed will enable you to design and analyse aerospace systems, automotive vehicles, biomedical instruments, energy conversion systems, fluidic and thermal systems, industrial machinery, manufacturing equipment, robotics and more. You will also be exposed to the frontiers of modern research in ME, including clean energy, advanced materials, micro/nanotechnology and biomechanics.

Graduating from the ME track, you will be very versatile and have career options in a broad spectrum of industries, including aerospace, automation and control, automobile, biomedical instrumentation, computer-aided design (CAD)/computer-aided manufacturing (CAM), manufacturing, mechanical design and consulting, oil and gas technology, pharmaceutical manufacturing, robotics, semiconductor manufacturing, thermal and power engineering and others.

TRACKS

With six tracks, including a Self-Directed Track, the EPD curriculum offers you the flexibility to customise it to suit your interests and aspirations. When you complete a track, it will be indicated on your transcript so that future employers can recognise this expertise.

TRACK SUBJECTS

• Fluid Mechanics

ELECTIVES

• Dynamics
• Thermal Systems for Power and Environment
• Machine Element Design
• Introduction to Materials Science
• Entrepreneurship
• Healthcare Product Design
• Structural Mechanics and Design
• Design and Fabrication of Microelectromechanical Systems
• Advanced Feedback and Control
• Topics in Biomedical and Healthcare Engineering
• Micro-Nano Projects Laboratory
• Intelligent Robotics
• Wireless Communications and Internet of Things

ELECTRICAL ENGINEERING

Electrical Engineering (EE) covers the study, application and product design of electrical, digital, as well as electromagnetism in the field of analog and digital electronics, power engineering, communication systems, control systems, signal processing and wireless technology.

As an EE graduate, you will have a wide range of career opportunities, from consumer electronics design, power and energy management systems engineering, manufacturing, internet of things, electrical and electronics engineering to high-end research and development, and more.

TRACK SUBJECTS

• Electromagnetic and Applications
• Power Electronics
• Electric Power Systems Analysis and Design

ELECTIVES

• Microelectronic Circuits and Devices
• Digital Systems Lab
• Entrepreneurship
• Healthcare Product Design
• Optical Engineering and Communications
• Introduction to Materials Science
• Design and Fabrication of Microelectromechanical Systems
• Digital Signal Processing
• Advanced Feedback and Control
• Wireless Communications and Internet of Things
• Healthcare Product Design
• Optical Engineering and Communications
• Structural Mechanics and Design
• Electric Power Systems Analysis and Design

ROBOTICS

Designing robots requires multi-disciplinary knowledge and expert skills in fabrication, mechanical, electronics, and electrical engineering, art, and user studies. With the emergence of service robotics industries and recent boom in the traditional industrial robotics market, this track aims to provide you with knowledge of robotics fundamentals, skills in modelling, design and development of robotic platforms, an insight into their theoretical essentials and the expertise to apply these methods to real world problems.

Your skill set allows you to design and realise novel robotic mechanisms, sensing and control strategies for mobile robots and build human interactive robotic systems. The Robotics track will also expose you to the frontiers of modern research, including bio-inspired designs, nanorobots, wearable systems and next generation industrial robotics. A series of tailor-made projects are seeded into the track providing opportunities for you to demonstrate skills related to simulation, design and implementation of industry-specific robotic platforms and research problems.

Specialising in this track, you will have exciting careers in robotics, automation, research agencies, manufacturing, aerospace, maritime, oil and gas, consumer electronics, biomedical, defence research and more.

TRACK SUBJECTS

• Fluid Mechanics/Electromagnetic and Applications
• Intelligent Robotics

ELECTIVES

• Digital Systems Lab
• Dynamics
• Machine Element Design
• Entrepreneurship
• Digital Signal Processing
• Advanced Feedback and Control
• Topics in Biomedical and Healthcare Engineering
• Wireless Communications and Internet of Things
• Healthcare Product Design
• Optical Engineering and Communications
• Structural Mechanics and Design
• Electric Power Systems Analysis and Design

*Tracks offered in a year are subject to changes.
Computer Engineering is the application of mathematical and scientific principles to the analysis, design, configuration and operation of computer-related systems. The track provides you with solid and applicable knowledge of computer architecture, computer science, electronic engineering, programming, network system, database management, information storage, enabling you to develop creative solutions for computer and network systems. You will be prepared for the design and analysis of personal computers, electronic circuits, microprocessors, Field Programmable Gate Array (FPGA), computer networks, network servers, embedded systems, operating systems and software with various applications, and more. The Computer Engineering track gives you research opportunities in computer software and hardware design, including visual and interactive computing, algorithms and analytics, computational intelligence, compilers, Very Large-Scale Integration (VLSI) design, and distributed computing.

You will be very versatile and have career opportunities in software development, computer architecture, electronics design, digital system, data analysis, software quality assurance, telecommunications, transportation, manufacturing, computer-aided design (CAD), hardware and software project management, consultancy, web-based applications development, network systems, and others.

Healthcare Engineering Design is a discipline that applies the design concepts and principles of engineering to medicine.

The track provides you with problem solving skills of engineering and appreciable knowledge connecting engineering and medical fields to advance medical treatment and diagnosis. You will be equipped to design and analyse surgical tools, surgical robots, lifesaving equipment, biomedical instruments for treatment and diagnosis, physiological parameter monitors using sensors, biomechanics (cardiovascular, musculoskeletal), biomedical imaging, medical devices, cell and tissue engineering and more, with various medical applications.

You will have research opportunities in biomaterials, drug delivery, biomechanics (hard and soft tissue), mechanobiology, sports engineering, cellular and tissue engineering, neuroscience and engineering, computational biomedical engineering, new DNA sequencing methods (genetic engineering) and more.

Graduates from the Healthcare Engineering Design track are multi-disciplinary (spanning engineering and medicine) and you will have career opportunities in medical regulatory authorities, medical devices and bioinstrumentation, imaging and diagnostic services (e.g. X-Ray, MRI, infusion pumps), medical robotics, implant design and fabrication, animal trails, hospital management and consultancy.

The Self-Directed Track gives you the opportunity to focus on a specific interest other than those in the offered tracks or that spans multiple tracks. It is the most flexible curriculum that allows you to pursue your interests beyond EPD. You will be equipped with a skill set in innovation and systems-level thinking, as well as in-depth technical fundamentals and a focus in your area of interest. Besides careers in your theme area, you are well-prepared to be designers and problem solvers in diverse fields, including engineering, finance, consulting, entrepreneurship, and government organisations.