

# THE COMMON ENGINEERING PROGRAMME

(JAE code: T56)

AY2024/2025

# THE COMMON ENGINEERING PROGRAMME @TEMASEK POLYTECHNIC



## DISCOVERY TIME!

With the Common Engineering Programme (CEP), you will have more time to learn about: the different disciplines in engineering, what the different diploma courses have to offer and the job prospects in the industry, before you select your preferred courses. You might also discover new interests which will then guide you in your choice of diploma course to pursue.

## VARIETY OF CHOICES

CEP currently offers 7 diploma courses for selection, covering a range of engineering disciplines:

- Aerospace Electronics
- Aerospace Engineering
- Biomedical Engineering
- Business Process & Systems Engineering
- Computer Engineering
- Electronics
- Mechatronics

## SEAMLESS TRANSITION

All the 7 diploma courses admit students directly into their courses as well. It is appropriate to apply directly to a diploma course if you are already certain that it is the course that you wish to pursue.

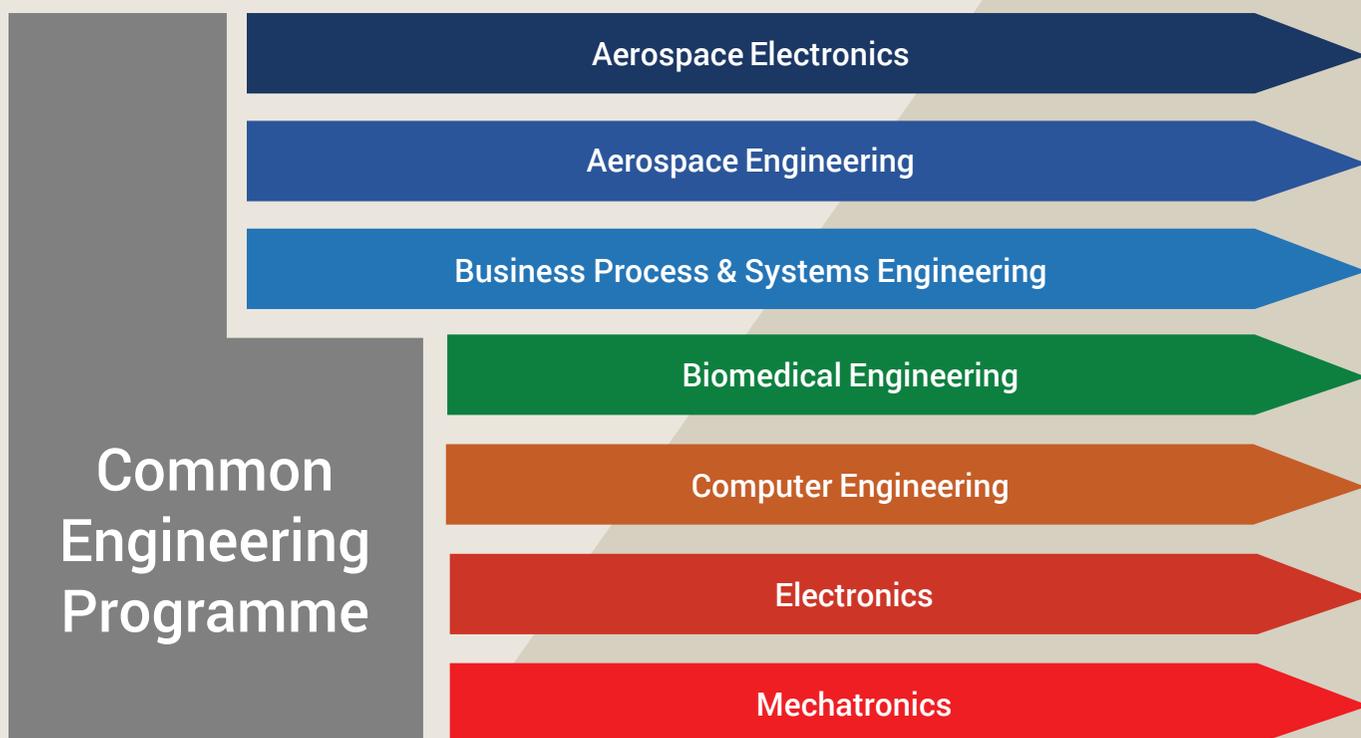
In CEP, you will do the same set of common 1<sup>st</sup> year subjects as those who had joined the diploma courses directly. Hence, you will be able to join your diploma course seamlessly and graduate along with all your peers, at the same time, in 3 years.

## A NEW BEGINNING

Course allocation is by merit and it will be based on your first semester's results. This gives everyone an opportunity of a fresh start. Do well in the programme and you will have a good chance of getting into your preferred course, including the popular ones, and subsequently even being part of a university pathway programme.

# PATHWAYS FOR STUDENTS IN COMMON ENGINEERING PROGRAMME

Year 1		Year 2		Year 3	
Semester 1	Semester 2	Semester 1	Semester 2	Semester 1	Semester 2



There will be 2 streaming exercises and you will join your diploma course either in Year 1 Semester 2, or in Year 2.

Some diploma courses offer elective clusters or elective subjects. These electives will give you options and allow you to explore more areas of interest.

# DIPLOMA IN AEROSPACE ELECTRONICS

Step into an aircraft cockpit and you will see colourful lights, state-of-the-art instruments, bright LCD displays and dual steering systems for flight control navigation. Want to know how these systems work together to control the aircraft thousands of metres above sea level? This course will provide you with the answers, and set you on the path towards an exciting career in the aviation industry!



## ABOUT THE COURSE

In this course you will learn about aircraft electrical, communication, navigation and flight control systems. And in order that you can appreciate and understand all these systems well, we will first help you to establish a strong foundation in the fundamentals of electrical and electronic engineering.

Temasek Polytechnic is the first Institute of Higher Learning in Singapore to achieve the SAR-147 Approved Maintenance Training Organisation (AMTO) certification for our Diploma in Aerospace Electronics (AEL) programme. We are also

currently the only local polytechnic that is partnering another SAR-147 organisation - Lufthansa Technical Training (LTT) of Germany - to provide you with quality and certified training in accordance with the new Singapore Airworthiness Requirements (SAR-66) specified by the Civil Aviation Authority of Singapore (CAAS).

You will be also equipped with SAR-66 Category B2 knowledge and skills in 10 CAAS modules, such that you can earn credits to shorten your subsequent professional training to become a Licensed Aircraft Engineer (LAE) by up to 10 months!

If you aspire to be a pilot, you can also fulfil your dream by taking flying lessons as part of your Student Internship Programme in your final semester of study, to get that coveted Private Pilot Licence (PPL). Alternatively, you will have the opportunity to be attached to a reputable local or overseas aerospace related company for the Student Internship Programme to gain valuable working experience and a strong head-start for your career in the aerospace industry.



## CAREER PROSPECTS

Singapore is today the most comprehensive aerospace Maintenance, Repair and Overhaul (MRO) hub in Asia, accounting for a quarter of the region's MRO output. Locally, about 21,000 workers, spread across more than 130 local and international companies, are involved in MRO. It is projected that many more highly skilled maintenance personnel will be needed locally and worldwide over the next few decades, thereby giving you outstanding prospects.

You will be highly sought after as:

- Aircraft Maintenance Engineer
- Aircraft Electrical System Specialist
- Avionics Design and Development Engineer
- Avionics System Specialist
- Avionics Test Engineer

## COURSE STRUCTURE

### YEAR 1

CEP

#### ► Semester 1

- Circuit Analysis
- Computer Programming for Problem Solving
- Digital Fundamentals 1
- Engineering Mathematics 1
- Current Issues & Critical Thinking
- Leadership Fundamentals
- Sports & Wellness

#### ► Semester 2

- Avionic Systems
- Digital Fundamentals 2
- Electronic Devices & Circuits
- Engineering Mathematics 2
- Engineering Physics
- Career Readiness
- Innovation & Entrepreneurship

### YEAR 2

#### ► Semester 1

- Aircraft Electrical Fundamentals
- Aircraft Electronics & Servomechanisms
- Data Visualisation & Analytics
- Engineering Mathematics 3
- Fundamentals of Aeronautical Science
- Global Studies
- Effective Communication
- Leadership in Action

#### ► Semester 2

- Aerospace Maintenance Practices

### YEAR 3

#### ► Semester 1

- Aircraft Digital Systems
- Aviation Legislation & Human Factors
- Basic Aerodynamics
- Cluster Elective Subject 1
- Cluster Elective Subject 2
- Career Management
- Sustainability & Climate Action/Guided Learning
- Professional Communication

#### ► Semester 2

- Student Internship Programme

#### Cluster Electives:

- IOT and Automation
  - Internet of Things Project
  - Intelligent Automation
- Aerospace Operations
  - Unmanned Aircraft Operations
  - Lean Processes



# DIPLOMA IN AEROSPACE ENGINEERING

Having grown at an average rate of 10 per cent in the last two decades and with a large pool of over 130 aerospace companies, Singapore is today the most comprehensive aerospace Maintenance, Repair and Overhaul (MRO) hub in Asia, accounting for a quarter share of the region's MRO output. The aerospace industry today employs close to 21,000 workers, of which 90% are skilled.



## ABOUT THE COURSE

Have you ever wondered how it feels to be inside the cockpit of an aircraft, how a 100-tonne aircraft overcomes gravity, or how an aircraft is shaped to fly faster than sound? These are some of the things you will find out in this course.

This course prepares you for an exciting future that realises man's dream of flight. You will learn about theories of flight, gas turbine engine, materials and hardware used for making aircraft, maintenance practices, aviation legislation, human factors, electrical and electronics fundamentals.



Temasek Polytechnic is the first Institute of Higher Learning in Singapore to achieve the SAR-147 Approved Maintenance Training Organisation (AMTO) certification for our Diploma in Aerospace Engineering (AEG) programme. We are also currently the only local polytechnic that is partnering another SAR-147 organisation - Lufthansa Technical Training (LTT) of Germany - to provide you with quality and certified training in accordance with the new Singapore Airworthiness Requirements (SAR-66) specified by the Civil Aviation Authority of Singapore (CAAS).

You will be equipped with SAR-66 B1.1 knowledge and skills in 10 CAAS modules and you can earn credits to shorten your subsequent professional training to become a Licensed Aircraft Engineer (LAE) by up to 10 months.

As the only polytechnic near to Changi Airport, the Seletar Aerospace Hub and major aerospace companies, we are strategically located for a final semester attachment to aerospace organisations, so that you can seamlessly join the industry before graduation.

If you aspire to be a pilot, you can also fulfil your dream by taking flying lessons as part of your Student Internship Programme and getting a Private Pilot Licence (PPL)!

## CAREER PROSPECTS

The rapid growth of the aerospace industry will create a strong demand for skilled aerospace professionals in the next few decades.

You will be highly sought after as:

- Aircraft Maintenance Engineer
- Structural or Composite Specialist
- Engine or Power Plant Technologist
- Aerospace Component Design Engineer
- Aeromechanical Systems Specialist

Your fundamental engineering training will also equip you with the knowledge to further your aspirations in local and overseas degree programmes.

## COURSE STRUCTURE

### YEAR 1

CEP

#### ► Semester 1

- Circuit Analysis
- Computer Programming for Problem Solving
- Digital Fundamentals 1
- Engineering Mathematics 1
- Current Issues & Critical Thinking
- Leadership Fundamentals
- Sports & Wellness

#### ► Semester 2

- Electronic Devices & Circuits
- Engineering Drawing
- Engineering Mathematics 2
- Engineering Physics
- Statics & Strength of Materials
- Thermodynamics
- Career Readiness
- Effective Communication

### YEAR 2

#### ► Semester 1

- Engineering Mathematics 3
- Engineering Materials
- Fluid Mechanics
- Gas Turbine Engine
- Principles of Dynamics
- Global Studies
- Innovation & Entrepreneurship
- Leadership in Action

#### ► Semester 2

- Aircraft Electrical Fundamentals
- Aircraft Electronics & Digital Systems
- Aviation Legislation & Human Factors
- Basic Aerodynamics
- Data Visualisation & Analytics
- Career Management
- Sustainability & Climate Action/Guided Learning
- Professional Communication

### YEAR 3

#### Lufthansa Technical Training (LTT) option

##### ► Semester 1

- Aerospace Maintenance Practices

##### ► Semester 2

- Student Internship Programme

#### Aerospace System Design (ASD) option

##### ► Semester 1

- Student Internship Programme

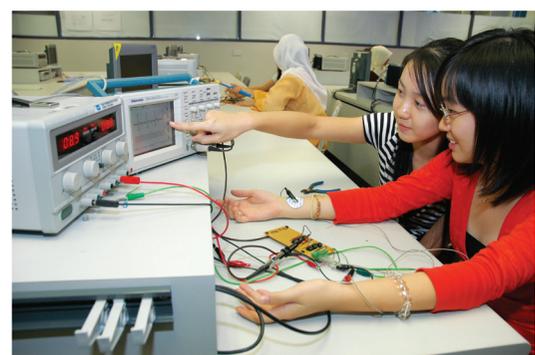
##### ► Semester 2

- Aircraft Structures & Composites
- Engine Maintenance & Workshop Practices
- Major Project



# DIPLOMA IN BIOMEDICAL ENGINEERING

The development of medical devices, from a small hearing aid to an X-ray machine; the search for a cure for human diseases; or even the very pills that you pop into your mouth — these are all part of the biomedical life sciences, which is now seeing a rapid boom worldwide.



## ABOUT THE COURSE

This course involves the application of biological sciences and engineering skills to the biomedical services. You will be equipped with knowledge in the inter-disciplinary fields of biomedical engineering.

As one of Singapore's key engines of economic growth, this industry is expected to contribute significantly to the manufacturing output (including medicines and biomedical

devices) and account for enormous jobs opportunities in the economy.

Singapore has established herself as a strategic hub for medical research and advanced patient care in specialised fields such as oncology, cardiology, ophthalmology, neurology and rehabilitation. A wide spectrum of services such as integrated healthcare services, hospital management, laboratory services, healthcare consultancy, pharmaceutical research and clinical trials are also provided.

World renowned biomedical sciences and medical technology (MedTech) companies have set up base in Singapore, opening up many lucrative job opportunities for holders of this diploma, in the field of manufacturing, regulatory sciences and clinical services. Together with the establishment of the Biopolis, Tuas Biomedical Park and MedTech Hub, all these will create a strong demand for biomedical and MedTech professionals well into the next century.



## CAREER PROSPECTS

You will be able to find employment in design, manufacturing and marketing companies dealing in the life sciences and instrumentation (MNCs, SMEs or public companies), as well as government agencies, health care institutions, commercial firms and hospitals. There are excellent career prospects in life science research centres, providing support in biological and medical research activities, the maintenance of equipment, and specialist procedures.

## COURSE STRUCTURE

### YEAR 1

**CEP**

#### ► Semester 1

- Circuit Analysis
- Computer Programming for Problem Solving
- Digital Fundamentals 1
- Engineering Mathematics 1
- Current Issues & Critical Thinking
- Leadership Fundamentals
- Sports & Wellness

#### ► Semester 2

- Digital Fundamentals 2
- Electronic Devices & Circuits
- Electronic Prototyping
- Engineering Mathematics 2
- Engineering Physics
- Career Readiness
- Global Studies
- Innovation & Entrepreneurship

### YEAR 2

#### ► Semester 1

- Engineering Mathematics 3
- Human Anatomy & Physiology
- Medical Electronics
- Microcontroller Applications
- Effective Communication
- Leadership in Action
- Sustainability & Climate Action/Guided Learning

#### ► Semester 2

- Chemistry
- Data Visualisation & Analytics
- Medical Device Manufacturing Practices
- Medical Devices
- Medical Imaging & Informatics
- Professional Communication

### YEAR 3

#### ► Semester 1

- Major Project
- Cluster Elective Subject 1
- Cluster Elective Subject 2
- Career Management

#### ► Semester 2

- Student Internship Programme

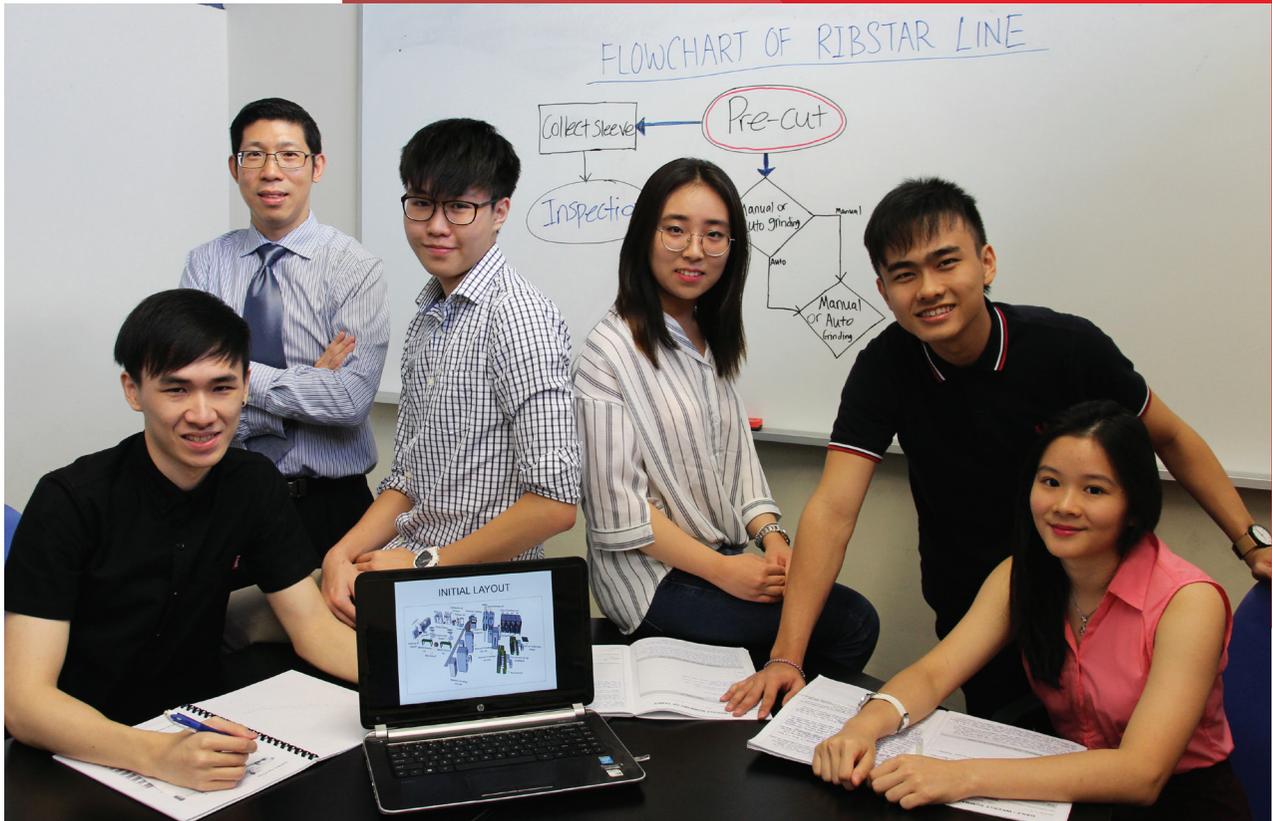
#### Cluster Electives:

- Clinical Equipment and Process
  - Clinical Laboratory Equipment
  - Medical Biochemistry
- Healthcare Informatics
  - Healthcare Analytics
  - Patient Monitoring Technology
- Biomedical Design and Devices
  - CAD and Additive Manufacturing
  - Audiometry and Hearing Devices
- Sustainability in Engineering (choose 2)
  - Solar Photovoltaic Technology and Leasing
  - Green Urban Transportation and Energy Storage
  - Renewable Energy Technologies
  - Life Cycle Analysis
- Structured Work-Based Learning
  - Work-Based Learning
- Advanced Engineering Skills
  - Advanced Skills Practices
- SUTD Pathway Programme
  - Modelling and Analysis
  - Physical World
  - Computational Thinking for Design
  - Social Science: Understanding Behaviour, Culture & Society



# DIPLOMA IN BUSINESS PROCESS & SYSTEMS ENGINEERING

In today's business environment, companies' operations have become more challenging and complex. In addition to performing the traditional role of managing an enterprise, business leaders now require the skills to continuously refine business processes in order to overcome vital challenges.



## ABOUT THE COURSE

This course combines engineering disciplines with business management principles, producing graduates who are highly sought after by multinational corporations as well as small and medium enterprises. As technology advances and Singapore strives to be a world-class manufacturing and



logistics hub, there is an increasing demand for tech-savvy professionals with multi-disciplinary knowledge and skills. You will also have the opportunity to be specialised in one of our Elective Clusters.

There are two main areas in this course:

- Business Analytics – which concerns the systematic investigation, prediction and prescription of business performance in order to provide insights for future planning.
- Systems Engineering – which deals with the management, improvement and optimisation of business processes using a systems thinking approach so as to enhance business productivity and profits.

The introduction of business concepts and principles into a core of engineering fundamentals in this course will enable holders of this diploma to easily find their niche in an extremely wide variety of industries, including the manufacturing, logistics and service sectors in Singapore.

## CAREER PROSPECTS

Working as a professional in cross-functional teams, you will excel in diversified industries. Your job functions are numerous, including: business development, business process improvement, product development, marketing, sales and provision of services. You will also find employment with numerous private companies (MNC and SME) and government agencies.

Your career prospects include working in:

- Logistics sectors — Support in business analytics, customer sales, customer relationship management (CRM) and product marketing functions
- Manufacturing sectors — Quality, process control, productivity improvement and management systems functions
- Service sectors — Operations and frontline staff dealing with customer service or client relations

## COURSE STRUCTURE

### YEAR 1

### CEP

#### ► Semester 1

- Circuit Analysis
- Computer Programming for Problem Solving
- Digital Fundamentals 1
- Engineering Mathematics 1
- Current Issues & Critical Thinking
- Leadership Fundamentals
- Sports & Wellness

#### ► Semester 2

- Business Fundamentals
- Introduction to Processes and Systems
- Quantitative Methods
- Career Readiness
- Global Studies
- Innovation & Entrepreneurship
- Effective Communication

### YEAR 2

#### ► Semester 1

- Decision Analysis
- Data Visualisation & Analytics
- Process Management Systems
- Manufacturing Logistics and Simulation
- Sustainability & Climate Action/Guided Learning
- Professional Communication
- Leadership in Action



#### ► Semester 2

- Process Optimisation and Improvement
- Systems Modelling and Simulation
- Project Management
- Sustainable Supply Chain Management
- Customer Relationship Management
- Elective Cluster Subject 1

### YEAR 3

#### ► Semester 1

- Major Project
- Career Management
- Elective Cluster Subject 2
- Elective Cluster Subject 3

#### ► Semester 2

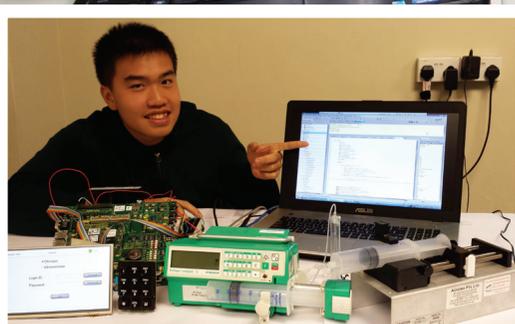
- Student Internship Programme

#### Elective Clusters:

- Process Analytics and Automation
  - Intelligent Automation
  - IOT Security
  - Data Management for Process Analytics
- Supply Chain Management
  - Procurement & Materials Management
  - Distribution Centre Management
  - International Trade & Transport
- Structured Work-Based Learning
  - Intelligent Automation
  - Work-Based Learning

# DIPLOMA IN COMPUTER ENGINEERING

As Singapore forges ahead as a Smart Nation, there is an urgent need for strong computer engineering talent across almost every sector, such as high-tech manufacturing, aerospace, aviation, transportation, telecommunication, healthcare, finance, business and the civil service.



## ABOUT THE COURSE

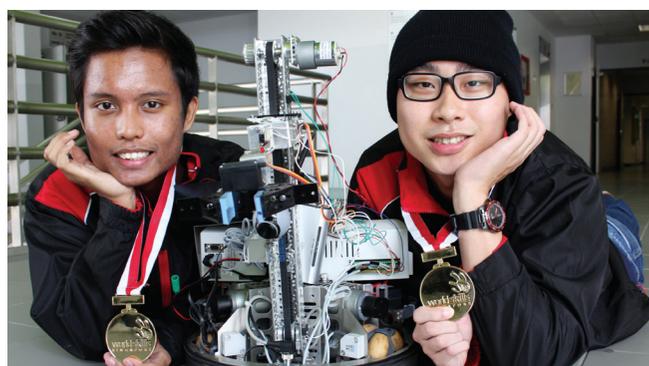
The Internet of Things (IoT), data analytics, artificial intelligence, cyber security and smart manufacturing are the enablers of a Smart Nation that are set to impact Singapore both socially and economically. This course will train you to become a part of the strong talent pool in these enabling technologies. It will equip you with IoT and system integration knowledge and skills – encompassing embedded systems to make things smart, computer networking for wired and wireless connectivity, as well as internet technology – all of which will empower you to create web and mobile applications, integrate systems and put together solutions using the latest technologies.

Such a multi-disciplinary, winning combination of electronics and computer science prepares you to be amongst the few who are fully proficient in hardware, software and integration of hardware and software systems. You will become total solution providers who are much sought after across various industry sectors.

The course also prepares you for internationally recognised industry certification examinations from National Instruments, CompTIA, Oracle, Microsoft and Cisco.

Furthermore, there is an opportunity for you to pursue the following interesting electives to add value to what you have learnt in the core curriculum.

- Industrial Internet of Things
- Virtual Reality
- Intralogistics and Cybersecurity
- Advanced Engineering Skills



## CAREER PROSPECTS

There will be a great demand for skilled and versatile computer engineers. Potential jobs with exciting career prospects await you as Singapore transforms into a Smart Nation. You will be sought after as:

- Hardware Engineers
- Software Engineers
- Systems Integrators
- Web Developers
- Data Analytics Specialists
- Network Engineers
- System Engineers

The strong Computer Engineering fundamentals will stand you in good stead, should you choose to pursue further studies at local and overseas universities.

## COURSE STRUCTURE

### YEAR 1

**CEP**

#### ► Semester 1

- Circuit Analysis
- Computer Programming for Problem Solving
- Digital Fundamentals 1
- Engineering Mathematics 1
- Current Issues & Critical Thinking
- Leadership Fundamentals
- Sports & Wellness

#### ► Semester 2

- Digital Fundamentals 2
- Electronic Devices & Circuits
- Electronic Prototyping
- Engineering Mathematics 2
- Engineering Physics
- Career Readiness
- Global Studies
- Innovation & Entrepreneurship

### YEAR 2

#### ► Semester 1

- Data Visualisation and Analytics
- Engineering Mathematics 3
- Microcontroller Applications
- Object-oriented Programming
- Effective Communication
- Sustainability & Climate Action/Guided Learning
- Leadership in Action

#### ► Semester 2

- Internet of Things Project
- Artificial Intelligence and Machine Learning
- Full Stack Development
- Intelligent Automation
- Professional Communication
- Elective Cluster Subject 1

### YEAR 3

#### ► Semester 1

- Elective Cluster Subject 2
- Major Project
- Career Management

#### ► Semester 2

- Student Internship Programme

#### Cluster Electives:

- Industrial Internet of Things
  - System and Network Integration
  - Mobile Device Applications Development
- Virtual Reality
  - 3D Modelling for Virtual Reality
  - Interactive Programming for Virtual Reality
- Intralogistics and Cybersecurity
  - Distribution Centre Management
  - IOT Security
- Sustainability in Engineering (choose 2)
  - Solar Photovoltaic Technology and Leasing
  - Green Urban Transportation and Energy Storage
  - Renewable Energy Technologies
  - Life Cycle Analysis
- Structured Work-Based Learning
  - Work-Based Learning
- Advanced Engineering Skills
  - Advanced Skills Practices
- SUTD Pathway Programme
  - Modelling and Analysis
  - Physical World
  - Computational Thinking for Design
  - Social Science: Understanding Behaviour, Culture & Society

# DIPLOMA IN ELECTRONICS

Electronics is an important part of human advancement and is used everywhere – in homes, offices, schools, industry, hospitals, transportation and even for leisure. Applications such as smart home, solar energy, electric vehicles, satellite system, Industrial 4.0, medical equipment and personal smart devices are all made possible through electronics. This course will give you tremendous flexibility and width – a springboard to a wide range of career options.



## ABOUT THE COURSE

This course is positioned to be in line with industry goals and trends. As Singapore progresses towards becoming a Smart Nation, this course prepares you for the current and emerging needs encompassing the Internet of Things (IoT), automation, digital transformation, advanced manufacturing, assistive technology and a green environment. It provides you with a solid foundation in the principles and applications of smart electronic devices, circuits, programming, and systems, so as to equip you to meet the changing needs of the industry. Special emphasis is placed on embedded systems, hardware, software, data analytics, power electronics and system control. You will also develop effective communication, problem solving, collaborative and transcultural skills, as well as skills in project planning and management, to prepare you for the workplace.

To be better prepared for the advancements in technology, in your final year, you can choose to take one of the following Cluster Electives: Industrial Artificial Intelligence, Avionics, Intralogistics & Cybersecurity, Robotics, Semiconductor Technology, Sustainability Engineering or Advanced Skills Practices. Alternatively, you can take on the university pathway programme or Year Long Internship.



## CAREER PROSPECTS

Many of the world's leading electronics and semiconductor manufacturers are based in Singapore, providing technological solutions to industries globally, and generating new products, applications and markets.

You will have excellent and flexible career prospects in the smart electronics systems, semiconductor, aerospace, robotics & automation, land transport, bio-pharmaceuticals, energy & power/chemicals, healthcare, telecommunications, instrumentation & control, computing, retail and logistic industries. Your job areas may include product design, development & testing, process improvement, data analysis, IoT/System Integration, automation/robotics, maintenance, marketing and sales. You can also look forward to career opportunities in the various industries that make use of applied electronics, such as the aerospace, semiconductor, robotics & automation, land transportation, green technology, as well as the biomedical and pharmaceutical industries.

## COURSE STRUCTURE

### YEAR 1

CEP

#### ► Semester 1

- Circuit Analysis
- Computer Programming for Problem Solving
- Digital Fundamentals 1
- Engineering Mathematics 1
- Current Issues & Critical Thinking
- Leadership Fundamentals
- Sports & Wellness

#### ► Semester 2

- Digital Fundamentals 2
- Electronic Devices & Circuits
- Electronic Prototyping
- Engineering Mathematics 2
- Engineering Physics
- Career Readiness
- Global Studies
- Innovation & Entrepreneurship

### YEAR 2

#### ► Semester 1

- Data Visualisation & Analytics
- Digital Sensors & Integrated Circuit Applications
- Engineering Mathematics 3
- Microcontroller Applications
- Printed Circuit Board Design
- Effective Communication
- Leadership in Action
- Sustainability & Climate Action/Guided Learning

#### ► Semester 2

- Advanced Electronics & Communications
- Circuits & Control Systems
- Integrated Project
- Power Electronics & Drives
- Professional Communication

### YEAR 3

#### ► Semester 1

- Major Project
- Elective Cluster Subject 1
- Elective Cluster Subject 2
- Career Management

#### ► Semester 2

- Student Internship Programme

#### Cluster Electives:

- Industrial Artificial Intelligence
  - Industrial IOT Analytics
  - Edge Computing and Machine Learning
- Avionics
  - Avionic Systems
  - Aircraft Digital Systems
- Semiconductor Technology
  - IC Process Integration
  - Cleanroom Equipment and Technology
- Robotics
  - Robotics and Automation
  - Smart Manufacturing System
- Intralogistics and Cybersecurity
  - IOT Security
  - Distribution Centre Management
- Sustainability in Engineering (choose 2)
  - Solar Photovoltaic Technology and Leasing
  - Green Urban Transportation and Energy Storage
  - Renewable Energy Technologies
  - Life Cycle Analysis
- Structured Work-Based Learning
  - Work-Based Learning
- Advanced Engineering Skills
  - Advanced Skills Practices
- SUTD Pathway Programme
  - Modelling and Analysis
  - Physical World
  - Computational Thinking for Design
  - Social Science: Understanding Behaviour, Culture & Society

# DIPLOMA IN MECHATRONICS

In an era that increasingly values productivity, engineering employers favour graduates with knowledge of both mechanical engineering and electronics, and their ability to integrate them with intelligent control systems. Mechatronics empowers students to blend creativity with technical prowess, fostering innovation and problem-solving skills.



## ABOUT THE COURSE

Industry 4.0 is transforming the modern workplace. From the basic tenets of engineering to cutting-edge technology, this course prepares you for the new era of advanced manufacturing where humans, machines, and systems communicate and collaborate as one.

Get hands-on training working on real-world industry projects at our TP Advanced Manufacturing Centre (TP-AMC) and the Digital Fabrication & Additive Manufacturing Centre (DFAMC). Our rigorous curriculum will also shape your critical thinking and problem-solving skills and develop you into a versatile professional ready for the workforce.

In your final year, you can choose from elective clusters in key areas of technology: 3D Printing, Advanced Manufacturing, Advanced Engineering Skills, Aerospace Systems, Intralogistics & Cybersecurity, Sustainability in Engineering and Semiconductor Technology. You can also choose a “through-train” University Pathway Programme to secure a university place or a Structured Work-Based Learning for a year-long internship in your 3rd year at TP.



## CAREER PROSPECTS

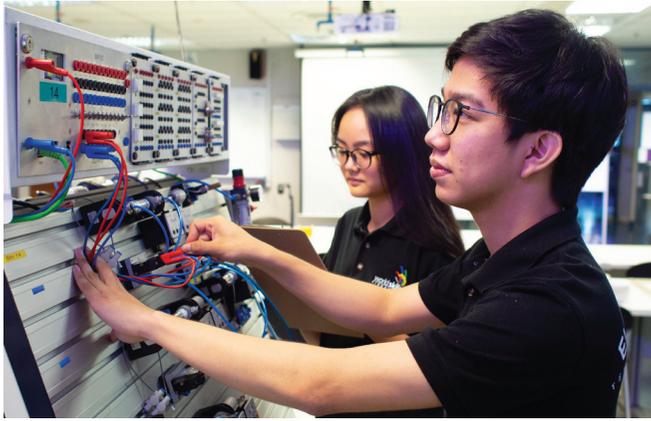
With the increasing convergence of Operational Technology (OT) and Information Technology (IT) that comes with today’s Industry 4.0 transformation, you will need to ensure that you can embrace new technologies and master the right skill-sets to become future-ready in advanced manufacturing.

The course is well positioned and recognised in multiple sectors under the SkillsFuture Industry Framework. You can excel in diverse advanced manufacturing sectors ranging from electronics, aerospace, precision engineering, food manufacturing, public transport, to semiconductor fabrication and pharmaceutical processing.

After getting this Mechatronics diploma, you may take a 12-month SkillsFuture Work-Study Post-Diploma Programme, called the Specialist Diploma in Robotics & Automation, fully sponsored while you work in one of various companies on the scheme. You get a sign-on bonus too! Conducted by TP, this specialist diploma will enhance your job prospects and allow you to upgrade your skills in advanced manufacturing.

Potential jobs include:

- Aerospace Technologists
- Associate Engineers / Application Engineers
- Automation Engineers / Engineering Assistants
- Equipment / Maintenance / Service / Test Engineers
- Ground Services Officers / Ramp Operators
- Process Control Engineers
- Manufacturing / Mechanical / Product Engineers
- Research & Development Specialists
- Robot Coordinators
- Technical Sale Engineers / Procurement Specialists



## COURSE STRUCTURE

### YEAR 1

CEP

#### ► Semester 1

- Circuit Analysis
- Computer Programming for Problem Solving
- Digital Fundamentals 1
- Engineering Mathematics 1
- Current Issues & Critical Thinking
- Leadership Fundamentals
- Sports & Wellness

#### ► Semester 2

- Digital Fundamentals 2
- Electronic Devices & Circuits
- Electronic Prototyping
- Engineering Mathematics 2
- Engineering Physics
- Career Readiness
- Global Studies
- Innovation & Entrepreneurship

### YEAR 2

#### ► Semester 1

- Data Visualisation and Analytics
- Engineering Drawing
- Engineering Mathematics 3
- Introduction to Smart Automation
- Statics and Strength of Materials
- Sustainability & Climate Action/Guided Learning
- Leadership in Action
- Effective Communication

#### ► Semester 2

- Machining Technology
- Principles of Dynamics
- Robotics and Automation
- Integrated Project
- Professional Communication

### YEAR 3

#### ► Semester 1

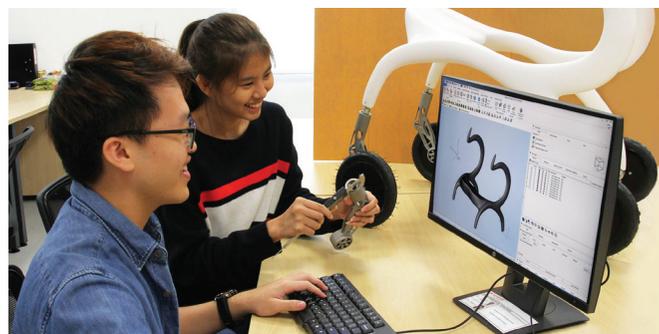
- Major Project
- Elective Cluster Subject 1
- Elective Cluster Subject 2
- Career Management

#### ► Semester 2

- Student Internship Programme

#### Cluster Electives:

- 3D Printing
  - CAD and Additive Manufacturing
  - Advanced CAD and Simulation
- Advanced Manufacturing
  - Smart Manufacturing System
  - Machine Vision and Pattern Recognition
- Semiconductor Technology
  - Cleanroom Equipment and Technology
  - IC Process Integration
- Intralogistics and Cybersecurity
  - Distribution Centre Management
  - IOT Security
- Aerospace Systems
  - Gas Turbine Engine
  - Thermodynamics
- Sustainability in Engineering (choose 2)
  - Solar Photovoltaic Technology and Leasing
  - Green Urban Transportation and Energy Storage
  - Renewable Energy Technologies
  - Life Cycle Analysis
- Structured Work-Based Learning
  - Work-Based Learning
- Advanced Engineering Skills
  - Advanced Skills Practices
- SUTD Pathway Programme
  - Modelling and Analysis
  - Physical World
  - Computational Thinking for Design
  - Social Science: Understanding Behaviour, Culture & Society



# SCHOOL OF ENGINEERING

## FULL-TIME DIPLOMA COURSES

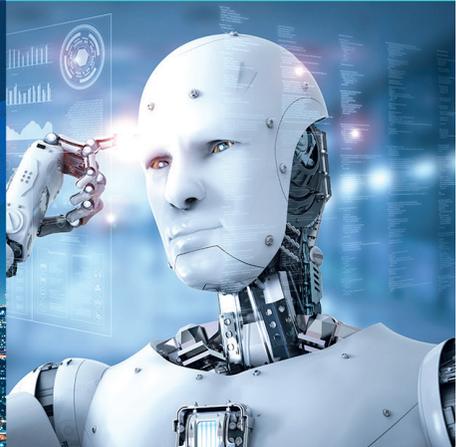
Our School currently offers 10 full-time diploma courses and a common entry programme:

- Aerospace Electronics (T50)
- Aerospace Engineering (T51)
- Architectural Technology and Building Services (T29)
- Aviation Management (T04)
- Biomedical Engineering (T38)
- Business Process & Systems Engineering (T43)
- Computer Engineering (T13)
- Electronics (T65)
- Integrated Facilities Management (T28)
- Mechatronics (T66)
- Common Engineering Programme (T56)\*

\* Students in Common Engineering Programme will then join one of the 7 diploma courses.

### COURSES BY INDUSTRY RELEVANCE

At a glance, the table below shows how our courses support the industries such as Aviation & Aerospace, Built Environment and Engineering in general.

► Aviation & Aerospace	► Built Environment	► Engineering
<ul style="list-style-type: none"> <li>• Aerospace Electronics</li> <li>• Aerospace Engineering</li> <li>• Aviation Management</li> </ul>	<ul style="list-style-type: none"> <li>• Architectural Technology &amp; Building Services</li> <li>• Integrated Facilities Management</li> </ul>	<ul style="list-style-type: none"> <li>• Biomedical Engineering</li> <li>• Business Process &amp; Systems Engineering</li> <li>• Computer Engineering</li> <li>• Electronics</li> <li>• Mechatronics</li> </ul>
		

# Get yourself future-ready while studying for a Diploma @ TP!



## Join the **TP-SUTD Pathway Programme!**

Jointly administered by Temasek Polytechnic (TP) in partnership with Singapore University of Technology and Design (SUTD), the TP-SUTD Pathway Programme (PP), allows students who enrol in TP courses to take modules taught by SUTD while studying for your diploma, and to

earn credits which are recognised for degree programmes offered by SUTD.

By taking SUTD modules in your final semester at TP, alongside first-year SUTD students, you can complete your SUTD degree one year ahead of your peers!



### Who is Eligible?

All students from the following courses:

- Diploma in Biomedical Engineering (BME)
- Diploma in Computer Engineering (CEN)
- Diploma in Chemical Engineering (CHE)
- Diploma in Electronics (ELN)
- Diploma in Mechatronics (MTN)
- Diploma in Food, Nutrition & Culinary Science (FNC)
- Diploma in Medical Biotechnology (MBT)
- Diploma in Pharmaceutical Science (PHS)
- Diploma in Veterinary Technology (VET)

### Application & Selection Criteria

- Students can apply to the Pathway Programme after a briefing in Year-2 Semester-1
- Selection of students will be by merit and interview
- The PP programme will start in Year-2 Semester-2

### What are the Benefits?

- Shortens the time to get from diploma to degree to work
- Gets an immersion of university life during your diploma studies
- Gains conditional admission to SUTD after TP Year-2 Semester-2

### Any Scholarships?

Yes, PP students can apply for SUTD undergraduate scholarships during Term 1 at SUTD.\*

### Matriculation to SUTD

PP students will be matriculated to SUTD's Term 2 directly after they have completed their TP diploma course requirements and upon meeting SUTD's Term 1 course requirements.

*\* Scholarship application outcome will only be known in Term 2.*

## ENTRY REQUIREMENTS

5 GCE 'O' Level subjects comprising:

English Language (EL 1)	(Grades 1-7)
Mathematics (E or A Maths)	(Grades 1-6)
One of the following subjects #	(Grades 1-6)
Any two other subjects (excluding CCA)	

#*Biology, Biotechnology, Chemistry, Combined Science, Computing/Computer Studies, Design & Technology, Electronics/Fundamentals of Electronics, Physics/Engineering Science, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry)/Physical Science.*

## SCHOLARSHIP

To encourage every student to put in effort once they are in our School, as well as to give every student a fair chance to earn the scholarship, 40 Temasek Polytechnic Scholarships (Engineering) are awarded each year primarily based on the students' performance and leadership potential demonstrated in the first semester at TP.

Valued at \$3,000 per year, the scholarship is bond-free and renewable for the subsequent 2 years of study. Scholars will be sponsored for an Overseas Experience Programme and they will have a chance to participate in the Temasek LEADership Programme.

## TEMASEK LEADERSHIP PROGRAMME

Students who take part in this programme will embark on an exciting journey of self-discovery and holistic development. The programme aims to groom students into leaders with vision, character and heart.

## ENGENIUS PROGRAMME

For students who wish to achieve more, you can sign up for additional engineering modules, take part in projects carried out at our Centres of Excellence, and participate in various prestigious competitions, such as the WorldSkills Singapore event.

## CCA

TP is an exciting hub for sports, student-led activities, art and cultural performances, project showcases and even entrepreneurial activities. Join the activities to enrich your experience!

## OVERSEAS TRIPS

You will have opportunities to go overseas for a study trip, an internship stint or a community project. You can also take part in the Youth Expedition Project and other programmes to learn more about the communities in the region. The exposure will broaden your perspective of the region and the world.

## SKILLSFUTURE

On joining the work force, you will have much to learn on-the-job. You can then build up your capability and competency through professional programmes and Continuing Education & Training (CET) courses. You can also consider Earn and Learn Programmes (ELP) that some companies offer.

## FURTHER STUDIES

Our graduates are granted advanced standing by many local and overseas universities. The National University of Singapore (NUS) and Nanyang Technological University (NTU) grant module exemptions to our graduates applying to relevant courses.

The Singapore Management University (SMU), Singapore University of Technology & Design (SUTD), Singapore University of Social Sciences (SUSS) and the Singapore Institute of Technology (SIT), also recognise our diplomas for admission into their degree programmes.

### SCHOOL OF ENGINEERING Temasek Polytechnic

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