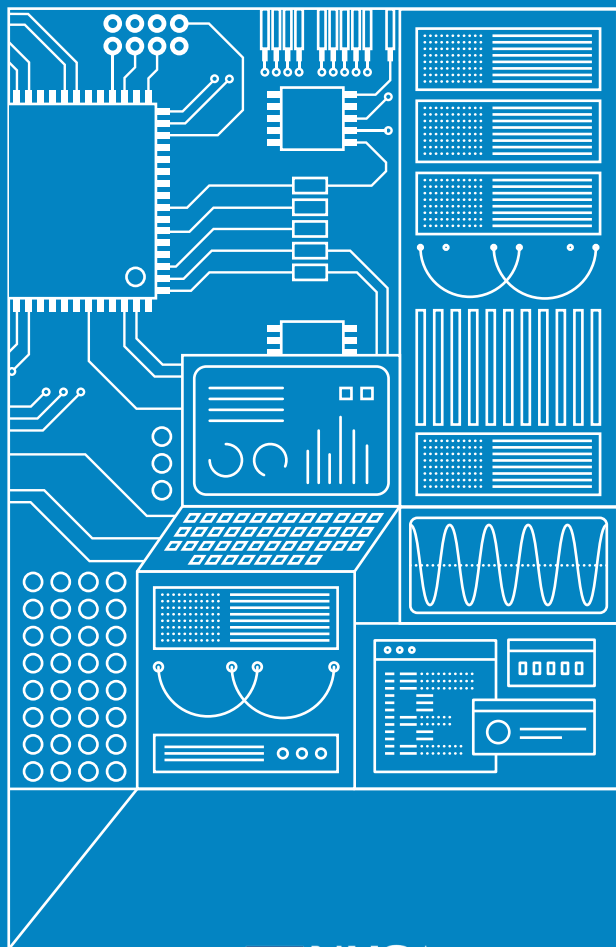


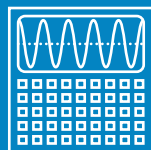


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National University
of Singapore

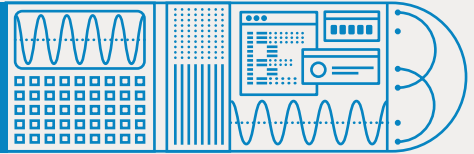
College of Design
and Engineering

COMPUTER ENGINEERING

BACHELOR'S DEGREE
PROGRAMME



Designing Intelligence, Transforming the Future



What Will I Learn?

At Computer Engineering (CEG), offered jointly by the Electrical and Computer Engineering (ECE) Department and the School of Computing, you will acquire a strong foundation in both hardware and software, as well as how they interact to create modern computing systems. The programme spans a wide array of topics, enabling you to explore areas such as:



Computer Architecture and Hardware Design

You'll learn how computer systems are designed, including microprocessors, memory systems, and embedded systems, as well as how hardware and software interact.



Digital Logic and Systems Design

This includes learning about digital circuits, logic gates, and how digital systems are implemented in hardware.



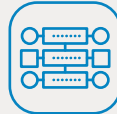
Software Development

You'll acquire problem-solving and systems design skills using programming languages like C, C++, Python, and Java.



Operating Systems

You'll explore how operating systems manage hardware resources, enable multitasking, and support software applications.



Data Structures and Algorithms

You'll develop the ability to design efficient algorithms and data structures, which are crucial for solving computational problems and optimising software performance.



Networking and Communications

You'll have a chance to explore cutting-edge topics such as computer networks, network protocols, wireless communications, and quantum communications.



Embedded Systems

This area covers the integration of computing into everyday devices, focusing on systems design for performance, power efficiency, and real-time processing.



Artificial Intelligence and Machine Learning

You'll explore foundational AI concepts, algorithms, and their applications in areas like robotics, data analysis, and smart systems.



Cybersecurity

You'll study secure computing practices, cryptography, and methods for protecting computer systems and data from threats.



Digital Signal Processing

This involves manipulating signals such as audio, video, and sensor data, crucial for fields like multimedia, telecommunications, and sensor networks.



Practical Experience

The curriculum offers opportunities for hands-on learning through lab work, projects, internships, and industry collaborations, allowing you to apply theoretical knowledge to real-world challenges.



Capstone Projects

You'll work on multidisciplinary projects that require innovative solutions, often in collaboration with industry partners, giving you exposure to practical applications of computer engineering concepts.

Why Choose Computer Engineering?

In a world where technology is integral to every aspect of our lives, the CEG programme equips graduates with the skills needed to design sophisticated computing systems for a smarter world.

The programme bridges the gap between computer science and electrical engineering, offering a balanced education that encompasses both software design and hardware/software integration. It prepares students to innovate in a variety of fields, from creating advanced, intelligent devices to developing the networked electronic systems and industrial controls that drive modern economies.

Career Prospects

CEG graduates enjoy a wide array of career opportunities, not only in the IT industry but also in sectors such as finance, government, healthcare and more. Past graduate employment surveys have consistently shown that computer engineers have some of the highest employment rates and best starting pay among all graduates.

Career Paths include Roles in:

Big Tech: Amazon, Apple, Google, Meta, Microsoft

Consumer Business: Dyson, Procter & Gamble

Finance & Investment: DBS, GIC, Goldman Sachs, VISA, Barclays Capital

Government Sector: DSO National Laboratories, DSTA, GovTech, LTA

Infocommunications: M1, Singtel, Starhub, Vodafone

IT Consulting: Accenture

Logistics & Supply Chain Management: DHL, FedEx, PSA

Media & Digital Entertainment: Mediacorp, Sony Singapore

Medical Technology & Healthcare: Medtronic, Philips Healthcare, Synapse

Online Commerce: Shopee, Amazon Web Services



Programme Overview

Build Your Own Degree

The CEG programme offers an innovative curriculum allowing students flexibility to tailor their education. Students will read a total of 160 units (or the equivalent of 40 courses), consisting of 40 units of Common Curriculum courses, 80 units of major requirements, and 40 units of Unrestricted Electives (UE), designed with input from industry partners.

Unrestricted Electives (UE): Within and Beyond Computer Engineering

The 40 units of UE enable students to deepen their knowledge within CEG or explore new areas, with options to pursue a second major, minor, specialisation or a combination thereof, fitting seamlessly into their degree without extending graduation time.

Specialisations within CEG include:

- Advanced Electronics
- Industry 4.0
- Internet of Things (IoT)
- Robotics
- Space Technology

Alternatively, students can broaden their horizons with over 100 second majors and minors:

Second major in:

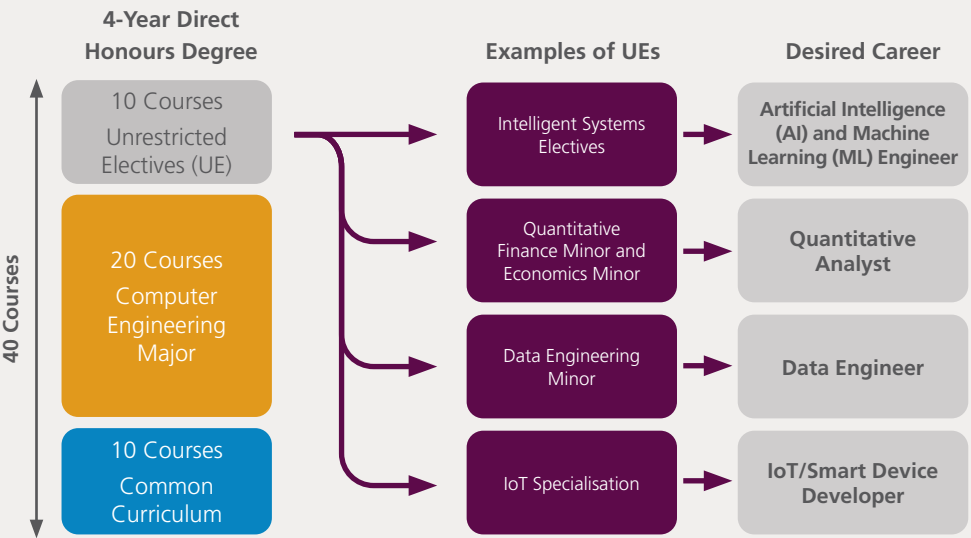
- Innovation & Design (iDP)
- Management
- Public Health
- Systems Engineering
- Sustainable Urban Development

Minor in:

- Data Engineering
- Entrepreneurship
- Management
- Public Health

Additional learning opportunities:

- **Enhancement Courses:** Experiential learning opportunities for innovation, teaching and research within CDE.
- **Design Your Own Course (DYOC):** Offers students the freedom to decide their learning content, method and mentors for up to eight units.
- **Career Catalyst:** A foundational course preparing students for internships and careers.



Student Projects

Bumblebee: A Multidisciplinary Student-Led Robotics Team

Comprising students mainly from Computer Engineering, Electrical Engineering, and Mechanical Engineering, the team designs and builds autonomous maritime vehicles capable of navigating underwater and on the water surface to perform complex tasks autonomously.

Computer Engineering students focus on embedded systems, programming real-time processors, and developing algorithms for



intelligent decision-making and autonomous navigation. They contribute to the design of the software architecture, ensuring seamless interaction between hardware and software, and optimise the integration of AI and machine learning models to enhance the vehicles' adaptability to changing environments.

yaR

Sparsh

Bachelor of Engineering (Computer Engineering), Class of 2026

Manas Bam

Bachelor of Computing (Computer Science), Class of 2026

yaR is an innovative wearable pendant designed to assist the visually impaired in navigating and managing daily tasks with greater independence. By combining advanced technology with user-centric design, yaR enhances accessibility and confidence for its users. This groundbreaking device earned the team the title of National Runners-up at the prestigious James Dyson Award 2024.



ARIELLE

(AR-based Independent and Experiential Language Learner on the Edge)

Man Juncheng, Hong Lin Shang

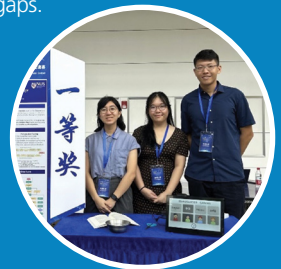
Bachelor of Engineering (Computer Engineering), Class of 2025

Ellia Tio Shu Yi

Bachelor of Engineering (Electrical Engineering), Class of 2025

The team developed an AI-driven English language learning device for rural children, utilising Augmented Reality, Computer Vision, ASR, and Edge Computing. Their innovative solution showcases the power of technology in bridging educational gaps.

The project won 1st place at the 2024 Intel Cup Undergraduate Embedded Systems Design Contest.



Profiles of Current Students

Vaibhav Dileep Pillai

Bachelor of Engineering (Computer Engineering), Class of 2026, NUS Mars Rover Team Lead

Bridging Theory and Practice with ECE and iDP

"The synergy between Computer Engineering at ECE and the Innovation & Design Programme (iDP) offers an ideal blend of foundational knowledge and practical application. Through Computer Engineering, I've built a strong understanding of core concepts, reinforced by hands-on projects. Meanwhile, iDP provides the platform and resources to tackle larger, real-world challenges. As the Deputy Team Lead and Software Lead for the NUS Mars Rover Team, I apply these skills to design, build, and refine the rover for competition readiness. This combination equips me with the expertise to seamlessly connect theory and practice, empowering me to confidently address real-world challenges."



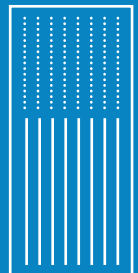
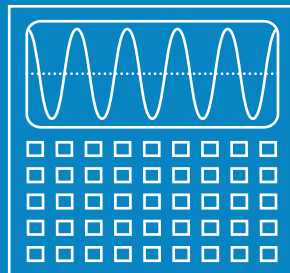
Barbara Chong

Bachelor of Engineering (Computer Engineering), Class of 2026, E-Scholar



A Rewarding Journey with CEG

"My time at CEG has been both enriching and transformative. Courses like Engineering Principles and Practice and Real-Time Operating Systems honed my problem-solving skills, encouraging me to tackle hardware and software challenges in robotics from multiple angles. Software courses equipped me with essential skills in logical thinking, project management, and teamwork—crucial for collaboration in real-world applications. Beyond academics, the supportive and welcoming ECE community, including peers and faculty, has been instrumental in my growth, offering guidance and fostering connections. My journey here has been incredibly fulfilling, and I'm truly grateful to have chosen CEG!"



Profiles of Alumni

Leong Wei Lun, Alfred

Bachelor of Engineering (Computer Engineering),
Valedictorian of Class of 2024

Transformative Experiences with CEG

"The CEG programme at NUS has been a truly transformative journey. Coming from a Computer Engineering background, I greatly appreciated the hands-on experience of building hardware projects and collaborating in team environments. A highlight of my time here was being part of the Engineering Scholars Programme, where a supportive community and dedicated mentorship fostered both personal and professional growth. The programme's flexibility allowed me to explore diverse fields such as software engineering, hardware acceleration, and machine learning, ultimately helping me discover my passion and define my career aspirations. Inspired by these experiences, I'm excited to be pursuing a Master's in Computer Engineering at NUS!"



Serena Wu

Bachelor of Engineering (Computer Engineering),
Class of 2024

Innovating at the Intersection of Hardware and Software

"Computer Engineering appealed to me for its seamless integration of hardware and software, equipping me with versatile technical and problem-solving skills. Through projects like our Capstone, where we developed a two-player combat game using custom AI hardware and Unity, and Interaction Design, which explored human-computer interaction methods, I gained hands-on experience that bridged theory and application. These opportunities honed my technical expertise, collaboration, and critical-thinking abilities, laying a strong foundation for my role as a software engineer."



Admission Requirements

Singapore-Cambridge GCE 'A' Level

A pass in H2 Mathematics or Further Mathematics; AND
A pass in H2 Physics or Chemistry or Computing.

Polytechnic Diploma

An accredited diploma.

International Baccalaureate (IB) Diploma

A pass in HL Mathematics: Analysis and Approaches; AND
A pass in HL Physics or Chemistry or Computer Science.

NUS High School Diploma

A good major GPA in Mathematics; AND
A good major GPA in Physics or Chemistry.

International Qualifications

Applicants presenting international qualifications may
apply with equivalent high school results.



Contact

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☎ +65 6516 2109
✉ askCEG@nus.edu.sg
