NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

College of Computing and Data Science

ARTIFICIAL INTELLIGENCE AND SOCIETY | DATA SCIENCE AND ARTIFICIAL INTELLIGENCE | COMPUTER SCIENCE | COMPUTER ENGINEERING

MOULDING THE FUTURE OF TECHNOLOGY
FOSTERING LEADERS, THINKERS, AND INNOVATORS

Be at the forefront of the AI revolution at the College of Computing and Data Science (CCDS). Be ready to challenge yourself to explore bold ideas and solve complex problems for the greater good. Be the innovator, the visionary, and the leader who shapes a better, more equitable future through technology.

CCDS empowers you to drive transformative change through experiential learning, global collaborations, and cutting-edge research.

⊛ **Join us to redefine the future.**

DISCOVER THE
CCDS DIFFERENCE

GLOBAL RECOGNITION FOR EDUCATIONAL EXCELLENCE

**U.S. News & World Report
Best Global Universities 2024**

#2
for Artificial Intelligence

#2
for Computer Science

**QS World University
Rankings 2024**

8th
for Data Science and Artificial Intelligence

9th
for Computer Science and Information Systems

**TOP
20**
in Computing on
**Times Higher Education
Rankings 2025**

**TOP
10**
Best AI And Data Science Undergraduate Programmes on
Forbes' 2021

WORLD-CLASS LEARNING EXPERIENCE

Access exceptional research and learning facilities.

Stay ahead with a cutting-edge, industry-relevant curriculum.

Engage in valuable experiential learning through competitions and hands-on projects.

Learn from internationally renowned experts in the field.

Gain real-world experience with professional internships and attachments.

FORGE YOUR FUTURE WITH CCDS UNDERGRADUATE DEGREES

The CCDS journey began over 35 years ago as a pioneer in computing education in Singapore. Today, we offer innovative programmes like AI & Society, preparing future AI practitioners to create impactful, socially responsible technology. Our Turing AI Scholars Programme is designed to cultivate exceptional talent, shaping visionary leaders who will drive the future of AI. CCDS will continue to evolve to meet individual and societal needs.

FULL-TIME UNDERGRADUATE DEGREES

CCDS offers four full-time undergraduate degrees, each with a distinct focus yet firmly grounded in core computing principles. These programmes provide a rigorous foundation in computational theory, system design, and emerging technologies, equipping students with the expertise to excel in a rapidly evolving digital landscape.

HARDWARE	SYSTEMS	APPLICATIONS	USERS

ARTIFICIAL INTELLIGENCE & SOCIETY (AISC) - 2024

DATA SCIENCE & ARTIFICIAL INTELLIGENCE (DSAI) - 2018

COMPUTER SCIENCE (CSC) - 2004

COMPUTER ENGINEERING (CE) - 1989

BACHELOR OF ENGINEERING

BACHELOR OF COMPUTING

PART-TIME UNDERGRADUATE DEGREES

CCDS also offers a Bachelor of Technology in Computing, a part-time SkillsFuture Work-Study Degree (WSDeg) for those who may already be working or who may wish to seek work experience before embarking of their undergraduate studies. Developed for the working professional in mind, the programme is designed to minimise disruptions to your work commitments.

FORGE YOUR FUTURE WITH CCDS

TURING AI SCHOLARS PROGRAMME

DEGREE PROGRAMMES

GLOBAL EXCHANGE

INTERNSHIPS

DOUBLE DEGREE PROGRAMMES

PART-TIME DEGREE PROGRAMME

TURING AI SCHOLARS PROGRAMME (TAISP)

TAISP: SHAPE THE FUTURE OF AI

The Turing AI Scholars Programme (TAISP) is for exceptional individuals passionate about advancing AI. Designed for students pursuing the Computer Science, Data Science & AI, and AI & Society degrees, TAISP equips scholars with cutting-edge AI expertise and global exposure. Graduates will be primed for groundbreaking careers in AI research and industry, advancing AI research and developing cutting-edge solutions to drive meaningful global progress.

TAISP: EMPOWERING EXCEPTIONAL TALENT

Masterclasses with Experts:
Gain insights into cutting-edge AI trends from renowned researchers and industry leaders.

Mentorship and Research Opportunities (Year 2):
Personalised one-on-one guidance from top AI specialists, including NTU professors, renowned researchers, and global industry experts.

Global Exposure (Year 3):
Study at a top university and intern with an AI industry leader, each for a semester. Broaden perspectives, build a global network, and boost employability.

Capstone Project (Year 4):
Design an AI solution for a real-world problem and make a lasting impact on society.

Comprehensive Scholarship:
Full financial support covering tuition, living expenses, overseas attachment, travel grant, and computer allowance, ensuring a seamless global learning experience.

TAISP: YOUR JOURNEY BEGINS HERE

- Open to all nationalities.
- Enrolled in one of the following:
  - Computer Science (CSC),
  - Data Science & AI (DSAI), or
  - AI & Society (AISC).
- Hold outstanding qualifications from any of the following:
  - Singapore-Cambridge GCE A-Levels
  - Polytechnic Diploma
  - NUS High School (NUSHS) Diploma
  - International Baccalaureate (IB) Diploma, or equivalent Year 12 qualifications.
- Excellent co-curricular achievements.
- Demonstrated leadership potential.
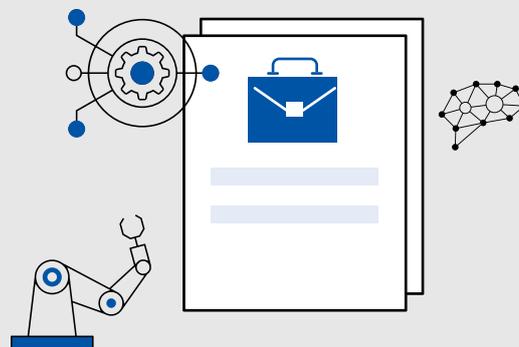
TAISP: CAREER PROSPECTS

- AI/ML Engineer
- AI Scientist
- AI Policy Advisor
- AI Consultant/ Strategist
- AI Ethics/ Safety Compliance Officer

TAISP: What has been your experience?

Yong Tze Fon Timothy
Class of 2028

One of TAISP's unique features is the masterclasses taught by external professors from renowned universities. These masterclasses greatly enrich our learning and diversify our understanding of AI and adjacent fields. For instance, our first masterclass was "Turing on Computability and Intelligence" taught by Professor Peter Milican from the University of Oxford. The masterclass was a very eye-opening experience as we got to peer into the mind of arguably the first person to invent the idea of a computer, Alan Turing.

Prof. Milican's rare background in both Philosophy and Computer Science enabled him to provide a fascinating perspective on the intersection of these two ostensibly unrelated fields, challenging us to consider the ethical implications of AI. These masterclasses serve to establish deep theoretical knowledge in us and challenge us to think critically beyond just learning practical programming skills, developing us into holistic practitioners of AI.

FORGE YOUR FUTURE WITH CCDS

TURING AI SCHOLARS PROGRAMME

DEGREE PROGRAMMES

GLOBAL EXCHANGE

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PART-TIME DEGREE PROGRAMME

BACHELOR OF COMPUTING (HONS) IN
AI AND SOCIETY (AISC)

OVERVIEW

The AI and Society programme is designed for forward-thinkers eager to shape the future of technology. This unique degree explores the intersection of AI and societal impact, focusing on responsible AI development and implementation. Students gain cutting-edge technical skills, ethical awareness, and hands-on experience through projects and internships. With an interdisciplinary approach, this programme equips future leaders to innovate, address global challenges, and drive meaningful change in an AI-powered world.

AI & SOCIAL GOOD: What is your biggest takeaway?

On top of learning the technical aspects of AI and computer science, this course also provides an opportunity to learn about the intricacies of implementing AI into solving social problems. I particularly enjoy the 'AI for social good' module, which touches on the advantages and limitations of various AI systems, and the problems surrounding data sourcing, among other relevant issues regarding the application of AI solutions into daily problems. The tutorials are very interactive and provide insight into what kind of limitations of AI we might have to mitigate in the future at work.

Santhiyaa Senthilkumar
Class of 2028

CURRICULUM OVERVIEW

YEAR 1	YEAR 2	YEAR 3	YEAR 4

Foundational Modules in Data Science & AI
• Algorithm Design and Analysis
• Artificial Intelligence
• Data Structures & Algorithms
• Computational Thinking & Programming
• Machine Learning
• Neural Networks & Deep Learning
• Object Oriented Design & Programming
• Mathematics
  – Calculus
  – Discrete Maths
  – Linear Algebra for Scientists
  – Probability & Statistics for Computing
		Core AI Modules
		• Natural Language Processing
		• Computer Vision
		
		**Design Project:
		AI in Society**
			Core AI Module
			• Introduction to Generative AI
			
			**Responsible AI (RAI)
			Capstone Project**

Interdisciplinary Collaborative Core (ICC) Modules		**Professional Internship** (Semester 2)	
Essential Modules • AI for Social Good • AI for Society • Ethical AI		**Major Prescribed Electives (MPEs)*** Selected from the following groups of courses:	
		Technical Group • Intelligent Agents • Blockchain Technology • Large Language Models • Generative AI for Computer Vision • Deep Generative Models	**Society Group** • Person & Society • Law of IP & New Media • Social Entrepreneurship • Classical Social Theory • Principles of Economics • Fundamentals of Politics
Broadening & Deepening Electives (BDE) Students must complete **SIX** BDEs over the course of study.			

*Students must complete a total of **EIGHT** Major Prescribed Electives (MPEs), **TWO** in Year 3 and the remaining **SIX** in Year 4. Students must select at least **TWO** MPEs from each group of courses.

FORGE YOUR FUTURE WITH CCDS

TURING AI SCHOLARS PROGRAMME

DEGREE PROGRAMMES

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PART-TIME DEGREE PROGRAMME

BACHELOR OF COMPUTING (HONS) IN
AI AND SOCIETY (AISC)

PROGRAMME STRUCTURE

TOTAL: 131 Academic Units (AUs)			
Year of Study	**Major Requirements (81 AUs)**	**Interdisciplinary Collaborative Core Requirement (32 AUs)**	**Broadening & Deepening Electives (18 AUs)**
Year 1 Build a strong foundation in mathematics, computing fundamentals, and the principles of AI for social good.	• Introduction to Computational Thinking & Programming • Probability & Statistics for Computing • Linear Algebra for Scientists • Calculus • Data Structures & Algorithms • Discrete Maths • Object Oriented Design & Programming • AI for Social Good	• Inquiry & Communication in an Interdisciplinary World • Navigating the Digital World • Ethics & Civics in a Multicultural World • Healthy Living & Well-being	• BDE 1
Year 2 Explore advanced topics in AI and responsible AI, delving into ethical frameworks and societal implications.	• Algorithm design and analysis • Artificial Intelligence • Ethical AI • Machine Learning • Neural Networks & Deep Learning • AI for Society	• Sustainability: Society Economy & Environment • Career & Innovative Enterprise for the Future World • Communication Across the Sciences • Science & Technology for Humanity	• BDE 2 & 3
Year 3 Deepen expertise in AI applications while honing practical skills in responsible AI implementation.	• Natural Language Processing • AI for Computer Vision • Group Design Project - AI in Society • MPE 1 & 2 • Professional Internship		• BDE 4
Year 4 Pursue flexible specialisation pathways and complete a capstone project focused on Responsible AI (RAI).	• Introduction to Generative AI • RAI Capstone Project • MPE 3 – 8		• BDE 5 & 6

Undergraduate Programmes in AI, Computing, and Data Science

PATHWAYS

Students may also choose from over 40 Minor courses including:
- Business
- Environmental Management
- Entrepreneurship
- Health & Society
- International Trading

CAREER PROSPECTS

Graduates of the AISC programme are primed to excel in the rapidly growing AI market, meeting the demand for ethical AI specialists. Beyond traditional AI roles, they are uniquely equipped to lead in emerging fields of Responsible AI, driving innovation across diverse industries.

Key Career Opportunities:
- AI/ML Engineers
- AI Scientists
- AI Policy Advisors
- Ethical AI Consultants
- Responsible AI Strategist
- AI Ethics Compliance Officer

FORGE YOUR FUTURE WITH CCDS

TURING AI SCHOLARS PROGRAMME

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PART-TIME DEGREE PROGRAMME

BACHELOR OF COMPUTING (HONS) IN
DATA SCIENCE AND AI (DSAI)

OVERVIEW

The Data Science and Artificial Intelligence (DSAI) programme is designed to equip students with rigorous training in statistics and computer science. Jointly offered by CCDS and the School of Physical and Mathematical Sciences, this programme empowers visionaries to tackle society's most pressing challenges through innovative AI and data-driven solutions. Gain hands-on experience solving real-world problems across diverse fields, including healthcare, business, finance, environmental sustainability, and more.

CURRICULUM HIGHLIGHTS

Students will gain expertise in artificial intelligence, data science, and analytics, among others, to tackle real-world challenges. From developing intelligent systems and leveraging machine learning to mastering data pipelines and AI-driven analytics, students will develop a strong foundation in extracting meaningful insights from complex datasets as they drive innovation across industries.

Artificial Intelligence
- Explore problem formulation, state-space search, and human cognitive models in AI.
- Examine reinforcement learning, computational game theory, and classification techniques.
- Dive into robotics, NLP, intelligent agents, and applied AI systems across industries.

Data Science Fundamentals
- Learn to implement key components of a data science pipeline to solve real-world problems.
- Master data preparation, storage, modeling, analytics, and visualisation for effective decision-making.
- Explore the role of ethics, policies, and data security in responsible data science practices.

Data Analytics & Mining
- Learn to transform raw data into meaningful insights beyond traditional database methods.
- Leverage AI-driven techniques to analyse and interpret massive datasets.
- Develop solutions for large-scale data bottlenecks using advanced computational methods.

CURRICULUM OVERVIEW

YEAR 1	YEAR 2	YEAR 3	YEAR 4

Foundational Modules in Data Science & AI
• Algorithm Design & Analysis
• Computational Thinking & Programming
• Data Structures & Algorithms
• Software Engineering
• Mathematics
  - Linear Algebra & Calculus
  - Probability & Statistics
  - Discrete Mathematics
		Core
		• Machine Learning
		• Data Analytics & Mining
		• Calculus
		
		Professional Internship
		(Semester 2)
			Final Year Project

Interdisciplinary Collaborative Core (ICC) Modules		**Major Prescribed Electives (MPEs)*** Selected from over 20 courses including: • Applied Cryptography • Simulation Techniques in Finance • Social Media Mining	
Broadening & Deepening Electives (BDE) Students must complete **SEVEN** BDEs over the course of study.			

*Students must complete a total of **SIX** Major Prescribed Electives (MPEs), **TWO** in Year 3 and the remaining **FOUR** in Year 4.

DEVELOPING DATA PRODUCTS: What did you learn?

The course teaches us how to create a 'data product' and the different stages of developing a data product. Some examples of data products include self-driving cars, voice recognition on your phone or a social media application recommending new content. This course places emphasis on 'learning how to learn'. I find this course very beneficial as it offers a comprehensive overview of what developing a data product entails. I also had the opportunity to solve real-world industrial problems and see how they are done in practice.

Vincent Ribli
Class of 2022

FORGE YOUR FUTURE WITH CCDS

TURING AI SCHOLARS PROGRAMME

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DOUBLE DEGREE PROGRAMMES

PART-TIME DEGREE PROGRAMME

BACHELOR OF COMPUTING (HONS) IN
DATA SCIENCE AND AI (DSAI)

PROGRAMME STRUCTURE

TOTAL: 131 Academic Units (AUs)			
Year of Study	**Major Requirements (78 AUs)**	**Interdisciplinary Collaborative Core Requirement (32 AUs)**	**Broadening & Deepening Electives (21 AUs)**
Year 1 Build a strong foundation in mathematics, programming, and AI fundamentals.	• Introduction to Computational Thinking & Programming • Calculus • Discrete Mathematics • Data Structures & Algorithms • Software Engineering • Object Oriented Design & Programming	• Inquiry & Communication in an Interdisciplinary World • Navigating the Digital World • Ethics & Civics in a Multicultural World • Healthy Living & Well-being	• BDE 1 & 2
Year 2 Dive into advanced algorithms, software engineering, and statistical methods.	• Introduction to Databases • Algorithm Design & Analysis • Probability & Introduction to Statistics • Linear Algebra for Scientists • Artificial Intelligence • Data Science Fundamentals • Statistics • Data Analysis with Computer	• Sustainability: Society, Economy, & Environment • Career & Innovative Enterprise for the Future World • Communication Across Sciences • Science & Technology for Humanity	
Year 3 Master AI applications like machine learning and data analytics.	• Machine Learning • Data Analytics and Mining • Calculus III • MPE 1 & 2 • Professional Internship		• BDE 3
Year 4 Specialise through electives and complete a capstone or internship.	• Final Year Project • MPE 3 – 6		• BDE 4 - 7

PATHWAYS

Students have the option of pursuing a Minor with no significant increase in workload. They may choose from over 40 Minor courses, including:
- Business
- Environmental Management
- Entrepreneurship
- Health & Society
- International Trading

Students who wish to stretch themselves can either pursue a Double Degree or a Second Major, with a slight increase in workload.

DOUBLE DEGREE

Bachelor of Computing in Data Science and Artificial Intelligence + Bachelor of Accountancy

Offered in collaboration with Nanyang Business School (NBS).

SECOND MAJOR

Bachelor of Computing in DSAI & Sustainability

Students must fulfil a minimum of 30 AUs for the second major comprising compulsory courses, electives, and an interdisciplinary subject.

CAREER PROSPECTS

Graduates of the DSAI programme are equipped with advanced technical expertise and analytical skills, making them ideal for cutting-edge roles in AI, machine learning, and data-driven innovation. They are well positioned to lead in research, development, and strategic applications across diverse industries.

Key Career Opportunities:
- Machine Learning Engineer
- Data Scientist
- Research Scientist
- R&D Engineer
- Business Intelligence Developer
- Computer Vision Research Engineer
- Data Analyst
- Data Architect
- AI Engineer
- AI Scientist

FORGE YOUR FUTURE WITH CCDS

TURING AI SCHOLARS PROGRAMME

DEGREE PROGRAMMES

GLOBAL EXCHANGE

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DOUBLE DEGREE PROGRAMMES

PART-TIME DEGREE PROGRAMME

BACHELOR OF COMPUTING (HONS) IN
COMPUTER SCIENCE (CSC)

OVERVIEW

The Computer Science (CSC) programme provides rigorous training in software design, algorithms, and computing systems. Blending academic depth with practical experience, it empowers students to craft innovative solutions for complex challenges. With hands-on projects and industry exposure, graduates are poised to excel across diverse fields, including technology, business, and healthcare.

CURRICULUM HIGHLIGHTS

CSC students will develop core skills in cybersecurity, software development, and machine learning to build a strong foundation for success in the tech world.

Computer Security
- Identify and analyse vulnerabilities in computer systems and software.
- Explore the principles and interdisciplinary aspects of cybersecurity.
- Gain insight into modern operating system security mechanisms.
- Learn the fundamentals of computer system principles.

Software Engineering
- Master the software development lifecycle: design, implementation, testing, and improvement.
- Apply proven design patterns and testing techniques to ensure high-quality applications.
- Develop skills for systematic problem-solving in software projects.

Machine Learning
- Build predictive models using supervised learning methods.
- Explore and analyse data structures with unsupervised learning techniques.
- Train and deploy AI models to solve practical problems.
- Gain foundational knowledge of AI/ML principles and their real-world applications.

MACHINE LEARNING: What key skills did you gain?

→ **Okkar Min**
Class of 2022

I like that the course is application oriented. For instance, there was a group project which focused on the application of the AI/ ML techniques taught in the lectures. In addition, I was able to utilise the techniques learnt to 'train' my own AI/ML model within a month of taking this course.

As more organisations are looking into the adoption of AI/ML in their business processes, the ability to understand the pros and cons of different approaches taken by employing the AI/ML techniques to solve a particular business problem is very useful.
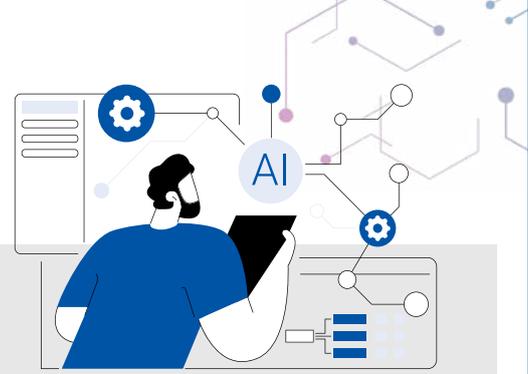
CURRICULUM OVERVIEW

YEAR 1	YEAR 2	YEAR 3	YEAR 4

Foundational Modules in Computer Science
• Algorithm Design & Analysis
• Automata, Computability & Complexity
• C & C++ Programming
• Computational Thinking & Programming
• Computer Network
• Computer Organisation & Architecture
• Databases
• Data Structures & Algorithms
• Digital Logic
• Object-Oriented Design and Programming
• Operating Systems
• Mathematics
  - Linear Algebra & Calculus
  - Probability & Statistics
  - Discrete Mathematics
		Capstone Project
		
		 Professional Internship
		(Semester 2)
			Final Year Project (Optional)

Interdisciplinary Collaborative Core (ICC) Modules			
Major Prescribed Electives (MPEs)* Selected from over 20 courses including: • Applied Cryptography • Simulation Techniques in Finance • Social Media Mining			
Broadening & Deepening Electives (BDE) Students must complete **SEVEN** BDEs over the course of study.			

*Students must complete a total of **NINE** Major Prescribed Electives (MPEs), **TWO** in Year 2, **TWO** in Year 3 and the remaining **FIVE** in Year 4.

FORGE YOUR FUTURE WITH CCDS

TURING AI SCHOLARS PROGRAMME

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PART-TIME DEGREE PROGRAMME

BACHELOR OF COMPUTING (HONS) IN
COMPUTER SCIENCE (CSC)

PROGRAMME STRUCTURE

TOTAL: 135 Academic Units (AUs)			
Year of Study	**Major Requirements (82 AUs)**	**Interdisciplinary Collaborative Core Requirement (32 AUs)**	**Broadening & Deepening Electives (21 AUs)**
Year 1 Build a strong foundation in mathematics, programming, and computational thinking.	• Introduction to Computational Thinking & Programming • Linear Algebra for Computing • Digital Logic • Discrete Mathematics • Computer Organisation & Architecture • Data Structures & Algorithms • C & C++ Programming • Probability & Statistics for Computing • Object Oriented Design and Programming	• Healthy Living & Well-being • Ethics & Civics in a Multicultural World • Inquiry & Communication in an Interdisciplinary World • Navigating the Digital World	
Year 2 Progress into algorithms, software engineering, and foundational computing concepts.	• Algorithm Design & Analysis • Operating Systems • Automata, Computability & Complexity • Software Engineering • Computer Network • Introduction to Databases • MPE 1 & 2	• Science & Technology for Humanity • Sustainability: Society, Economy, & Environment • Career & Innovative Enterprise for the Future World	• BDE 1
Year 3 Explore key topics like operating systems, database systems, and computer networks.	• Capstone Project • MPE 3 & 4 • Professional Internship	• Engineering Communication	• BDE 2 & 3
Year 4 Specialise through electives and complete a capstone project.	• Final Year Project • MPE 5 – 9		• BDE 4 – 7

PATHWAYS

Students pursuing the CSC programme have the option of pursuing a Specialisation or a Minor, with no significant increase in workload.

SPECIALISATIONS

Students may specialise in one of the following three areas:
- Artificial Intelligence
- Data Science
- Security

MINOR

Students may choose from over 40 Minor courses, including:
- Mathematics
- Business
- Entrepreneurship
- Health & Society
- International Trading

Students who wish to stretch themselves can either pursue a Double Degree or a Second Major, with a slight increase in workload

DOUBLE DEGREE*

Bachelor of Computing (Hons) in Computer Science + Bachelor of Business

Bachelor of Computing (Hons) in Computer Science + Bachelor of Social Sciences (Economics)

SECOND MAJOR

Students may choose from one of the following:
- Business
- Entrepreneurship
- Sustainability

*You may refer to programme details on page 26.

CAREER PROSPECTS

CSC graduates are equipped to lead in tech-driven industries, excelling in roles like software development, AI, and cybersecurity. With strong technical skills and hands-on experience, they are poised to drive innovation and transform sectors from technology to healthcare and finance.
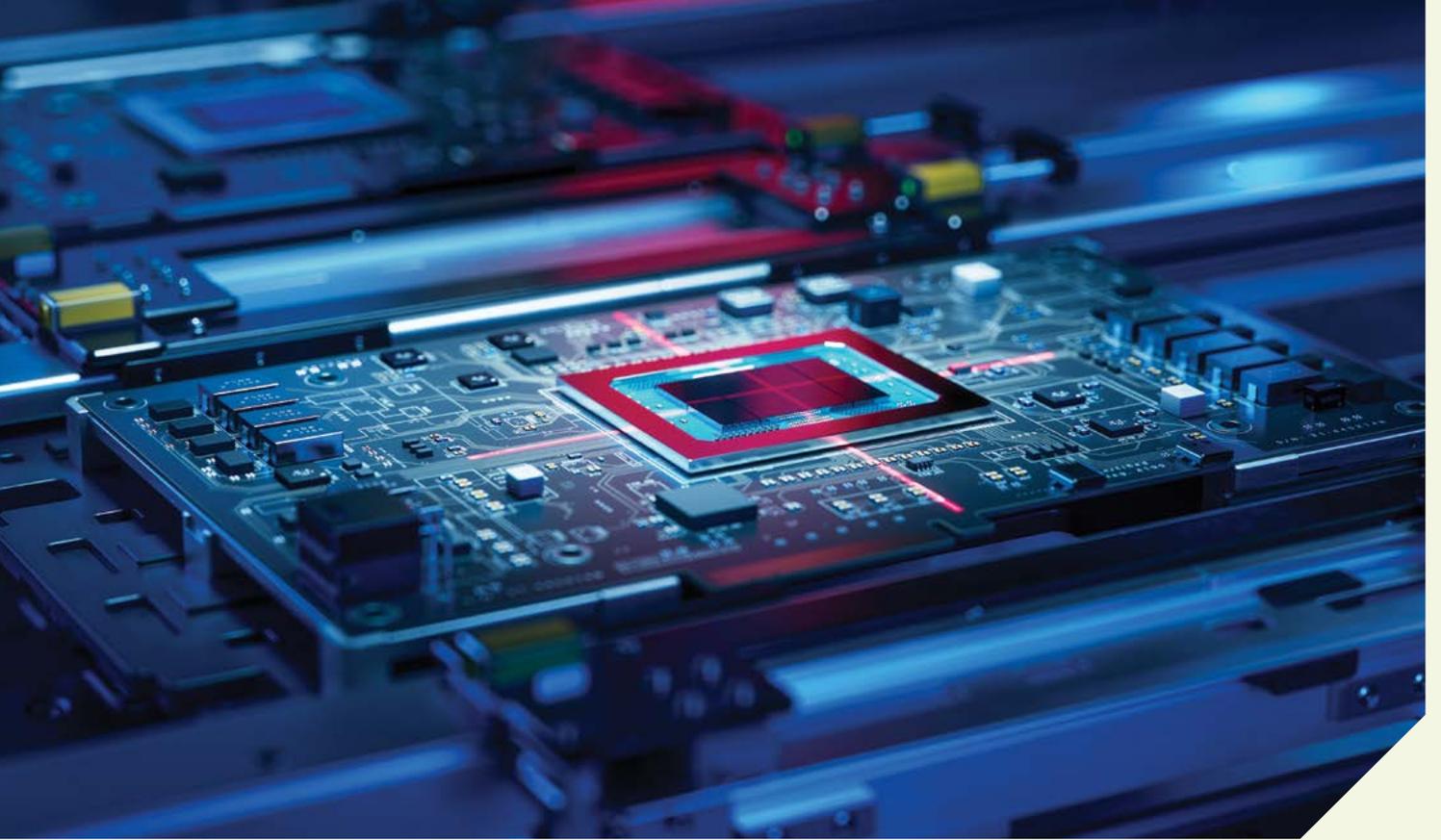
Job Roles
- Machine Learning Engineer
- Data Scientist
- Research Scientist
- R&D Engineer
- Business Intelligence Developer
- Computer Vision Research Engineer
- Data Analyst
- Data Architect
- AI Engineer
- AI Scientist

Industries
- Finance/ Financial Technology
- Software Development
- Technology
- Telecommunications
- Aerospace/ Aviation
- Electronics
- Oil & Gas/ Petrochemicals/ Specialty Chemicals

Companies
- Bank of America
- DBS Bank
- PayPal
- Adobe
- Amazon
- Apple
- Google
- HP
- Intel
- LinkedIn
- Meta
- Microsoft
- Singtel
- Boeing
- Singapore Airlines
- Nokia
- Samsung
- ExxonMobil

FORGE YOUR FUTURE WITH CCDS

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PART-TIME DEGREE PROGRAMME

BACHELOR OF ENGINEERING (HONS) IN
COMPUTER ENGINEERING (CE)

PROGRAMME OVERVIEW

The Computer Engineering programme at CCDS provides a comprehensive blend of hardware and software knowledge, fostering expertise in designing advanced systems. With a focus on embedded systems, microcontroller programming, and computer architecture, the programme equips students with critical technical skills and problem-solving abilities to excel in today's rapidly evolving technological landscape.

CURRICULUM HIGHLIGHTS

From cybersecurity to AI and software engineering, CE students will gain hands-on skills and real-world expertise to excel in a rapidly evolving digital world.
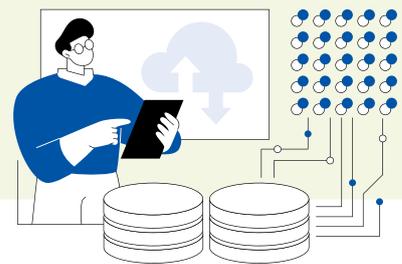
Computer Security

- Identify vulnerabilities in computer systems and software.
- Learn cybersecurity principles and modern security mechanisms.
- Explore interdisciplinary aspects of cybersecurity.

Software Engineering

- Design, develop, and improve software systematically.
- Apply proven design patterns and testing techniques to ensure quality.
- Manage software projects effectively for real-world applications.

Microcontroller Programming

- Explore microcontroller components, including processors, memory, and peripherals.
- Develop multithreading and multitasking software for embedded systems.
- Gain practical experience with embedded operating systems.

SOFTWARE ENGINEERING: What practical skills did you gain?

Yap Shen Hwei
Class of 2025

This course explores project management and software development, focusing on skills crucial for the tech industry. Our group was tasked with a stimulating project – to create an app like Grab but for on-demand jobs. Collaboration was key in crafting the app, while problem-solving and entrepreneurial thinking shaped its functionality.

Additionally, I appreciate the vital software engineering and front-end development skills I acquired, which is a plus point for future internships. I feel that the concepts taught in this course make it highly relevant to real-world jobs in the technological field.

CURRICULUM OVERVIEW

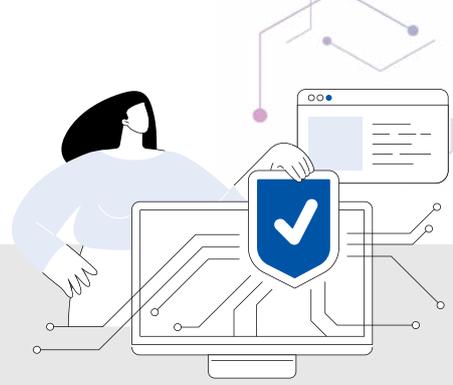| YEAR 1	YEAR 2	YEAR 3	YEAR 4
Foundational Modules in Computer Engineering		**Core Modules**	Final Year Project
• C & C++ Programming • Computer Organisation & Architecture • Data Structures & Algorithms • Digital Logic • Engineers in Society • Introduction to Computational Thinking & Programming • Physics for Computing Mathematics • Discrete Mathematics • Linear Algebra for Computing • Probability & Statistics for Computing	• Algorithm Design & Analysis • Computer Network • Digital Systems Design • Microprocessor System Design & Development • Object Oriented Design & Programming • Operating Systems • Sensors, Interfacing, & Digital Control • Signals, Systems, and Transforms • Software Engineering	• Embedded Programming • M Multi-disciplinary Project • Professional Internship	
Interdisciplinary Collaborative Core (ICC) Modules			
		Major Prescribed Electives (MPEs)* Selected from over 20 courses including: • Applied Cryptography • Simulation Techniques in Finance • Social Media Mining	
Broadening & Deepening Electives (BDE) Students must complete **SEVEN** BDEs over the course of study.			

*Students must complete a total of **FIVE** Major Prescribed Electives (MPEs), **ONE** in Year 3 and the remaining **FOUR** in Year 4.

FORGE YOUR FUTURE WITH CCDS

TURING AI SCHOLARS PROGRAMME

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PART-TIME DEGREE PROGRAMME

BACHELOR OF ENGINEERING (HONS) IN
COMPUTER ENGINEERING (CE)

PROGRAMME STRUCTURE

TOTAL: 135 Academic Units (AUs)			
Year of Study	**Major Requirements (83 AUs)**	**Interdisciplinary Collaborative Core Requirement (32 AUs)**	**Broadening & Deepening Electives (21 AUs)**
Year 1 Build a strong foundation in mathematics, programming, and computational thinking.	• Introduction to Computational Thinking & Programming • Linear Algebra for Computing • Digital Logic • Physics for Computing • Engineers in Society • Computer Organisation & Architecture • Data Structures & Algorithms • C & C++ Programming • Probability & Statistics for Computing • Discrete Mathematics	• Healthy Living & Well-being • Ethics & Civics in a Multicultural World • Inquiry & Communication in an Interdisciplinary World • Navigating the Digital World	
Year 2 Progress into algorithms, software engineering, and foundational computing concepts.	• Algorithm Design & Analysis • Object Oriented Design & Programming • Software Engineering • Computer Network • Microprocessor System Design & Development • Digital Systems Design • Operating Systems • Sensors, Interfacing, & Digital Control • Signals, Systems, and Transforms	• Science & Technology for Humanity • Sustainability: Society, Economy, & Environment • Career & Innovative Enterprise for the Future World	• BDE 1
Year 3 Explore key topics like operating systems, database systems, and computer networks.	• Embedded Programming • Capstone Project • MPE 1 • Professional Internship	• Engineering Communication	• BDE 2 & 3
Year 4 Specialise through electives and complete a capstone project.	• Final Year Project • MPE 2 – 5		• BDE 4 – 7

PATHWAYS

Students pursuing a CE degree have the option of pursuing an Elective Focus Area or a Minor with no significant increase in workload.

ELECTIVE FOCUS AREAS

Students may choose from the following:
- Artificial Intelligence
- Data Science
- Internet of Things (IoT)
- Networking
- Security

MINOR

Students may choose from over 40 Minor courses, including:
- Business
- Environmental Management
- Entrepreneurship
- Health & Society
- International Trading

Students who wish to stretch themselves can either pursue a Double Degree or a Second Major with a slight increase in workload.

DOUBLE DEGREE*

Bachelor of Engineering (Hons) in Computer Engineering + Bachelor of Business

Bachelor of Engineering (Hons) in Computer Engineering + Bachelor of Social Sciences (Economics)

SECOND MAJOR

Students may choose one of the following:
- Business
- Data Analytics
- Entrepreneurship
- Sustainability

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TURING AI SCHOLARS PROGRAMME

DEGREE PROGRAMMES

GLOBAL EXCHANGE

INTERNSHIPS

DOUBLE DEGREE PROGRAMMES

PART-TIME DEGREE PROGRAMME

BACHELOR OF ENGINEERING (HONS) IN
COMPUTER ENGINEERING (CE)

CAREER PROSPECTS

CE graduates are equipped to lead in tech-driven industries, excelling in roles like software development, AI, and cybersecurity. With strong technical skills and hands-on experience, they are poised to drive innovation and transform sectors from technology to healthcare and finance.

Job Roles

Cybersecurity
- Cybersecurity Analyst/ Consultant
- Malware Analyst
- Regulator
- Security Architect
- Technology Risk Manager

Software Development and Engineering
- Software Engineer
- Software Architect
- Software Consultant
- Software R&D Engineer
- Firmware R&D Engineer
- System Analyst
- Full-Stack Developer
- System Architect
- AI Application Developer

Data Science and Analytics
- Data Analyst
- Data Engineer
- Data Scientist
- Algorithm Engineer
- Business Intelligence Developer
- Research Scientist

Artificial Intelligence and Machine Learning
- AI Engineer
- AI Scientist
- Machine Learning Engineer
- Interactive Entertainment Specialist

Embedded Systems and Hardware
- Computer Engineer
- Computer Hardware Engineer
- Embedded System Developer
- System/ Field Application Engineer
- Product Test and Validation Engineer

Others
- Business Analyst
- Consultant
- Network Manager

Industries
- Aerospace/ Aviation
- Automotive/ Robotics
- Electronics
- Finance/ Financial Technology
- Oil & Gas/ Petrochemicals/ Specialty Chemicals
- Technology
- Telecommunications/ IoT

Companies
- Amazon
- Apple
- Aptiv
- Bank of America
- Boeing
- Continental
- DBS Bank
- Desay SV
- ExxonMobil
- Google
- HP
- Intel
- LinkedIn
- Meta
- Microsoft
- Nokia
- PayPal
- Samsung
- Singtel
- Singapore Airlines

EXPERIENCE THE
CCDS DIFFERENCE

BEYOND BORDERS: BRIDGING CULTURES, BUILDING FUTURES

NTU's global programmes, including the Global Education and Mobility (GEM) series, prepare students for a connected world. These initiatives offer academic exchanges, internships, virtual learning, entrepreneurship, and community engagement. Students gain cultural immersion, tackle real-world challenges, and build valuable global networks, equipping them with the skills and perspectives to excel in an increasingly interconnected future.

GEM Explorer
Spend a semester abroad with GEM Explorer, engaging in coursework or research. This programme enhances cultural immersion, fosters diverse learning experiences, and builds global networks. Students earn academic credits while developing cultural intelligence and new language skills.

GEM Discoverer
GEM Discoverer offers short-term global experiences designed to foster cultural empathy and tackle real-world issues. Ideal from Year 1, these programmes help students build interdisciplinary skills and prepare for global citizenship.

GEM VEnturer (Virtual Education)
GEM VEnturer provides flexible virtual courses that align with varied academic plans. Through online or hybrid learning, students gain international perspectives and cultural insights without leaving Singapore. These credit-bearing courses contribute to graduation requirements.

Overseas Internship
Gain practical experience and cultural intelligence with NTU's overseas internships. These opportunities provide real-world training and global readiness, enabling students to contribute meaningfully to organisations and build networks for future career success.

Overseas Entrepreneurship Programme (OEP)
OEP offers internships with tech start-ups in global innovation hubs, providing hands-on entrepreneurial experience. Students gain business insights, build networks, and develop start-up skills, supported by MOE funding of up to S$10,000.

Overseas Community Engagement Projects (OCEP)
OCEP empowers students to make meaningful contributions to underserved communities. Through impactful acts of kindness, participants foster cultural empathy, engage with social issues, and become forces for positive change in the world.

EXCHANGE PROGRAMME: Expand your horizon.

Chee Wen Zhan
Class of 2025

I participated in the GEM Discoverer Programme where I studied in University of California Berkeley, United States for six weeks. I went there with the intention of immersing myself in a culture that is polar opposite of that in Singapore.

There, the spirit of individuality fuels innovation, where art is not just crafted but asserted as a personal statement. My most memorable experience was the Berkeley's Juneteenth Festival, where black people gathered to honour the legacy of resilience and freedom, celebrating the end of slavery with music, dance, and a deep sense of community. By going on exchange programmes, you can look forward to exploring new cultures, gaining global perspectives, and building friendships that transcend borders. Be sure to keep an open mind and interact with the local community!

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❙ INTERNSHIPS

CAREER CONNECTIONS: THE INTERNSHIP ADVANTAGE

CCDS mandates that all students complete an internship prior to graduation. This requirement aims to enhance practical professional training, reduce post-graduation on-the-job training, and instil a strong work ethic and professionalism. Students stand to gain invaluable work experience through these internships.

Internship Options

Details	Professional Internship (PI)	Enhanced Professional Internship (EPI)	Professional Attachement
Duration	20 weeks (Jan – Jun or Jul – Dec)	30 weeks (Jan – Aug)	10 weeks (May – Jul)
Credits: Academic Units (AUs)	10	15	5
Eligibility	Year 3 standing with at least four completed semesters.		
Placement	Self-sourced or through CAO*	Self-sourced or company-requested	Self-sourced or through CAO*

*CAO: Career & Attachment Office

INTERNSHIPS: SEIZE THE GROWTH OPPORTUNITY

Ng Yong Jie shares his internship experience at TikTok between May 2024 and Oct 2024.

During this internship, I contributed to TikTok's livestream payment systems by writing code and building real features for the app. Additionally, I developed internal tools to improve debugging processes and facilitate efficient log tracing, making it easier for the team to diagnose and resolve issues.

I gained hands-on experience in system design, such as implementing caches and idempotency for real-world systems with high user traffic and high QPS (queries per second). I learned how to writing performant and reliable code through this experience.

I significantly deepened my databases knowledge – working with distributed systems taught me about replication strategies, data-syncs, and concepts like eventual consistency, which are critical when dealing with payment systems.

How to maximise your internship experience:

Be outspoken:

Communicate openly with your colleagues, share ideas and your opinion, ask questions when necessary.

Seek challenges:

To maximise your learnings, request challenging projects to work on and always aim to deliver high-quality work.

Take ownership:

Show initiative and responsibility over your tasks. Try to solve problems independently before seeking help.

Be very curious:

Do not just aim to complete tasks – take the time to explore surrounding topics so you can understand the bigger picture of what you are working on. This is an important skill in software development.

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DOUBLE DEGREE IN
COMPUTER SCIENCE AND BUSINESS

PROGRAMME OVERVIEW

Combine tech expertise with business strategy with this Double Degree in Computer Science and Business. The programme equips you with cutting-edge skills in software development, business analytics, and market insights, preparing you to lead and innovate in today's dynamic industries. Perfect for ambitious individuals ready to thrive at the intersection of technology and commerce.

CURRICULUM HIGHLIGHTS

Service Operations Management

- Design efficient service processes by leveraging the key elements of a service package and their interconnections.
- Explore service network design and workforce management for efficient operations.
- Gain expertise in modeling and simulation to support data-driven decision-making.
- Master yield management techniques to optimise capacity and maximise revenue.

Security Management

- Build knowledge of cybersecurity governance and the tools used to manage diverse stakeholders.
- Analyse real-life case studies of cyber incidents, exploring solutions and their strengths and limitations.
- Participate in practical, group-driven projects to propose and evaluate solutions for organisational challenges, tailored for decision-makers.

Advanced Predictive Techniques

- Acquire expertise in quantile regression for explaining variables with non-constant error variance.
- Identify high-probability associations between items and events using association rules.
- Leverage multivariate adaptive regression splines to adjust predictions based on trends and changes.
- Enhance prediction accuracy and stability with Random Forest techniques.

CURRICULUM OVERVIEW

YEAR 1	YEAR 2	YEAR 3	YEAR 4
Foundational Modules		**Capstone Project**	**Final Year Project**
Computer Science • Introduction to Computational Thinking & Programming • Linear Algebra for Computing • Digital Logic • Data Structures & Algorithms • C & C++ Programming • Discrete Mathematics • Computer Organisation & Architecture • Probability & Statistics for Computing • Algorithm Design & Analysis • Automata, Computability & Complexity	***Business** • Statistics & Analysis • Business Law • Financial Accounting • Organisational Behaviour & Design • Communication Management Strategies • Careers II • Designing & Developing Databases • Analytics I: Visual & Predictive Analysis • Analytics II: Advanced Predictive Analysis • Financial Management	**Core Modules** • Object Oriented Design & Programming • Operating Systems • Software Engineering • Computer Network • Marketing • Management Accounting	**Core Modules** • Strategic Management • Principles of Economics
Professional Attachment (Special Semester)			
Interdisciplinary Collaborative Core (ICC) Modules		**Major Prescribed Electives (MPEs)** Students must complete a total of 12 Major Prescribed Electives (MPEs), **NINE** from Computer Science & **THREE** from Business disciplines.	

*The Business courses listed above represent a Business Analytics specialisation.

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DOUBLE DEGREE IN
COMPUTER SCIENCE AND BUSINESS

PROGRAMME STRUCTURE

Year of Study	Core Requirements		Interdisciplinary Collaborative Core Requirement (30 AUs)	Major Prescribed Electives (36 AUs)
	Computer Engineering (52 AUs)	*Business (39 AUs)		
Year 1	• Introduction to Computational Thinking & Programming • Linear Algebra for Computing • Digital Logic • Data Structures & Algorithms • C & C++ Programming • Discrete Mathematics	• Statistics & Analysis • Business Law • Financial Accounting • Organisational Behaviour & Design	• Ethics & Civics in a Multicultural World • Healthy Living & Well-being • Inquiry & Communication in an Interdisciplinary World • Navigating the Digital World	
Special Semester	• Professional Attachment			
Year 2	• Computer Organisation & Architecture • Probability & Statistics for Computing • Algorithm Design & Analysis • Automata, Computability & Complexity	• Communication Management Strategies • Careers II • Designing & Developing Databases • Analytics I: Visual & Predictive Analysis • Analytics II: Advanced Predictive Analysis • Financial Management	• Science & Technology for Humanity • Sustainability: Society, Economy, & Environment • Career & Innovative Enterprise for the Future World	
Year 3	• Capstone Project			• MPE 1 – 4 • BA/CS Integration 1
	• Object Oriented Design & Programming • Operating Systems • Software Engineering • Computer Network	• Marketing • Management Accounting		
Year 4	• Final Year Project			• MPE 5 – 9 • BA/CS Integration 2 & 3
		• Strategic Management • Principles of Economics		

*The Business courses listed above represent a Business Analytics specialisation.

SERVICE OPERATIONS MANAGEMENT: What insights did you gain?

This course looks at the operations of service-based companies like ComfortDelGro and Din Tai Fung, deciphering the secrets behind impeccable service quality and streamlined wait times. We modelled real-world service processes – ordering food or booking taxis – to gain an insight to how staffing dynamics play a role.
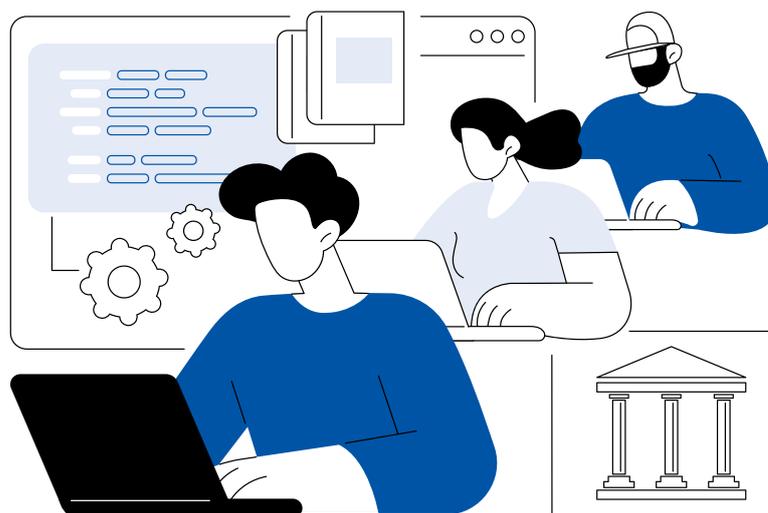
What fascinated me most was visualising processes like food orders as dynamic graphs, showcasing the versatility of computational thinking beyond tech realms. This course spotlights how Computer Science expertise influences decision-making in operational roles of tech-centric companies, making it a unique asset in diverse career paths.

Leow Ken Hing Bryan
Class of 2024

CAREER PROSPECTS

Graduates of this Double Degree in Computer Science and Business programme are equipped with a powerful combination of technical expertise and business acumen. They are uniquely positioned to excel at the intersection of technology and commerce. Their unique skill set allows them to innovate, optimise business processes, and create impactful solutions across diverse industries. Their ability to navigate the two key industries makes them invaluable in today's fast-evolving market.

Key Career Opportunities:
- Business Intelligence Analysts
- AI and Data Science Specialists
- Cybersecurity Consultants
- IT Product Managers
- Technology Strategists
- Financial Technology (FinTech) Specialists
- Technopreneurs

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DOUBLE DEGREE IN
COMPUTER ENGINEERING AND BUSINESS

PROGRAMME OVERVIEW

The Double Degree in Computer Engineering and Business blends technical expertise with business strategy in a rigorous 4-year programme. Students gain skills in software development, systems design, and business analytics, preparing them to tackle challenges at the intersection of technology and commerce. Graduates are equipped to drive innovation, forecast trends, and lead in today's tech-driven industries.

CURRICULUM HIGHLIGHTS

Students can expect to develop technical expertise in hardware and software systems, gaining hands-on experience in FPGA, ASIC, and system troubleshooting. With a focus on both innovation and real-world applications, graduates are well-equipped to tackle complex challenges across various industries.

Engineers in Society
- Explore the impact of engineers on societal development and future challenges.
- Examine how engineering contributes to sustainability and public safety.
- Assess the broader societal impact of engineering and its evolving responsibilities.

Digital Systems Design
- Learn to design, model, and prototype digital systems using modern techniques.
- Gain expertise in cutting-edge FPGA and ASIC design for high-performance computing.
- Master digital circuit modeling, simulation, and verification for complex designs.

Computer Organisation & Architecture
- Explore CPU operations and program execution processes.
- Delve into subsystems like memory, peripherals, and interfaces.
- Develop structured troubleshooting and system design skills.

CURRICULUM OVERVIEW

YEAR 1	YEAR 2	YEAR 3	YEAR 4
Foundational Modules		**Capstone Project**	**Final Year Project**
Computer Science • Introduction to Computational Thinking & Programming • Physics for Computing • Linear Algebra for Computing • Engineers in Society • Digital Logic • Data Structure & Algorithms • C & C++ Programming • Discrete Mathematics • Computer Organisation & Architecture • Probability & Statistics for Computing • Algorithm Design & Analysis • Digital Systems Design	***Business** • Statistics & Analysis • Business Law • Financial Accounting • Organisational Behaviour & Design • Communication Management Strategies • Careers II • Designing & Developing Databases • Analytics I: Visual & Predictive Analysis • Analytics II: Advanced Predictive Analysis • Financial Management	**Core Modules** • Object Oriented Design & Programming • Operating Systems • Software Engineering • Computer Network • Microprocessor System Design & Development • Sensors, Interfacing, & Digital Control • Signals, Systems, & Transforms • Embedded Programming • Marketing • Management Accounting	**Core Modules** • Strategic Management • Principles of Economics
Professional Attachment (Special Semester)			
Interdisciplinary Collaborative Core (ICC) Modules		**Major Prescribed Electives (MPEs)** Students must complete a total of **SEVEN** Major Prescribed Electives (MPEs), **FOUR** from Computer Science & **THREE** from Business disciplines.	

*The Business courses listed above represent a Business Analytics specialisation.

DATA VISUALISATION: What is one valuable lesson learnt?

It is a journey into deciphering data, unveiling its hidden patterns, and effectively conveying these insights through visual representations. Amidst this exploration, we tapped into our creativity, while honing our data presentation and communication skills.

From this, I learned the art of storytelling through numbers and charts, leveraging programming languages and analytics to unearth patterns within vast datasets. This is definitely a valuable asset for my future endeavours.

Ng Tze Kean
Class of 2025

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PROGRAMME STRUCTURE

Year of Study	Core Requirements		Interdisciplinary Collaborative Core Requirement (30 AUs)	Major Prescribed Electives (21 AUs)
	Computer Engineering (68 AUs)	*Business (39 AUs)		
Year 1	• Introduction to Computational Thinking & Programming • Physics for Computing • Linear Algebra for Computing • Engineers in Society • Digital Logic • Data Structure & Algorithms • C & C++ Programming • Discrete Mathematics	• Statistics & Analysis • Business Law • Financial Accounting • Organisational Behaviour & Design	• Ethics & Civics in a Multicultural World • Healthy Living & Well-being • Inquiry & Communication in an Interdisciplinary World • Navigating the Digital World	
Special Semester	• Professional Attachment			
Year 2	• Computer Organisation & Architecture • Probability & Statistics for Computing • Algorithm Design & Analysis • Digital Systems Design	• Communication Management Strategies • Careers II • Designing & Developing Databases • Analytics I: Visual & Predictive Analysis • Analytics II: Advanced Predictive Analysis • Financial Management	• Science & Technology for Humanity • Sustainability: Society, Economy, & Environment • Career & Innovative Enterprise for the Future World	

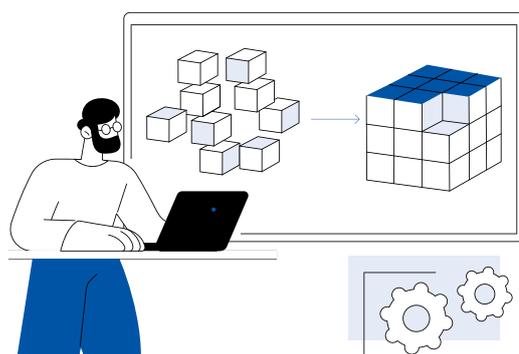|	Core Requirements		Interdisciplinary Collaborative Core Requirement (30 AUs)	Major Prescribed Electives (21 AUs)
Year of Study	Computer Engineering (68 AUs)	*Business (39 AUs)		
Year 3	• Capstone Project			• MPE 1 -4 • BA/CS Integration 1
	• Object Oriented Design & Programming • Operating Systems • Software Engineering • Computer Network • Microprocessor System Design & Development • Sensors, Interfacing, & Digital Control • Signals, Systems, & Transforms • Embedded Programming	• Marketing • Management Accounting		
Year 4	• Final Year Project			• MPE 5 - 9 • BA/CS Integration 2 & 3
		• Strategic Management • Principles of Economics		

*The Business courses listed above represent a Business Analytics specialisation.

CAREER PROSPECTS

Graduates of the Double Degree in Computer Engineering and Business are uniquely positioned to excel in roles that require both technical expertise and strategic business insight. This interdisciplinary training prepares them to drive innovation and deliver impactful solutions in industries such as financial services, engineering, manufacturing, telecommunications, and consultancy. With a strong foundation in both fields, graduates are ready to meet the demands of today's dynamic, tech-driven business environment.

Key Career Opportunities:
• Technology Consultants
• Systems Engineers
• IT Product Managers
• Business Intelligence Analysts
• Financial Technology (FinTech) Specialists
• Operations Managers

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ADMISSION
REQUIREMENTS

In addition to NTU's general admission requirements, applicants must fulfil the minimum subject requirements as for each programme as listed below.

Qualification	BACHELOR OF COMPUTING (HONS) IN DATA SCIENCE & AI DSAI	BACHELOR OF COMPUTING (HONS) IN AI & SOCIETY AISC	BACHELOR OF COMPUTING (HONS) IN COMPUTER SCIENCE CSC	DOUBLE DEGREE IN COMPUTER SCIENCE AND BUSINESS CSC + BIZ	BACHELOR OF ENGINEERING (HONS) IN COMPUTER ENGINEERING CE	DOUBLE DEGREE IN COMPUTER ENGINEERING AND BUSINESS CE + BIZ
Singapore-Cambridge GCE A-Levels	Pass in H2 Mathematics	Pass in H2 Mathematics, or H2 Physics, or H2 Computing			Pass in H2 Mathematics, and H2 Biology/ Chemistry/ Computing/ Physics	
International Baccalaureate (IB) Diploma	Pass in HL Mathematics	Pass in HL Mathematics, or HL Physics, or HL Computer Science			Pass in HL Mathematics, and HL Biology/ Chemistry/ Computing/ Physics	
NUS High School (NUSHS) Diploma	Major CAP of 2.0 in Mathematics	Major CAP of 2.0 in Mathematics or Physics or Computing			Major CAP of 2.0 in Mathematics, and Biology/ Chemistry/ Computing / Physics	
International & Other Qualifications	Pass in Senior High Mathematics	Pass in Senior High Mathematics or Physics; UK CIE A-Level Computer Science			Pass in Senior High Mathematics, and Biology/ Chemistry/ Physics,	
Polytechnic Diploma	Applicants with relevant local Polytechnic Diplomas or equivalent qualification may apply. Check NTU admissions for the latest information. <www.ntu.edu.sg/admissons>					

BACHELOR OF TECHNOLOGY IN COMPUTING
A SKILLSFUTURE WORK-STUDY DEGREE

PROGRAMME OVERVIEW

A dynamic, part-time SkillsFuture Work-Study Degree (WSDeg), the Bachelor of Technology in Computing offers a flexible and industry-relevant pathway for working adults to earn a bachelor's degree in computing. Designed in collaboration with leading industry partners, the curriculum bridges the gap between academic knowledge and real-world application, equipping graduates with future-ready skills. This programme is carefully curated to facilitate professional growth while minimising disruptions to existing work commitments.

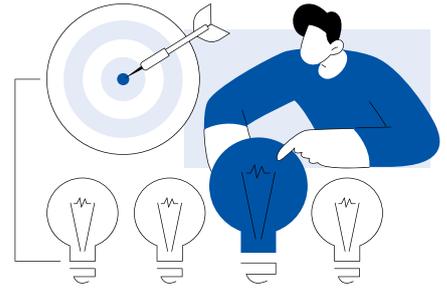Specifically aimed at working adults, this programme enables you to:

- Unlock professional growth opportunities in the Information Technology sector.
- Experience a curriculum carefully designed with a strong industry focus.
- Enhance and validate your skills and knowledge to meet industry demands.
- Access pathways to pivot into impactful and rewarding IT roles.
- Study at your own pace with minimal disruption to your current work commitments.

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BACHELOR OF TECHNOLOGY IN COMPUTING
A SKILLSFUTURE WORK-STUDY DEGREE

CURRICULUM OVERVIEW

This programme follows a structured, three-tier, stackable model designed to support progressive learning and industry readiness. Students earn an Advanced Specialist Certificate upon completion of each of the first two stacks. The final stack, Industry Immersion, comprises full time On-the-Job training (OJT) in the student's specialist area, an industry capstone project, and three Broadening and Deepening Electives (BDEs).
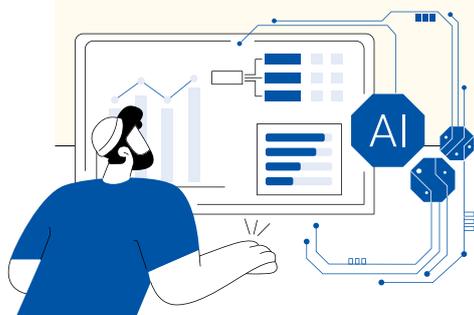
		PROGRAMME STRUCTURE		QUALIFICATION
1 YEAR	3. INDUSTRY IMMERSION STACK	• Full-time On-the-Job training (OJT) • Company-sponsored Final Capstone (by OJT company) • Broadening & Deepening Electives (BDEs) (school and/or industry training)		BACHELOR OF TECHNOLOLGY IN COMPUTING
1.5 YEARS	2. SPECIALIST STACK	Students must select **ONE** of the following		ADVANCED SPECIALIST CERTIFICATE IN SOFTWARE ENGINEERING or AI ENGINEERING or CYBERSECURITY
		SOFTWARE ENGINEERING	AI ENGINEERING / CYBERSECURITY	
1.5 YEARS	1. FOUNDATION STACK	**CORE MODULES** • Computer Design • Programming & Software Development • Operating Systems • Databases		ADVANCED SPECIALIST CERTIFICATE IN FULL-STACK DEVELOPMENT

PROGRAMME DETAILS

FOUNDATION STACK	SPECIALIST STACK	INDUSTRY IMMERSION STACK
Core courses	Choose **ONE** of the following specialisations:	• Industry OJT Modules • Industry Capstone Project • **THREE** Broadening & Deepening Electives (BDE)
• Algorithm Design and Analysis • Data Analysis & Market Sensing (Business Intelligence) • Data Structures and Algorithms • Design Thinking • Introduction to Computer Architecture and Networks • Introduction to Computer Security • Introduction to Database • Object-Oriented Design • Operating Systems Principles • Programming • Project Management (Business Needs Analysis & Risk Analysis) • Software Engineering • Mini Capstone (Full-Stack) Project	**SOFTWARE ENGINEERING** • Advanced Software Engineering • Big Data Management • Cloud Computing • Data Science and Analytics • Data Visualisation • Software Testing • UX/UI Design • World Wide Web Technologies and Applications **AI ENGINEERING** • Big Data Management • Cloud Computing • Computer Vision for AI • Data Visualisation • Introduction to Artificial Intelligence • Machine Learning Fundamentals • Natural Language Processing Fundamentals • Principles of Deep Neural Networks **CYBERSECURITY** • Application Security • Applied Cryptography • Concepts and Techniques of Malware Security • Cyber Threat Intelligence • Digital Forensics • Network Security • Security Management • Software Security Principles Common Modules: • Any **THREE** modules from the other two specialisations • Mini Capstone (Specialisation) Project	

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BACHELOR OF TECHNOLOGY IN COMPUTING
A SKILLSFUTURE WORK-STUDY DEGREE

ADMISSION CRITERIA

ACADEMIC

- Singapore-Cambridge GCE A-Levels
- Polytechnic Diploma or equivalent institutions
- NUS High School (NUSHS) Diploma
- International Baccalaureate (IB) Diploma
- Other recognised qualifications

PRE-REQUISITE

- Successful completion of the following bridging modules:
    - Linear Algebra & Calculus for Computing
    - Discrete Mathematics for Computing
    - Probability & Statistics for Computing
    - Introduction to Computational Thinking and Programming
    - Introduction to Computer Systems

These bridging modules are carefully curated to enhance foundational knowledge and prepare students for the academic rigour of a computing degree. It allows applicants to evaluate their readiness for the Bachelor of Technology in Computing programme, ensuring a well-informed transition into a professional computing career.

ADDITIONAL REQUIREMENTS

- At least 21 years of age as at 31 July of admission year AND
- At least **TWO** years full-time working experience OR
- Currently engaged in full-time employment* OR
- Completed full-time National Service**

*Part-time employment will not be considered as full-time working experience. Applicants who are self-employed may be required to submit additional documents for evaluation and verification.

**Full-time NSmen (NSF) are not eligible for disruption of service to pursue this part-time degree programme.

EXEMPTIONS

Applicants who are younger than 21, or who do not have two years of full-time working experience may be granted exemptions if they are either:

a. Sponsored by the company to pursue the programme OR
b. Currently employed in a job role/sector related to the programme.

CAREER PROSPECTS

Graduates of the Bachelor of Technology in Computing (WSDeg) programme are equipped with industry-relevant skills, opening doors to diverse and rewarding career opportunities in the tech sector.

Key Career Opportunities:
- AI/ML Engineer
- Cyber Risk Analyst
- Data Engineer
- Full Stack Developer
- Product Manager
- Security Engineer
- Software Engineer

OTHER UNDERGRADUATE PROGRAMMES

In addition to the comprehensive list of undergraduate degree programmes listed, the College also collaborates with other Colleges & Schools to offer the following:

BACHELOR OF APPLIED COMPUTING IN FINANCE

Jointly offered by Nanyang Business School and the College of Computing & Data Science, the Bachelor of Applied Computing in Finance integrates finance with advanced technological and analytical skillsets.

This interdisciplinary programme prepares students to address digitalisation challenges in finance and FinTech through specialisations in Financial Analytics and WealthTech, Crypto Asset and Blockchain, or Digital Banking and Security.

Graduates will be well-equipped to drive innovation, improve efficiency, and deliver critical insights for financial institutions and FinTech companies.

ntu.sg/ACF

BACHELOR OF SCIENCE IN ECONOMICS & DATA SCIENCE

The Bachelor of Science (Honours) in Economics and Data Science is an interdisciplinary programme that integrates expertise from three schools: the College of Computing and Data Science (CCDS), School of Social Sciences (SSS), the and the School of Physical and Mathematical Sciences (SPMS).

This four-year degree programme offers a robust curriculum encompassing Economics, Mathematics, and Data Science. Students will develop a solid foundation in Economics, acquire the technical skills to manage and analyse big data, and learn to derive meaningful economic insights from modern large-scale data analysis.

Graduates are well-prepared for roles such as data analysts, data scientists, economists, and industry analysts, leveraging their expertise in big data analysis and economic applications.

ntu.sg/ECDS

BACHELOR OF SCIENCE IN MATHEMATICAL & COMPUTER SCIENCES

This programme is a collaborative offering by the College of Computing and Data Science (CCDS) and the School of Physical and Mathematical Sciences (SPMS).

Students gain a solid foundation in both Mathematical Sciences and Computer Science, along with specialised training in one of four interdisciplinary areas: Theoretical Computer Science, Cryptography and Cybersecurity, Financial Modelling, and Data Science.

Graduates are highly prepared for careers in financial technology, cybersecurity, and data analytics, as well as advanced studies in mathematics, computer science, and related disciplines.

ntu.sg/MACS

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Join NTU's College of Computing and Data Science and be the **INNOVATOR**, the **VISIONARY**, and the **LEADER** you are meant to be!

CONNECT WITH US

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