Department of Computer Science and Engineering
計算機科學與工程學系

Computer Science and Engineering (BCSE)(JS4412)
Computer Engineering (CENG)
Computer Science (CSCI)

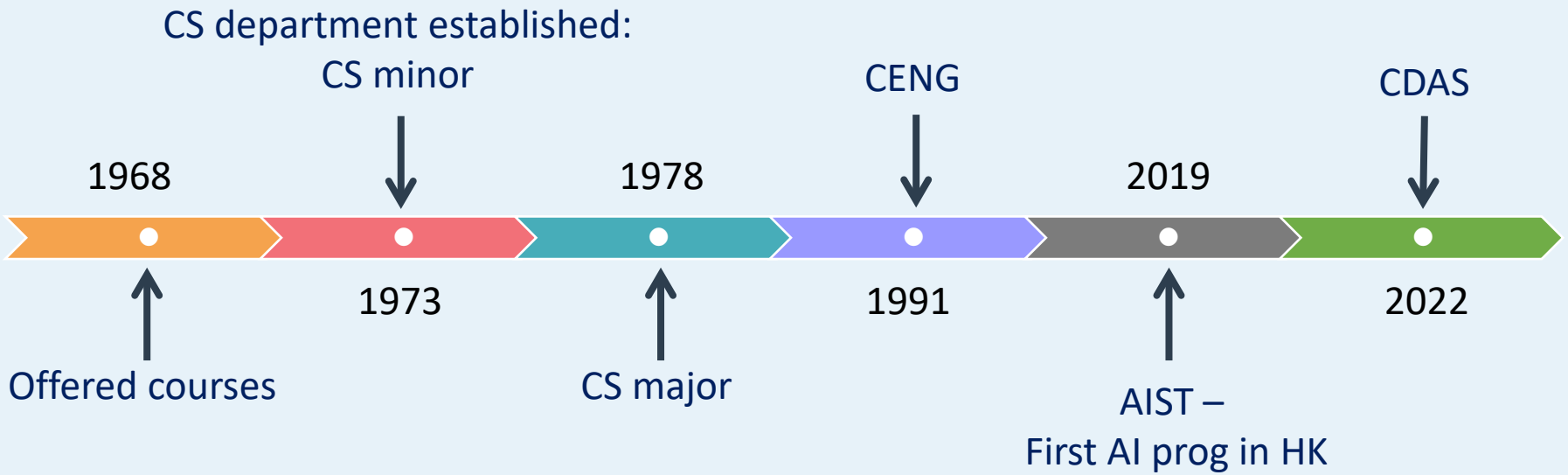
Agenda

1. Introduction of our Department
2. Introduction of BCSE/CENG/CSCI Programmes
3. Admission Requirements
4. Curriculum Structure
5. FAQ

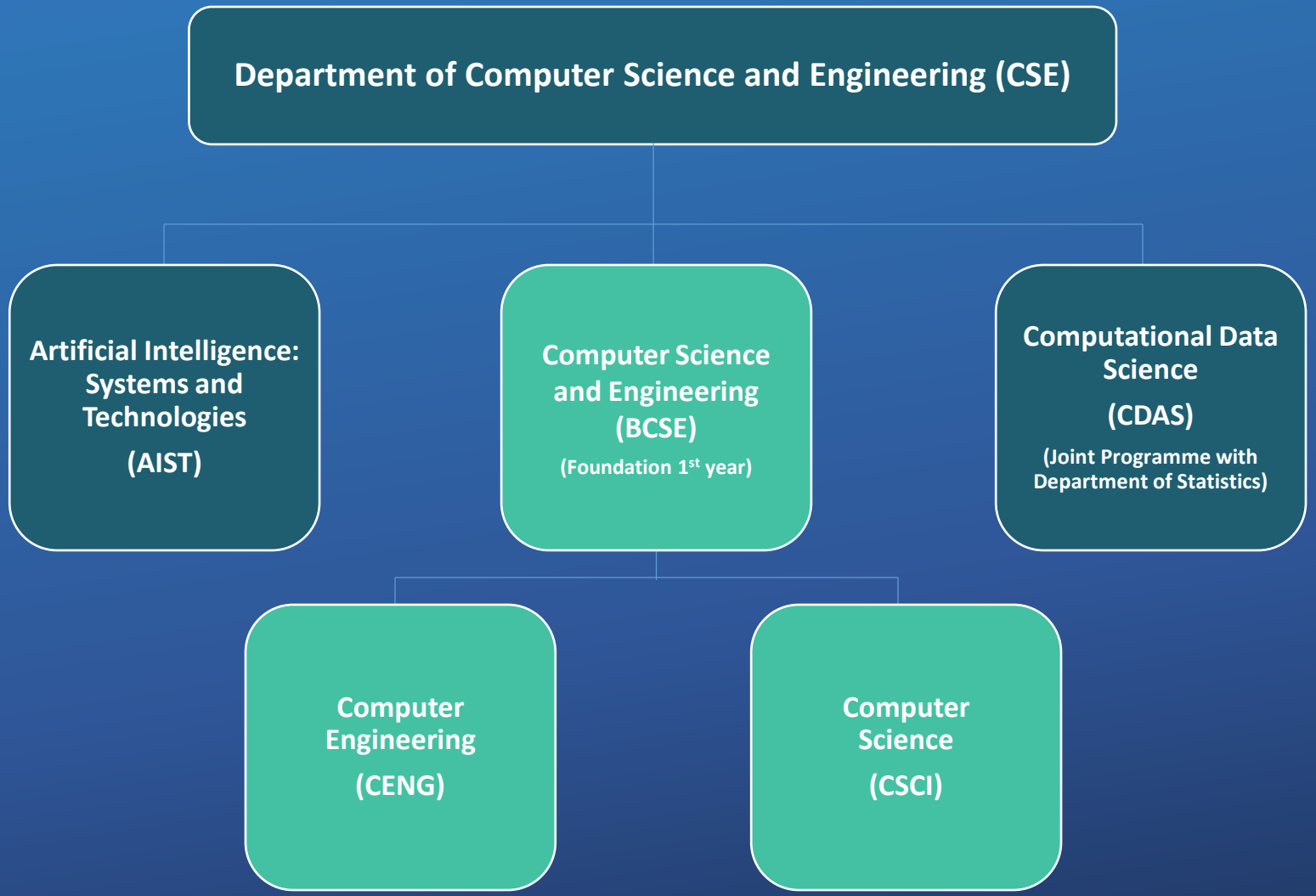

Department of
Computer Science and
Engineering

A Long History

- The first computer science department in HK
- A strong alumni network



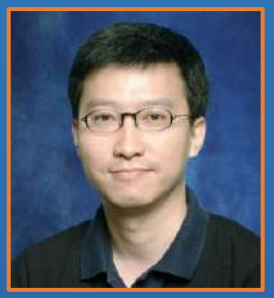
Our Undergraduate Programmes



Excellent Teaching and Research Team

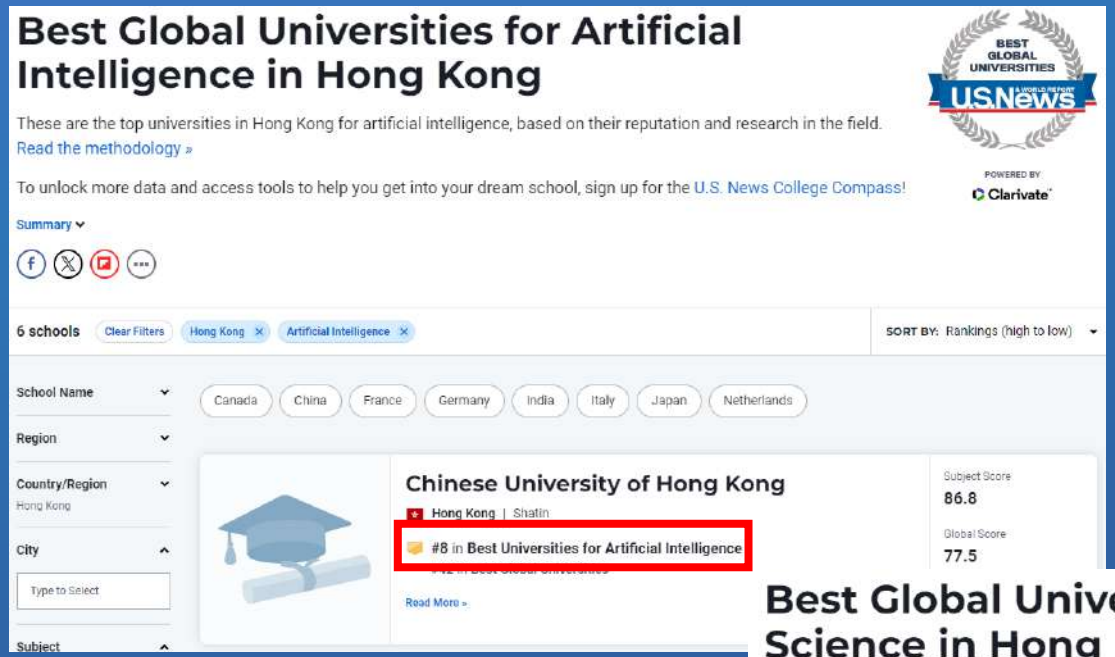





- **2021 Kyoto Prize Laureate and Turing Award Recipient**
  Prof. Andrew Yao
- **7 ACM Fellows**
  Prof. Benjamin Wah, Prof. John Lui, etc.
- **15 IEEE Fellows**
  Prof. Irwin King, Prof. Evangeline Young, Prof. Yufei Tao, etc.
- **2022 IEEE CEDA Ernest S. Kuh Early Career Award**
  Prof. Bei Yu
- **Hong Kong Academy of Engineering Sciences Fellows 2021**
  Prof. Michael Lyu
- **Forbes 30 Under 30 Asia (Healthcare & Science Category) – Class of 2022**
  Prof. Yu Li
- **Distinguished Fellow of the Hong Kong Computer Society 2022**
  Prof. Jimmy Lee

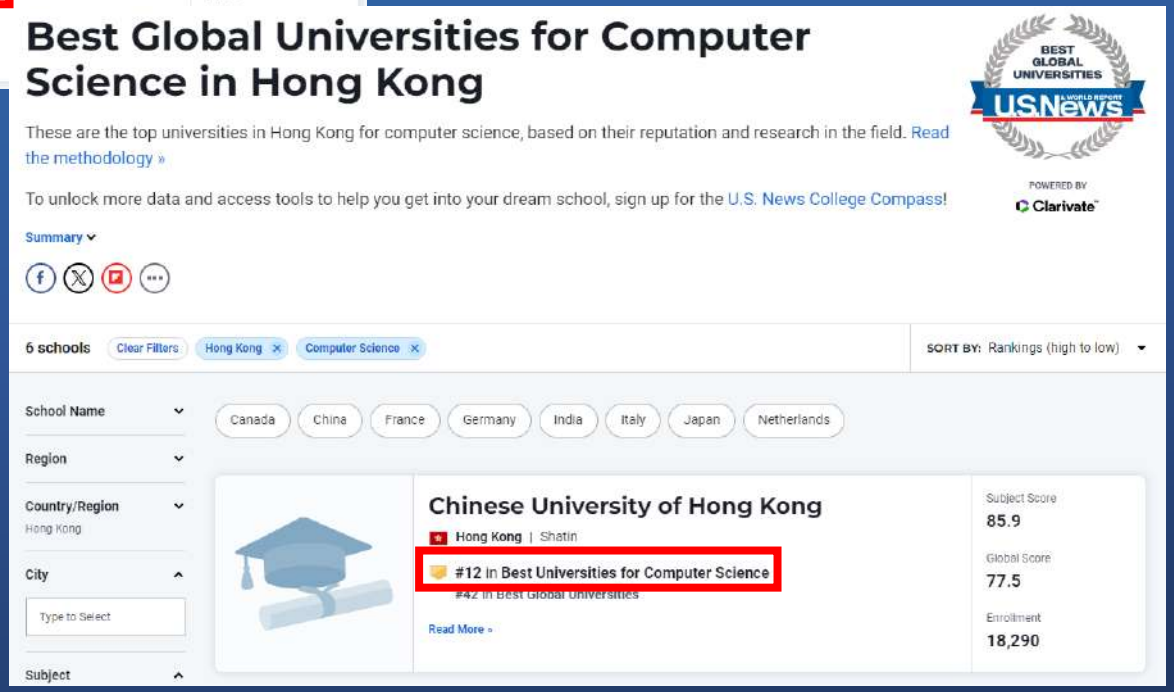
Rankings



US News and World Report: Best Universities in Artificial Intelligence 2024-2025

#1 in Hong Kong

#8 Globally



US News and World Report: Best Universities in Computer Science 2024-2025

#1 in Hong Kong

#12 Globally

Recent Achievements in Intl'/Local Competitions

Champion in ACM-HK Programming Contest 2024

Champion in Robocon Hong Kong Contest in 2021 and 2022

High Honors in the 48th International Collegiate Programming Contest (ICPC) World Finals (2024)

Strong Alumni Network

IT Industry

Microsoft

Google

IBM

NOKIA

amazon.com

facebook

Education

Georgia Tech

Banking

HSBC

citibank

Morgan Stanley

Deutsche Bank

Deloitte.

Goldman Sachs

Computer Science and Engineering Programme

Growing Demand and Opportunities

Due to the pandemic :

- workers going remote
- companies turning to e-commerce to survive
- organizations needing to be more digitally agile

➢ Engineering is the fastest-growing field in the world

➢ 24 of 28 countries listed data engineer among its fastest-growing careers

Linkedin: The Fastest-Growing Jobs Around the World in 2023

(https://www.linkedin.com/business/talent/blog/talent-acquisition/fastest-growing-jobs-2023)

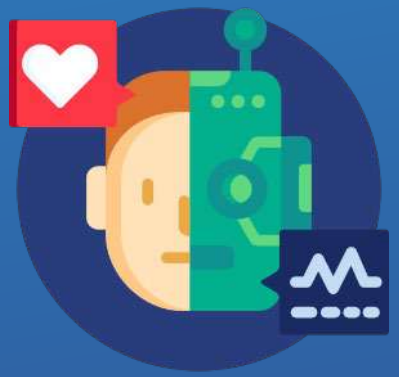
Growing Demand and Opportunities

- The Shenzhen-Hong Kong-Guangzhou science and technology cluster was ranked as the world's second-best in terms of performance by the WIPO's Global Innovation Index 2024 top 100 science and technology (S&T) clusters.
- Hong Kong's start-up ecosystem is thriving. In 2023, the number of start-ups in Hong Kong grew by 7% to more than 4,200 with some 16,453 people employed in such businesses.
- Since 2019, Hong Kong has consistently placed in the top 10 of the IMD World Digital Competitiveness Ranking, affirming the city's prowess and accomplishments in innovation and technology.

Global Rankings	2020	2021	2022	2023
Global Innovation Index	11/131	14/132	11/131	17/132
IMD Digital Competitiveness	5/63	2/64	9/63	10/64

Reference: https://research.hktdc.com/en/article/MzEzOTIwMDIy

Things You Can Learn



- Artificial Intelligence
  - Teach computers to think better
  - Learning, vision, voice recognition
- Algorithms and Complexity
  - Find the most efficient ways to solve problems
  - Learn their limitations: things computers cannot do
- Systems and Networks
  - Find out how to build large services like Google and Facebook
  - Learn how cloud computing works

Things You Can Learn

- Software Engineering
  - Learn how to write very big programme projects and test that they work properly
- Graphics and Multimedia Technology
  - Build exciting new computer games
- Cyber-security
  - Apply your knowledge of algorithms, systems, networks to make application secure

Things You Can Learn

- VLSI and Embedded Systems
  - Design smart, energy efficient hardware devices
- Bioinformatics
  - Use computers to figure out microorganisms, genetics, and understand diseases
- Databases, Computational Finance, Control, …

  … and much more

Admission Arrangements and Requirements (First Year Entry)

Admission Arrangements (First Year Entry)

- Students will first be admitted into the Computer Science and Engineering (BCSE) programme for a common 1st year of study

- They will then be allocated into either Computer Engineering (CENG) **or** Computer Science (CSCI) according to their CGPA after finishing their 1st year of study

Admission Requirements (For JUPAS Applicants)

HKDSE Subject	*Minimum Level*	*Subject Weighting*
HKDSE Core Subjects		
English Language	3	1
Chinese Language	3	1
Mathematics (Compulsory Part)	4	1.5
Citizenship and Social Development	A (Attained)	-
HKDSE Elective Subjects		
One specific science subject ^	3	1.5 – 1.75
Any one other subject #	3	1 – 1.75

^ *Specific science subjects and subject weighting include 1.75 for Math M1/M2, 1.5 for Biology, Chemistry, Information and Communication Technology, and Physics.*

\# *Preferred subjects include 1.75 for Math M1/M2, 1.5 for Biology, Chemistry, Design and Applied Technology, Information and Communication Technology, and Physics, 1 for other subjects.*

Selection is based on the Best 5 HKDSE subjects with subject weighting applied. Bonus points will be awarded to the 6th and 7th subjects, if any.

BCSE Admission Grades (2024 Entry)

Percentile	CHI	ENG	MATHS	Citizenship and Social Dev	M1/M2	1st Elective	2nd Elective	3rd Elective	Programme Weighted Total^
Upper Quartile	5	4	5**	Attained	5	5	5	4	44.875
Median	4	5*	5	Attained		5*	5*	4	42.25
Lower Quartile	5*	4	5*	Attained		5*	5		40.25

^ *Category A subjects score conversion scale: 5** = 8.5 | 5* = 7 | 5 = 5.5 | 4 = 4 | 3 = 3 | 2 = 2 | 1 = 1;*
Category C subjects score conversion scale: A = 5 | B = 4 | C = 3 | D = 2 | E = 1;

Subject Weighting: Math (x 1.5); M1 or M2 (x 1.75);
Bio, Chem, DAT, ICT, Phy (x 1.5)

Admission Requirements (for Non-JUPAS & International Applicants)

- Applicants seeking admission on the strength of qualifications other than HKDSE examination results (*e.g.*, IB, GCE-AL, overseas qualifications) can apply through Non-JUPAS channels

- Will be considered on the basis of their education background and academic achievements

- Can apply for "Admission with Advanced Standing" *(for particular qualifications only)*

Check out details on the website of CUHK's Office of Admissions and Financial Aid:
Non-JUPAS Applications: http://admission.cuhk.edu.hk/non-jupas-yr-1/requirements.html
International Applications: http://admission.cuhk.edu.hk/international/requirements.html

Admission Arrangements and Requirements (Senior Year Entry)

Admission Arrangements (Senior Year Entry)

- To meet the minimum entrance requirements for direct entry to year 3 of CENG / CSCI, you need to have:
  - » successfully completed a LOCAL course of study leading to the qualification of associate degree (AD) / higher diploma (HD) AND
  - » Met the minimum required scores or grades in English and Chinese languages (e.g. HKDSE level 3 or above / IELTS 6.0 or above, etc.)

- To make your application more competitive, you need to demonstrate outstanding capabilities in mathematics, programming and English

Admission Arrangements (Senior Year Entry)

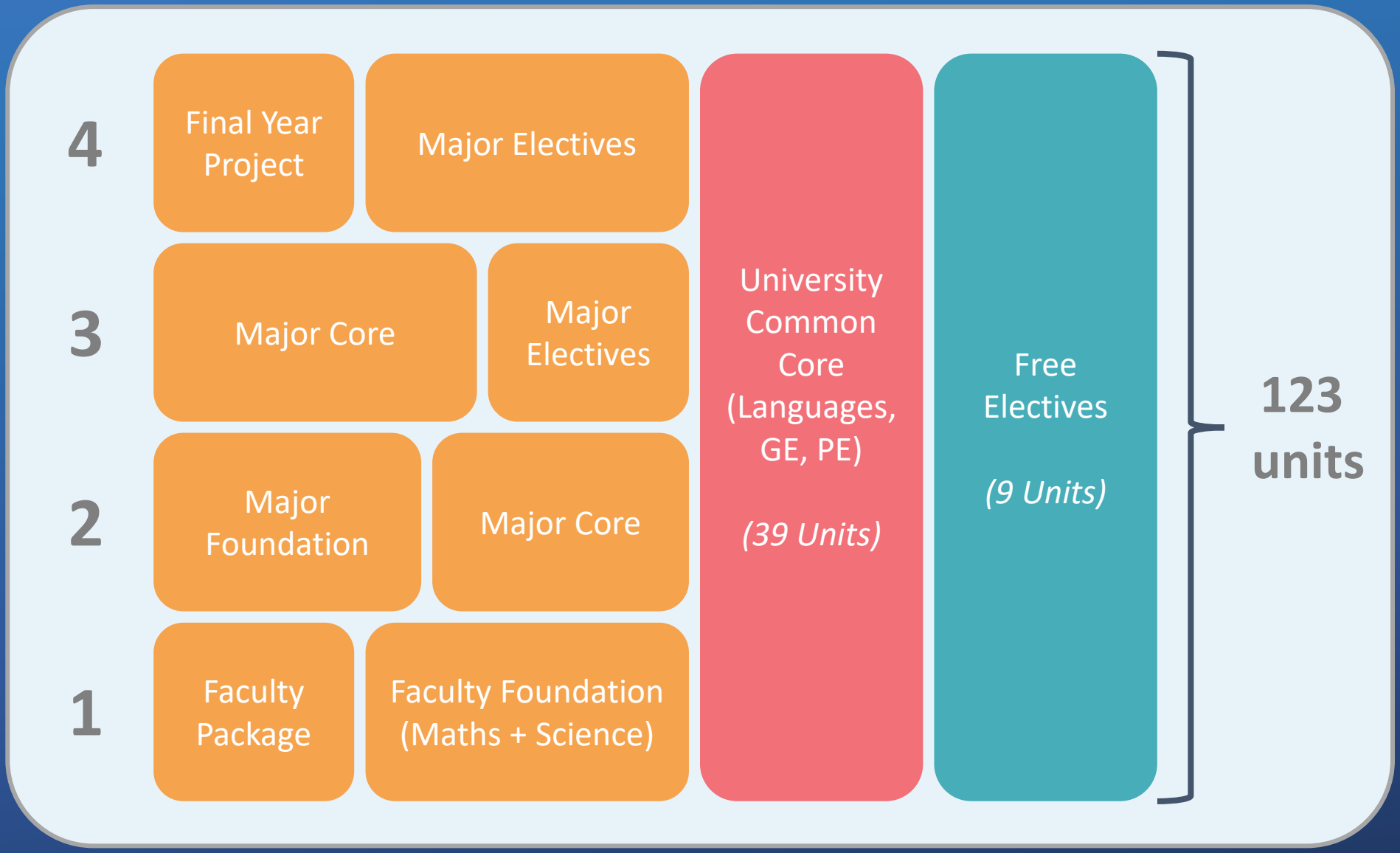
- If you are unsuccessful for Senior Year Entry, you will be considered for First Year Entry with Advanced Standing to the Computer Science and Engineering (BCSE) programme. If admitted:
  - You will be exempted from up to 23 units. Most would be able to finish their studies in 3 years.
  - You will study a common 1st year and be allocated to either CENG or CSCI according to your CGPA after you finish your 1st year.

- For reference, students admitted to senior year in the past had a CGPA of 3.5 or above

Check out more details on *Senior Year Applications:*
https://admission.cuhk.edu.hk/application/hong-kong-sub-degree/requirements/

Curriculum Structure

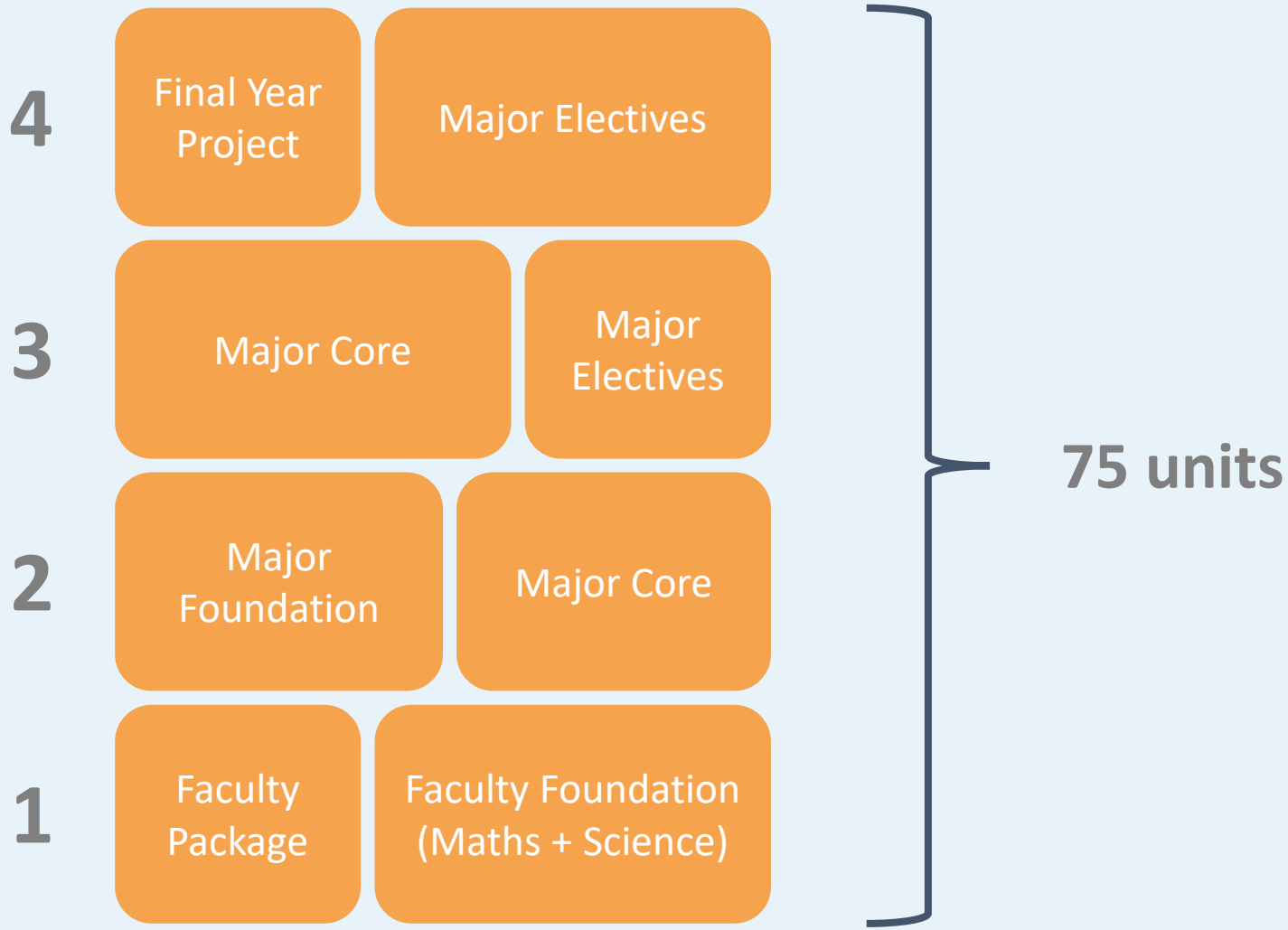
Curriculum – Overview



University Core Requirements

University Core Courses	Units Requirements
English Language	8
Chinese Language	5
University General Foundation	6
University General Education	7 (At least 2 units in Area A, C, D)
College General Education	6
Understanding China (UGCP1001) *(online course - complete before graduation in any one term, including summer term)*	1
Hong Kong in the Wider Constitutional Order (UGCP1002) *(online course - complete before graduation in any one term, including summer term)*	1
Digital Literacy and Computational Thinking (ENGG1003 or ENGG1004)	3
Physical Education	2
Total of units required	**39**

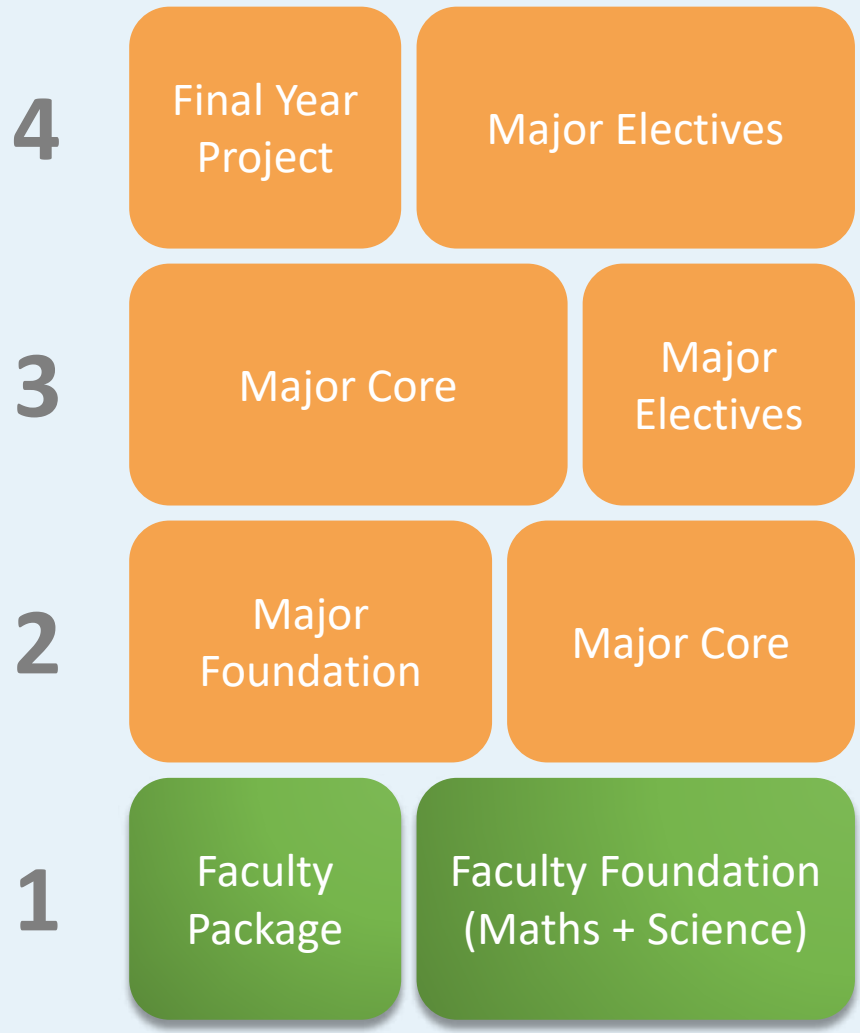
Curriculum – Major Requirements



Major Requirements

Major Requirements	Computer Engineering	Computer Science
Faculty Package	9	
Foundation Courses	17	16
Major Required Courses	31	27
Research Components	6	
Stream Requirements	12	17
Total of units required	**75**	

Curriculum – Faculty Package and Foundation



Faculty Package and Foundation (15 units)

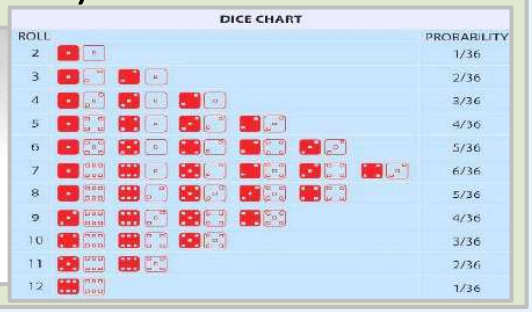
- Problem Solving By Programming (ENGG1110)
- Linear Algebra for Engineers (ENGG1120)
- Multivariable Calculus for Engineers (ENGG1130)
- Calculus for Engineers (MATH1510)
- Foundation Science

Curriculum – Major Foundation *(for CENG)*

4	Final Year Project	Major Electives
3	Major Core	Major Electives
2	Major Foundation	Major Core
1	Faculty Package	Faculty Foundation (Maths + Science)

Major Foundation (11 units)

- Introduction to Computing Using C++ (CSCI1120)
- Complex Variables for Engineers (ENGG2720)
- Differential Equations for Engineers (ENGG2740)
- Probability for Engineers (ENGG2760)
- Statistics for Engineers (ENGG2780)

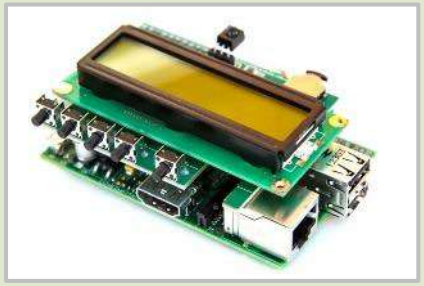


Curriculum – Major Core *(for CENG)*

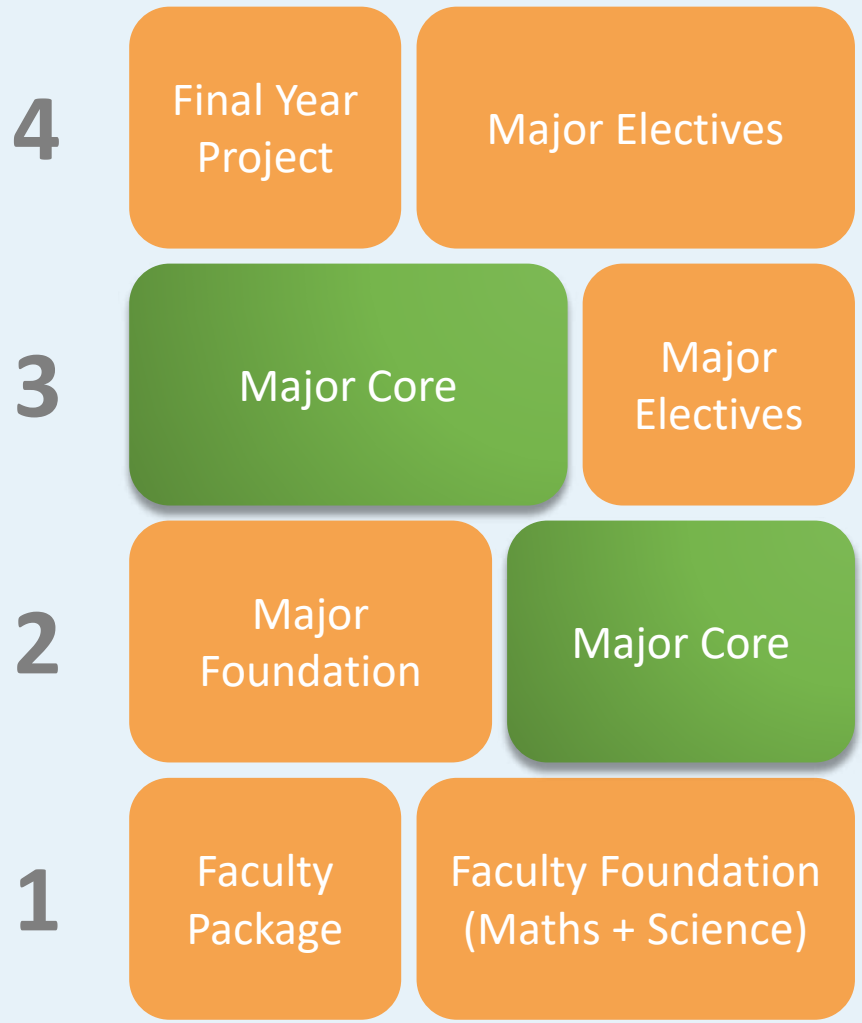
4	Final Year Project	Major Electives
3	Major Core	Major Electives
2	Major Foundation	Major Core
1	Faculty Package	Faculty Foundation (Maths + Science)

Major Core (31 units)

- Digital Logic Design Laboratory (CENG2010)
- Fundamentals of Embedded Systems (CENG2030)
- Embedded System Design (CENG2400)
- Computer Organization and Design (CENG3420)



Curriculum – Major Core *(for CENG)*



Major Core (31 units)

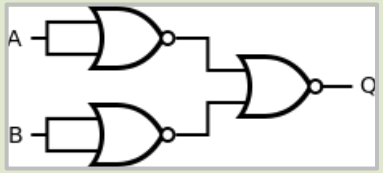
- Data Structures (CSCI2100)
- Software Engineering (CSCI3100)
- Introduction to Operating Systems (CSCI3150)
- Introduction to Discrete Mathematics and Algorithms (CSCI3190)
- Computers and Society (CSCI3250)
- Engineering Practicum (CSCI3251)

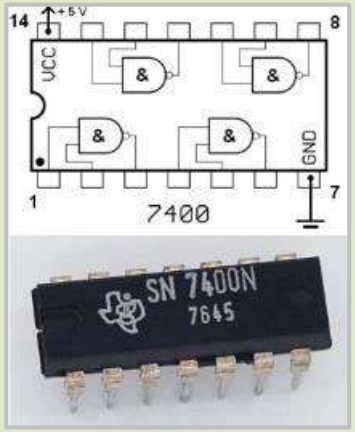
Curriculum – Major Core *(for CENG)*

4	Final Year Project	Major Electives
3	Major Core	Major Electives
2	Major Foundation	Major Core
1	Faculty Package	Faculty Foundation (Maths + Science)

Major Core (31 units)

- Fundamental of Electric Circuits (ELEG2202)
- Digital Logic and Systems (ENGG2020)





Curriculum – Major Electives *(for CENG)*

4	Final Year Project	Major Electives
3	Major Core	Major Electives
2	Major Foundation	Major Core
1	Faculty Package	Faculty Foundation (Maths + Science)

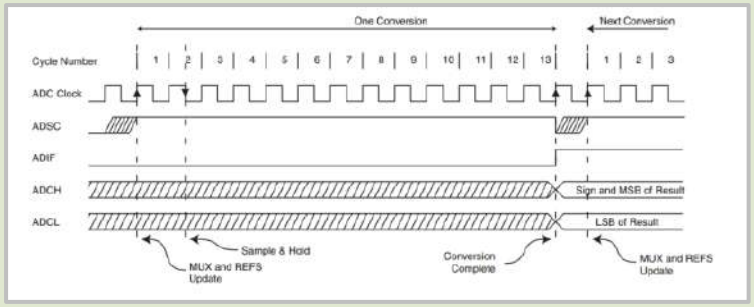
Major Electives (12 units)

Streams

1. Embedded Systems
2. VLSI Design and EDA

Non-Stream

3. General Computer Engineering

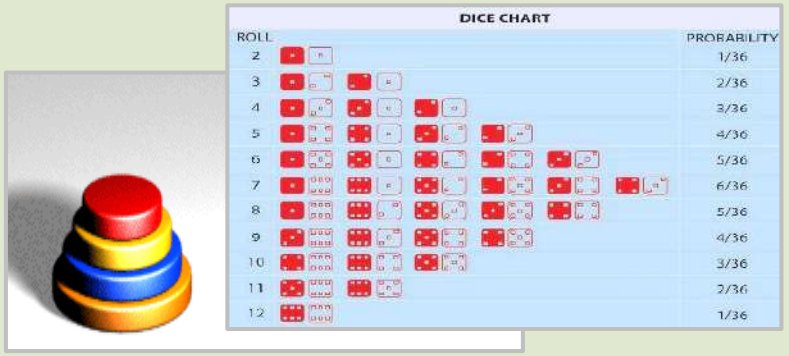


Curriculum – Major Foundation *(for CSCI)*

4	Final Year Project	Major Electives
3	Major Core	Major Electives
2	Major Foundation	Major Core
1	Faculty Package	Faculty Foundation (Maths + Science)

Major Foundation (10 units)

- Introduction to Computing Using Java (CSCI1130)
- Discrete Mathematics for Engineers (ENGG2440)
- Probability for Engineers (ENGG2760)
- Statistics for Engineers (ENGG2780)

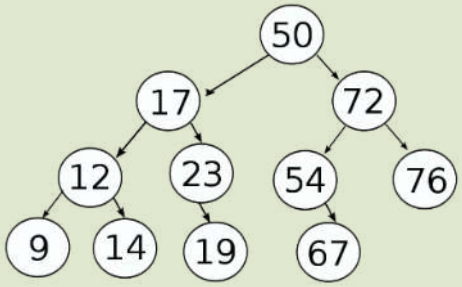


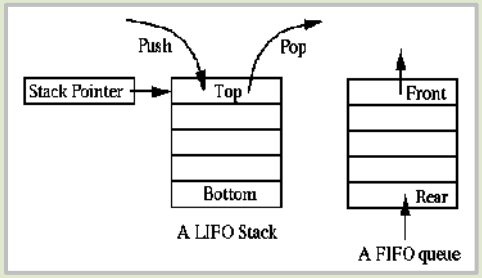
Curriculum – Major Core *(for CSCI)*

4	Final Year Project	Major Electives
3	Major Core	Major Electives
2	Major Foundation	Major Core
1	Faculty Package	Faculty Foundation (Maths + Science)

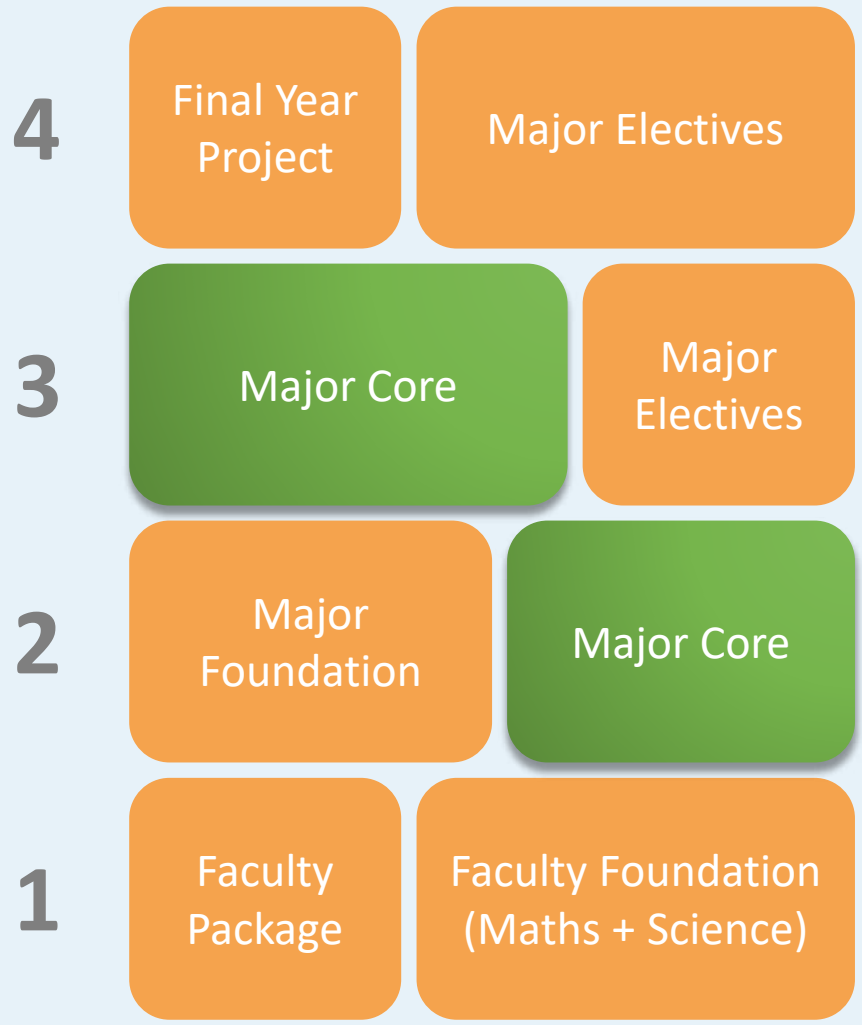
Major Core (27 units)

- Computer Organization and Design (CENG3420)
- Data Structures (CSCI2100)





Curriculum – Major Core *(for CSCI)*



Major Core (27 units)

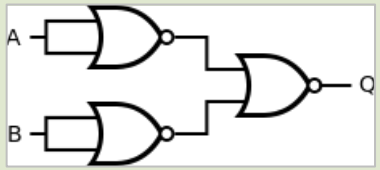
- Software Engineering (CSCI3100)
- Formal Languages and Automata Theory (CSCI3130)
- Introduction to Operating Systems (CSCI3150)
- Design and Analysis of Algorithms (CSCI3160)
- Principles of Programming Languages (CSCI3180)

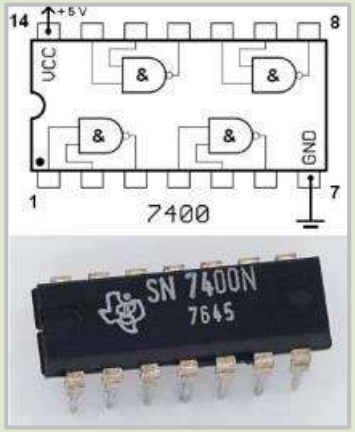
Curriculum – Major Core *(for CSCI)*

4	Final Year Project	Major Electives
3	Major Core	Major Electives
2	Major Foundation	Major Core
1	Faculty Package	Faculty Foundation (Maths + Science)

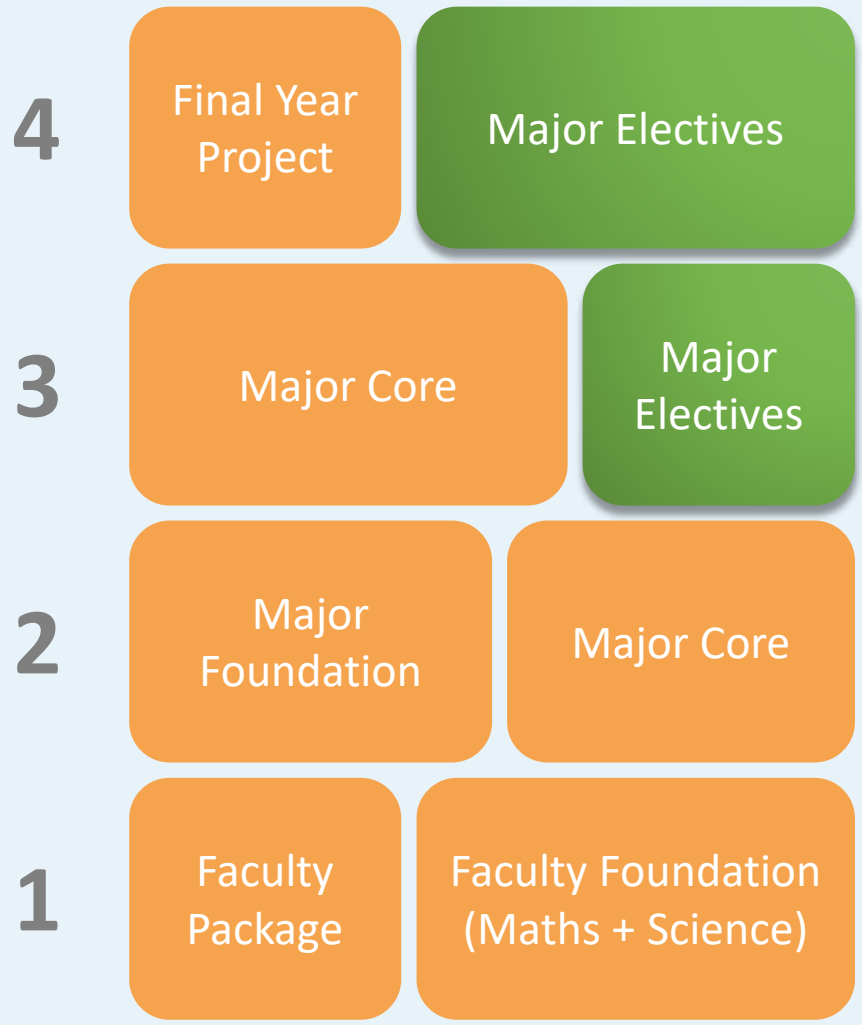
Major Core (27 units)

- Computers and Society (CSCI3250)
- Engineering Practicum (CSCI3251)
- Digital Logic and Systems (ENGG2020)





Curriculum – Major Electives *(for CSCI)*



Major Electives (17 units)

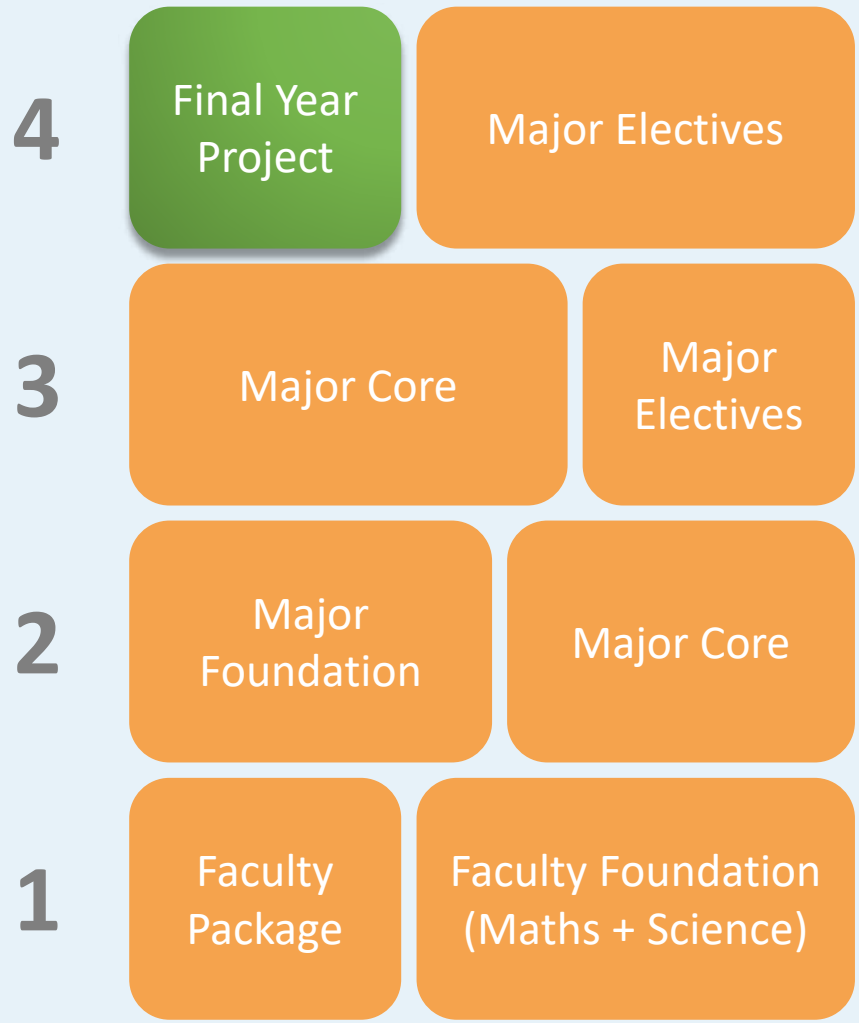
Streams

1. Intelligence Science
2. Database and Information Systems
3. Rich Media
4. Distributed Systems, Networks and Security
5. Algorithms and Complexity
6. Data Analytics

Non-Stream

7. General Computer Science

Curriculum – Final Year Project (FYP)



Final Year Project (6 units)

- Pick an interesting topic
- Interdisciplinary nature
- Apply the knowledge learnt in the previous courses
- Many open topics. Your creativity and discussion with the supervisor
- Complete a project under the supervision of an advisor

Open topic FYP – you may also propose a project to a professor

Various practical and interesting topics:

- Algorithms
- Big Data Analytics and Machine Learning
- Cloud Computing
- Computer-aided Design for Very Large Scale Integrated Circuits
- Computational Finance
- Computer Graphics and Multi-media
- Computer Game Software
- Computer and Network Security
- Databases
- Energy Efficient Computing
- Embedded System Development and Applications
- Networks
- Operating Systems
- Rapid Prototyping of Digital Systems
- Smart Hardware Design
- ……

What's More?

- Chances to create your own project and innovation with support and advice from CSE teachers
- Exchange opportunities to world-class universities
- High competitiveness in job market with 90% of CSE graduates employed within one month of graduation
- CSE teachers usually have the highest teaching evaluation scores

Industrial Visits

- Visit to companies to learn about the latest developments in the industry

Cathay Pacific

Hong Kong Science and Technology Parks Corporation

PwC

Work-Study Scheme

- One-year placement and internship for students to gain practical experience in a real working environment
- 3 years study + 1 year work-study + 1 final year study

Example of Previous Opportunities in CSE

Google

Microsoft

hp

HSBC

恒生銀行 HANG SENG BANK

新鴻基地產 Sun Hung Kai Properties

ASM Pacific Technology

HKSTP 香港科技園

FUJITSU

Sharing from our CSE Alumni

What I liked about the Computer Science curriculum is the emphasis on theoretical knowledge, taught through courses like Data Structures, Formal Languages and Automata Theory, and Principles of Programming Languages. The importance of these courses is often overlooked by many as they seem too abstract and impractical. However, they have been fundamental in building my understanding of how computers work. I think that is what differentiates studying Computer Science from solely trying to land a job as a Software Engineer.

Ethen Yuen,
CSCI Graduate of 2024

Sharing from our CSE Alumni

Hei Yiu LAW,
CENG Graduate of 2021

During the 4 years of my study as a CENG student, I could take courses on different topics. These courses not only consolidate my knowledge related to my major but can also train up my critical thinking and logical thinking skills. We have to design and implement a smart hardware product in just a few weeks and this project not only gives me a hands-on experience on designing smart hardware product, but also improves my communication skill and time management skill.

FAQs

Q: Will there be any interview?

Interview Arrangements (JUPAS)

- Interviews will be arranged in mid/late June every year.
- Not all applicants will be interviewed. We only consider Band A applications when shortlisting interviewees.
- Shortlisted applicants will receive an invitation email by early June for the details, *e.g., date, time, format, etc.*
- Stay tuned! Check your email regularly for the latest update!

Interview Arrangements (Non-JUPAS)

- Interviews will be conducted in batches from ~Dec. every year.
- You are encouraged to attach adequate supporting documents, *e.g., transcripts, predicted grade, certificates, etc.,* in your application for our holistic review.
- Shortlisted applicants will receive an invitation email for the details, *e.g., date, time, format, etc.*
- Stay tuned! Check your email regularly for the latest update!

Q: How does the major allocation work for BCSE?

Major Allocation

- BCSE students will be allocated into either CENG or CSCI according to their CGPA after finishing their 1st year of study

- Students with outstanding entry grades / renewable scholarships and good academic performance in their first year of study are guaranteed their first choice of major

- It is expected that a relatively high percentage of students would be allocated to their preferred major.

More details:
https://www.cse.cuhk.edu.hk/academics/major-allocation/

Q: Computer Engineering (CENG) or Computer Science (CSCI) ?

Differences between CENG and CSCI

- Computer Engineering is more about building things
  - » To take care of design and hardware/software integration (*e.g.*, lower cost, higher speed, more energy efficient)

- Computer Science is more about designing software solutions
  - » To take care of coding, software architecture, and the underlying theory

Q: How many students will be admitted to BCSE / CENG / CSCI?

Local Intake Quota (for reference only)

- First Year Entry to Computer Science and Engineering (BCSE) (JS4412): around **107**

- Senior Year Entry to Computer Engineering (CENG) / Computer Science (CSCI): around **7**

Note: There is no fixed quota for international students and Mainland students attempting Gao Kao.

Q: Will there be any exchange opportunity?

Exchange to Overseas Universities

- You are encouraged to join the exchange programme to broaden your horizon and learn with peers from diverse background

- List of some overseas universities for the exchange
  - The University of Sydney, Australia
  - University of Toronto, Canada
  - University of Waterloo, Canada
  - Tsinghua University, China
  - Seoul National University, Korea
  - Nanyang Technological University, Singapore
  - National University of Singapore, Singapore
  - University College London (UCL), UK
  - Georgia Institute of Technology, USA
  - University of Illinois at Urbana-Champaign, USA
  - ETH Zurich, Switzerland

Submit you application via Office of Academic Links (OAL)!

Q: Will there be any scholarship or financial aid?

Scholarships and Financial Aids

- The Government and the University offer various scholarships and financial aids depending on student's financial situation, or their outstanding performance in academic or other areas

- List of some scholarships and financial aids
  - » Admission Scholarships
  - » Scholarships for Overseas Studies
  - » Government or University Financial Aid
  - » Summer Subsistence and Travel Loan Scheme
  - » Student Residence Bursary Scheme
  - …

Check out more details on the website of CUHK's Office of Admissions and Financial Aid: https://admission.cuhk.edu.hk/finance.html

Q: What are the career prospects of CENG/CSCI graduates?

Career Prospects

- Employers of our graduates include:
  - » Google
  - » Intel
  - » Microsoft
  - » IBM
  - » Apple
  - » Facebook
  - » Yahoo
  - » Deloitte
  - » Hong Kong Government
  - » Investment Banking Institutes
  - … …

Career Choices

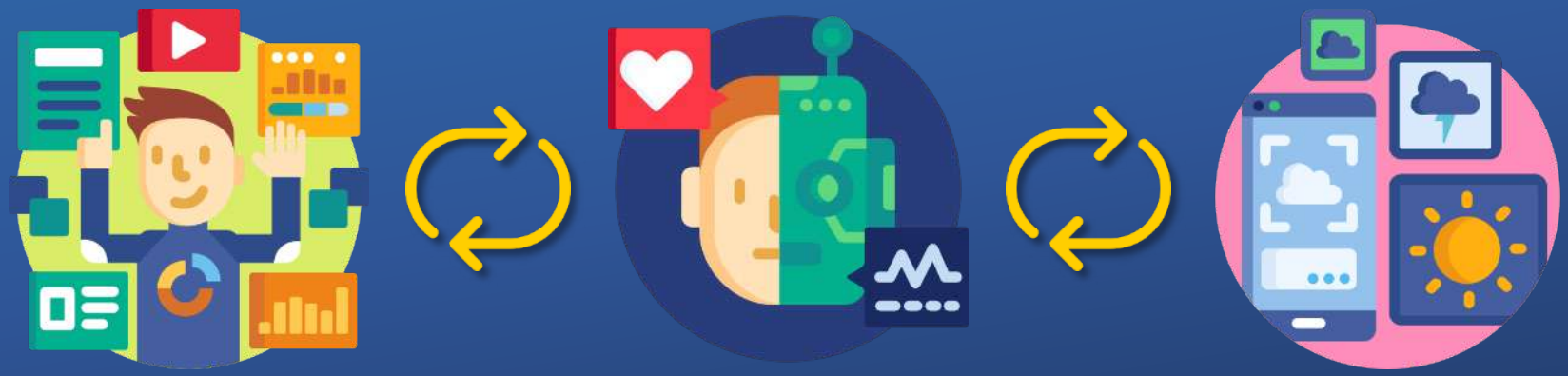
- ☑ Entrepreneur
- ☑ Systems programmer
- ☑ Mobile app developer
- ☑ Database administrator
- ☑ Management/IT consultant
- ☑ Researcher
- ☑ Bioinformatics specialist
- ☑ System consultant
- ☑ Data analyst
- ☑ Web and content developer
- ☑ Network administrator
- ☑ Game designer/programmer
- ☑ Medical imaging specialist
- ☑ Software engineer
- ☑ System analyst
- ☑ Systems administrator
- ☑ Network engineer
- ☑ Data miner
- ☑ Systems integrator
- ☑ Business analyst

Q: Can I transfer to AIST or other majors in Year 2?

If you look for AIST / other majors instead…

- You may submit application for change of major (to AIST or other majors), subject to prevailing regulations stipulated by RES and approval by relevant unit(s).

- If you are determined to go for AIST, you may choose JS4468 / AIST as your first choice directly.



Q: Can I declare AIST / CENG / CSCI as second major or minor?

Declare Second Major / Minor

- You are not allowed to declare AIST / CENG / CSCI as your second major or minor if you are a CSE student.
- However, you are encouraged to broaden your horizons and declare second major / minor offered by other departments.

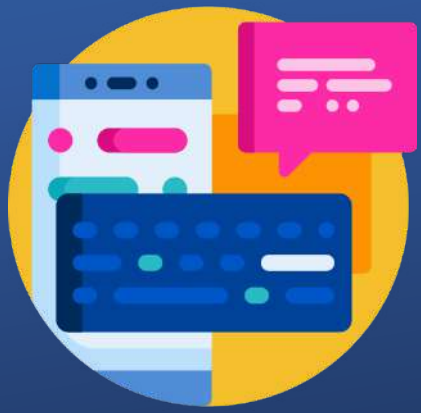


Q: I am still struggling to choose between AIST / CENG / CSCI. What can I do?

If you are still struggling to choose…

- You can go through our website and admission materials for a better understanding before applying, and write to us via email at ug-admiss@cse.cuhk.edu.hk if you have any further queries.

- You can join our outreach activities in the future and chat with our teachers and student ambassadors.



Contact Us

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