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)

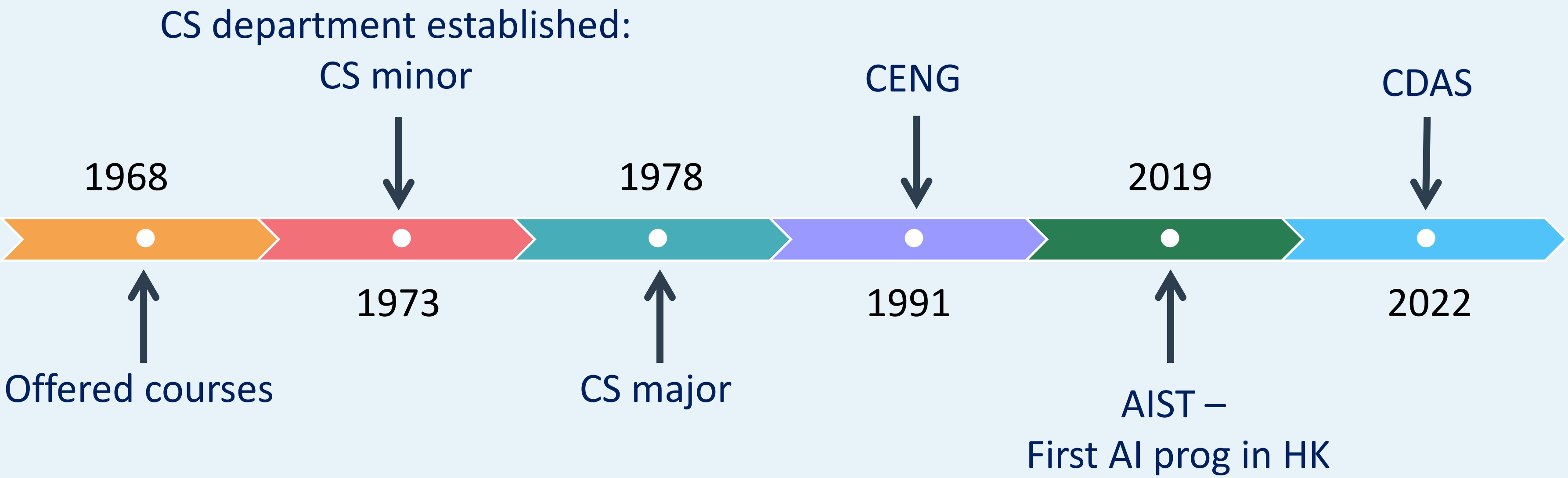
Agenda

1. Introduction of our Department
2. Introduction of the BCSE/CENG/CSCI Programmes
3. Curriculum Structure
4. Other Learning Options Available
5. Admission Requirements
6. FAQ

Department of Computer Science and Engineering

A Long History

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



CS department established:
CS minor

CENG

CDAS

1968

1978

2019

1973

1991

2022

Offered courses

CS major

AIST –
First AI prog in HK

Strong Alumni Network

- High competitiveness in job market with 90% of CSE graduates employed within one month of graduation

IT Industry

Microsoft

Google

IBM

NOKIA

amazon.com

facebook

Education

CityU

NUS
National University
of Singapore

CARNEGIE MELLON UNIVERSITY

Georgia Tech

Banking

HSBC

citibank

Morgan Stanley

Deutsche Bank

Deloitte.

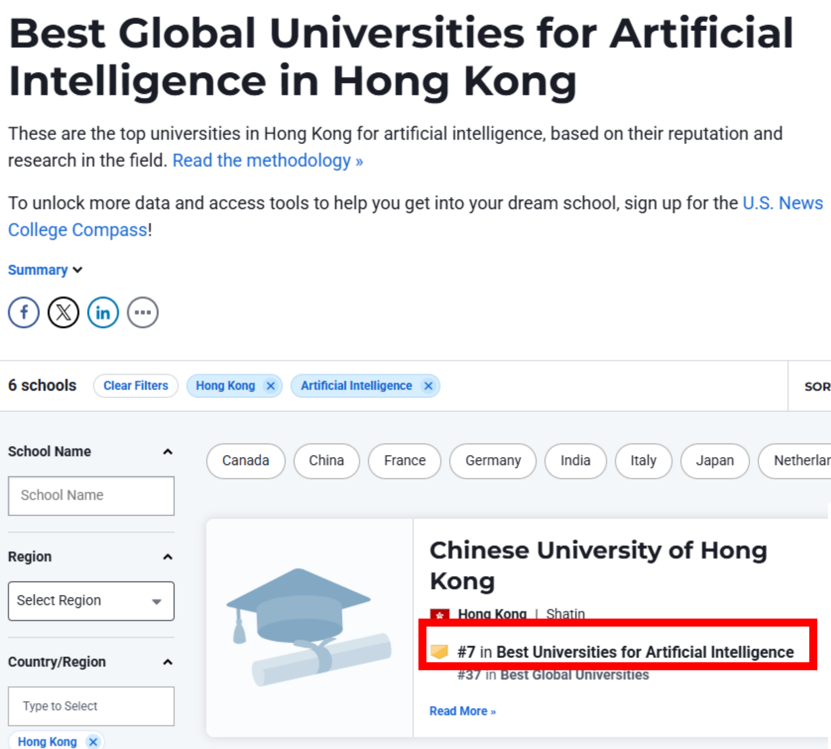
Goldman Sachs

Excellent Teaching and Research Team

- **2021 Kyoto Prize Laureate and Turing Award Recipient**
  Prof. Andrew Yao
- **8 ACM Fellows**
  Prof. Benjamin Wah, Prof. John Lui, etc.
- **16 IEEE Fellows**
  Prof. Irwin King, Prof. Evangeline Young, etc.
- **MIT TR35 China 2024**
  Prof. Yu Li
- **DAC Under-40 Innovator Award 2024**
  Prof. Bei Yu
- **Editor-in-Chief (EiC) of ACM Transactions on Database Systems (TODS)**
  Prof. Yufei Tao

- CSE teachers usually have the highest teaching evaluation scores

Rankings



Best Global Universities for Artificial Intelligence in Hong Kong

These are the top universities in Hong Kong for artificial intelligence, based on their reputation and research in the field. Read the methodology »

To unlock more data and access tools to help you get into your dream school, sign up for the U.S. News College Compass!

Chinese University of Hong Kong

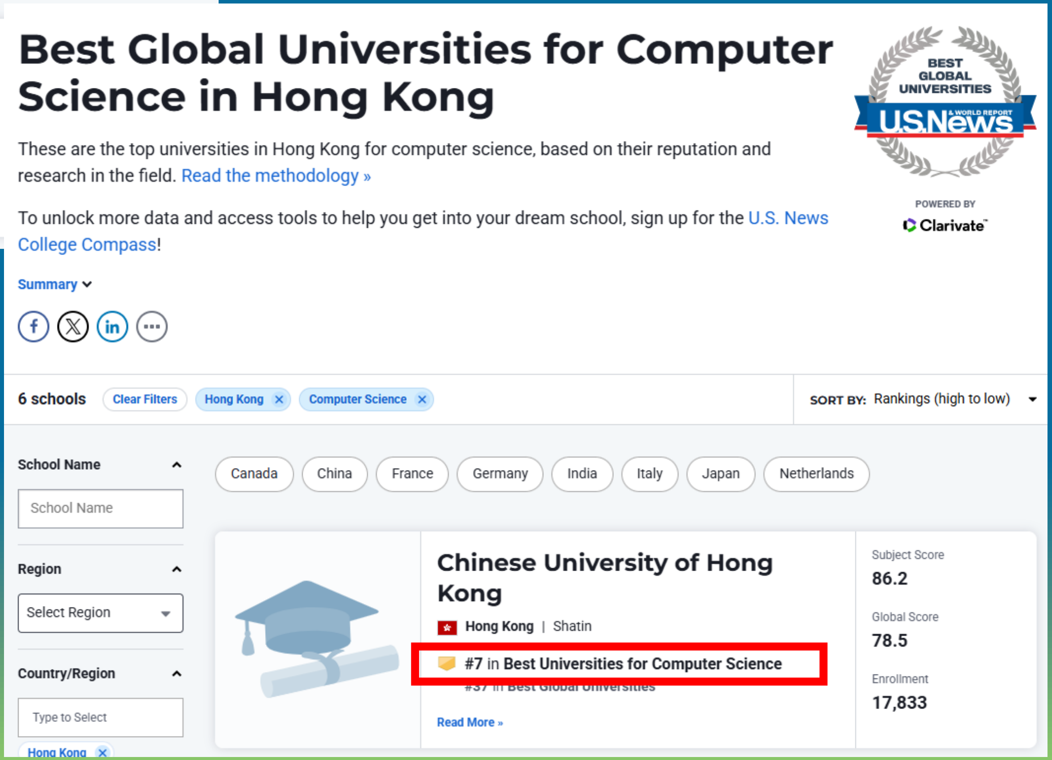
Hong Kong | Shatin

#7 in Best Universities for Artificial Intelligence

#37 in Best Global Universities

US News and World Report:
Best Universities in
Artificial Intelligence
2025-2026
#1 in Hong Kong
#7 Globally

US News and World Report:
Best Universities in
Computer Science
2025-2026
#1 in Hong Kong
#7 Globally



Best Global Universities for Computer Science in Hong Kong

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Chinese University of Hong Kong

Hong Kong | Shatin

#7 in Best Universities for Computer Science

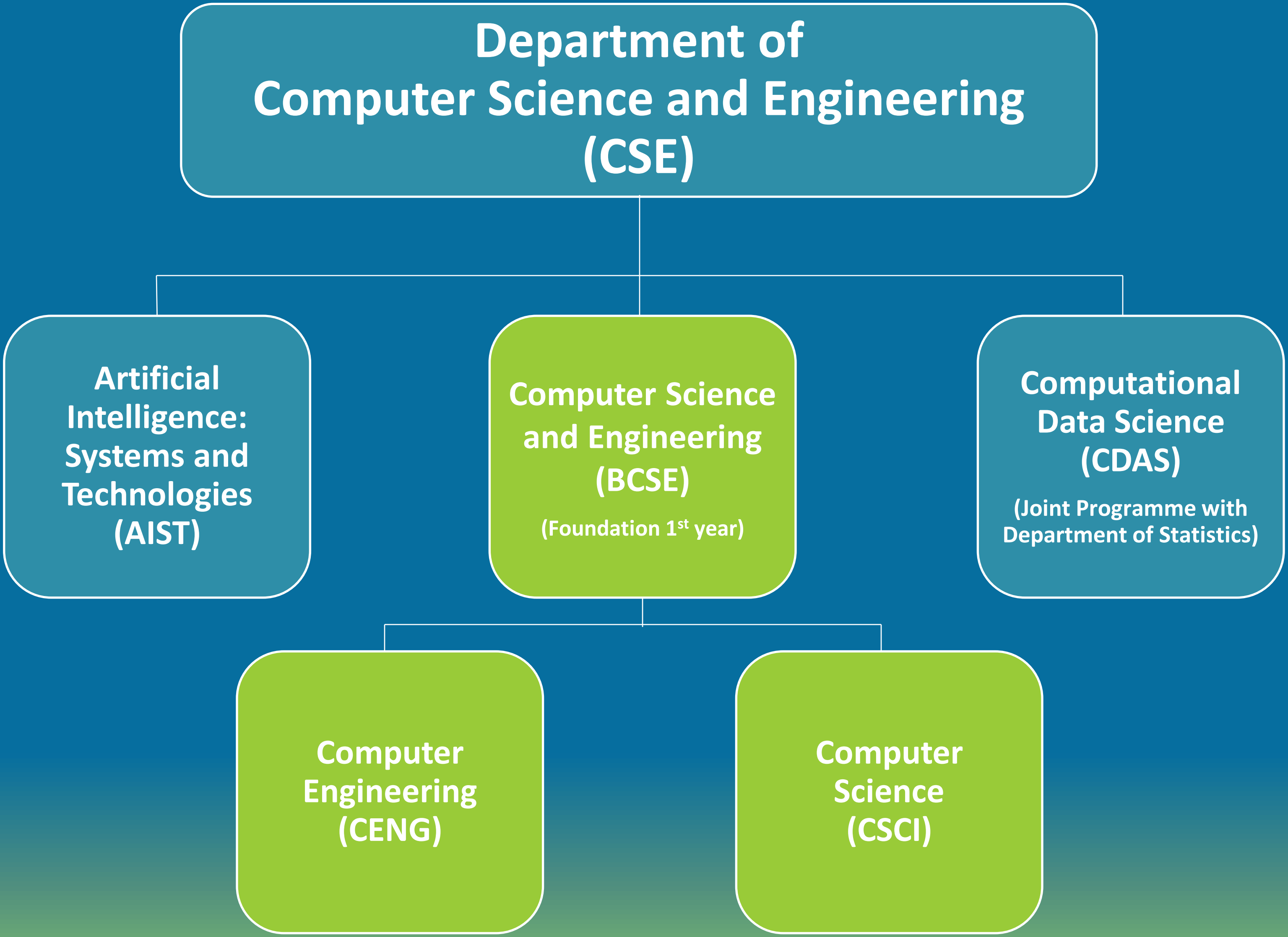
#37 in Best Global Universities

Subject Score: 86.2

Global Score: 78.5

Enrollment: 17,833

Overview of CSE's UG Programmes



Department of Computer Science and Engineering (CSE)

Artificial Intelligence: Systems and Technologies (AIST)

Computer Science and Engineering (BCSE)

(Foundation 1st year)

Computational Data Science (CDAS)

(Joint Programme with Department of Statistics)

Computer Engineering (CENG)

Computer Science (CSCI)

BCSE / CENG / CSCI Programmes

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

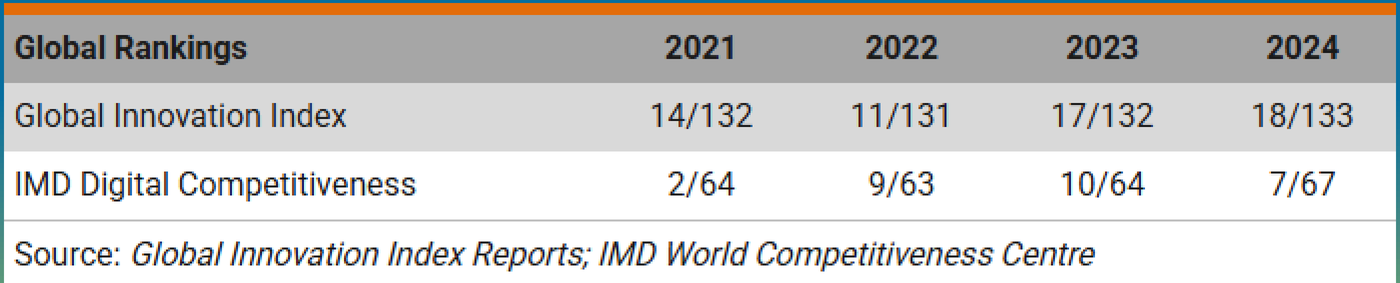
(https://www.linkedin.com/business/talent/blog/talent-acquisition/fastest-growing-jobs-2023)

Growing Demand and Opportunities

- The Shenzhen-Hong Kong-Guangzhou science and technology cluster **ranks first globally** in terms of performance by the WIPO's Global Innovation Index 2025 top 100 science and technology (S&T) clusters.

- Hong Kong's start-up ecosystem is thriving. In 2024, the number of start-ups in Hong Kong grew by 10% to more than 4,600 with some 17,651 people employed in such businesses.

- Hong Kong has consistently placed in the top 10 of the IMD World Digital Competitiveness Ranking in recent years. In 2024, Hong Kong ranked seventh worldwide, affirming the city's prowess and accomplishments in innovation and technology.

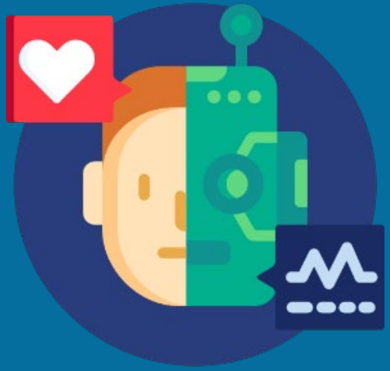


Global Rankings	2021	2022	2023	2024
Global Innovation Index	14/132	11/131	17/132	18/133
IMD Digital Competitiveness	2/64	9/63	10/64	7/67

Source: *Global Innovation Index Reports; IMD World Competitiveness Centre*

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

Things You Can Learn in the Programmes



- 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 in the Programmes

- 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 in the Programmes

- VLSI and Embedded Systems
  - ➢ Design smart, energy efficient hardware devices

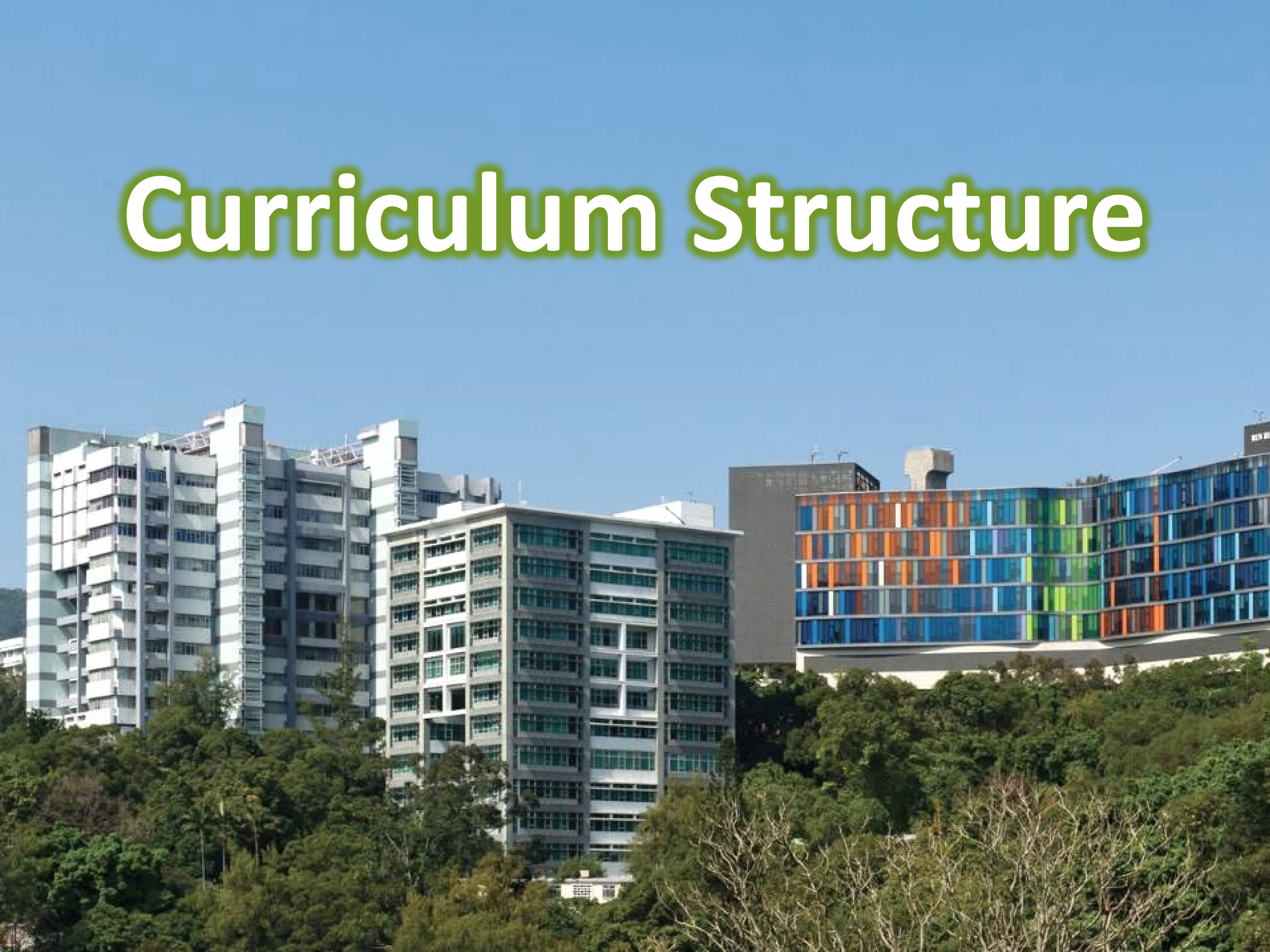
- Bioinformatics
  - ➢ Use computers to figure out microorganisms, genetics, and understand diseases

- Databases, Computational Finance, Control, …
  ... and much more

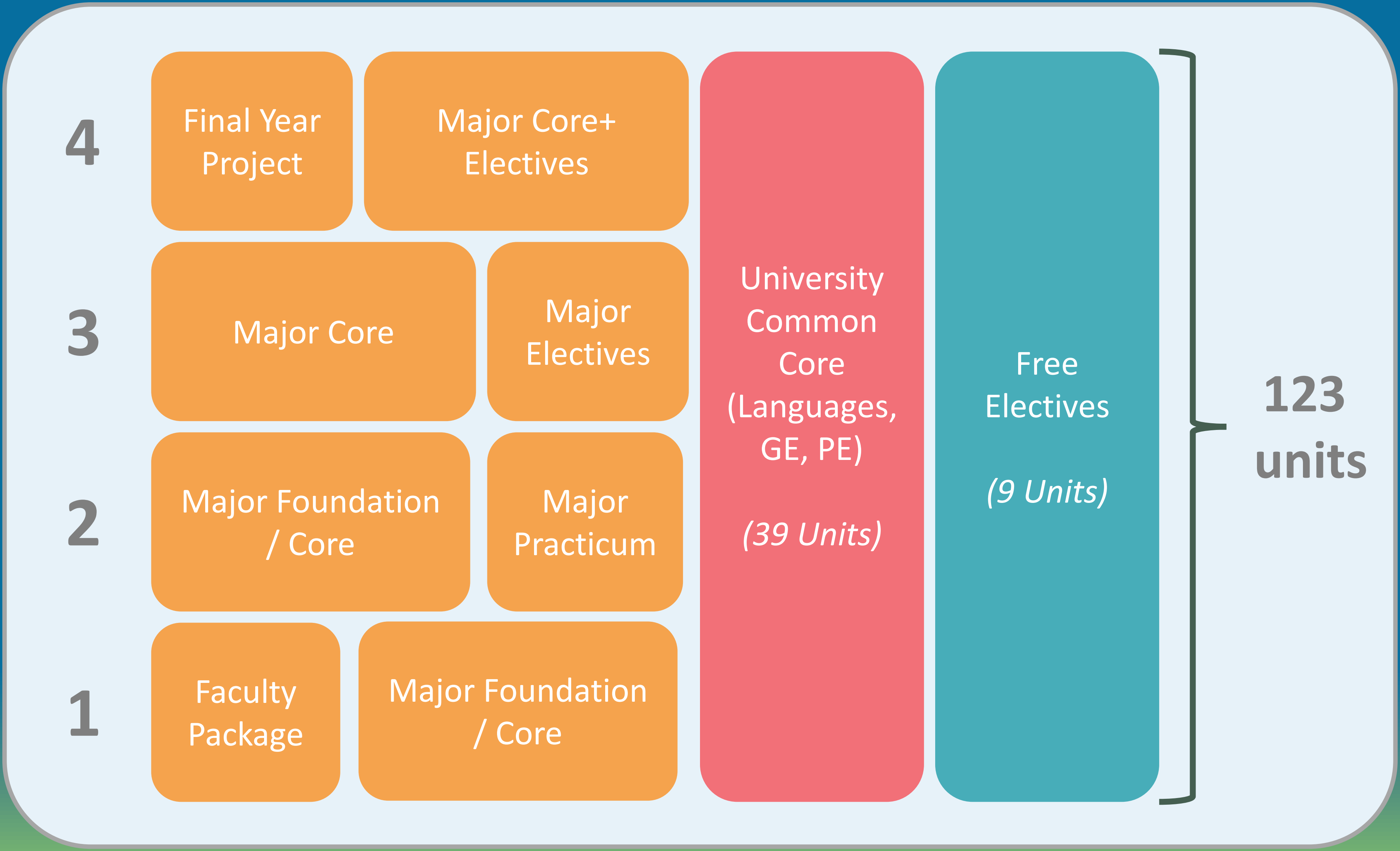
Difference between CENG and CSCI

- 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

Curriculum Structure



Curriculum – Overview



4

Final Year Project

Major Core+ Electives

3

Major Core

Major Electives

2

Major Foundation / Core

Major Practicum

1

Faculty Package

Major Foundation / Core

University Common Core (Languages, GE, PE)

(39 Units)

Free Electives

(9 Units)

123 units

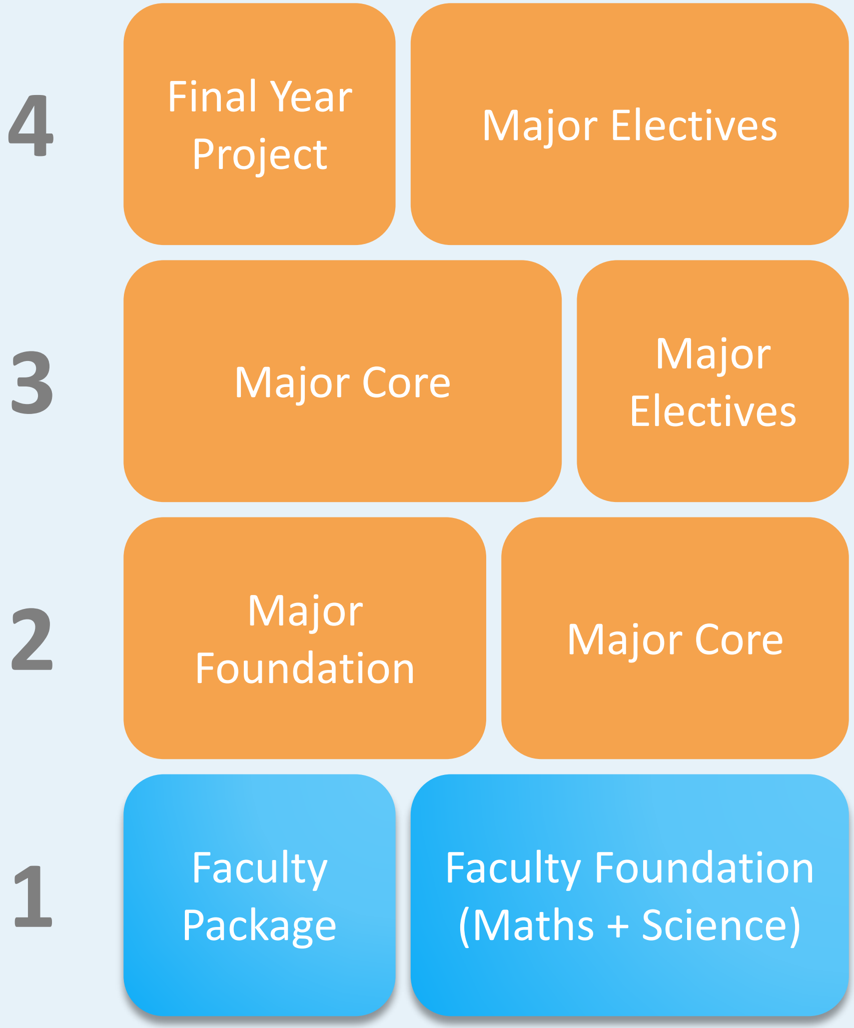
University Core Requirements

University Core Courses		Units Requirements
Language	English	8
	Chinese	5
General Education	University Foundation	6
	University GE	7 (At least 2 units in each Area A, C & D)
	College GE	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**

Major Requirements

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

BCSE Curriculum – Faculty Package and Foundation: A common 1st year for both CENG & CSCI

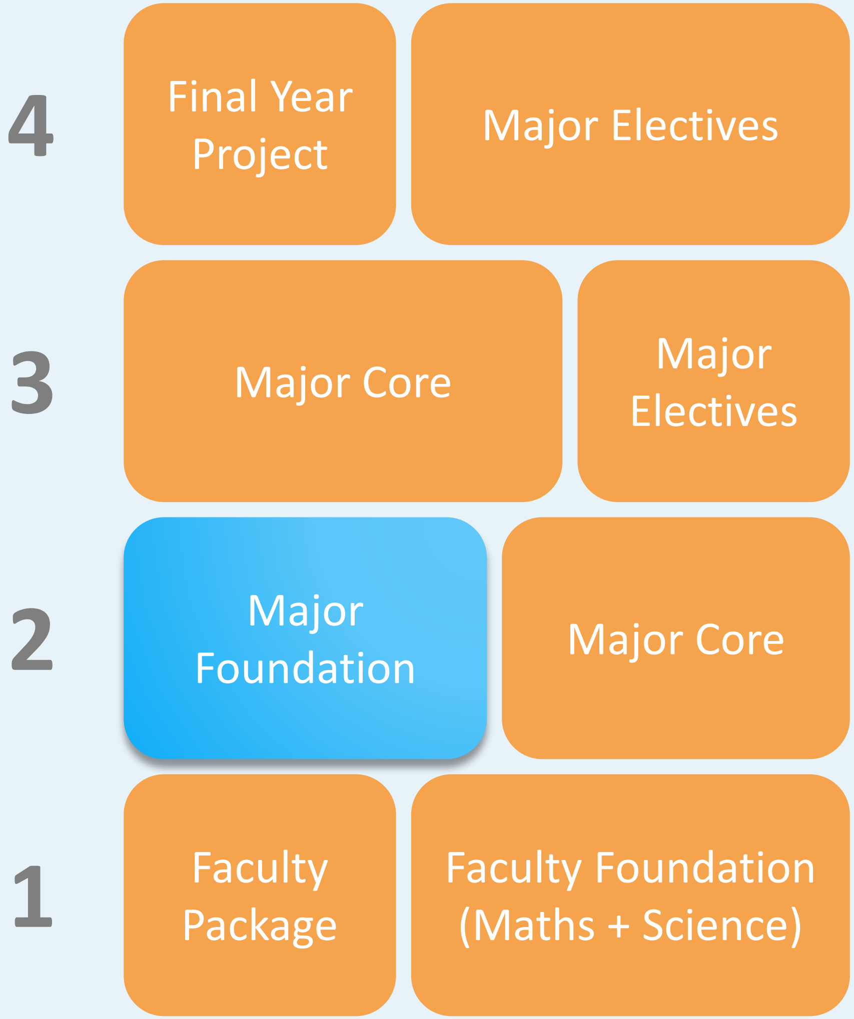


Faculty Package and Foundation (15 units)

- Problem Solving By Programming (ENGG1110)
- AI Literacy Workshop (ENGG1111)
- Linear Algebra for Engineers (ENGG1120)
- Single Variable Calculus for Engineers (ENGG1125)

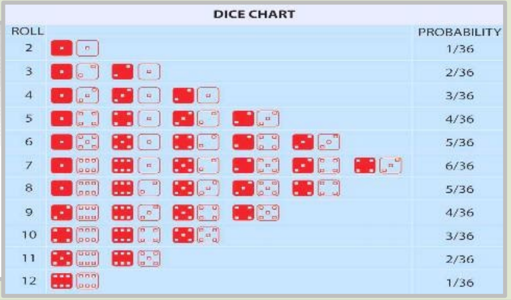
- Multivariable Calculus for Engineers (ENGG1130)
- Foundation Science

CENG Curriculum – Major Foundation



Major Foundation (11 units)

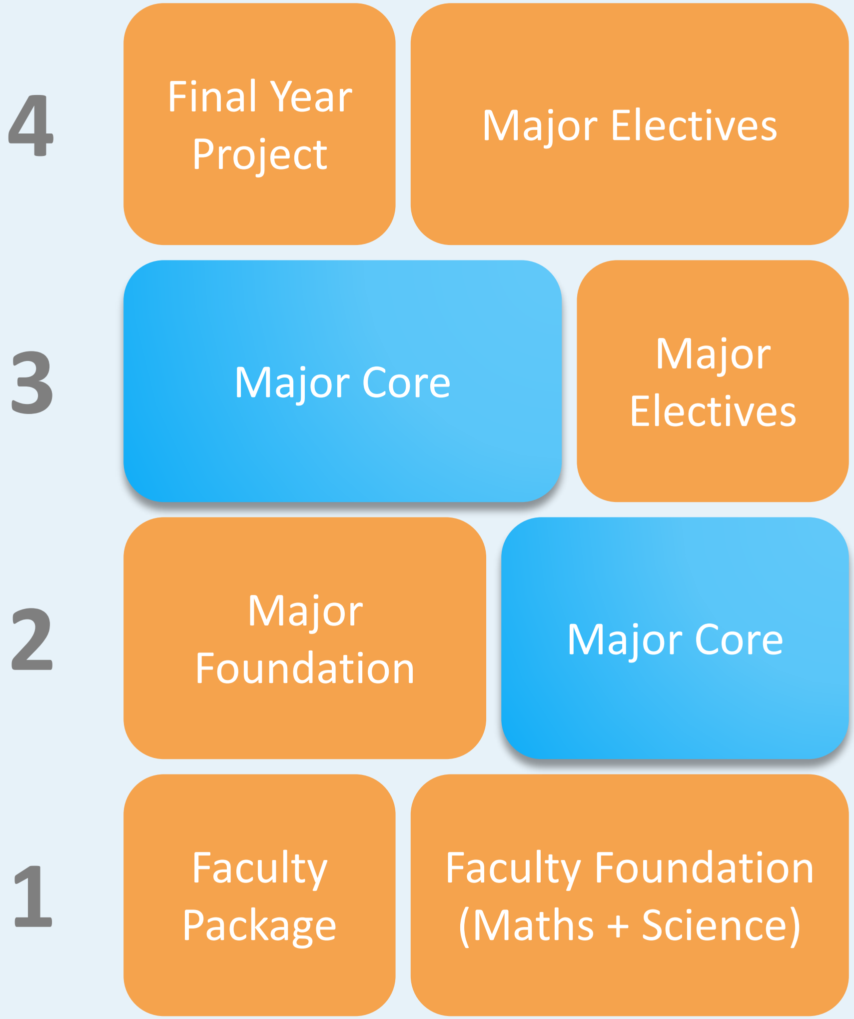
- Introduction to Computing Using C++ (CSCI1120)
- Complex Variables for Engineers (ENGG2720)
- Differential Equations for Engineers (ENGG2740)
- Probability for Engineers (ENGG2760)
- Statistics for Engineers (ENGG2780)



DICE CHART

ROLL	PROBABILITY
2	1/36
3	2/36
4	3/36
5	4/36
6	5/36
7	6/36
8	5/36
9	4/36
10	3/36
11	2/36
12	1/36

CENG Curriculum – Major Core



4
Final Year Project
Major Electives

3
Major Core
Major Electives

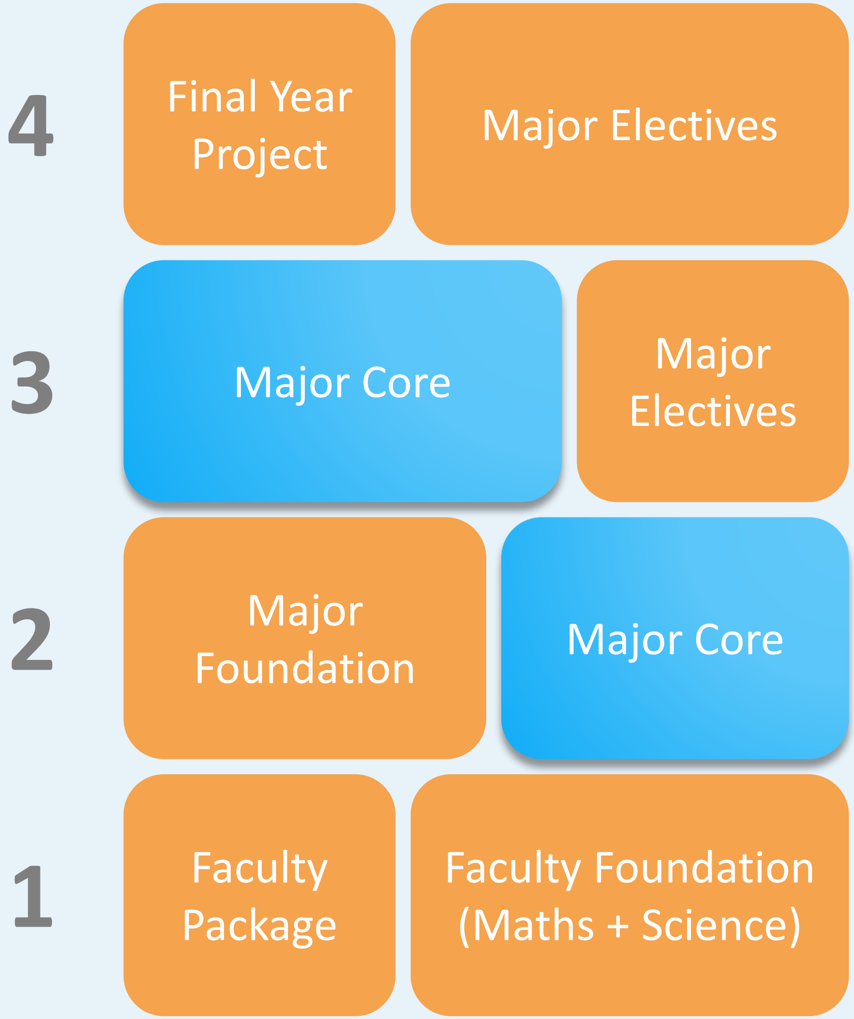
2
Major Foundation
Major Core

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)

CENG Curriculum – Major Core



4
Final Year Project
Major Electives

3
Major Core
Major Electives

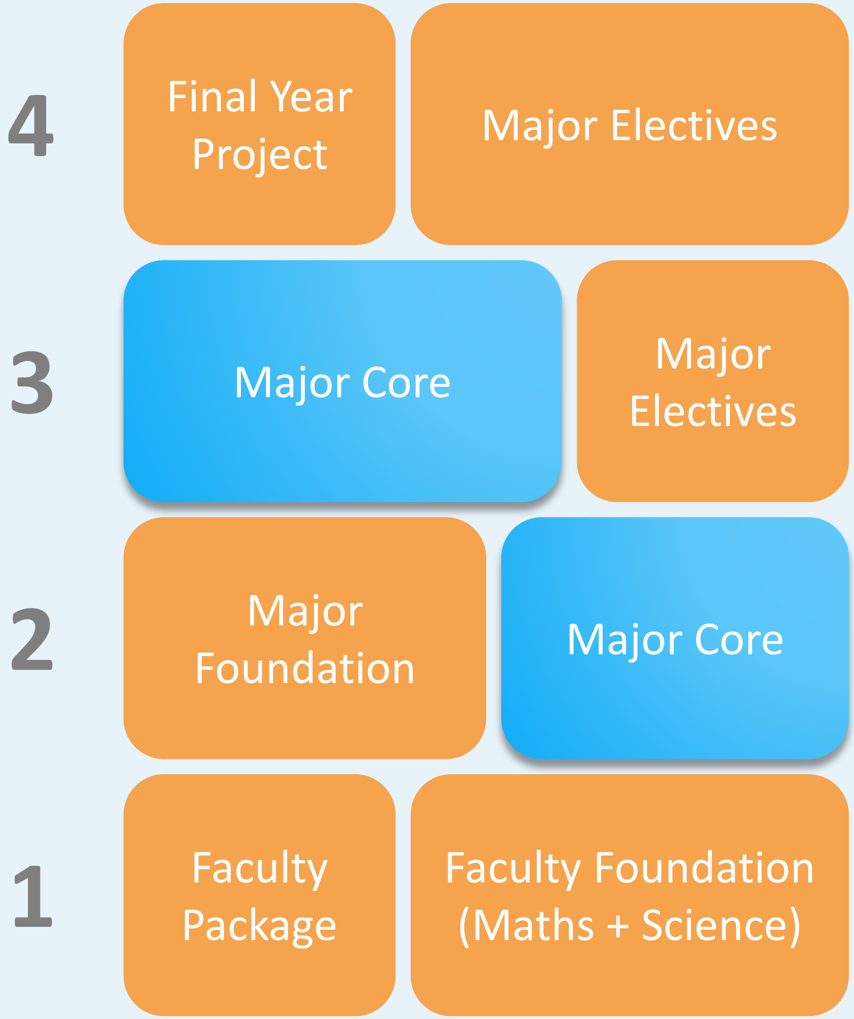
2
Major Foundation
Major Core

1
Faculty Package
Faculty Foundation (Maths + Science)

Major Core (31 units)

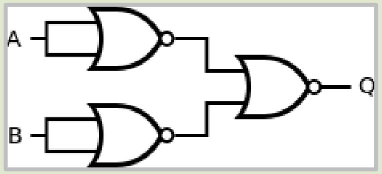
- » Data Structures (CSCI2100)
- » Software Engineering (CSCI3100)
- » Introduction to Operating Systems (CSCI3150)
- » Introduction to Discrete Mathematics and Algorithms (CSCI3190)
- » Computers and Society (CSCI3250)
- » Engineering Practicum (CSCI3251)

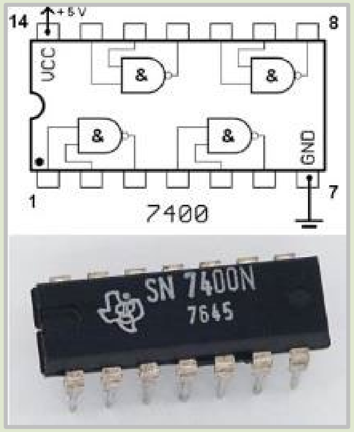
CENG Curriculum – Major Core



Major Core (31 units)

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





CENG Curriculum – Major Electives

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

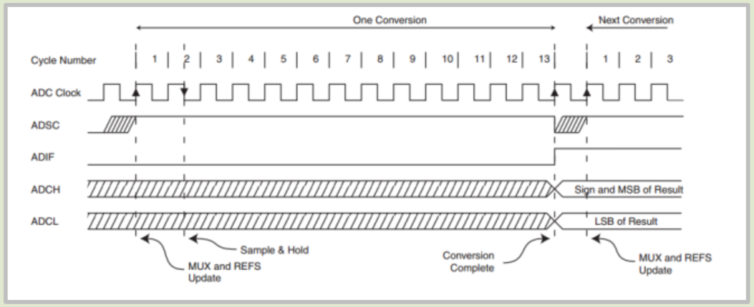
Major Electives (12 units)

Streams

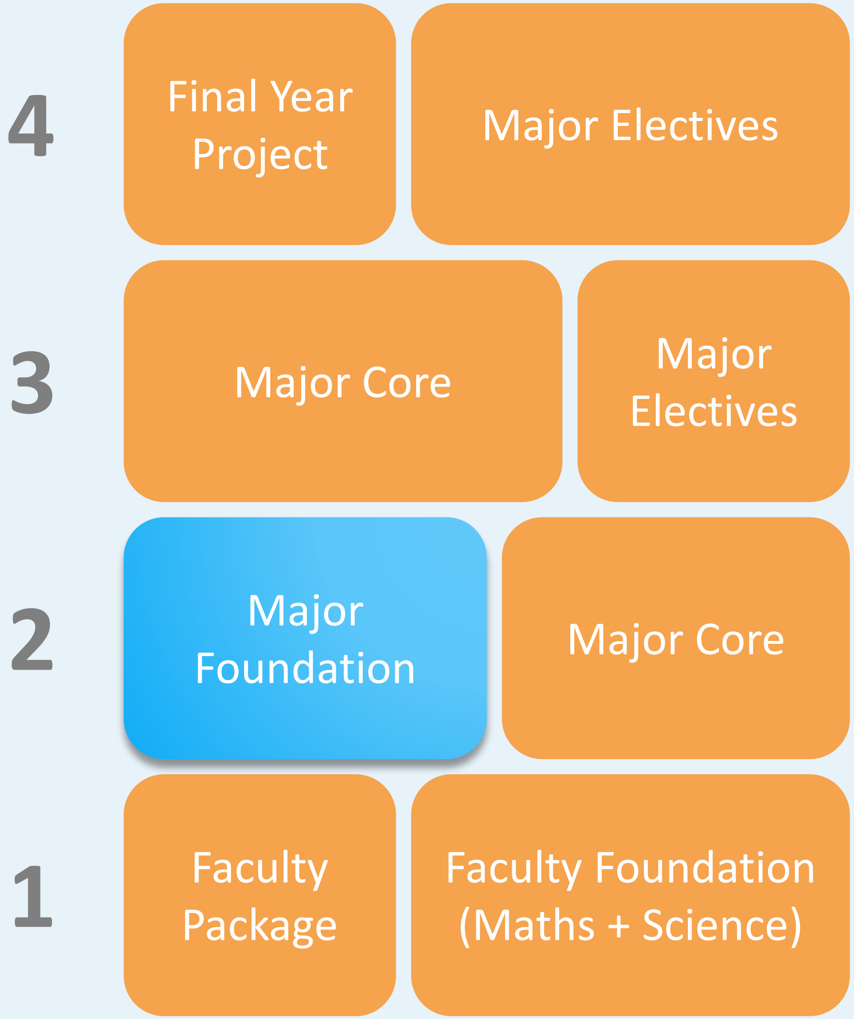
1. **Embedded Systems**
2. **VLSI Design and EDA**

Non-Stream

3. General Computer Engineering

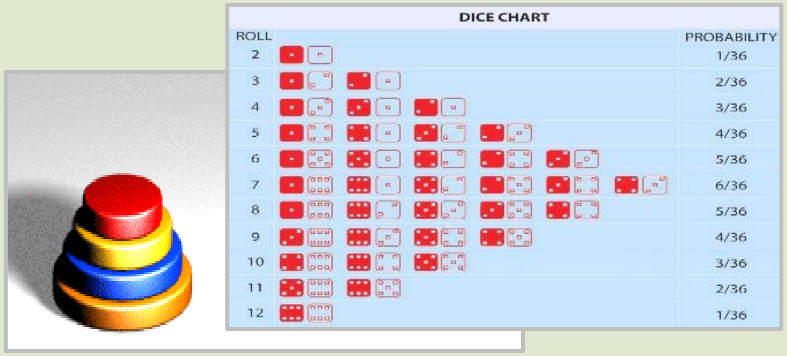


CSCI Curriculum – Major Foundation



Major Foundation (10 units)

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



DICE CHART

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7	6/36
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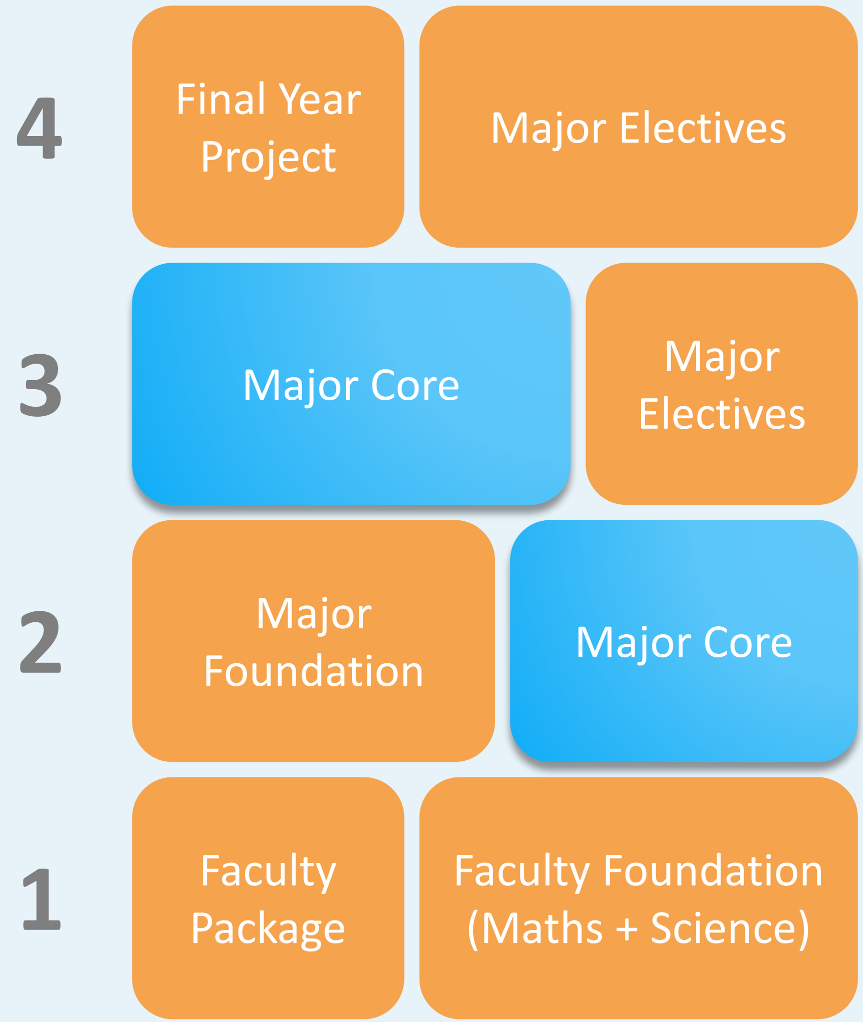
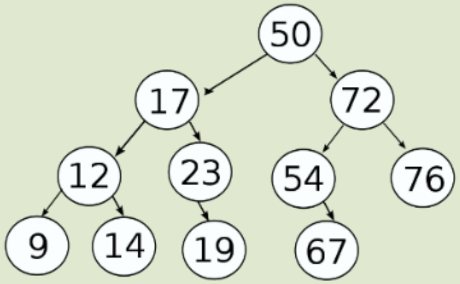
10	3/36
11	2/36
12	1/36

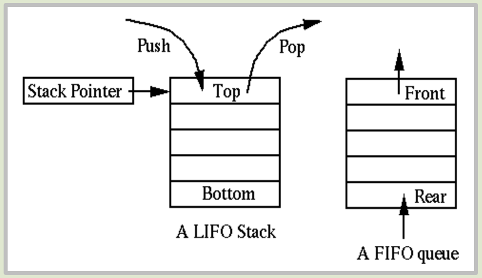
CSCI Curriculum – Major Core



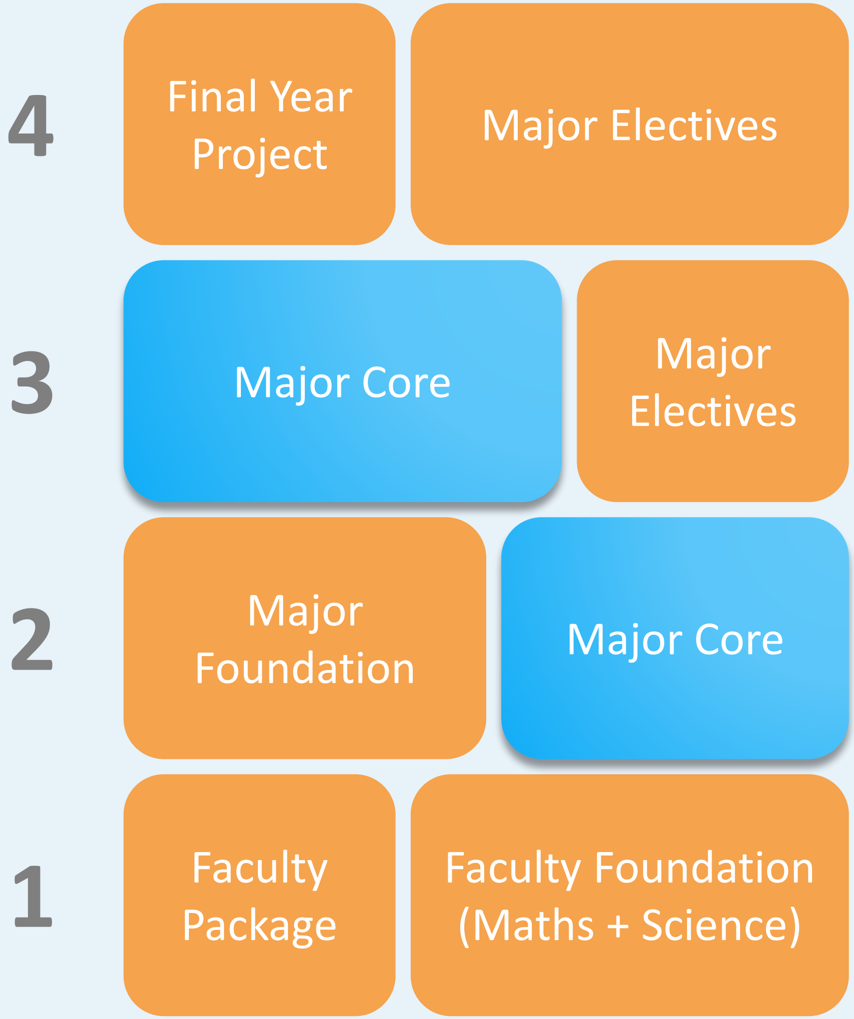
Major Core (27 units)

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





CSCI Curriculum – Major Core



4

Final Year Project

Major Electives

3

Major Core

Major Electives

2

Major Foundation

Major Core

1

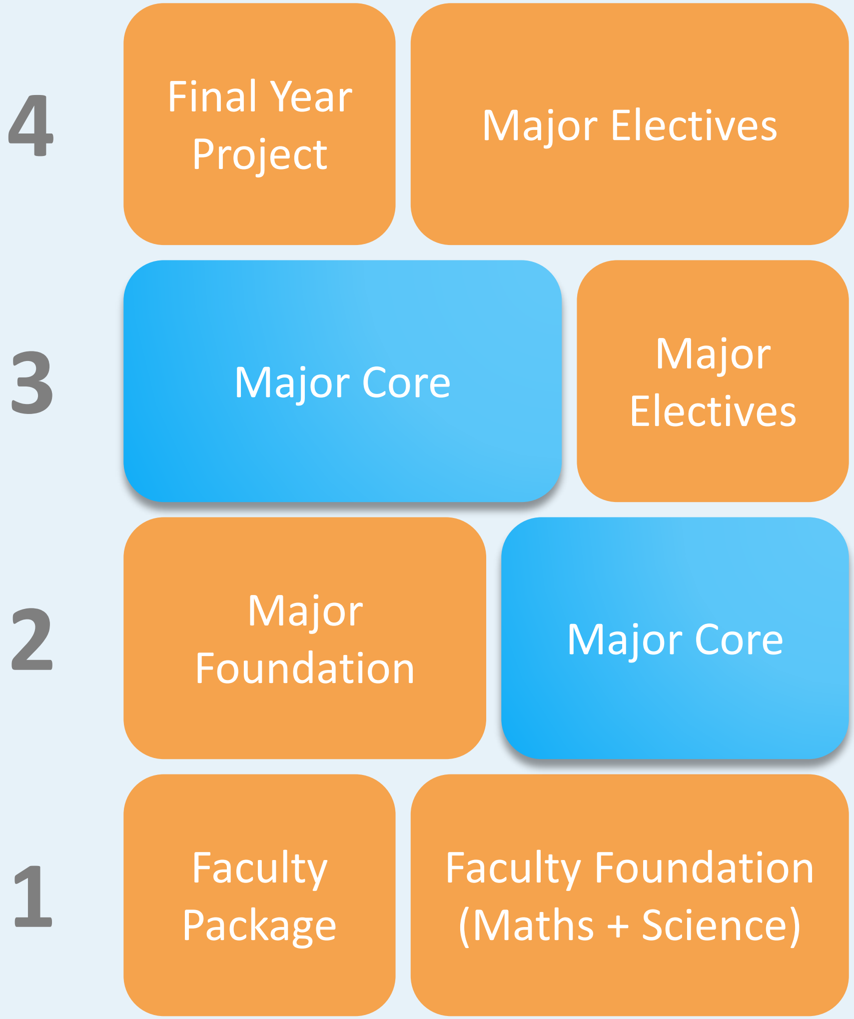
Faculty Package

Faculty Foundation (Maths + Science)

Major Core (27 units)

- 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)

CSCI Curriculum – Major Core



4
Final Year Project
Major Electives

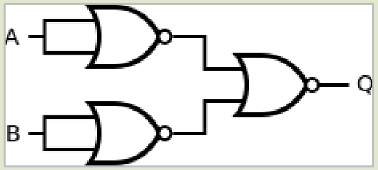
3
Major Core
Major Electives

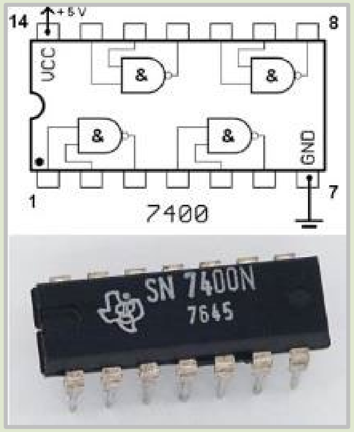
2
Major Foundation
Major Core

1
Faculty Package
Faculty Foundation (Maths + Science)

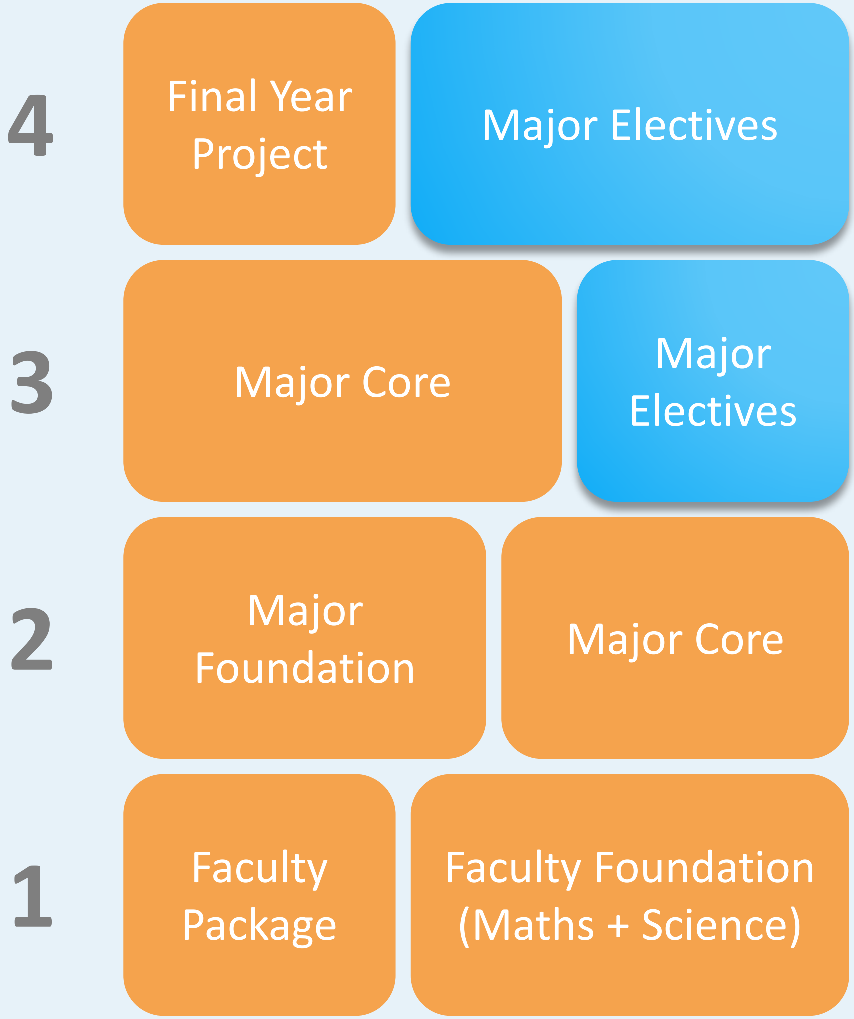
Major Core (27 units)

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





CSCI Curriculum – Major Electives



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 (17 units)

Streams

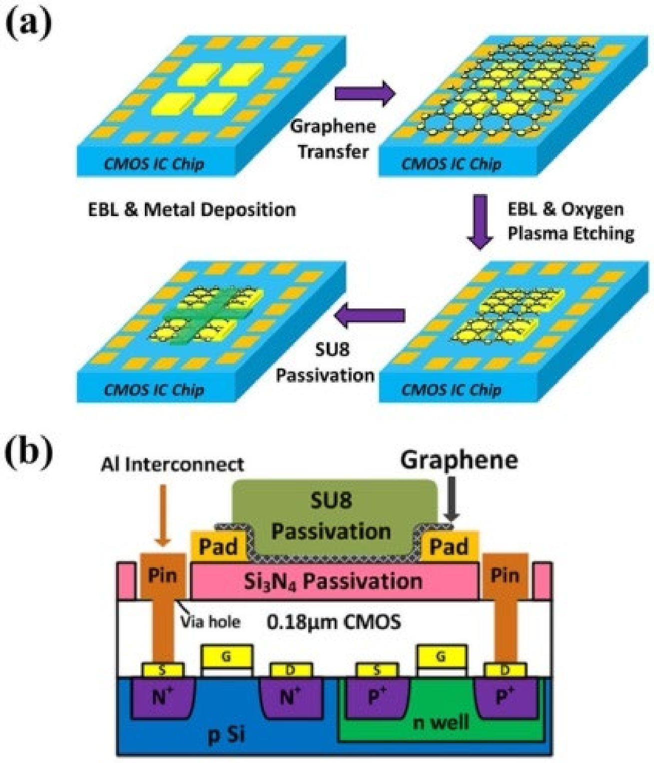
1. Intelligence Science
2. Database and Information Systems
3. Rich Media
4. Distributed Systems, Networks and Security
5. Algorithms and Complexity
6. Data Analytics

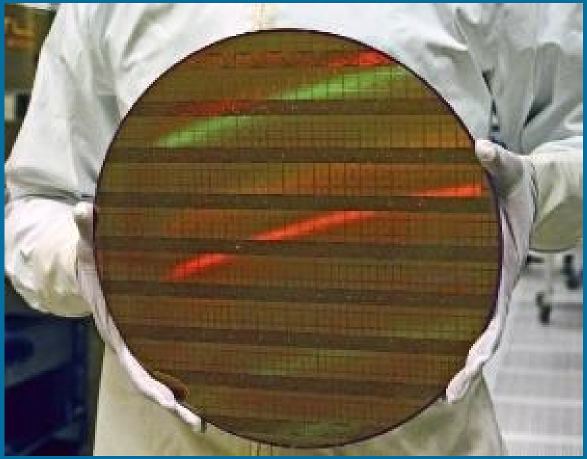
Non-Stream

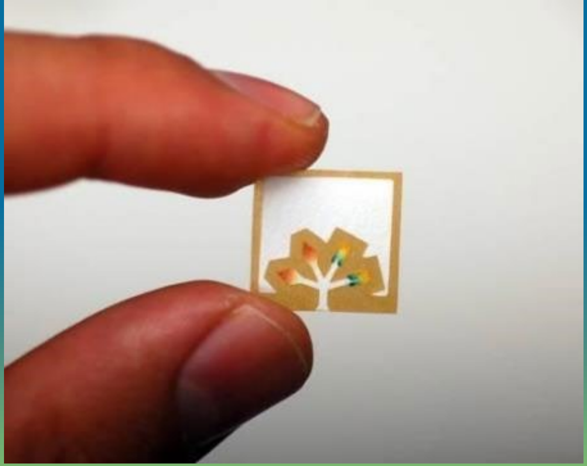
7. General Computer Science

Topic of Interest:

Computer-aided Design for Very Large Scale Integrated Circuits (CENG4120/CENG5030/CENG5270)

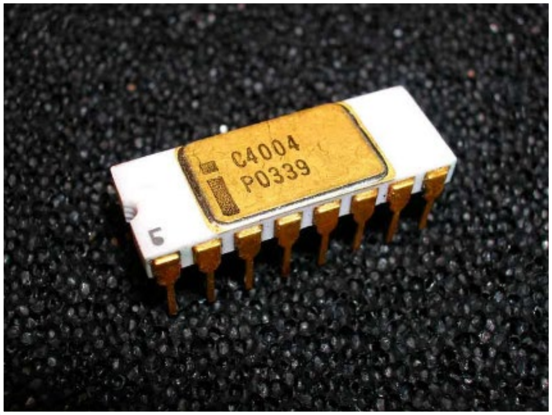






Topic of Interest:

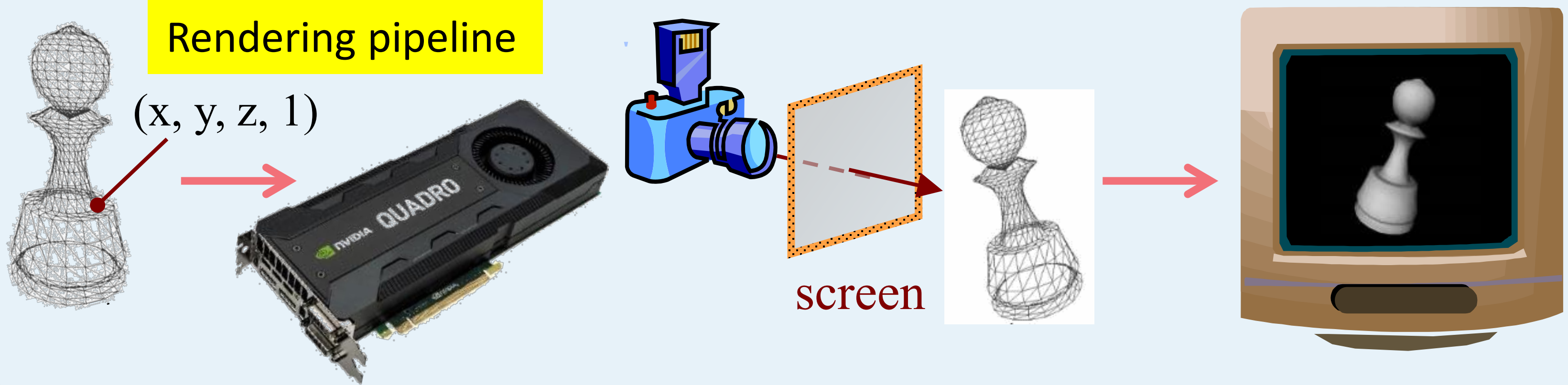
Embedded System Development and Applications (CENG4480)

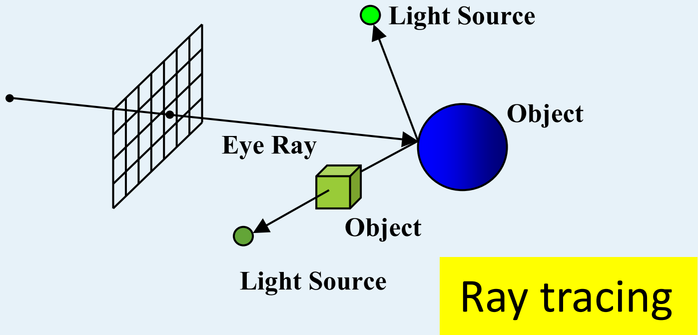


Topic of Interest:

Computer Graphics and Multi-media (CSCI3260/CSCI3280/CSCI3290)

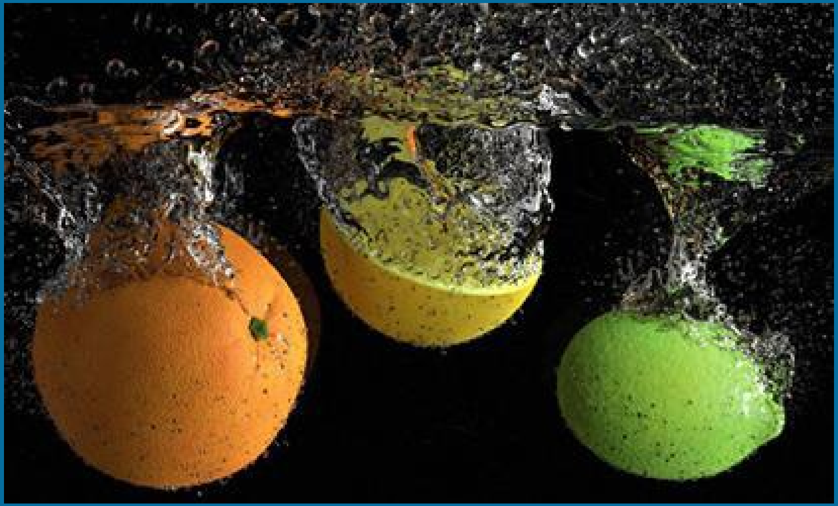
- Use graphics cards to create photorealistic images and movies

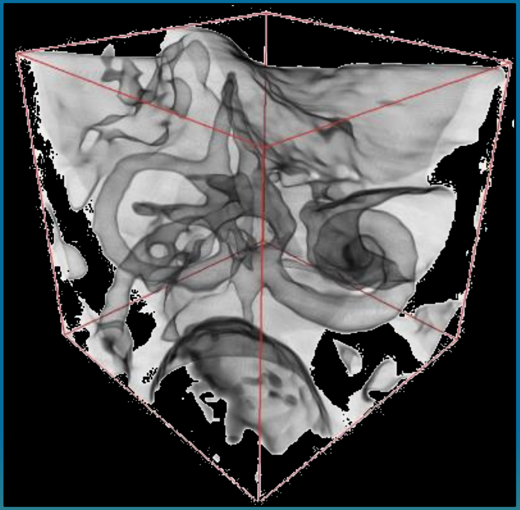




Is it real?

Topic of Interest:
Computer Graphics and Multi-media
(CSCI3260/CSCI3280/CSCI3290)

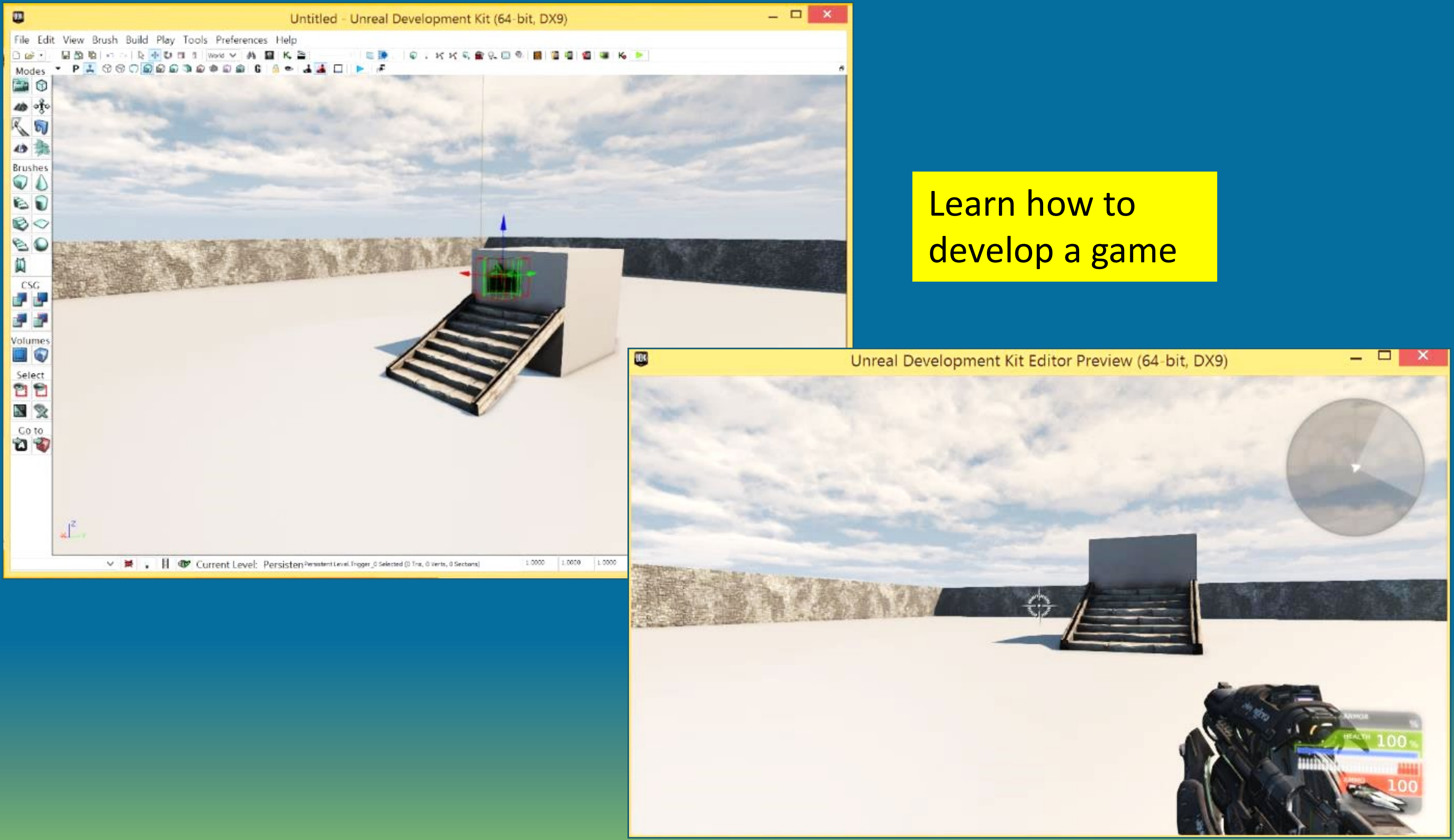




Film & visual effects
& data visualization

Topic of Interest:

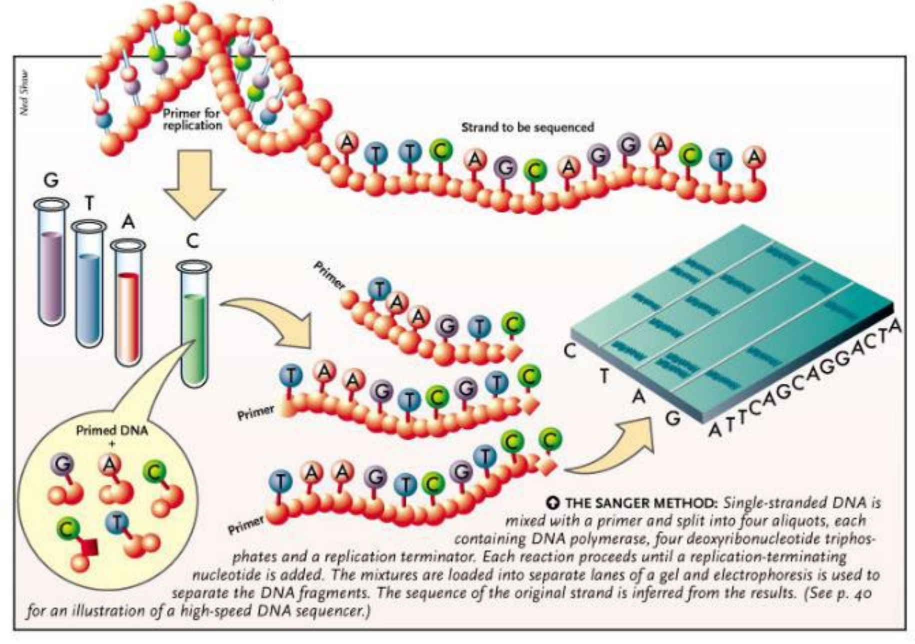
Computer Game Software (CSCI4120)



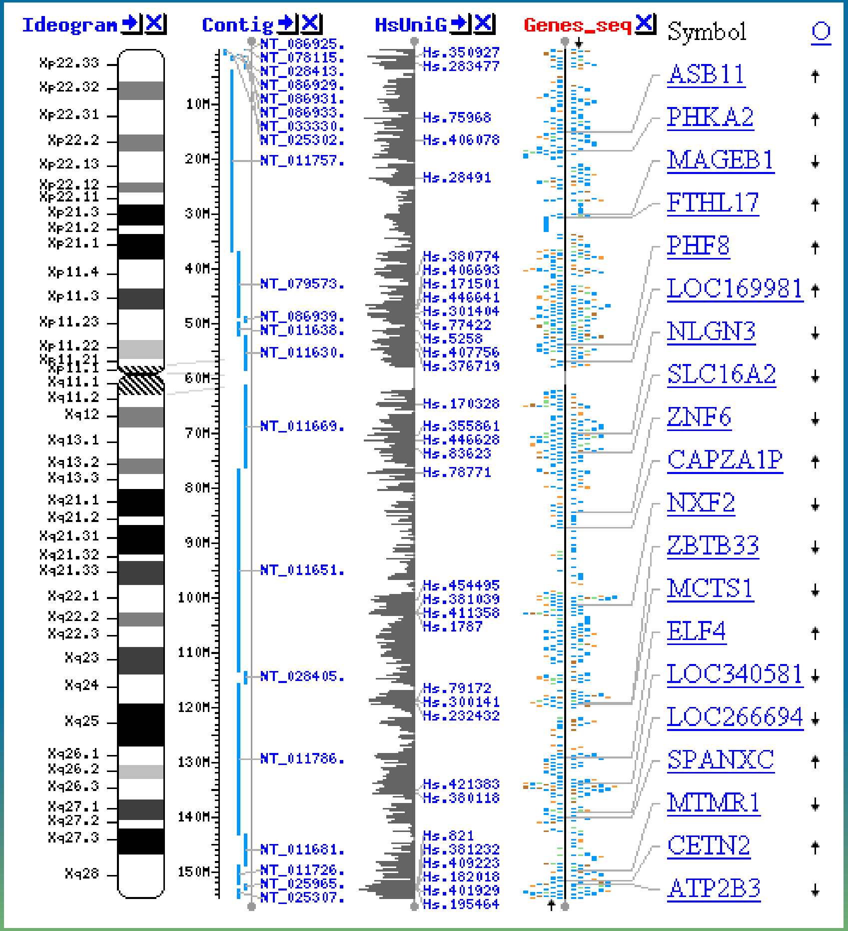
Learn how to develop a game

Topic of Interest:
Algorithms for Bioinformatics (CSCI3220)

- Use computer to model and interpret biological data
- DNA mutation ↔ diseases



THE SANGER METHOD: *Single-stranded DNA is mixed with a primer and split into four aliquots, each containing DNA polymerase, four deoxyribonucleotide triphosphates and a replication terminator. Each reaction proceeds until a replication-terminating nucleotide is added. The mixtures are loaded into separate lanes of a gel and electrophoresis is used to separate the DNA fragments. The sequence of the original strand is inferred from the results. (See p. 40 for an illustration of a high-speed DNA sequencer.)*



Topic of Interest:

Big Data Analytics and Machine Learning (CSCI3170/CSCI3320/CSCI4180/CSCI5510)

ATCGAATTCCATAATC
ATTATCGAACTTACGA
AATTTACAATCAATCG

Data

ATCGAATTCCATAATC
ATT**ATCG**AACTTACGA
AATTTACAATCA**ATCG**

Patterns

Fast and Efficient

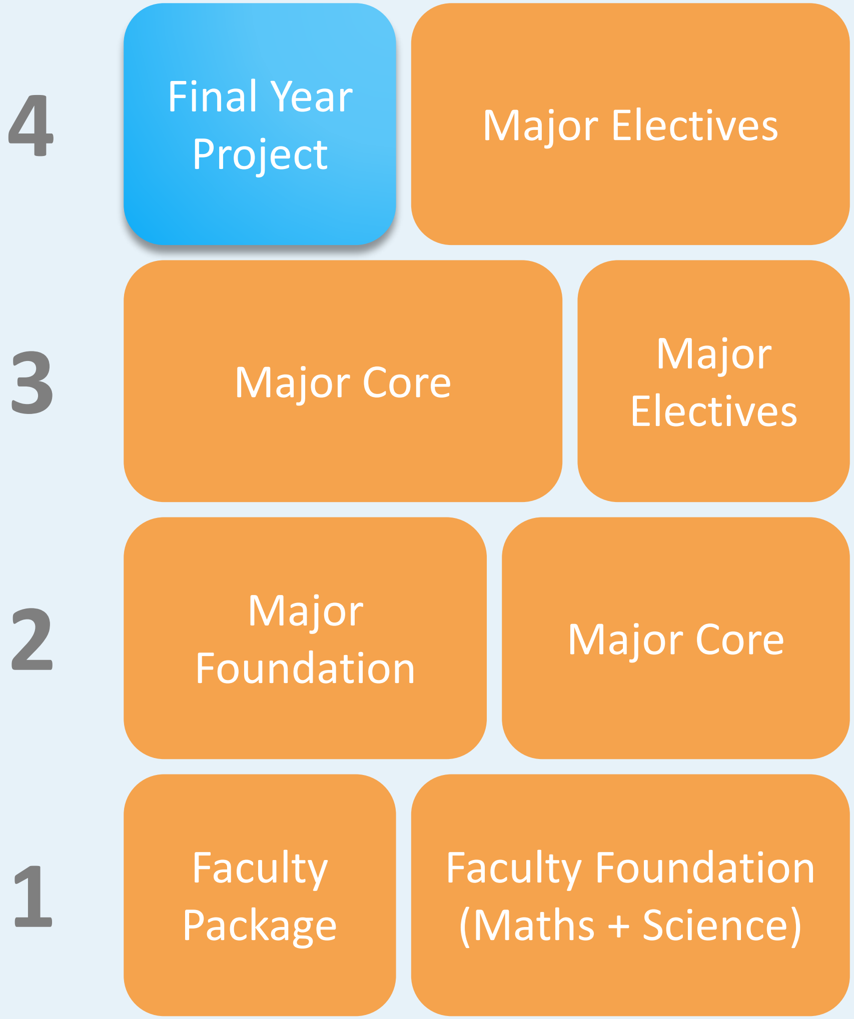
Knowledge

Information

Other Topics of Interest

- Many other practical and interesting courses:
  - » Algorithms
  - » Cloud Computing
  - » Computational Finance
  - » Computer and Network Security
  - » Databases
  - » Energy Efficient Computing
  - » Networks
  - » Operating Systems
  - » Rapid Prototyping of Digital Systems
  - » Smart Hardware Design
  - » ……

CENG & CSCI Curriculum – Final Year Project (FYP)



4

Final Year Project

Major Electives

3

Major Core

Major Electives

2

Major Foundation

Major Core

1

Faculty Package

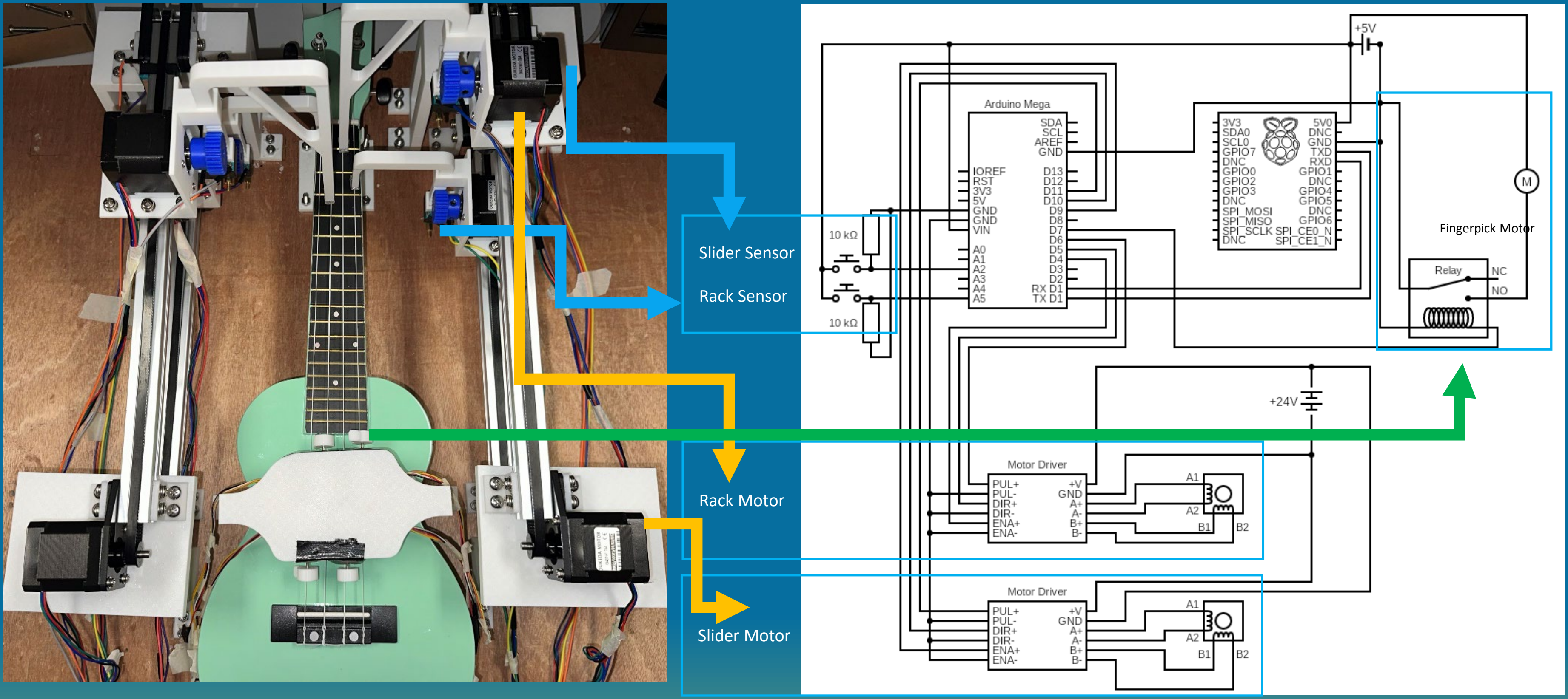
Faculty Foundation (Maths + Science)

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

FYP Example (Ukulele Robot with Mobile Application)



Slider Sensor

Rack Sensor

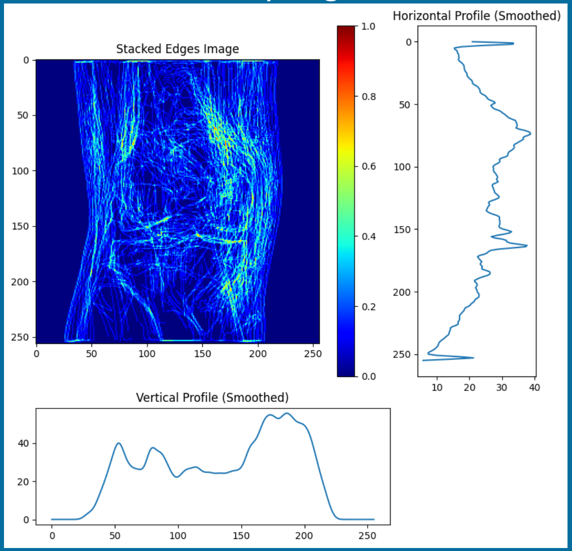
Rack Motor

Slider Motor

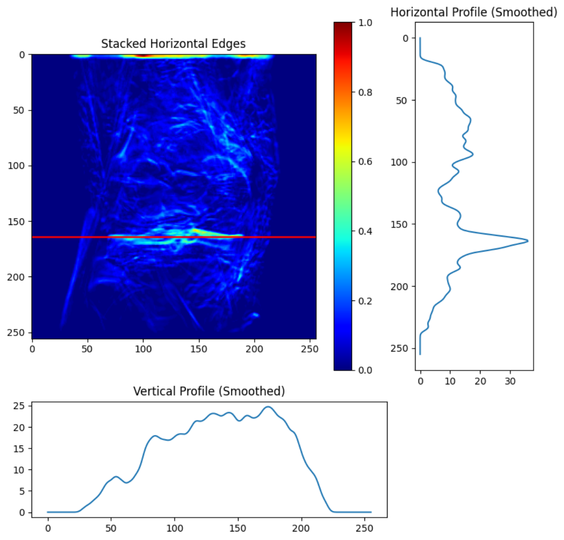
Sample from FYP KWS2403

FYP Example (Knee MRI Diagnosis by Deep Learning)

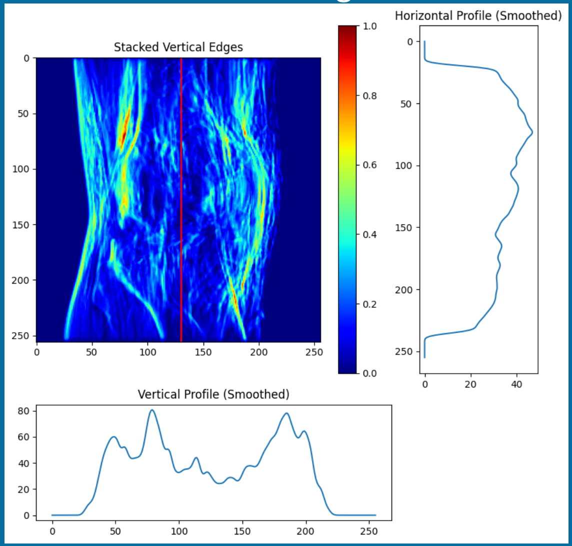
Canny Edge



Horizontal Edge

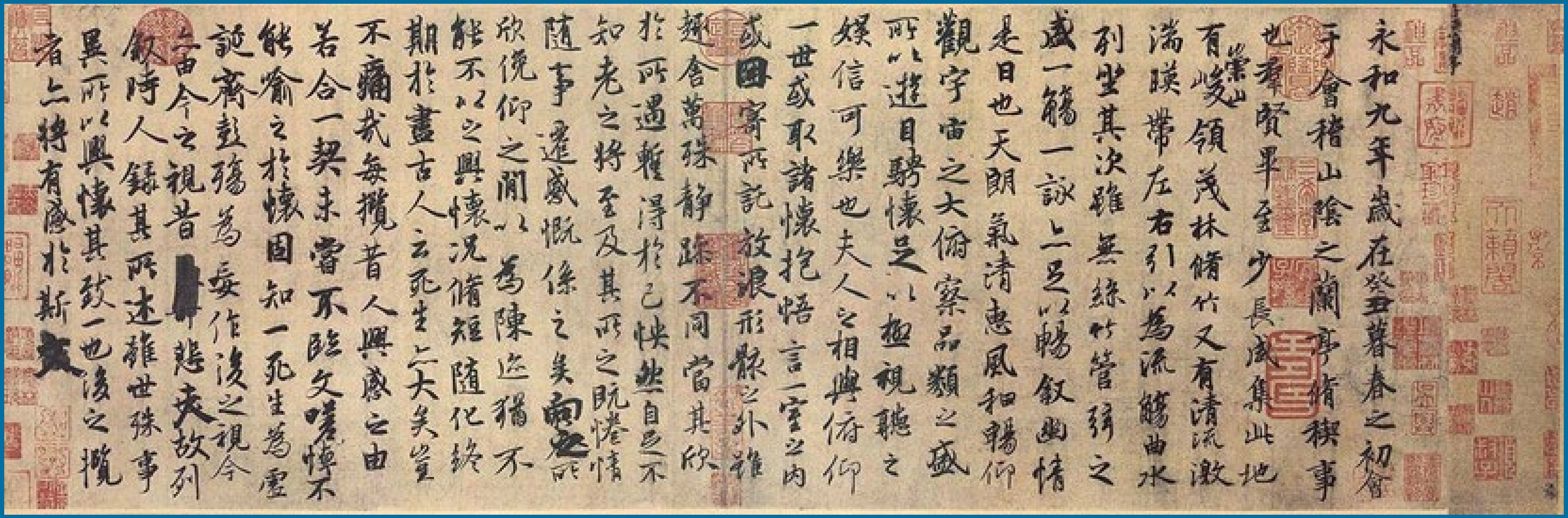


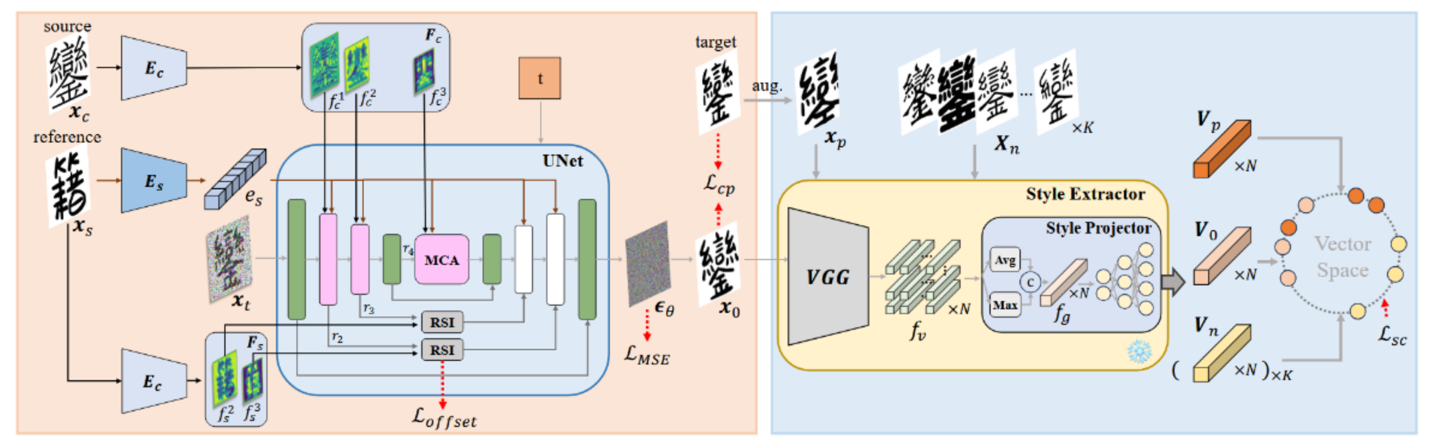
Vertical Edge



Sample from FYP CT2401

FYP Example
(New Font Generation from classic Calligraphy)





(a) Conditional Diffusion for Font Generation (b) Style Contrastive Refinement

Sample from FYP FYY2401

Diverse Learning Experience and Other Learning Options

International / Local Competitions

High Honors in the 48th International Collegiate Programming Contest (ICPC) World Finals 2024, ranked **31st amongst the 141** top university programming teams worldwide

Championship in ACM-HK Programming Contest 2024


Champion Team

Team	HKOI 0
Affiliation	CUHK
Solved	7 questions

Industrial Visits

- Visit to companies to learn latest development in industry

Cathay Pacific

The Hong Kong Productivity Council

PwC

Work-Study Scheme

3 years study + 1 year work-study + 1 final year study

Google

Microsoft

hp

FUJITSU

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

Exchange Opportunities

Students are encouraged to join an exchange programme to broaden their horizon and learn with peers from diverse background

Some examples of exchange opportunities to world-class universities:

- The University of Sydney, Australia
- University of Toronto, Canada
- University of Waterloo, Canada
- Tsinghua University, China
- National University of Singapore, Singapore
- University College London (UCL), UK
- Georgia Institute of Technology, USA
- University of Illinois at Urbana-Champaign, USA
- Telecom & Management SudParis, France
- ETH Zurich, Switzerland
- Royal Institute of Technology (KTH), Sweden

Admission Arrangements and Requirements
(First Year Entry)

Department-based Admission for CENG & CSCI

- Students pursuing the CENG and CSCI programmes would have a common first year of study: BCSE

- Upon finishing their first year of studies, BCSE students will undergo the “major allocation” exercise and be allocated into either the CENG or CSCI programme

- Allocation is primarily based on CGPA but students’ preferences will be accommodated as much as possible

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)

Note: Admission grades of 2025 entry will be published by the JUPAS Office soon. Please stay tuned.

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

FAQ

Q: Will there be any interview?

Interview Arrangements (JUPAS)

- Interviews will be arranged in 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 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): **113**

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

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 about 80% of students would be allocated to their preferred major every year

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

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: I am still struggling to choose between AIST / CENG / CSCI / CDAS. 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

☎ (852) 3943 4269

✉ ug-admiss@cse.cuhk.edu.hk

www.cse.cuhk.edu.hk

Hope to see you in class In 2026 !