Academic Counselling Session for New Students
Computer Science and Engineering (BCSE)
Computer Engineering (CENG)
Computer Science (CSCI)
1. Brief introduction of our Department
2. Graduation Requirements & Curriculum Structure
   (4 year curriculum)
3. Graduation Requirements & Curriculum Structure
   (2 year curriculum)
4. Declaration of Major for BCSE students
5. Diverse Learning Experience
6. Other Learning Options
7. Important Reminders
8. Q&A
9. Academic Advising
A Long History

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

- CS department established:
  - CS minor

- CSCI accredited

- AIST – First AI prog in HK

- Offered courses

- CS major

- CENG

- CDAS
Our Undergraduate 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)
Excellent Teaching and Research Team

- 2021 Kyoto Prize Laureate and Turing Award Recipient
  Prof. Andrew Yao

- 7 ACM Fellows
  Prof. Martin Wong, Prof. Benjamin Wah, Prof. John Lui, etc.

- 13 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

- InnoStars Award 2021
  Prof. Jiaya Jia

- 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
Graduation Requirements
For BCSE
(4-year Curriculum)
Graduation Requirements

- Major Requirements (75 units)
- University Core Requirements (39 units)
- Free Electives (9 Units)

Min. 123 Units for Graduation
# University Core Requirements

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

<table>
<thead>
<tr>
<th>Major Requirements</th>
<th>Computer Engineering</th>
<th>Computer Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Package</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Foundation Courses</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Major Required Courses</td>
<td>31</td>
<td>27</td>
</tr>
<tr>
<td>Research Components</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Stream Requirements</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total of units required</strong></td>
<td></td>
<td><strong>75</strong></td>
</tr>
</tbody>
</table>
Curriculum Structure
Curriculum – Faculty Package and Foundation

Faculty Package and Foundation (15 units)

- Programming (ENGG1110)
- Linear Algebra (ENGG1120)
- Multivariable Calculus (ENGG1130)
- Calculus for Engineers (MATH1510)
- Foundation Science
Curriculum – Major Foundation (for CE)

Major Foundation (11 units)

» C++ (CSCI1120)
» Complex Variables (ENGG2720)
» Differential Equations (ENGG2740)
» Probability (ENGG2760)
» Statistics (ENGG2780)
Curriculum – Major Core *(for CE)*

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 CE)*

**Major Core** *(31 units)*

- Data Structures (CSCI2100)
- Software Engineering (CSCI3100)
- Intro to Operating Systems (CSCI3150)
- Discrete Mathematics and Algorithms (CSCI3190)
- Computers and Society (CSCI3250)
- Engineering Practicum (CSCI3251)
Curriculum – Major Core *(for CE)*

**Major Core** *(31 units)*

- Fundamental of Electric Circuits (ELEG2202)
- Digital Logic and Systems (ENGG2020)
Curriculum – Major Electives (for CE)

- **Major Electives (12 units)**
  - **Streams**
    1. Embedded Systems
    2. VLSI Design and EDA
  - **Non-Stream**
    3. General Computer Engineering

- **Faculty Foundation (Maths + Science)**
- **Major Core**
- **Major Electives**
- **Final Year Project**
- **Faculty Package**

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Curriculum – Major Foundation *(for CS)*

**Major Foundation (10 units)**

- Java *(CSCI1130)*
- Discrete Maths *(ENGG2440)*
- Probability *(ENGG2760)*
- Statistics *(ENGG2780)*
Curriculum – Major Core (for CS)

Major Core (27 units)

- Computer Organization and Design (CENG3420)
- Data Structure (CSCI2100)
Major Core (27 units)

- Software Engineering (CSCI3100)
- Formal Languages and Automata Theory (CSCI3130)
- Intro to Operating Systems (CSCI3150)
- Design and Analysis of Algorithms (CSCI3160)
- Principles of Programming Languages (CSCI3180)
Curriculum – Major Core *(for CS)*

**Major Core (27 units)**

- Computers and Society *(CSCI3250)*
- Engineering Practicum *(CSCI3251)*
- Digital Logic and Systems *(ENGG2020)*
Curriculum – Major Electives *(for CS)*

**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)**

- **Major Electives**
  - Final Year Project
  - Major Core
  - Major Electives
  - Major Foundation
  - 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
Graduation Requirements

Major Requirements (52 units)

University Core Requirements (12 – 16 units)

Free Electives (Remaining Units if any)

Min. 69 Units for Graduation
### University Core Requirements

<table>
<thead>
<tr>
<th>University Core Requirements</th>
<th>Associate Degree Holders</th>
<th>Higher Diploma Holders</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Language</td>
<td>2-unit (ELTU3014)</td>
<td>5 units (ELTU2014 &amp; ELTU3014)</td>
</tr>
<tr>
<td>University General Education</td>
<td></td>
<td>3 units (GE Foundation); 2 units (Area A GE course)</td>
</tr>
<tr>
<td>College General Education</td>
<td></td>
<td>2 to 3 units depending on College affiliation</td>
</tr>
<tr>
<td>Understanding China</td>
<td></td>
<td>1-unit</td>
</tr>
<tr>
<td></td>
<td>(online course - complete before graduation in any one term, including summer term)</td>
<td></td>
</tr>
<tr>
<td>Hong Kong in the Wider Constitutional Order</td>
<td></td>
<td>1-unit</td>
</tr>
<tr>
<td></td>
<td>(online course - complete before graduation in any one term, including summer term)</td>
<td></td>
</tr>
<tr>
<td>Physical Education</td>
<td></td>
<td>1-unit</td>
</tr>
<tr>
<td><strong>Total of units required</strong></td>
<td><strong>12-13</strong></td>
<td><strong>15-16</strong></td>
</tr>
</tbody>
</table>
# Major Requirements

<table>
<thead>
<tr>
<th>Major Requirements</th>
<th>Computer Engineering</th>
<th>Computer Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Package</td>
<td>3-unit (ENGG1120)</td>
<td></td>
</tr>
<tr>
<td>Foundation Courses</td>
<td>3-unit</td>
<td>7-unit</td>
</tr>
<tr>
<td>Major Required Courses</td>
<td>28-unit</td>
<td>21-unit</td>
</tr>
<tr>
<td>Research Components</td>
<td></td>
<td>6-unit</td>
</tr>
<tr>
<td>Stream Requirements</td>
<td>12-unit</td>
<td>15-unit</td>
</tr>
<tr>
<td><strong>Total of units required</strong></td>
<td></td>
<td><strong>52</strong></td>
</tr>
</tbody>
</table>
Curriculum Structure
Curriculum – Major Requirements *(for CE)*

**Year 1 Term 1 (13 units)**
- Calculus for Engineers (MATH1510)
- Digital Logic Design Laboratory (CENG2010)
- Embedded System Design (CENG2400)
- Discrete Mathematics and Algorithms (CSCI3190)
- Digital Logic and Systems (ENGG2020)

<table>
<thead>
<tr>
<th>T4</th>
<th>Final Year Project (3)</th>
<th>Major Required (6) + Stream Courses (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T3</td>
<td>Final Year Project (3)</td>
<td>Major Required (3) + Stream Courses (9)</td>
</tr>
<tr>
<td>T2</td>
<td>Faculty Package (3)</td>
<td>Major Required (9)</td>
</tr>
<tr>
<td>T1</td>
<td>Major Required (10)</td>
<td>Faculty Foundation (3)</td>
</tr>
</tbody>
</table>
Curriculum – Major Requirements *(for CE)*

### Year 1 Term 2 (12 units)
- Linear Algebra (ENGG1120)
- Fundamentals of Embedded Systems (CENG2030)
- Computer Organization and Design (CENG3420)
- Data Structures (CSCI2100)

### T1
- Major Required (10)
- Faculty Foundation (3)

### T2
- Final Year Project (3)
- Faculty Package (3)
- Major Required (9)

### T3
- Final Year Project (3)
- Major Required (3) + Stream Courses (9)

### T4
- Major Required (6) + Stream Courses (3)
- Final Year Project (3)
Curriculum – Major Requirements *(for CE)*

**Year 2 Term 1 (15 units)**

- FYP (CENG4998)
- Intro to Operating Systems (CSCI3150)
- Stream courses (9 units)
Curriculum – Major Requirements *(for CE)*

**Year 2 Term 2 (12 units)**
- FYP (CENG4999)
- Software Engineering (CSCI3100)
- Computers and Society (CSCI3250)
- Engineering Practicum (CSCI3251)
- Stream courses (3 units)

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**T4**
- Final Year Project (3)
- Major Required (6) + Stream Courses (3)

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**T3**
- Final Year Project (3)
- Major Required (3) + Stream Courses (9)

---

**T2**
- Faculty Package (3)
- Major Required (9)

---

**T1**
- Major Required (10)
- Faculty Foundation (3)
Curriculum – Major Requirements (for CE)

Major Electives (12 units)

Streams
1. Embedded Systems
2. VLSI Design and EDA

Non-Stream
General Computer Engineering

T4
- Final Year Project (3)
- Major Required (6) + Stream Courses (3)

T3
- Final Year Project (3)
- Major Required (3) + Stream Courses (9)

T2
- Faculty Package (3)
- Major Required (9)

T1
- Major Required (10)
- Faculty Foundation (3)

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Curriculum – Major Requirements (for CS)

Year 1 Term 1 (14 units)
- Discrete Maths (ENGG2440)
- Probability (ENGG2760) (2)
- Formal Languages and Automata Theory (CSCI3130)
- Design and Analysis of Algorithms (CSCI3160)
- Stream courses (3 units)
Curriculum – Major Requirements *(for CS)*

**T4**
- Final Year Project (3)
- Major Required (3) + Stream Courses (6)

**T3**
- Final Year Project (3)
- Major Required (3) + Stream Courses (6)

**T2**
- Faculty Package (3)
- Foundation (2) + Major Required (9)

**T1**
- Stream Courses (3)
- Foundation (5) + Major Required (6)

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**Year 1 Term 2 (14 units)**
- Linear Algebra (ENGG1120)
- Statistics (ENGG2780)
- Computer Organization and Design (CENG3420)
- Software Engineering (CSCI3100)
- Principles of Programming Languages (CSCI3180)
# Curriculum – Major Requirements (for CS)

<table>
<thead>
<tr>
<th>Year 2 Term 1 (12 units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>» FYP (CSCI 4998)</td>
</tr>
<tr>
<td>» Intro to Operating Systems (CSCI3150)</td>
</tr>
<tr>
<td>» Stream courses (6 units)</td>
</tr>
</tbody>
</table>

## T4
- Final Year Project (3)
- Major Required (3) + Stream Courses (6)

## T3
- Final Year Project (3)
- Major Required (3) + Stream Courses (6)

## T2
- Faculty Package (3)
- Foundation (2) + Major Required (9)

## T1
- Stream Courses (3)
- Foundation (5) + Major Required (6)
Curriculum – Major Requirements *(for CS)*

**Year 2 Term 2 (12 units)**
- **FYP (CSCI 4999)**
- **Computers and Society (CSCI3250)**
- **Engineering Practicum (CSCI3251)**
- **Stream courses (6 units)**

**T4**
- **Final Year Project (3)***
- **Major Required (3) + Stream Courses (6)***

**T3**
- **Final Year Project (3)***
- **Major Required (3) + Stream Courses (6)***

**T2**
- **Faculty Package (3)***
- **Foundation (2) + Major Required (9)***

**T1**
- **Stream Courses (3)***
- **Foundation (5) + Major Required (6)***

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Curriculum – Major Requirements (for CS)

**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
For both 4 year and 2 year curriculum – Distinct Topics

• Computer-aided Design for Very Large Scale Integrated Circuits (CENG4120/CENG5030/CENG5270)
For both 4 year and 2 year curriculum – Distinct Topics

- Embedded System Development and Applications (CENG4480)
For both 4 year and 2 year curriculum – Distinct Topics

• Artificial Intelligence (CSCI3230/ESTR3108)
  » Create computer software that are capable of intelligent behavior
    ✓ Searching
    ✓ Pattern recognition
    ✓ Genetics algorithms
    ✓ Artificial neural networks
    ✓ Deep learning
For both 4 year and 2 year curriculum – Distinct Topics

- Computer Graphics and Multi-media (CSCI3260/CSCI3280/CSCI3290)
  - Use graphics cards to create photorealistic images and movies

Rendering pipeline

(x, y, z, 1)

Ray tracing

Is it real?

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For both 4 year and 2 year curriculum – Distinct Topics

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

Film & visual effects & data visualization
For both 4 year and 2 year curriculum – Distinct Topics

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

Students’ course projects

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For both 4 year and 2 year curriculum – Distinct Topics

- Computer Game Software (CSCI 4120)

Learn how to develop a game
For both 4 year and 2 year curriculum – Distinct Topics

• Computer Game Software (CSCI4120)

Students’ course projects
For both 4 year and 2 year curriculum – Distinct Topics

- Algorithms for Bioinformatics (CSCI3220)
  - Use computer to model and interpret biological data
  - DNA mutation ↔ diseases
For both 4 year and 2 year curriculum – Distinct Topics

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

Data Patterns Information

Fast and Efficient

Knowledge

- ATCGAATTCCATAATC
- ATTATCGAACTTACGA
- AATTTACAATCAATCG

- ATCGAATTCCATAATC
- ATTATCGAACTTACGA
- AATTTACAATCAATCG
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
» ......
FYP Example (AI + Bioinformatics)

- Apply machine learning to predict RNA-protein interaction

From FYP KY1804
FYP Example (AI + Multimedia)

- Design a neural network that learns to produce a tiling
FYP Example (AI + Computer Vision)

- Chinese Medicinal Herb Recognizer

From FYP MHW1804
FYP Example (AI + Autonomous Driving)

- Design a deep framework for real-time detection of 3D objects (vehicles) in 3D point cloud data

From FYP CWF2002 (The UG student co-authored a paper in AAAI 2021 & another in CVPR 2021)
FYP example (Self-driving Robots)

- Controls: Serial, Bluetooth, and Raspberry Pi, etc.

From FYP MCY1801
Declaration of Major for BCSE
Declaration of Major

-After BCSE students finished their 2nd semester, they will undergo the “major allocation” exercise and be allocated into either the CENG and CSCI programme.

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

Declaration procedure:

<table>
<thead>
<tr>
<th>Tentative Dates</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late March/Early April</td>
<td>The Department to announce the procedures via email; Students will then have a month to submit their preferences</td>
</tr>
<tr>
<td>Late May/Early June</td>
<td>Release of Term 2 results; Students will be given 3 days to modify their preferences after the results have been released</td>
</tr>
<tr>
<td>Late June</td>
<td>Release of major allocation results by email</td>
</tr>
</tbody>
</table>
Diverse Learning Experience
Recent Achievements in Intl’/Local Competitions

**Champion in**
Robocon Hong Kong Contest in 2021 and 2022

**Hong Kong Computer Society Student Sponsorship 2022**

**First Prize in the Cloud Track of the Huawei ICT Competition (2023)**
Industrial Visits

• Visit to companies to learn latest development in industry
Work-Study Scheme

2 or 3 years study + 1 year work-study

Google
Microsoft
HP
FUJITSU
HSBC
HANG SENG BANK
Sun Hung Kai Properties
ASM Pacific Technology
HKSTP
Exchange Opportunities

e.g.

• Macquarie University, Australia
• University of Toronto, Canada
• University of Waterloo, Canada
• Shanghai Jiao Tong University, China
• Soka University, Japan
• National University of Singapore, Singapore
• University of Sheffield, UK
• University of California, Davis, USA
• University of Massachusetts Amherst, USA
Other learning options

Double degree with IBBA

Double majors

Minor programme(s)
Important Reminders

• Treasure your time in University.

• Manage your time wisely: study, extra-curricular activities, part-time job, etc.

• Study scheme is updated every year. You SHOULD follow the study scheme of your entry year, i.e., 2023 entry, and keep following it when you progress.

• Pay attention to course prerequisite!

• Declaration of stream: you should declare in September of your final year.
Important Reminders (cont)

• Our CSE Tech Team will provide each of you with a CSE account for our systems and PCs in our labs.

• Make good use of our intranet for UG students. The department will make announcements via emails and put the announcements in our intranet. [https://i.cse.cuhk.edu.hk/undergraduate/](https://i.cse.cuhk.edu.hk/undergraduate/) (access through Department website)

• Set up email forwarding to/from your CUHK email accounts
Useful Links

• Student Handbook

• Registration and Examinations Section (RES)
  http://www.res.cuhk.edu.hk/

• Office of Academic Links (OAL)
  https://www.oal.cuhk.edu.hk/

• Office of Student Affairs (OSA)
  http://www.osa.cuhk.edu.hk/

• Financing Your Studies by the Office of Admissions and Financial Aid
  http://admission.cuhk.edu.hk/finance.html

• ITSC
  https://www.itsc.cuhk.edu.hk/

• Library
  https://www.lib.cuhk.edu.hk/
Questions & Answers
Q1: Can I “NOT follow” the recommended study pattern?

Almost all courses are **pre-assigned in year 1**. You need to obtain the Department’s consent to drop the required courses.

We advise against not following the study pattern. If you do so, you may face **time conflict** in the major required courses in your senior years.
Q2: Can I take more than 18 units per semester?

Yes, you may apply for credit overload in a semester, but we do not recommend rushing to finish your study.

Note:
Some students may be pre-assigned to take 19 units in year 1. It depends on your affiliated college; some colleges will pre-assign College General Education (GE) for students, while some will not.
Q3: Can I declare more than one stream?

No, you cannot.

CE

Major Electives (12 units)

Streams
1. Embedded Systems
2. VLSI Design and EDA

Non-Stream
3. General Computer Engineering

CS

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
Q4: Can I apply for course exemption using AD/HD courses?

Yes, you may apply, but they will be considered on a case by case basis.

Upon approval, you will be exempted from the approved course(s) only, but NOT the units.

You are required to take other major courses to fulfill the major requirements.
Q5: If I go for exchange, can I apply for credit transfer?

Yes, you may.

But PLEASE apply for credit transfer IN ADVANCE by providing the course details to the Department before enrolling the courses in the exchange university.
Lastly, Academic Advising

-Every student is assigned an academic advisor

-You will meet at least once a year for purposes of general supervision such as course selection, guided study, adaptation to University learning modes and disciplinary fundamentals, etc.

-Students with academic problems or on academic probation / extended probation are required to have a monthly meeting with the academic advisor.
Department may, in providing Academic Advisory Service or in emergency, contact your parent(s)/guardian(s), if necessary, and disclose to them my personal data held by the Department and in the Student Information System.

Please take a few minutes before you go to complete the consent form:
Contact Us

department@cse.cuhk.edu.hk
http://www.cse.cuhk.edu.hk

Note:
Our department is responsible for AIST / CENG / CSCI courses only. If you have questions on other courses, please contact the concerned course offering department for assistance.
Thank you!