Academic Counselling Session for New Students
Artificial Intelligence: Systems & Technologies (AIST)
Agenda

1. Brief introduction of our Department
2. Graduation Requirements & Curriculum Structure
3. Diverse Learning Experience at CSE
4. Other Learning Options
5. Important Reminders
6. Q&A
7. Academic Advising
A Long History

• The first computer science department in HK
• A strong alumni network
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
Curriculum Structure
Curriculum – Overview

1. Faculty Package
2. Major Foundation / Core
3. Major Core
4. Final Year Project

- Major Electives
- University Common Core (Languages, GE, PE) (39 Units)
- Free Electives (9 Units)

123 units
## University Core Requirements

<table>
<thead>
<tr>
<th>University Core Courses</th>
<th>Units Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Language</strong></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>8</td>
</tr>
<tr>
<td>Chinese</td>
<td>5</td>
</tr>
<tr>
<td><strong>General Education</strong></td>
<td></td>
</tr>
<tr>
<td>University Foundation</td>
<td>6</td>
</tr>
<tr>
<td>University GE</td>
<td>7</td>
</tr>
<tr>
<td>(At least 2 units in each Area A, C &amp; D)</td>
<td></td>
</tr>
<tr>
<td>College GE</td>
<td>6</td>
</tr>
<tr>
<td>Understanding China (UGCP1001)</td>
<td>1</td>
</tr>
<tr>
<td><em>online course - complete before graduation in any one term, including summer term</em></td>
<td></td>
</tr>
<tr>
<td>Hong Kong in the Wider Constitutional Order (UGCP1002)</td>
<td>1</td>
</tr>
<tr>
<td><em>online course - complete before graduation in any one term, including summer term</em></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>39</td>
</tr>
</tbody>
</table>
## Major Requirements

<table>
<thead>
<tr>
<th>Major Requirements</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Package</td>
<td>9</td>
</tr>
<tr>
<td>Foundation Courses</td>
<td>16</td>
</tr>
<tr>
<td>Major Required Courses</td>
<td>22</td>
</tr>
<tr>
<td>Research Components</td>
<td>6</td>
</tr>
<tr>
<td>Stream Requirements</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total of units required</strong></td>
<td><strong>75</strong></td>
</tr>
</tbody>
</table>
Curriculum – Major Requirements

- **Major Foundation/Core**
- **Major Practicum**
- **Major Electives**
- **Final Year Project**

Total: 75 units
Curriculum – Faculty Package and Foundation

Faculty Package (9 units)

- Programming (ENGG1110)
- Linear Algebra (ENGG1120)
- Multivariable Calculus (ENGG1130)
Curriculum – Major Practicum

Major Electives

Final Year Project

Major Core

Major Electives

Major Foundation / Core (10 units)
- Calculus for Engineers (MATH1510)
- Physics (PHYS1003/1110)
- Intro to AI & ML (AIST1000)
- Intro to Computing Using Python (AIST1110)

Faculty Package

Major Foundation / Core

Major Practicum
## Curriculum – Major Foundation

<table>
<thead>
<tr>
<th>Year</th>
<th>Major Foundation/Core</th>
<th>Major Core</th>
<th>Major Electives</th>
<th>Final Year Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Faculty Package</td>
<td></td>
<td>Major Foundation/Core</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Major Foundation/Core</td>
<td></td>
<td>Major Electives</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Major Core</td>
<td>Major Core</td>
<td>Major Electives</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>Major Electives</td>
<td>Final Year Project</td>
</tr>
</tbody>
</table>

### Major Foundation / Core (13 units)

- Discrete Maths (ENGG2440)
- Probability (ENGG2760)
- Statistics (ENGG2780)
- Data Structures (CSCI2100)
- Intro to Computer Systems (AIST3020)
Curriculum – Major Practicum

- Major Practicum (3 units)
  - Technology, Society and Engineering Practice (AIST2601)
  - Engineering Practicum (AIST2602)
Curriculum – Major Core

Major Core (12 units)

- Numerical Optimization (AIST3030)
- Design and Analysis of Algorithms (CSCI3160)
- Fundamentals of Artificial Intelligence (CSCI3230)
- Fundamentals of Machine Learning (CSCI3320)
Major Electives (22 units)

Streams
1. Biomedical Intelligence
2. Intelligent Multimedia Processing
3. Large-scale Artificial Intelligence – Theory and Systems
4. Intelligent Manufacturing and Robotics

Non-Stream
5. General Artificial Intelligence: Systems and Technologies
Stream 1: Biomedical Intelligence

• Study how to build **intelligent biomedicine** and **healthcare applications**

• Two emerging markets:
  » **Personalized genomics** and **precision medicine** (e.g. disease prevention, prediction, early diagnosis and treatment)
  » **Clinical record systems** (e.g. electronic medical records and pharmacy prescription information and insurance records)
Stream 2: Intelligent Multimedia Processing

• Study how to bridge AI and human brain functions and design models, algorithms, and systems for multimedia processing with high performance and high accuracy.

• Areas: digital image processing, face recognition, computer animation, human-computer interactions, speech and audio processing, computer linguistics
Stream 3: Large-scale AI – Theory and Systems

- Study the **advanced techniques** of realizing large-scale artificial intelligence from both theory and system perspectives
  - **Theory**: machine learning theory, statistical inference, online algorithms, *etc.*
  - **Systems**: high performance computing, distributed storage, big data management, *etc.*
Stream 4: Intelligent Manufacturing & Robotics

• Study **how to integrate manufacturing and robotics with AI** for different aspects of human activities.

• Focus on the topics of **mechanics**, sensing and control, design & manufacturing, **human-robot interactions**, etc.
Distinct Topics

• Many other practical and interesting courses in AI:
  » Machine Learning
  » Deep Learning
  » Large Scale Distributed Computing
  » Intelligent Embedded Systems
  » Knowledge Representation/Inference
  » Human-Computer Interactions
  » Natural Language Processing
  » Big Data Analytics
  ... ...
Final Year Project (FYP) (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
FYP Example (AI + Bioinformatics)

• Apply machine learning to predict RNA-protein interaction

RNA-binding protein (RBP)

RNA folds to a specific structure to fit into the protein binding site

Sample from current CE/CS students (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

Sample from current CE/CS students (FYP MHW1804)
<table>
<thead>
<tr>
<th>Term 1</th>
<th>Units</th>
<th>Term 2</th>
<th>Units</th>
</tr>
</thead>
</table>
| ENGG1110/ESTR1002  
Problem Solving By Programming  
(Student is required to take this course in term 2 if he/she needs to take MATH1020) | 3     | ENGG1120/ESTR1005  
Linear Algebra for Engineers | 3     |
| AIST1000  
Introduction to Artificial Intelligence and Machine Learning | 1     | ENGG1130/ESTR1006  
Multivariable Calculus for Engineers | 3     |
| MATH1510 *  
Calculus for Engineers | 3     | AIST1110  
Introduction to Computing using Python | 3     |
| PHYS1003 / 1110  
Physics course | 3     | UGFH / UGFN University Foundation GE | 3     |
| ENGG1003  
Digital Literacy and Computational Thinking | 3     | ELTU1001  
Foundation English for University Studies | 3     |
| CHLT1001  
University Chinese I | 3     | College GE | 0-2 |
| College GE | 0-3 | PE | 1 |
| PE | 1 |  |  |
| MATH1020 *  
General Mathematics  
*(only for students who could not pass the placement test of MATH1510)* | 3     |  |  |

17-20 16-18
## Recommended Course Pattern in Year 2

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Units</th>
<th>Term 2</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG2440/ESTR2004 Discrete Mathematics for Engineers</td>
<td>3</td>
<td>AIST3020 Introduction to Computer Systems</td>
<td>3</td>
</tr>
<tr>
<td>ENGG2760/ESTR2018 Probability for Engineers</td>
<td>2</td>
<td>AIST2601 Technology, Society and Engineering Practice</td>
<td>2</td>
</tr>
<tr>
<td>CSCI2100/ESTR2102 Data Structures</td>
<td>3</td>
<td>AIST2602 Engineering Practicum</td>
<td>1</td>
</tr>
<tr>
<td>CHLT1002 University Chinese II</td>
<td>2</td>
<td>ENGG2780/ESTR2020 Statistics for Engineers</td>
<td>2</td>
</tr>
<tr>
<td>UGFH / UGFN University Foundation GE</td>
<td>3</td>
<td>ELTU2014 English for Engineering Students I</td>
<td>3</td>
</tr>
<tr>
<td>University GE</td>
<td>2-3</td>
<td>University GE</td>
<td>2-3</td>
</tr>
<tr>
<td>Minor / Free Electives</td>
<td>Remaining units</td>
<td>Minor / Free Electives</td>
<td>Remaining units</td>
</tr>
<tr>
<td></td>
<td>15-18</td>
<td></td>
<td>13-18</td>
</tr>
</tbody>
</table>
# Recommended Course Pattern in Year 3

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Units</th>
<th>Term 2</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIST3030/ESTR3114 Numerical Optimization</td>
<td>3</td>
<td>CSCI3320 Fundamentals of Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>CSCI3160/ESTR3104 Design and Analysis of Algorithms</td>
<td>3</td>
<td>Stream electives</td>
<td>9-12</td>
</tr>
<tr>
<td>CSCI3230/ESTR3108 Fundamentals of Artificial Intelligence</td>
<td>3</td>
<td>ELTU3014 English for Engineering Students II</td>
<td>2</td>
</tr>
<tr>
<td>Stream electives</td>
<td>3-6</td>
<td>Minor / Free Electives</td>
<td></td>
</tr>
<tr>
<td>University GE</td>
<td>2-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor / Free Electives</td>
<td></td>
<td>Remaining units</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 2</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-18</td>
<td>14-18</td>
</tr>
<tr>
<td>Term 1</td>
<td>Units</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>AIST4998 Final Year Project I</td>
<td>3</td>
</tr>
<tr>
<td>Stream electives</td>
<td>6-9</td>
</tr>
<tr>
<td>Minor / Free Electives</td>
<td>Remaining units</td>
</tr>
<tr>
<td></td>
<td>9-18</td>
</tr>
</tbody>
</table>
Diverse Learning Experience at CSE
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
Exchange

• Students often do overseas exchange in the 2\textsuperscript{nd} or 3\textsuperscript{rd} year

• Credit transfer
  • PLEASE apply for credit transfer \textbf{IN ADVANCE} by providing the course details to the Department before enrolling the courses in the exchange university.
  • Grade B is required for credit transfer
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
Life at CSE

• CSE Corner: https://i.cse.cuhk.edu.hk/
• Facebook pages:
  • Faculty of Engineering https://www.facebook.com/cuhkengg
Life at CUHK

• Living on Campus: http://www.cuhk.edu.hk/english/campus/accommodation.html
• Library: https://www.lib.cuhk.edu.hk/
  • Past papers
• Independent Learning Center (ILC) https://www.ilc.cuhk.edu.hk/
• Facebook pages:
  • 中大人資訊專頁 https://www.facebook.com/cuhkinfo
Other learning options

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
Study Scheme

• Personal advice
  • Take as many credits as possible in the 1st year
  • Maximum = 18 units per semester
  • Year 1 Term 1 Max. units: 19 (default)
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: Where can I find course information?

• CUSIS
  • **Teaching timetable by Subj/Dept**
    • Make sure to select “view all”
  • **Browse Course Catalog**: Course syllabus, learning outcomes
  • **Browse Program Information**: Study scheme
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/
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

dept@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!