



Curriculum Renewal on Senior Secondary Information and Communication Technology

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Outline

1. University admission info about engineering related subjects
(HKDSE admission score and subject weighting)
2. Skills preparation in secondary school
3. University professional education
4. Career path and preparation

CityU EE Admission

JS1205 Department of Electrical Engineering

Options:

- *BEng Computer and Data Engineering*
(電子計算機及數據工程學工學士)
- *BEng Electronic and Electrical Engineering**
(電子及電機工程學工學士)
- *BEng Information Engineering*
(資訊工程學工學士)

Intake Quota: 163

Current UG students: 960+

- **Common first year**
- **Students will enter a major after one year of study**



JS1205 Department of Electrical Engineering
Department of Electrical Engineering
CityU
香港城市大學
Department of Electrical Engineering

(Options: BEng Computer and Data Engineering, BEng Electronic and Electrical Engineering*, BEng Information Engineering)

Our Majors

- Common first year
- Students choose a major after one year of study
- Major options:
 - BEng in Computer and Data Engineering (CDE) 工學士 (電子計算機及數據工程學)
 - BEng in Electronic and Electrical Engineering (EEE) 工學士 (電子及電機工程學)*
 - BEng in Information Engineering (INF) 工學士 (資訊工程學)

* Change of major title from "Electronic and Communication Engineering" to "Electronic and Electrical Engineering" is subject to approval of the University.

Program Highlights

CDE - Computer Applications

- Digital Systems 數碼系統
- Computer and Embedded Systems 電腦及嵌入式系統
- Security Systems 保安系統
- Data Center and Cloud Computing 數據中心及雲端運算
- Big Data and Multimedia 大數據及多媒體科技

EEE - Electronic and Electrical Systems

- Wireless Communications & Data Technology 無線通訊及大數據技術
- Terahertz & Optical Technologies 太赫茲及光學科技
- Photonics, Electronics and Sensors 光子、電子感測器
- Smart Control & Power Systems 智能管理及能源系統
- Bioelectronics and Bioinformatics 生物電子和生物信息技術

INF - Computer Network and System

- Networking and Telecommunications 網絡與通訊
- Algorithms and Software 演算法與軟件
- Cybersecurity and Forensics 網絡安全與鑑證
- Artificial Intelligence and Big Data 人工智能與大數據
- Signal and Image Processing 訊號與影像處理

Job opportunities
Engineering companies, telecommunications, major utilities (CLP, PCCW)
• Engineer (Systems, Technical Support, Telecommunication, Electronic, Electrical, Instrumentation)



THE FUTURE Vol. 1.0 EDUCATION

New Tech Education Trends in HK

Why Electrical Engineering is the Future?

CityU EE empowers STEM Education in HK

CityU Department of Electrical Engineering
香港城市大學 電機及電子工程學系



Minimum Entrance Requirements (CityU)

To be eligible for admission, you must satisfy the minimum entrance requirements.

English Lang.	Chinese Lang.	Math.	Liberal Studies	Elective 1	Elective 2
Level 3	Level 3	Level 3	Level 2	Level 3 any one of specified subjects ^(Notes)	Level 3 any one subject ^(Notes)

Notes:

- i. Elective 1 (specified): [M1-Calculus and Statistics/ M2-Algebra and Calculus, Information and Communication Technology, Physics, Chemistry, Biology, Combined Science and Integrated Science.](#)
- ii. M1/M2 included as specified or unspecified elective subject. If a student takes both M1 and M2, they will be counted as one subject only.
- iii. Unspecified electives may include “other languages” at grade E or above.
- iv. Applied Learning subjects are not counted as elective subjects.
- v. *Other Considerations:*
Only subject results obtained in current and past two years, i.e. 2017 to 2019 DSE results, will be considered

Assessment of JUPAS Applications (CityU)

Admission Score for Main Consideration

Subjects included	Subject Weighting					
	Eng Lang.	Chin. Lang.	Math.	Liberal Studies	Elective 1	Elective 2
4 core + 2 elective subjects	2	1	2	1	2	2

Scoring Scale

Category A Core and Elective Subjects (including M1/M2)

Level	5**	5*	5	4	3	2	1
Score	7	6	5	4	3	2	1

Category C Other Language Subjects

Grade	A	B	C	D	E
Score	5	4	3	2	1

- | | |
|---|---|
| <ul style="list-style-type: none"> • M1/M2 • Information and Communication Technology • Physics • Combined Science (Phy + Chem) • Combined Science (Phy + Bio) | <ul style="list-style-type: none"> • M1/M2 • Information and Communication Technology • Physics • Combined Science (Phy + Chem) • Combined Science (Phy + Bio) |
| <p>1.5</p> <ul style="list-style-type: none"> • Chemistry • Biology • Combined Science (Bio + Chem) • Integrated Science | <p>1.5</p> <ul style="list-style-type: none"> • Chemistry • Biology • Combined Science (Bio + Chem) • Integrated Science <p>1</p> <ul style="list-style-type: none"> • other electives |

Examples

	Subjects	Student 1	Student 2	Student 3	Student 4
Core	English	5 (x 2)	4 (x 2)	3 (x 2)	3 (x 2)
	Chinese Language	4 (x 1)	4 (x 1)	3 (x 1)	3 (x 1)
	Liberal Studies	5 (x 1)	4 (x 1)	3 (x 1)	3 (x 1)
	Mathematics	4 (x 2)	4 (x 2)	5 (x 2)	5 (x 2)
Elective 1	Physics		4 (x 2)	4 (x 2)	
	Chemistry	4 (x 1.5)			
	ICT				5 (x 2)
Elective 2	M1 or M2			5 (x 2)	
	ICT		4 (x 2)		
	Biology	4 (x 1.5)			
	Economics				5 (x 1)
Unweighted score		26	24	23	24
Weighted score 4 core + 2 elective subjects (for main consideration)		39	40	40	37



() denotes the weighting

CUHK Admission HKDSE Subject Weighting (2020)

JUPAS Catalogue No.	Programme/ Stream	2 Programme-specific HKDSE Requirements					3 Selection Principle			
		Core Subjects				Elective Subjects		Additional Remarks	Selection Principle	HKDSE Subject Weighting/ Additional Remarks (unless specified below, subject weighting ranges from 1.2 – 2.0)
		Eng	Chi	Maths	LS	Elective 1	Elective 2 or M1/M2			
FACULTY OF ENGINEERING http://www.erg.cuhk.edu.hk										
JS4401	Engineering (broad-based) <ul style="list-style-type: none"> • Computer Engineering • Computer Science • Information Engineering • Mathematics and Information Engineering • Mechanical and Automation Engineering • Systems Engineering and Engineering Management 	3	3	3	2	One of the following: <ul style="list-style-type: none"> • M1/M2 • Biology • Chemistry • Combined Science • Physics 	3 ^(a)	(a) The following subjects are preferred: <ul style="list-style-type: none"> • M1/M2 • Biology • Chemistry • Combined Science • DAT • ICT • Physics 	Best 5	<ul style="list-style-type: none"> • Mathematics (x 1.5) • M1 or M2 (x 1.75) • Biology, Chemistry, Combined Science, DAT, ICT, Physics (x 1.5) • Liberal Studies (x 0.5)
JS4434	BEng in Electronic Engineering	3	3	3	2	One of the following: <ul style="list-style-type: none"> • M1/M2 • Biology • Chemistry • Combined Science • ICT • Physics 	3	<ul style="list-style-type: none"> • ICT *1.5 • M1/M2 *1.5 	Best 5	<ul style="list-style-type: none"> • Mathematics (x 1.5) • M1 or M2 (x 1.5) • Physics (x 1.5)
JS4468	BEng in Artificial Intelligence: Systems and Technologies	4	3	5 [^]	3	3	3	The following subjects are preferred: <ul style="list-style-type: none"> • M1/M2 • Biology • Chemistry • Combined Science • ICT • Physics [^] Candidates with Level 4 in Mathematics (Compulsory Part) and good results in other HKDSE subjects will be exceptionally considered on a case by case basis.	Best 5	<ul style="list-style-type: none"> • English (x 1.25) • Chinese (x 1.25) • Mathematics (x 1.75) • M1 or M2 (x 1.75) • Biology, Chemistry, Combined Science, ICT, Physics (x 1.5)

HKUST Admission HKDSE Subject Weighting (2020)

JUPAS CODE	JUPAS CHOICE	MINIMUM ADMISSION REQUIREMENTS					
		ENGLISH LANG.	CHINESE LANG.	MATH (COMP.)	LIBERAL STUDIES	ELECTIVE 1	ELECTIVE 2 OR M1/M2
JS5200	Engineering	3	3	3	2	3	3
JS5211	BSc Integrative Systems and Design						

ELECTIVE 1

SCHOOL/PROGRAM-SPECIFIC SUBJECT REQUIREMENTS

One of: Biology/Chemistry/Physics/Combined Science/Information and Communication Technology

One of: Biology/Chemistry/Physics/Combined Science/Design and Applied Technology/Information and Communication Technology

SCORE FORMULAE

English x 2 + Math x 2 + [Best Elective 1 x 2]* + Best 2 other subjects*

* If the Elective 1 is Information and Communication Technology, the score will be multiplied by a factor of 1 only

* If one of these 2 subjects is M1/M2, the score will be multiplied by a factor of 1.5

English x 2 + Math x 2 + [Best Elective 1 x 2]* + Best 2 other subjects*

* If the Elective 1 is Information and Communication Technology, the score will be multiplied by a factor of 1 only

* If one of these 2 subjects is M1/M2, the score will be multiplied by a factor of 1.5

- ICT *1
- M1/M2 *1.5



AI Teaching Materials for Secondary School

- 中國國務院於2017年7月發布了國內中小學人工智能教育國家文件，中國的40所學校由2018年9月開始將開始AI學習課程



National Initiative for AI Education

http://www.gov.cn/zhengce/content/2017-07/20/content_5211996.htm



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国务院关于印发 新一代人工智能发展规划的通知

国发〔2017〕35号

各省、自治区、直辖市人民政府，国务院各部委、各直属机构：

现将《新一代人工智能发展规划》印发给你们，请认真贯彻执行。

国务院

2017年7月8日



RESOURCES

SHARE

Artificial Intelligence for the American People

01 Executive Order on AI >

02 AI for American Innovation >

<https://www.whitehouse.gov/ai/>

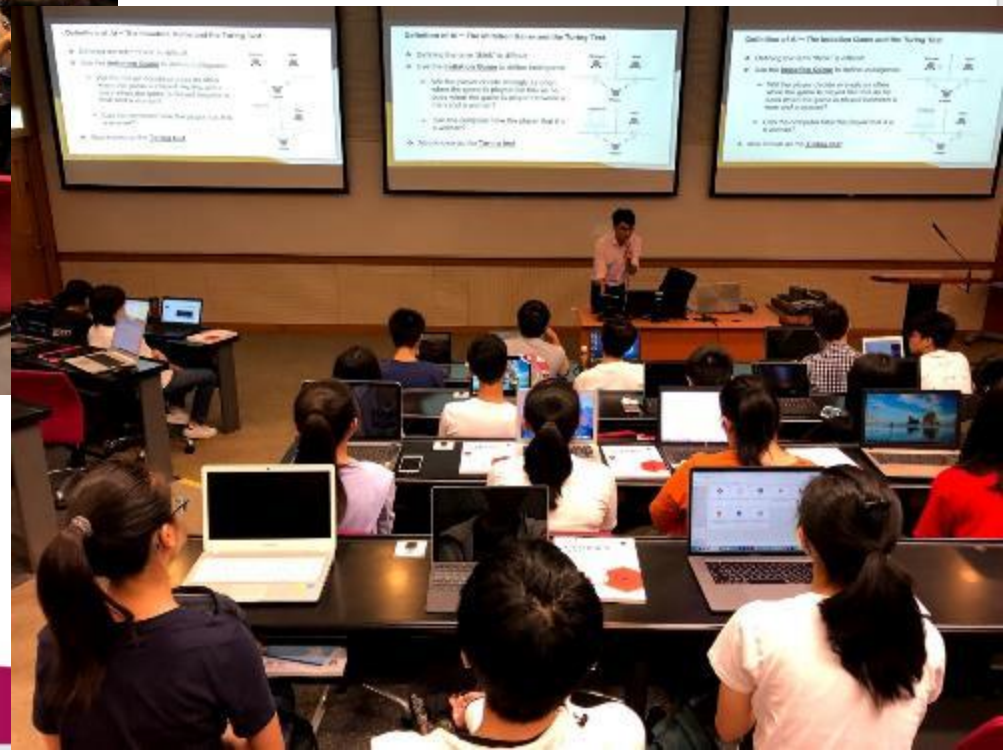


CityU EE AI Summer Course 2018

- 城大也開辦了中學生人工智能暑期班
- 全港共15間學校, 30個學生參與

	School Name	Number of students
1	Carmel Alison Lam Foundation Secondary School	3
2	Carmel Secondary School	3
3	Christian and Missionary Alliance Sun Kei Secondary School	1
4	Chinese YMCA College	1
5	Chinese YMCA Secondary School	2
6	Christian Alliance S W Chan Memorial College	2
7	CUHKFAA Chan Chun Ha Secondary School	2
8	Diocesan Girls' School	3
9	HKSKH Bishop Hall Secondary School	2
10	Lok Sin Tong Yu Kan Hing Secondary School	2
11	Sacred Heart Canossian College	2
12	Shatin Methodist College	2
13	St. Paul's College	2
14	St. Stephen's College	2
15	St. Teresa Secondary School	1
	Total	30

CityU EE AI Summer Course 2018



Codes Written by the Students

Model training

Building the model

```
[ ] 1 #Type your code here
    2 from keras.models import Sequential
    3 from keras.layers import Dense
    4
    5 model = Sequential()
    6 model.add( Dense(100, input_shape=(28*28,), activation='relu') )
    7 model.add( Dense(num_class, activation='softmax') )
    8
    9 model.compile(loss='categorical_crossentropy',
   10               optimizer='adam',
   11               metrics=['accuracy'])
   12
   13 model.summary()
```



Layer (type)	Output Shape	Param #
dense_1 (Dense)	(None, 100)	78500
dense_2 (Dense)	(None, 10)	1010
Total params: 79,510		
Trainable params: 79,510		
Non-trainable params: 0		

AI is a New Skill Required for Our Next Generation



摩根大通的人工智能程式

在數秒內完成律師團隊需時 360,000 小時才能完成的工作！

AI Education Movement in HK

中學籌300萬伙商湯教AI 設教學中心
學生試圖像識別無人駕駛編程

讚好 105

A+ A+ +



圖1之1 - 樂善堂余近鄉中學與商湯科技設立的人工智能教學中心 (AI LA..... (蘇智鑫攝)



百仁基金 - Centum Charitas Foundation

動態時報相片 · 1月30日 ·



香港賽馬會
The Hong Kong Jockey Club



CityU EE Face Recognition Workshop 2019



香港城市大學
City University of Hong Kong
專業 服務 國際化
Professional - Creative
For The World



Department of
Electronic Engineering

Face Recognition Workshops 2019

Workshops for High School Students Organized
by CityU-Electronic Engineering Department



Learn how computer
recognizes human faces.

CityU EE Face Recognition Workshop



CityU EE Face Recognition Workshop



```
video_capture = cv2.VideoCapture(0)
```

```
while True:
```

```
    # Initialize some variables
```

```
    face_locations = []
```

```
    face_names = []
```

```
    # Grab a single frame of video
```

```
    ret, frame = video_capture.read()
```

```
    if not ret:
```

```
        print('No frame is read!')
```

```
        break
```

```
    # Resize frame of video to 1/4 size for faster face  
    detection processing
```

```
    small_frame = cv2.resize(frame, (0, 0), fx=1/resolution,  
                             fy=1/resolution)
```

```
    # Find all the faces and face encodings in the current frame  
    of video
```

```
    face_locations = fr.face_locations(small_frame, model="hog")
```

```
    print('No of faces:', len(face_locations))
```

```
    unknown_encodings = fr.face_encodings(small_frame,
```

CityU EE Face Recognition Workshop – Student Sharing







Python coding background is essential!

CityU EE Face Recognition Workshop – Teaching Team



Student Experience – KL Hui

-  1 STEM Tutor
-  2 Competition
-  3 Intern - Mobile app developer
-  4 Career

STEM Tutor

✓ EE Courses tutor

✓ Esquel's intern



✓ Coolthink@JC Ambassador

Cool/Think @JC >
賽馬會運算思維教育



Competition

- ✓ > 15 competition in 2 years
- ✓ 5 awards
- ✓ Join alone. Worked with > 50 people.

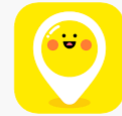


Apps Developed During Internship

Foodbulous



BabyDating



雲滙



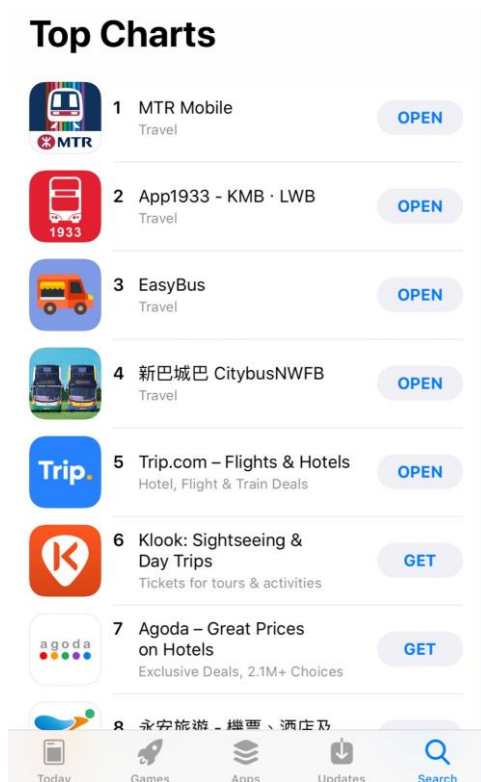
Toudays



Bluecross



Personally Developed Apps



- ✓ Ranked No. 3
- ✓ > 8000 downloads
- ✓ Scored 4.9 / 5 & > 200 five-star reviews

Career

JPMorgan Chase & Co.

- Software Engineer
- 2 years training program
- 1 month training in Singapore

JPMORGAN
CHASE & CO.



Student Experience – Rica Ng

Deloitte.



Competitions





Mr Marcus OR (2016 BEng)
Senior Associate at Risk Assurance -
Cybersecurity
PwC HK: PricewaterhouseCoopers
Hong Kong



Mr Oswis WONG (2012 BEng)
CEO & Co-founder
Air Button

MindLayer 爭廣東話 Chatbot 領導地位

By 信報財經新聞 on October 24, 2016

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原文刊於信報財經新聞



Mr Vincent HU (2011 BEng)
Software Engineer
Google, San Francisco, USA



Dr YUM Tsz Yin (2002 BEng; 2005 PhD)
Global Product Director
Oregon Scientific
IDT International Limited
(Hong Kong & Singapore listed
company)



Miss ZHANG Yujing (2012 BEng)
Software Development Engineer
Facebook,
California, USA



Ms Zhang Yalei (2005 BEng)
Insurance Regional Director
HSBC

Career Opportunities

Future Envision – Overseas Studies

Graduation yr.	Further Study (some examples for PhD/Master)	Employers in U.S. (Many stay in U.S. after further studies)
Recent 10 years	<ul style="list-style-type: none"> • University of Michigan • Carnegie Mellon University • Cornell University • University of Toronto • University of Waterloo • Dartmouth College 	<ul style="list-style-type: none"> • Actuarial Analyst, Sunflower Insurance • Amazon • Amazon Web Services • Bloomberg • Canada Post • Citigroup Inc. • Enova Financial Holdings • Facebook, Inc. • Google • Oracle Corporation • Yahoo! Inc. • YinzCam, Pittsburgh



講者



Sunny Au Yeung

我是Sunny，一位小六生，我喜歡用Python寫App。我學之過python、JavaScript.....。我也是一位Google fans。我參加了GDG HK Voice Hackathon，我十分感謝Dr.Ray邀請我在Hour Of Code Hong Kong 做小導師。

How to use AutoML Vision
Python API

Au Yeung Yat Long (Sunny)

@xxxxxx

sunny.ayyl@gmail.com

Role:Student



#DevFestTaipei19



Self-introduction

1. 香港嘉諾撒學校六年級學生(在台灣屬於國小學生)
2. 興趣是寫程式
3. 家中有一百本以上的電腦書
4. 我喜歡研究電腦硬件如Raspberry Pi和Adriuno
5. 為了寫程式, 我可以廢寢忘餐
6. 沒有報讀任何電腦課程
7. 多謝父母的支持
8. 現在自學TensorFlow
9. 我最熟悉是python

#DevFestTaipei19



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Thank you very much!