



COMP 2211 Exploring Artificial Intelligence
Course Logistics
Dr. Desmond Tsoi

Department of Computer Science & Engineering
The Hong Kong University of Science and Technology, Hong Kong SAR, China

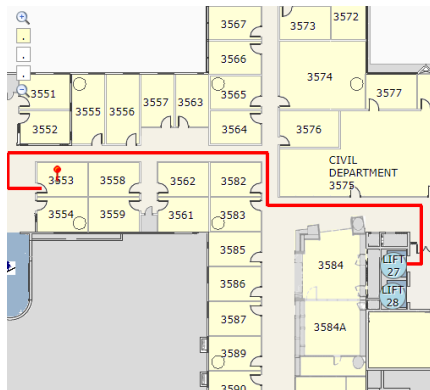


Instructor

Dr. Desmond Yau-chat TSOI (Simply call me “Desmond” ;))



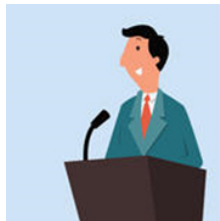
- Personal website:
<http://www.cse.ust.hk/~desmond>
- E-mail: desmond@ust.hk
- Office: Rm 3553 (Lift 27)
- Work phone: 2358-6984
- Office hours: To be confirmed



More about Me

List of institutes that I was teaching at: (in chronological order)

- Hong Kong University of Science and Technology (HKUST)
 - Department of Computer Science and Engineering
 - Department of Accounting
- Nanyang Technological University, Singapore (NTU)
 - Department of Computer Science, School of Computer Engineering
- Hong Kong College of Technology
 - Department of Computer and Information Technology (HKCT)
- Community College of City University (CCCU)
 - Division of Applied Science and Technology
- Hong Kong Polytechnic University
 - School of Professional Education and Executive Development (SPEED)



Now, I am once again serving CSE, HKUST

You are welcome to talk to me if you have any questions about further study and/or career development!

Teaching Assistants

Full-time IA

- CHANG, Bing Yen
 - Office: Rm 2532
 - E-mail: bychang@ust.hk
 - Office hours: To be confirmed

Postgraduate TAs

- CHAN, Tsz Ho
 - Office: CYT-3007
 - E-mail: tszho.chan@connect.ust.hk
 - Office hours: To be confirmed
- CHUNG, Tsz Ting
 - Office: CYT-3007
 - E-mail: ttchungac@connect.ust.hk
 - Office hours: To be confirmed
- FUNG, Nai Chit
 - Office: None
 - E-mail: ncfung@connect.ust.hk
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Postgraduate TAs

- HUANG, Zeyu
 - Office: Rm 4203
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 - Office hours: To be confirmed
- PAK, Chan Ho
 - Office: Rm 4208
 - E-mail: chparkaa@connect.ust.hk
 - Office hours: To be confirmed
- RAO, Zhefan
 - Office: Rm 4208
 - E-mail: zhefan.rao@connect.ust.hk
 - Office hours: To be confirmed
- XU, Ruijia
 - Office: TBD
 - E-mail: rxuaq@connect.ust.hk
 - Office hours: To be confirmed

Course Website and Supplementary Website

- Official website (For Lecture Notes, Lab Materials, ...):
<https://course.cse.ust.hk/comp2211>
- Supplementary website (For Lecture Videos, Progress, ...):
https://www.cse.ust.hk/~desmond/comp2211/Password_Only/
 - Login: comp2211
 - Password: < please mark it down :) >

COMP 2211 Exploring Artificial Intelligence (Spring 2022)

Supplementary Site

Official Site: <https://course.cse.ust.hk/comp2211/>



Announce.

This is where you can find the announcements that I made

Instructor

- Dr. Desmond TSOI
- E-mail: desmond@ust.hk (followed by ust.hk)
- Office: Rm 3553
Path Advisor

Lectures

- **Section L1 (Dr. TSOI, Desmond)**
Wednesday/Friday, 1:30pm - 2:50pm,
Zoom/Rm 2465 (Real-time Online Mode/Mixed-mode Lite later)
- **Section L2 (Dr. TSOI, Desmond)**
Monday 1:30pm - 2:50pm, and Friday 9:00am - 10:20am,
Zoom/LT-K (Real-time Online Mode/Mixed-mode Lite later)
- **Section L3 (Dr. TSOI, Desmond)**
Wednesday/Friday, 4:30pm - 5:50pm,
Zoom/ CYT-G010, (Real-time Online Mode/Mixed-mode Lite later)

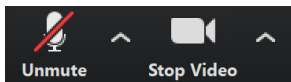


- L1: <https://hkust.zoom.us/j/96562086881?pwd=OENDcm1MbVR5SVYzd1NGUHJwNjFyQT09>
- L2:
Mon: <https://hkust.zoom.us/j/91235842922?pwd=RWR2VnJrY3dCN1pLY2t5TzN3Z1ZnUT09>
Fri: <https://hkust.zoom.us/j/98011527279?pwd=d3JSMGFFUnp1NVRXdnhSYkRtL0FRdz09>
- L3: <https://hkust.zoom.us/j/93395605894?pwd=S21qSVhkWFdudGVMR2grei8vcTdPZz09>

For those who are not on campus or not in Hong Kong, when attending a lecture Zoom meeting, make sure to set up your screen username to:

LASTNAME Firstname studentusername E.g., CHAN Tai Man (ctaiman)

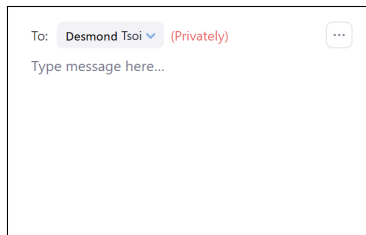
- During a Zoom lecture meeting, please **remain muted** in order to **avoid background noise**



- If you **have questions**, **click "Raise hand"** and you will be unmuted to speak

Raise Hand

- You can also **use the Chat function** to **post questions and comments**



- Try to **join the meeting** with your **camera turned on** as this helps create a more interactive online class experience

I will start the Zoom meeting 5 to 10 minutes earlier. :)

Labs

- **Section LA1**

Wed, 11:00am - 12:50pm, Zoom (Real-time Online Mode throughout the Semester)

Zoom Link: <https://hkust.zoom.us/j/98076383894?pwd=N2NZSUJIdi9pVU1Qb3E0LzZqNkNPdz09>

- **Section LA2**

Tue, 3:00pm - 4:50pm, Zoom (Real-time Online Mode throughout the Semester)

Zoom Link: <https://hkust.zoom.us/j/97305140488?pwd=SGZXdGNFL1B0aXR1UT1TdHRhYWJidz09>

- **Section LA3**

Mon, 3:30pm - 5:20pm, Zoom (Real-time Online Mode throughout the Semester)

Zoom Link: <https://hkust.zoom.us/j/99148863647?pwd=d1V0YXI5c1E2Nm40GJmQW9vdWdHUT09>

- **Section LA4 (This session will have no scheduled meetings)**

You will be provided with access to video-on-demand recordings of the weekly lab material which you will follow at your own pace.

Check the lab page in the course website: <https://course.cse.ust.hk/comp2211/>

Labs

Note

- There will be no labs in the first two weeks (February 7, 8, 9 & February 14, 15, 16).
- The first lab starts in Week 3 (February 21, 22, 23).

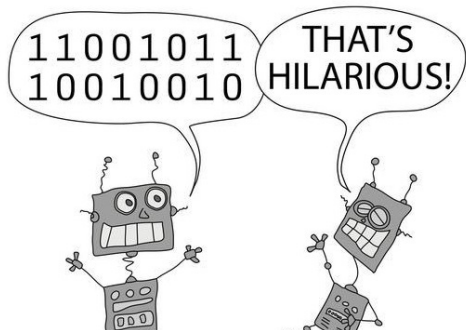


When attending a Zoom lab meeting, make sure to set up your screen username to:

LASTNAME Firstname studentusername E.g., CHAN Tai Man (ctaiman)

- During a meeting

If you want to **talk to your TA**, “**raise your hand**”, the TA will answer your questions. If you need to share your screen, the TA will place you in the “Private Discussion Room” and go in temporarily to handle it. **TA will follow chronological order when handling the raise hand request.**

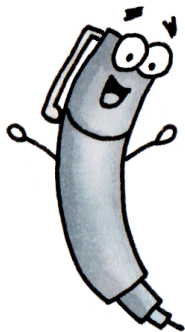


Important Notes about the Labs

- 10 lab exercises will be given to consolidate your understanding of course materials.
- **Only 5 labs will be graded.** Tentatively, they are Lab 2, Lab 4, Lab 6, Lab 8, & Lab 10.
- Although we do not expect you to finish the lab exercises before you attend the lab, we expect you to **have read the lab's materials and understand what you are required to do.**
- **2 points for each graded lab.**
- To get point/partial point for the lab, you are required to **finish the requirement/program and submit it to ZINC** (automatic grading system) on or before **23:59 on Friday of the lab week.** No late lab assignment will be accepted.
- Materials will be released around a week before the lab.
- Holiday policy.

Course Description

- The course consists of, per week
 - 3 hours of lectures
 - 2 hours of laband it gives 3 credits for successful completion of the course.
- Prerequisites
 - COMP 1021 Introduction to Computer Science OR
 - COMP 1029P Python Programming Bridging Course
- Exclusions (24 Courses)
 - COMP 3211 Fundamentals of Artificial Intelligence
 - COMP 4211 Machine Learning
 - COMP 4221 Introduction to Natural Language Processing
 - COMP 4331 Data Mining
 - COMP 4332 Big Data Mining and Management
 - COMP 4421 Image Processing
 - COMP 4471 Deep Learning in Computer Vision



- Exclusions (Continued)
 - COMP 4901K Machine Learning for Natural Language Processing
 - COMP 4901L Foundations of Computer Vision
 - ELEC 4130 Machine Learning on Images
 - ELEC 4230 Deep Learning for Natural Language Processing
 - IDPO 4110 Practical Machine Learning
 - ISOM 3360 Data Mining for Business Analytics
 - MATH 4336 Introduction to Mathematics of Image Processing
 - MATH 4432 Statistical Machine Learning
 - RMBI 4310 Advanced Data Mining for Risk Management and Business Intelligence
 - COMP 5211 Advanced Artificial Intelligence
 - COMP 5212 Machine Learning
 - COMP 5213 Introduction to Bayesian Networks
 - COMP 5221 Natural Language Processing
 - COMP 5222 Statistical Learning Models for Text and Graph Data
 - COMP 5223 Perception and Information Processing for Robotics
 - COMP 5331 Knowledge Discovery in Databases
 - COMP 5421 Computer Vision

Course Objectives/Aims

- This course aims to give a **gentle introduction to the basic elements of artificial intelligence (AI)** through understanding examples from various applications and **hands-on experimentation using AI software tools**.
- In addition to **covering the technical aspect of AI** through such topics as search and problem solving, knowledge representation, probabilistic reasoning, machine learning, computer vision and image processing, speech and language processing, and robotics, this course will also **study the historical perspective, social and ethical implications, as well as potential and limitations of AI**.



In short

COMP 2211 gives a gentle introduction to the basic elements of AI. It also studies the historical, social and ethical implications, as well as potential and limitations of AI.

Topics Covered

- Brief history of Artificial Intelligence
- Search and problem solving
- Knowledge representation
- Probabilistic reasoning
- Machine learning
- Computer vision and image processing
- Speech and language processing
- Robotics
- Social and ethical implications of AI
- Potential and limitations



Keyword Syllabus (More Exact Topics)

- Brief History of Artificial Intelligence
- Naive Bayes
- K-Nearest Neighbour
- K-Means Clustering
- Perceptron and Multi-Layer Perceptron
- Fundamentals of Image Processing
- Convolutional Neural Networks
- Minimax and Alpha-beta Pruning
- Reinforcement Learning (Value Iteration)
- Artificial Intelligence Ethics



Intended Learning Outcomes

On successful completion of this course, you are expected to be able to:

1. Demonstrate understanding of the historical perspective and development of artificial intelligence (AI)
2. Demonstrate understanding of the basic elements of AI thinking
3. Demonstrate proficiency in applying basic principles and techniques of AI and using AI software tools to solve problems in a range of applications
4. Demonstrate awareness of the social and ethical implications as well as potential and limitations of AI

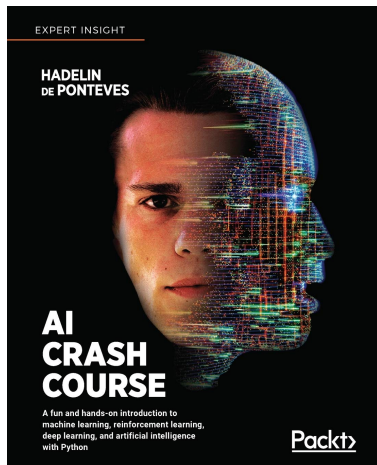


Reference Textbooks

- **AI Crash Course:** A fun and hands-on introduction to machine learning, reinforcement learning, deep learning, and artificial intelligence with Python, Hadelin de Ponteves, Packt Publishing , c2019, First Edition.
- ISBN: 9781838645359 (360 pages)
- HKUST library provides online access to this textbook

URL

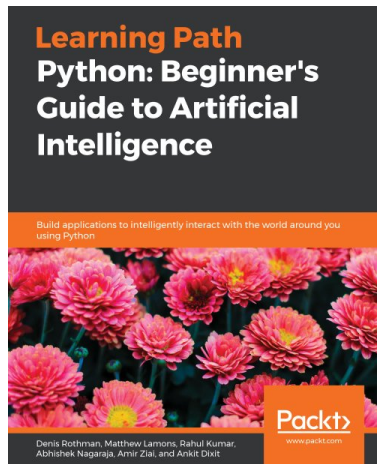
<https://lbdiscover.ust.hk/bib/991012881204303412>



Learn from friendly, plain English explanations and practical activities

Reference Textbooks

- **Python: Beginner's Guide to Artificial Intelligence:** Build applications to intelligently interact with the world around you using Python, Denis Rothman, Matthew Lamons, Rahul Kumar, Abhishek Nagaraja, Amir Ziai, and Ankit Dixit, Packt Publishing, c2018, First Edition.
- ISBN: 9781789957327 (676 pages)



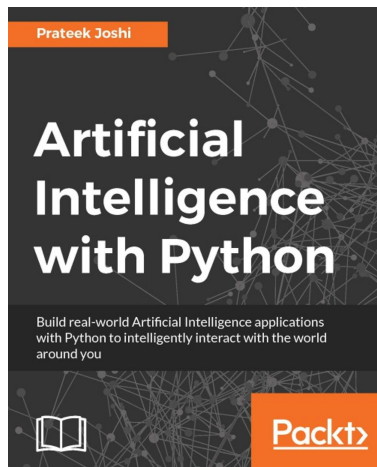
Design and implement machine intelligence using real-world AI-based examples

Reference Textbooks

- **Artificial intelligence with Python:** Build real-world Artificial Intelligence applications with Python to intelligently interact with the world around you, Prateek Joshi, Packt Publishing, c2017, First Edition.
- ISBN: 9781786464392 (446 pages)
- HKUST library provides online access to this textbook

URL

<https://lbdiscover.ust.hk/bib/991012884447803412>



Work through simple yet insightful examples that will get you up and running with Artificial Intelligence in no time

Tentative Teaching Schedule

Topic	# Lectures	Cumulative # Lectures
Introduction to Artificial Intelligence	1.5	1.5
Python Programming Fundamentals for AI	2.5	4
Naive Bayes	1.5	5.5
K-Nearest Neighbour	1.5	7
K-Mean Clustering	1.5	8.5
Perceptron	1	9.5
Multi-layer Perceptron	3	12.5
Fundamentals of Image Processing	3	15.5
Convolution Neural Networks	2.5	18
Minimax and Alpha-beta Pruning	3	21
Reinforcement Learning (Value Iteration)	4	25
AI Ethics	1	26

Note

- **The schedule is subject to change** according to the teaching and learning progress!
- **Makeup/Additional classes will be offered**
 - L2: May 2 (Monday): The day following the Labor Day
 - L2: May 9 (Monday): The day following the Birthday of Buddha

Python Version and Software

- We use [Python 3.7](#) as the programming standard for this course
- Integrated Development Environment (IDE)
 - [Google Colaboratory](#)



Welcome To Colaboratory

File Edit View Insert Runtime Tools Help

Share Settings

Table of contents

- Getting started
- Data science
- Machine learning
- More Resources
 - Featured examples
- Section

+ Code + Text Copy to Drive

Connect Editing

Welcome to Colab!

If you're already familiar with Colab, check out this video to learn about interactive tables, the executed code history view, and the command palette.

3 Cool Google Colab Features

Grading Scheme

Assessment breakdown:

- Coursework (40%)
 - Lab Exercises (10%)
10, but only 5 of them will be graded, 2% each
 - 2 Individual Programming Assignments (30%)
- Examination (60%)
 - Mid-term Exam (20%)
 - Final Exam (40%)



Coursework (40%) + Examination (60%) = Total (100%)

Note

No make-up exams will be given unless under very unusual circumstances, e.g., sickness, with letters of proof

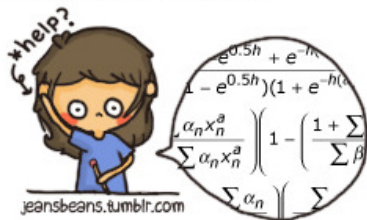
Midterm Exam

- The midterm examination is scheduled on **April 2, 2022 (Saturday)**, **2pm - 4pm**
- Venue: To be confirmed

What we learn in class
and what i study



Whats actually on the test



Academic Dishonesty

- Anyone “both the copier and the copiee” caught cheating on their assignments will get zero marks for the assignment.
- In addition, they BOTH will **get an additional 10%** deduction from the final grade for the first time of cheating. Anyone get caught for cheating in an assignment for the **2nd time** will get an immediate **FAIL** grade.
- On the other hand, anyone caught cheating in the final exam will get a FAIL grade **immediately**.
- There can be additional disciplinary actions as well from the department and university.
- Links:
 - University's Honor code:
<http://ugadmin.ust.hk/integrity/student-1.html>
 - University's Penalties for Cheating:
<http://ugadmin.ust.hk/integrity/student-5.html>

Academic Dishonesty (Cont'd)

- We will use a software to check your codes with others' program, and even with previous assignments. The tool is hard to beat. The suspected cases will be further studied by the instructor and the TAs.



If you are not sure what is considered plagiarism

- **DO NOT** copy program codes from another student/person.
- **DO NOT** look at the actual program codes of another student.
- **DO NOT** share actual program codes with other students/people (by paper, emails, blogs, FB, Google Doc, etc.).
- **DO NOT** give your program codes to other students who ask for it, and do not ask for a copy of their code either.
- **DO NOT** post your program codes anywhere online.
- **DO NOT** leave your finished/unfinished program codes unattended.
- While we encourage discussion among students, you have to write codes on your own.
- During discussion, you **SHOULD NOT** go to the details such that everyone will end up in the same code.

The list is by no means exhaustive, and you will need to use your own discretion.

How Hard Should I Work?

- Some people say that a 3-unit course takes 8 hours/week.
- Guideline:
 - **Pre-study** (1 hour): what topic/materials will the coming lecture be covering?
 - **Attend class** (3 hours): The A+ students tell you that they pay FULL attention in class and try to understand everything in the class so that it is easy to review the class materials.
 - **Attend labs** (2 hours)
 - **Post-study** (2 hours): Re-reading the notes, book reading.



That's all!
Any question?



**Welcome
Back!**