



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

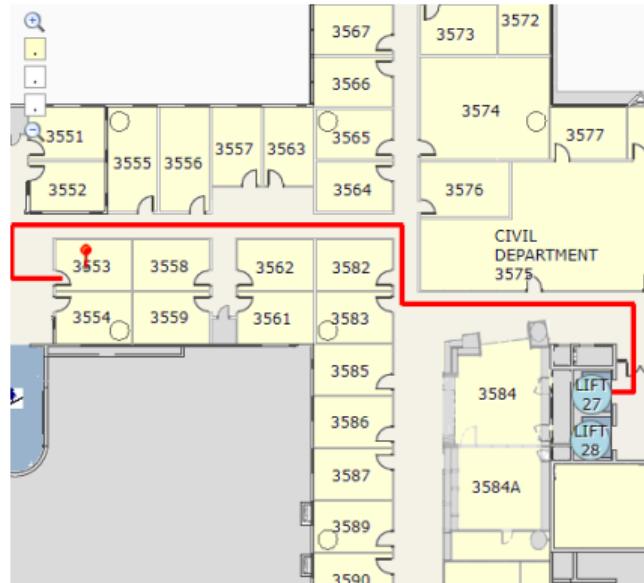


Instructor

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



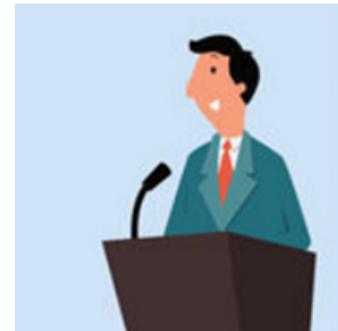
- Personal website:
<http://www.cse.ust.hk/~desmond>
- E-mail: desmond@ust.hk
- Office: Rm 3553 (Lift 27-28)
- Work phone: 2358-6984
- Office hours: To be confirmed



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)
Now, it has been renamed to UOW College Hong Kong
 - 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

- XIAO, Huiru (Pearl)
 - Office: Rm 3543
 - E-mail: huiruxiao@ust.hk
 - Office hours: To be confirmed

Postgraduate TAs

- BAE, Juyoung (Justin)
 - Office: RPG Hub on LG1, Room 1008
 - E-mail: jbaeaa@connect.ust.hk
 - Office hours: To be confirmed
- NGUYEN, Truong Hai
 - Office: RPG Hub on LG1, Room 1008
 - E-mail: thnguyenab@connect.ust.hk
 - Office hours: To be confirmed
- LI, Kaican
 - Office: RPG Hub on LG4, Room LG4002
 - E-mail: klibf@connect.ust.hk
 - Office hours: To be confirmed

Postgraduate TAs

- WANG, Jialiang
 - Office: RPG Hub on LG1, Room 1008
 - E-mail: jwangic@connect.ust.hk
 - Office hours: To be confirmed

Undergraduate TAs

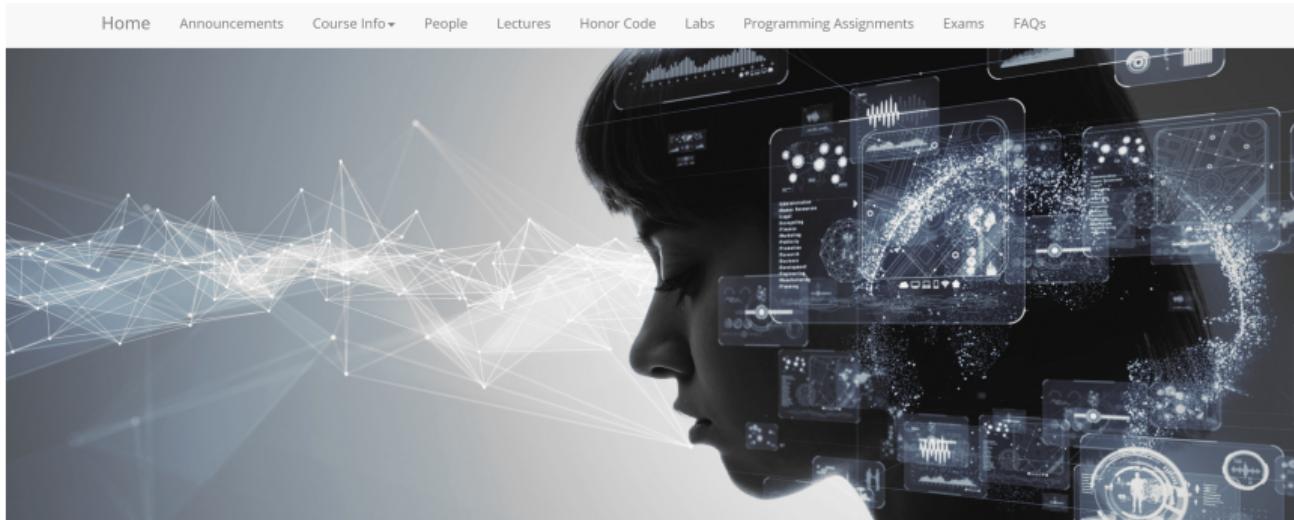
- CHAN, Shu Pui
 - E-mail: spchanae@connect.ust.hk
- DING, Wenxuan (Claire)
 - E-mail: wdingaj@connect.ust.hk



Course Website

- Official website (For Lecture Notes, Lab Materials, ...):

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



COMP 2211 Exploring Artificial Intelligence

- Canvas site (For Grades and Discussion via Piazza)

<https://canvas.ust.hk/courses/47838>

Supplementary Website

- 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 2023)

Supplementary Site

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



Extra

Announce.

This is where you can find the announcements that I made



Instructor

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

Course Desc.

This course aims to give a gentle introduction to the basic elements of artificial intelligence

Lectures

- **Section L1 (Dr. TSOI, Desmond)**
Monday, 01:30pm - 02:50pm, LT-F
Friday, 09:00am - 10:20am, LT-F
- **Section L2 (Dr. TSOI, Desmond)**
Wednesday/Friday,
01:30pm - 02:50pm,
Rm 2407



Labs

- **Section LA1**

Mon, 04:00pm - 05:50pm, Zoom (**Real-time Online Mode throughout the Semester**)

Zoom Link: <https://hkust.zoom.us/j/91338833225?pwd=a1dmaCtHV1NjUGJEaGpPR05LUm1GUT09>

- **Section LA2**

Mon, 10:30am - 12:20pm, Zoom (**Real-time Online Mode throughout the Semester**)

Zoom Link: <https://hkust.zoom.us/j/95720943737?pwd=VWpRLytLNFJVVXJQaHdZWDVlV1VRdz09>

- **Section LA3 (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.

Link: <https://course.cse.ust.hk/comp2211/LA3-videos.html>

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 6 & 13).
- The first lab starts in Week 3 (February 20).

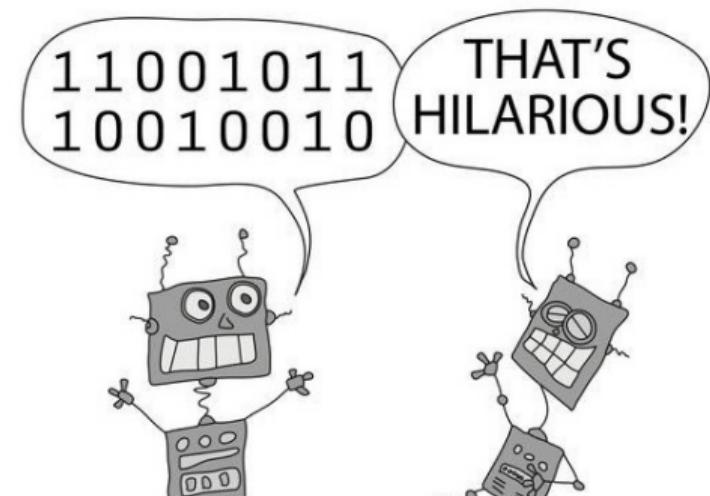


When attending a Zoom lab meeting, make sure to set up your screen username to:

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.

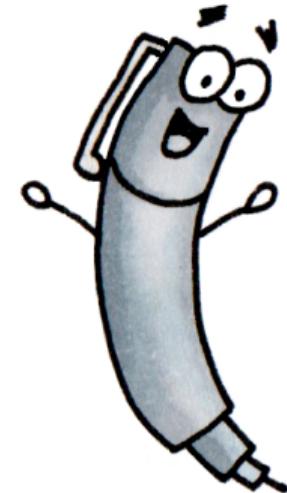


Important Notes about the Labs

- 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 9.
- 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.

Course Description

- The course consists of, per week
 - 3 hours of lectures
 - 2 hours of lab
- and 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.

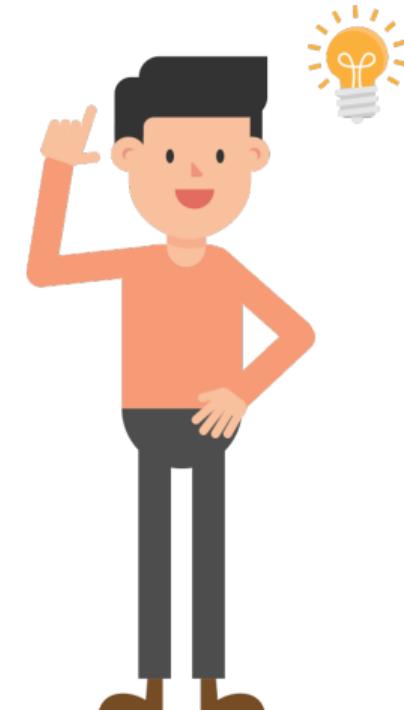


In short

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
- Artificial Intelligence Ethics
- Reinforcement Learning (The inclusion of this may be optional depending on the progression of the teaching and learning.)



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

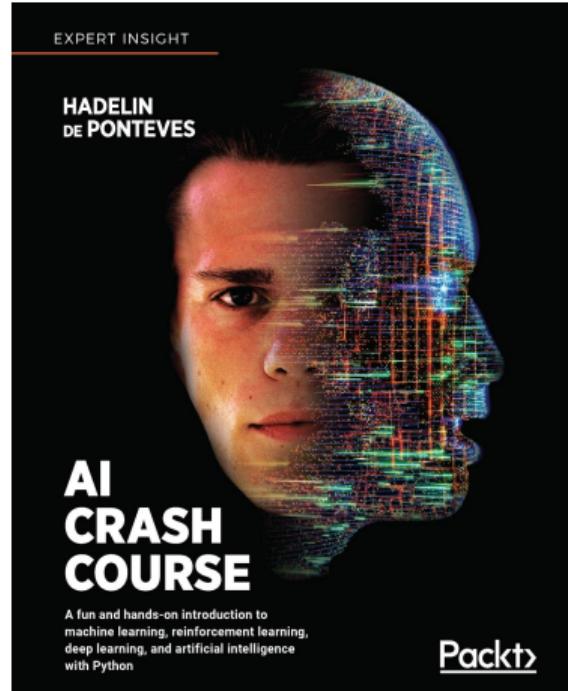


Reference Textbooks

- [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

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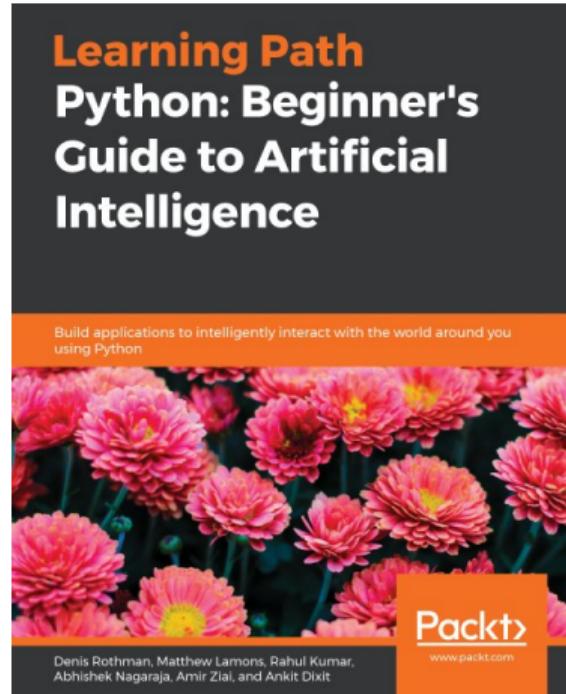
[https://lbdiscover.ust.hk/bib/
991012881204303412](https://lbdiscover.ust.hk/bib/991012881204303412)



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

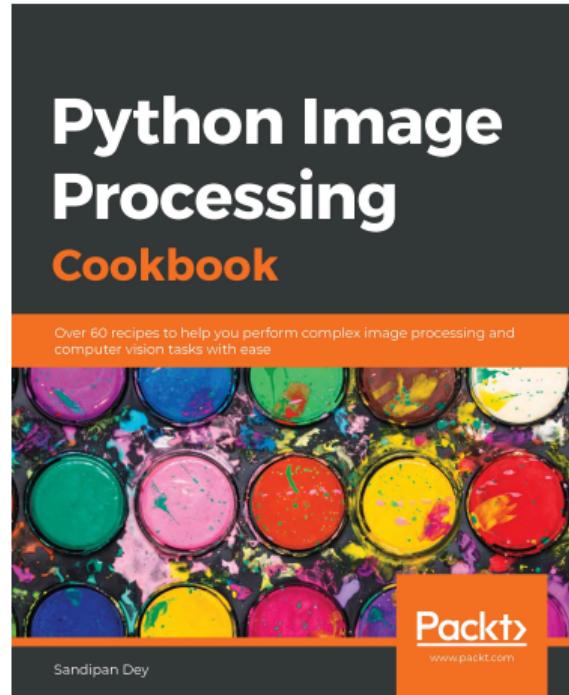


Reference Textbooks

- [Python Image Processing Cookbook](#), Sandipan Dey, Packt Publishing, c2020, First Edition.
- ISBN: 9781789537147 (438 pages)
- HKUST library provides online access to this textbook

URL

[https://lbdiscovers.hkust.edu.hk/bib/
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Provide solutions addressing the challenges and complex tasks of image processing

Other Materials

- 12 self-tests
(one for each topic)
- Past exam papers
(Midterm and Final Exam -
Spring 2022)



Tentative Teaching Schedule

Topic	# Lectures	Cumulative # Lectures
Course Logistics & Introduction to Artificial Intelligence	2	2
Python Programming Fundamentals for AI	4.5	6.5
Naive Bayes	2	8.5
K-Nearest Neighbours	2	10.5
K-Means Clustering	1	11.5
Perceptron	2	13.5
Multi-layer Perceptron	4.5	18
Fundamentals of Image Processing	2	20
Convolution Neural Networks	2.5	22.5
Minimax and Alpha-beta Pruning	2.5	25
AI Ethics	1	26
Reinforcement Learning (Depends on the progression of TL)	2	28

Note

- The schedule is subject to change according to the teaching and learning progress!
- Makeup/Additional classes will be offered
 - L1: May 1 (Monday): Labor Day

Make-up Class / Additional Classes

- Make-up Class for L1 (For compensating the cancelled class due to the public holiday - Labor Day) and Additional Class for L2
 - 9 May 2023 (Tuesday), 8:00pm - 10:00pm
- Additional Classes for L1 & L2 (To develop your AI programming skills)
 - 9 February 2023 (Thursday), 8:00pm - 10:00pm
 - 16 February 2023 (Thursday), 8:00pm - 10:00pm



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  

Table of contents 

+ Code + Text 

Connect  

Getting started
Data science
Machine learning
More Resources
Featured examples
Section

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

- Coursework (40%)
 - 10 Lab Exercises (10%), 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%)



WWW.PHDCOMICS.COM

Note

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

There are **two different ways** to assess your performance.

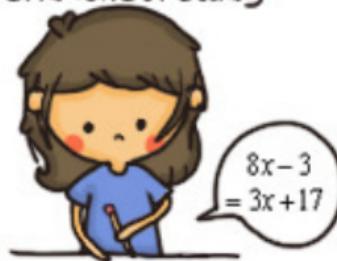
1. Lab exercises (10%) + Programming assignments (30%) + Midterm exam (20%) + Final exam (40%)
2. Lab exercises (10%) + Programming assignments (30%) + Final exam (60%)

We will automatically **choose the higher score of the two** for you.

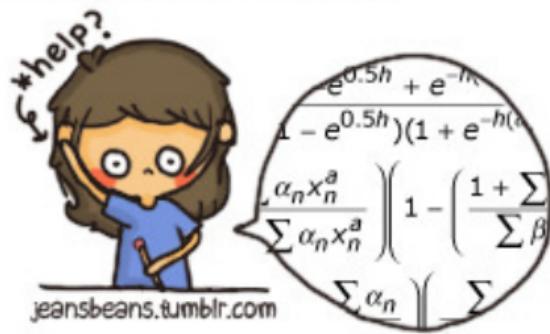
Midterm Exam

- The midterm examination is scheduled on **April 1, 2023 (Saturday)**,
2pm - 4pm
- Venue: LT-A
- Coverage: To be confirmed

What we learn in class
and what i study



What's actually on the test



Academic Dishonesty

- Honesty and integrity are central to academic work. You must observe and uphold the highest standards of academic integrity and honesty in all the work (lab exercises, programming assignments, exams, etc.) you do in this course.
- We deal with cheating cases seriously and the maximum penalty is a FAIL in the course plus additional disciplinary actions from the CSE Department as well as from the University.
- Both the copier(s) and the coppee will be punished, and the penalty will be more than just a zero mark in your assignments/exams.
- 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 instructors 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!**