能 源 及 環 境 學 院
SCHOOL OF ENERGY AND ENVIRONMENT

CityU

SEE 1003
Introduction to Energy and Environmental Engineering

Dr. Shauhrat Chopra
School of Energy and Environment

01 – Course Information, Introduction

Jan 10, 2021

Course instructors

- **Instructor:** Dr. Shauhrat Chopra

  Email: sschopra@cityu.edu.hk

  Office phone: 3442-4665

Office hours
YEUNG G5449
Tue 10-12 pm
Wed 10-12 pm

- **TAs:** LUO Hongqing — hongqiluo2-c@my.cityu.edu.hk
  MAHESHWARI Apoorva — amaheshwa3-c@my.cityu.edu.hk

Course objective:
Introduce students to concepts related to energy and environmental science and engineering.

Background Dr. Shauhrat Chopra

Dr. Shauhrat Chopra

- Industrial ecology and symbiosis
- Life cycle assessment (LCA) for emerging materials and technology
- Energy Systems Analysis
- Climate change adaptation
- Ecosystem goods and services management
- Resilience of urban infrastructure systems
- Food production systems

- **PhD in Civil and Environmental Engineering from the University of Pittsburgh, U.S., in 2015.**
- **Postdoctoral Researcher at the Institute for Environmental Science and Policy, University of Illinois at Chicago, U.S.**
- **Assistant Professor at School of Energy and Environment, City University of Hong Kong.**

Class schedule and info

Time: 9.00-12.00 pm MON
Venue: **AC1 (YEUNG), LT 9**

We plan to start at 9:05 am.

PLEASE DO NOT BE LATE.

You can bring food to class, as long as you do not disrupt your classmates from listening

No talking on phone in class

We will take one-two breaks (about 5-10 mins each) in class.

If you cannot attend a lecture, email the instructor

Class Schedule

January 2022

	S	M	T	W	T	F	S
							1
	2	3	4	5	6	7	8
WK 1	9	10	11	12	13	14	15
WK 2	16	17	18	19	20	21	22
WK 3	23	24	25	26	27	28	29
	30						

February 2022

	S	M	T	W	T	F	S
			1	2	3	4	5
WK 4	6	7	8	9	10	11	12
WK 5	13	14	15	16	17	18	19
WK 6	20	21	22	23	24	25	26
WK 7	27	28					

March 2022

	S	M	T	W	T	F	S
			1	2	3	4	5
WK 8	6	7	8	9	10	11	12
WK 9	13	14	15	16	17	18	19
WK 10	20	21	22	23	24	25	26
WK 11	27	28	29	30	31		

April 2022

	S	M	T	W	T	F	S
						1	2
WK 12	3	4	5	6	7	8	9
WK 13	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

May 2022

	S	M	T	W	T	F	S
	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				

Final class on Apr 11th

Exam period

13 weeks of classes

Chinese New Year break
Holiday on 31st Jan, 2022

Talk by the Dean (Mar 7, 2022)

SEE 1003 class overview

Week	Topics	Assignment issued	Key dates
Week 1	Course introduction; Climate Change and the Engineering approach		**Quiz 1**
Week 2	**MODULE I** Introduction to Sustainability Energy, Electrical energy – Lighting Natural Resources and pollution, light pollution Lighting (2), Electromagnetic energy; Policy	**Semester-long Project**	
Week 3		**Project deliverable 1.1**	
Week 4	**MODULE II** Motor, Generator – Transportation Air Pollution and Energy Consumption; Policy		
Week 5		**Project deliverable 1.2**	**Project deliverable 1.1**
Week 6	**MODULE III** Noise Pollution in Urban Environment	**Project deliverable 1.3**	**Quiz2**
Week 7	**MODULE IV** Urban Sustainability; Water and Energy Nexus		**Project deliverable 1.2**
Week 8	**MODULE V** Tools: Systems Analysis for Sustainability Cost-Benefit Analysis, Material Flow Analysis, Life Cycle Assessment		
Week 9			
Week 10	**MODULE VI** Advances in Environmental and Energy Engineering	**Project deliverable 1.4**	**Project deliverable 1.3; Quiz3**
Week 11	**MODULE VII** Waste management and Waste-to-Energy		
Week 12	**MODULE VIII** Economics and Policy of Energy and Environment	**Project deliverable 1.5**	**Quiz4** **Project deliverable 1.4**
Week 13	**Individual Presentations (5-mins)**		**Final Project Report**

Homework (Assignments)

RULES:

1. **Homework are to be submitted through Canvas (at 9:00 am)**
2. **Penalty 20% off per day late (after 9:00 am, Mon)**
3. **No copying (I will know!)**
4. **Homework format (Digital)**
5. **List all reference sources**

If you cannot attend a lecture, email the instructor

Teaching method

- Starts with fundamentals of each topic

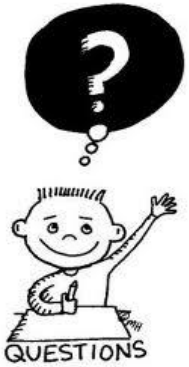
  Principles, equations
  Calculations

- Application

  Example of how a topic is related to real life

- Class demos

  To solidify your understanding of the topic by demonstrations
  (suggests to sit in front of classroom)



Students' role

- Think, be curious and observant
- Ask questions
- Learn outside class

Lecture notes – No print outs please!!!!
It is better to listen during class, rather than reading notes

Academic honesty

NO copying
and pasting

We know

You are not learning if you copy
You have to take responsibility of your act

Who are engineers? What do engineers do?

A person who design and build things to solve specific problems

What is the problem that needs to be solved?
Who has the problem that needs to be solved?
Why is this problem important to solve?

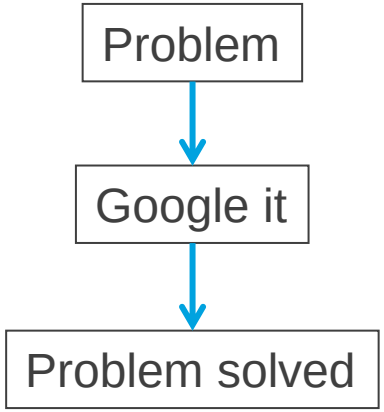
What are the essential characters of an engineer?

Curiosity, self-motivation and independent thinking

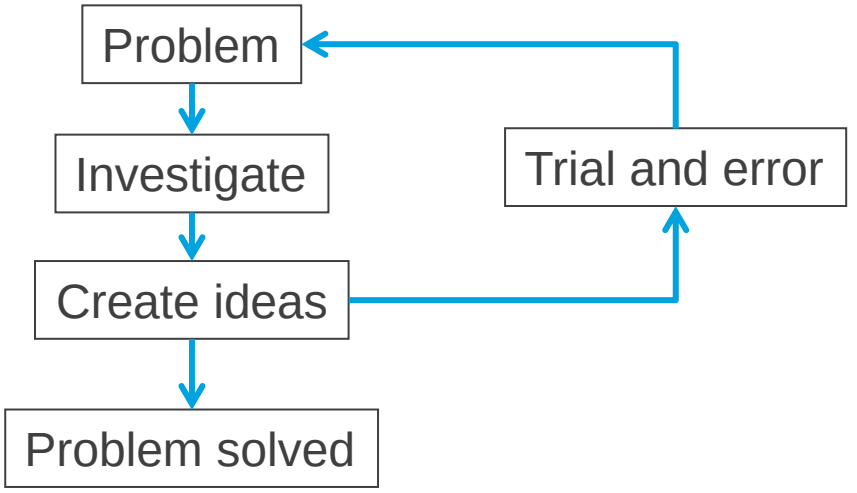
How to engineer something?

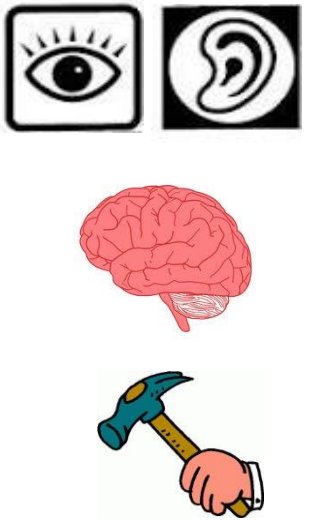
“Engineering is the application of scientific, economic, social, and practical knowledge in order to design, build, maintain, and improve structures, machines, devices, systems, materials and processes. It may encompass using insights to conceive, model and scale an appropriate solution to a problem or objective” – from Wikipedia

There is a problem, how do you solve it?



BAD method





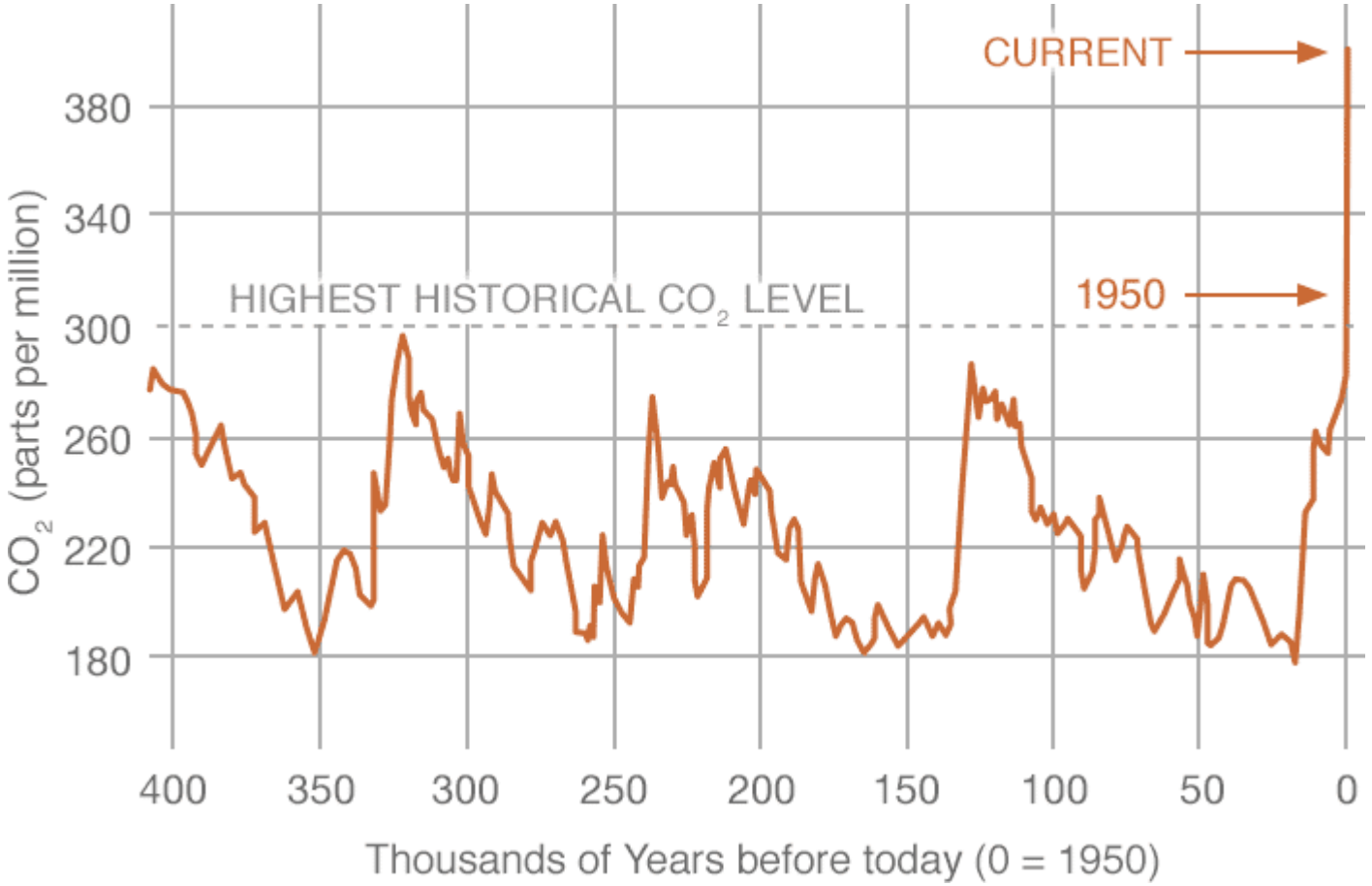
Energy and Environmental Engineers

What is the problem that needs to be solved?

National Academy of Engineering, USA

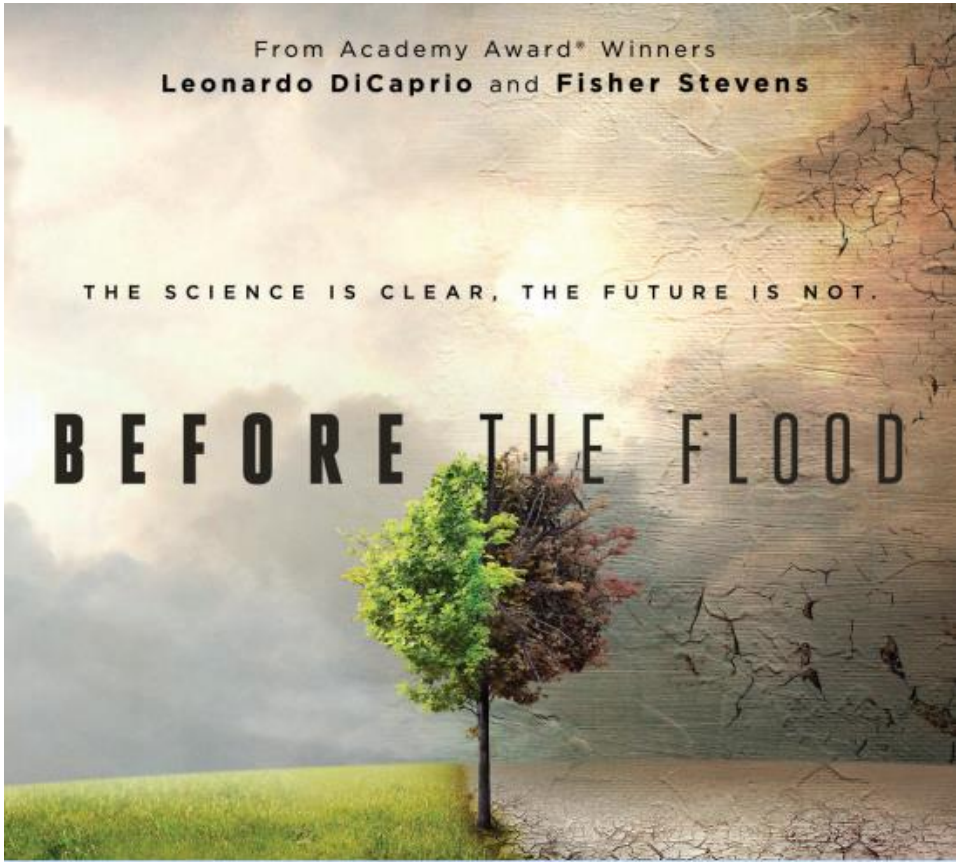
All these Grand Challenges are related to a larger PROBLEM

Climate Change!!



Future Engineers need to UNDERSTAND the Problem!

Let's watch…



More: https://www.beforetheflood.com/explore/
Online source for watching: https://www.youtube.com/watch?v=kSHId9hRtNQ

This is your first Quiz

- Pay attention
- Take the Quiz over Canvas https://canvas.cityu.edu.hk
- Answer questions while you watch the movie and submit before leaving the class!