

Introduction to UFUG2602

Wei Wang @ HKUST(GZ)

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Outline

- About the course
- Motivating exercises

- Data Structure and Algorithm Design
 - Course URL: <https://www.cse.ust.hk/~weiwcs/UFUG2602>, with all the course syllabus and course materials (for all the three sessions) there.
 - Lecture time: Tue (1330 –), Wed (0900 –), Thu (1630 –)
- Lecturer: Wei Wang @ HKUST(GZ)
 - <https://www.cse.ust.hk/~weiwcs>
 - Research interests: Data management; Artificial intelligence (LLM, NLP, KG), AI for Science
- Tutor: Songze, Biaolin, Changkai
- Notes:
 - Slow me down by asking **questions**, 😊
 - Hopefully you will have more **questions** after the course!
 - Your discussion and participation are essential.

Contents (Tentative)

- Python basics
- Elementary data structure (and algorithms)
 - Array, List
 - Queue, Stack
- Algorithmic Paradigms
 - Asymptotic complexity
 - Recursion, Divide-and-conquer, Dynamic Programming
 - Randomize algorithm
- Data structures and algorithms for discrete objects
 - Tree
 - Graph
- Introduction to computational complexity
 - P vs NP
 - NPC proof

Assessment (Tentative)

- Pre-class participation and class participation
- Labs: work on lab exercises and submit by the deadline (each week).
- Project: a large-scale programming exercise
- Mid-term exam: programming-based exam → *2ab exam*
- Final exam: closed book, written → *written*

Pay attention to the academic integrity rules of this course (See Web page)



Recommended Learning Style

Goal: Encourage deeper and more diverse understanding via questioning, discussion, and teaching

- Prepare for the lecture
- Class participation. Questions and discussion welcome and to be rewarded.
- Lab exercises
- Review contents timely (using, e.g., Feynman's method)
- Ask questions!

Try not to use the same style as the textbook.

Tips:

- Learning by doing
- Good time management skills
- Ask (yourself/others) “why” and don’t settle with one answer (even if it comes from an authority)

Survey

- Learned data structures or algorithms before?
- Learned programming before joining HKUST(GZ)?
- Anything bothering you in your programming experience/projects? What do you want to learn in this course?