Data Structures and Database Systems

COMP5112

Instructor Info —

👤 HUANG, Xiao

🕐 Office Hrs: Wed 14:20 - 15:20

📍 PQ837

ℹ️ `https://www4.comp.polyu. edu.hk/~xiaohuang/index. html`

@ xiaohuang@comp.polyu.edu.hk

Course Info ———

⚡ Prereq: None

📅 Wednesday

🕐 15:30 - 18:20

📍 QR404 & Microsoft Teams

TA Info ————

👤 LI Yiran

@ csyrli@comp.polyu.edu.hk

👤 SONG Ziyang

@ cszsong@comp.polyu.edu.hk

Overview

The objectives of this subject are: 1) Apply data structures, sorting and searching algorithms in developing computer programs; 2) Use and administrate a database system properly. This subject emphasizes the technical aspects of data structures and practical aspects of database systems. It is intended to equip the student with knowledge and experience on solving real-life problems by using data structures and database systems.

Grading Scheme

35%	Five Assignments
35%	Five In-class Quizzes (pick highest four from five)
5%	In-class Exercises (random)
25%	Final Exam (open-book, how to prepare for open-book assessments?)

Grades will based on the following scale: A+ $\geq$ 97; A = 93-96.99; A- = 90-92.99; B+ = 87-89.99; B = 83-86.99; B- = 80-82.99; C+ = 77-79.99; C = 73-76.99; C- = 70-72.99; D+ = 67-69.99; D = 65-66.99; F <65.

Learning Objectives

Upon completion of the subject, students will be able to:

- Understand the properties, strengths and weaknesses of different data structures
- Possess the knowledge of sorting and searching algorithms
- Be able to use the associated tools and techniques for database systems
- Understand and apply the principles and practices of good database design and analysis

Academic Integrity

Academic Integrity refers to the honest and ethical manner in which academic work is done, whether it is an assignment, an examination, an oral presentation, a project, or a report. PolyU views Plagiarism as a serious disciplinary offence. It is a fundamental value that all students at PolyU are expected to uphold. Academic Integrity is central to the ideals of this course. Students are expected to be independently familiar with the Regulations of Academic Integrity and to recognize that their work in the course is to be their own original work that truthfully represents the time and effort applied. Violations of the Regulations are most serious and will be handled in a manner that fully represents the extent of the Regulations and that befits the seriousness of its violation.

Grading Policy

Assignments have to be uploaded using BlackBoard. If homework is submitted after its due time, it will be considered a full day late. There will be a 10% deduction for homework that is up to two days late, and a 20% deduction for homework that is three days late. We will not accept any homework that is more than three days late. Plan your time carefully, and don't wait until the last minute to start an assignment so you have time to ask questions and get help. For assignments, quizzes, and final exam, extensions and makeups will only be given in documented cases of serious illness or other emergencies. Leaving a phone message or sending an e-mail without confirmation is not acceptable.

Class Schedule (tentative)

MODULE 1: Data structures and algorithms

Week 1 (Sep 1)	Overview of data structures and algorithms, linked-lists	
Week 2 (Sep 8)	Stacks, queues, binary trees, tree traversals	
Week 3 (Sep 15)	Binary search trees, priority queues, heaps	HW1 due (for Weeks 1&2)
Week 4 (Sep 22)	[Happy Mid-Autumn Festival]	
Week 5 (Sep 29)	Hash tables, searching algorithms, selection sort	In-class Quiz1 (20mins, for Weeks 1&2)

MODULE 2: Basic concepts of database system, SQL

Week 6 (Oct 6)	Sorting algorithms, Intro to database (Chapter 1)	HW2 due (for Weeks 3&5)
Week 7 (Oct 13)	[Make-up lectures available on Teams] Intro to database (2), Intro to relational model (Chapter 2)	
Week 8 (Oct 20)	Intro to SQL (Chapter 3)	In-class Quiz2 (20mins, for Weeks 3&5) HW3 due (for Weeks 6&7)
Week 9 (Oct 27)	Intro to SQL (Chapter 4), join	In-class Quiz3 (20mins, for Weeks 6&7)
Week 10 (Nov 3)	Intermediate SQL (Chapter 5)	HW4 due (for Weeks 8&9)

MODULE 3: Database design

Week 11 (Nov 10)	Entity-relationship model (Chapter 6)	In-class Quiz4 (20mins, for Weeks 8&9)
Week 12 (Nov 17)	Normalization (Chapter 7)	HW5 due (for Weeks 10&11)
Week 13 (Nov 24)	Normalization algorithms (Chapter 7)	In-class Quiz5 (20mins, for Weeks 10&11)
Dec 2-17	FINAL EXAM for all content	

Textbook

A. Silberschatz, H.F. Korth, S. Sudarshan. Database System Concepts 7th Edition. McGraw Hill, 2019.

`https://www.db-book.com/db7/index.html`

Diversity and Inclusivity Statement

I consider this online classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability - and other visible and non-visible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Resources and Support Section at 2766 6800 or srss.info@polyu.edu.hk, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please e-mail me as soon as possible in order to set up a time to discuss your learning needs.