Lahore University of Management Sciences

Lahore University of Management Sciences

CS 202/EE 202 Data Structures

Spring 2024

Subject to Change

Course Description
Data structures are the key abstractions for storing data in computer systems and thus form an essential building block for efficient algorithms. They are used in the design of a wide variety of applications today including cryptocurrencies (e.g., Bitcoins), search engines (e.g., Bing, Google), social networking (e.g., Twitter, Facebook), and data processing frameworks for machine learning and data science (e.g., Spark and Tensorflow). Thus, a sound conceptual understanding of data structures and experience with implementing them is a highly sought-after skill in the technology industry and beyond. This course introduces the fundamentals of data structures and aims to provide a deep understanding of how different ways of structuring information in computer systems leads to different design tradeoffs. Students will be introduced to analytical tools for comparing different data structures in terms of their time and space complexities. The course will augment student's theoretical understanding with rigorous programming assignments, which form an essential component of the course.

COURSE DISTRIBUTION	
Core	Yes
Elective	No
Open for Student Category	All (whoever satisfies the course prerequisite)
Close for Student Category	None

COURSE PREREQUISITE(S)	
CS 200	Introduction to Programming

Course Teaching Methodology
• **Teaching Methodology**:Synchronous (Live Lectures)• **Lecture details**: Lectures will be conducted live over Zoom. The lecture recordings will be made available to students for later viewing. Moreover, links to related reference material or resources may be provided from time to time.

COURSE OFFERING DETAILS				
Credit Hours	3			
Lectures	Nbr of Lec(s) Per Week	2	Duration	75 mins
Labs	Nbr of Lec(s) Per Week	None	Duration	
Tutorials	Nbr of Lec(s) Per Week	TBA	Duration	

Instructor	Dr. Ihsan Ayyub Qazi
Room No.	SBASSE 9-G14A
Class Timings	2pm-3:15pm Wed/Fri
Office Hours	TBA
Email	ihsan.qazi@lums.edu.pk
Telephone	8368
TA	TBD
TA Office Hours	TBA
Course URL (if any)	lms.lums.edu.pk

Lahore University of Management Sciences

Course Basics				
Credit Hours	3			
Lectures	Nbr of Lec(s) Per Week	2	Duration	75 mins
Labs	Nbr of Lec(s) Per Week	None	Duration	
Tutorials	Nbr of Lec(s) Per Week	TBA	Duration	

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)	
PEO-01	Demonstrate excellence in profession through in-depth knowledge and skills in the field of Computing.
PEO-02	Engage in continuous professional development and exhibit quest for learning.
PEO-03	Show professional integrity and commitment to societal responsibilities.

Course Objectives	
CO-1	To understand the fundamental tradeoffs in the design of common data structures
CO-2	To introduce tools for analyzing the time and space complexity of data structures and algorithms
CO-3	To provide rigorous 'hands-on' experience with implementing different data structures in a programming language

Course Learning Outcomes (CLOs)	
CLO1	Students will be able to understand the working of basic data structures
CLO2	Students will be able to understand the fundamental tradeoffs in the design of data structures
CLO3	Students will be able to compare the time and space efficiency of different data structures
CLO4	Students will be able to appreciate how changing application requirements can lead to new data structures
CLO5	Students will be able to write programs to efficiently store, retrieve, and manipulate data.

CLO	**CLO Statement**	**Bloom's Cognitive Level**	**PLOs/Graduate Attributes (Seoul Accord)**
CLO1	Students will be able to understand the working of basic data structures	C1	PLO2
CLO2	Students will be able to understand the fundamental tradeoffs in the design of data structures	C1, C2	PLO2
CLO3	Students will be able to compare the time and space efficiency of different data structures	C3, C4	PLO3
CLO4	Students will be able to appreciate how changing application requirements can lead to new data structures	C4	PLO3, PLO4
CLO5	Students will be able to write programs to efficiently store, retrieve, and manipulate data	C5, C6	PLO4, PLO5