Lahore University of Management Sciences
CS 200/EE201 – Introduction to Programming
Spring 2024

Subject to Change

Instructor	Dr. Shafay Shamail
Room No.	9-G13A, CS Department, SBASSE Building
Office Hours	To be decided
Email	sshamail@lums.edu.pk
Telephone	8187
Secretary/TA	Mr. Afaq Butt/ TAs to be assigned
TA Office Hours	To be decided
Course URL (if any)	lms.lums.edu.pk
Lecture Mode	Online

COURSE TEACHING METHODOLOGY

- Teaching Methodology:
  - Face-to-Face synchronous teaching on campus
  - Students will be guided to supplementary reading material also.
- Lecture Details:
  - Since teaching methodology is going to be synchronous, face-to-face on-campus, therefore there will be no pre-recorded lectures.
  - Links to related reference material available online from different sources will also be provided from time to time.
  - All course related resources will be shared via course site on LMS.

COURSE DESCRIPTION

This course provides a conceptual and practical introduction to programming. The focus is on programming rather than the choice of programming language, with general principles being brought out through the study of 'C++'. This course will equip students with tools and techniques to implement a given problem programmatically.

COURSE PREREQUISITE(S)

•	CS100

Course Basics

Credit Hours	4			
Lecture(s)	Nbr of Lec(s) Per Week	2	Duration	75 min – Mondays, Wednesdays– 8:00am-09:15am
~~Recitation~~/Lab (per week)	Nbr of Lab(s) Per Week	1	Duration	180 minutes – Monday – 3: 30 PM – 6:20 PM
Tutorial (per week)	Nbr of Tutorial(s) Per Week	As needed	Duration	

COURSE DISTRIBUTION

Core	Yes
Elective	No
Open for Student Category	Freshmen, Sophomore
Close for Student Category	None

EXAMINATION DETAIL

Midterm Exam	Yes/No:	Yes
	Combine Separate:	NA
	Duration:	75 mins
	Preferred Date:	Mid-term exam week
	Exam Specifications:	Closed book / closed notes
Final Exam	Yes/No:	Yes
	Combine Separate:	NA
	Duration:	150 mins (may change)
	Exam Specifications:	Closed book / closed notes

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PROGRAM EDUCATIONAL OBJECTIVES (PEO)	
• 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 LEARNING OUTCOMES (CLOs)

At the successful completion of the course students will be able to: (Compare, Develop, Engage, Analyze, Discuss, Demonstrate…)

• **CLO1**	• **Enabling Knowledge:** (C1) ***use*** object-oriented programming model: abstract data types, encapsulation, inheritance and polymorphism to ***code*** algorithmic solutions using standard coding conventions. (C1) ***use*** of fundamental features of an object-oriented language like C++. This includes knowledge of: 1. classes, constructors, destructors 2. overloaded functions, overloaded operators 3. inheritance, base classes, derived classes 4. interfaces, abstract classes 5. exceptions 6. Standard Template Library (STL)
• **CLO2**	• **Critical Thinking and Analysis:** (C4) ***analyze*** the requirements for solving simple algorithmic problems.
• **CLO3**	• **Problem Solving:** (C6) ***design*** algorithm and ***implement*** program code in an object-oriented programming language such as C++ to solve simple algorithmic computing problems, based on the analysis of the requirements. (C5) ***evaluate*** the correctness of the proposed solution.
• **CLO4**	• **Communication:** (C2) ***explain*** key concepts of algorithmic design in written form.
• **CLO5**	• **Responsibility:** (C3) ***apply*** relevant standards and ethical considerations to writing computer programs.

GRADING BREAKUP AND POLICY

Instrument	Weight	Course Learning Objectives (CLO)
Laboratory Sessions:	20% (~13 labs; 2 labs will be dropped)	CLO1 – CLO5
Homework Assignments:	20% (5 assignments; One assignment will be dropped)	CLO1 – CLO5
Quizzes:	20% (~7 quizzes; 2 quizzes will be dropped)	CLO1 – CLO5
Midterm:	20%	CLO1 – CLO5
Final Exam:	20%	CLO1 – CLO5

Note: No individual petitions will be addressed for Labs, Assignments, and Quizzes.

Please refer to the undergraduate student handbook 2019-20 pp 38.

"*The possible options include assigning average grade based on performance in other instruments, allowing a retake of the instrument or denying the petition and assigning a zero score for that instrument. In the case of an instrument with multiple sub instruments, such as quizzes, the instructor may apply best (N-X) policy.*"

COURSE MODULES

Module	Topics	Recommended Readings Problem Solving with C++	Recommended Readings C++ For Everyone	CLOs
1.	Recap of Programming 1 – Basics	CH2, CH3	CH1 to CH4	CLO1 – CLO3
2.	Recap of Programming 2 – Structs and Functions	CH4, CH5	CH5 to CH8	CLO1 – CLO3
3.	Classes and Objects / Streams	CH6, CH10	CH9	CLO1 – CLO3
4.	Friends and Overloaded Operators	CH11		CLO1 – CLO3
5.	Recursion	CH14	CH11	CLO1 – CLO3
6.	Pointers	CH9, CH12	CH7	CLO1 – CLO3
7.	Linked Lists		CH13	CLO1 – CLO3
8.	Queues and Stacks (Subject to time)		CH13	CLO1 – CLO3
9.	Inheritance	CH15	CH10	CLO1 – CLO3
10.	Polymorphism	CH15		CLO1 – CLO3
11.	Exception Handling	CH16		CLO1 – CLO3

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12.	Templates / STL (Subject to time)	CH17, CH18		CLO1 – CLO3

TEXTBOOK(S)/SUPPLEMENTARY READINGS

Books	Problem Solving with C++ (PSC), (6th or 7th Edition)	Walter Savitch, Addison-Wesley ISBN 0321531345. ©2009.
	Thinking in C++ (Vol1 and 2)	http://www.mindview.net/Books/TICPP/ThinkingInCPP2e.html
	C++ for Everyone (CFE)	https://horstmann.com/cpp4everyone/cpp4everyone.html
Tutorials	C++ Language Tutorial	http://www.cplusplus.com/doc/tutorial/
	C++ Made Easy	http://www.cprogramming.com/tutorial.html
Videos	Seminar with Alan Kay on Object Oriented Programming	https://www.youtube.com/watch?v=QjJaFG63Hlo
Handouts	Supplemental readings may also be provided by the instructor.	

HARASSMENT POLICY

- SSE, LUMS and particularly this class, is a harassment free zone. There is absolutely zero tolerance for any behaviour that is intended or has the expected result of making anyone uncomfortable and negatively impacts the class environment, or any individual's ability to work to the best of their potential.
- In case a differently abled student requires accommodations for fully participating in the course, students are advised to contact the instructor so that they can be facilitated accordingly.
- If you think that you may be a victim of harassment, or if you have observed any harassment occurring in the purview of this class, please reach out and speak to me. If you are a victim, I strongly encourage you to reach out to the Office of Accessibility and Inclusion at oai@lums.edu.pk or the sexual harassment inquiry committee at shic@lums.edu.pk for any queries, clarifications, or advice. You may choose to file an informal or a formal complaint to put an end of offending behaviour. You can find more details regarding the LUMS sexual harassment policy here.
- To file a complaint, please write to harassment@lums.edu.pk.

SSE COUNCIL ON EQUITY AND BELONGING

- In addition to LUMS resources, SSE's Council on Belonging and Equity is committed to devising ways to provide a safe, inclusive, and respectful learning environment for students, faculty, and staff. To seek counsel related to any issues, please feel free to approach either a member of the council or email at cbe.sse@lums.edu.pk