

Department of Data Science
University of the Punjab
Object Oriented Programming – Spring 2023
(BSDS F22 M&A Sections)

Course code	CC-201
Credit hours	3
Prerequisite	CC-102 Programming Fundamentals (and Enthusiasm, Consistency and Honesty too)
Follow up	CS-203 Artificial Intelligence
Course Instructor	Muhammad Idrees Email: sir.idrees@gmail.com (general) Google Classroom code: fqp7two Office hours: Any time (working day) with permission through email.

Course Objectives

- To equip the learner with the philosophy and necessary skills to formulate solutions of real world problems using object-oriented paradigm.
- Justify the philosophy of object-oriented design and the concepts of encapsulation, abstraction, inheritance, and polymorphism.
- Strong concepts of object manipulation and dynamic memory allocation within classes

Textbook

- Tony Gaddis, *Starting out with Python*: 5th Ed., Addison-Wesley.
- Dusty Phillips, *Python 3, Object Oriented Programming*, 3rd Edition, Packt Publishing.

Reference Books/Websites

- Mark Lutz, *Programming Python*, O'REILLY.
- <https://pynative.com/python/object-oriented-programming/>
- <https://www.youtube.com/> and <https://www.google.com/> appropriate topic search.

Grading Instruments (Sessional decomposition may vary at end of course)

5 to 8 marks for	Quizzes, planned/announced or sudden
10 to 15 marks for	Programming assignments
2 to 3 marks for	Written assignments
Up-to 5 marks for	Term project / technical report
35 marks for	Midterm exam/pre-mid lecture notes
40 marks for	Final exam/post-mid lecture notes

Passing Criteria

- As per college rules, minimum requirement to pass this course is to get overall 50% marks.

Important Notes

- Academic integrity is expected of all students. Plagiarism or cheating in any assessment will result in at least an **F** grade in the course, and possibly more severe penalties.
- You bear all the responsibility for protecting your assignments from plagiarism. If anyone else submits your assignment or uses your code in his/her assignment, you will be considered equally responsible.
- The instructor reserves the right to modify the grading scheme/marks division and course outline during the semester.
- There is no makeup for a missed sessional grading instruments like quizzes, assignments, and home works.

Tentative Course Outline and Lecture Plan

Topics	No. of Lectures
Introduction of the course; Motivation: from structured programming to object oriented programming (OOP), every thing (tangible, mathematical, or conceptual) is object; OOP Terminology and real world examples	1
Introduction to user defined types, class and pass keywords, variables of user defined types, creating and accessing data members using character ·	1
Revision of Structured Programming; Pitfalls of Structured Programming; Argument categories (positional arguments); Revision of Exceptions and Mutable and immutable objects	4
Revision of File handing in Python	2
4 pillars of OOP, Abstraction (information hiding or separation of interface from implementation), Encapsulation (data and function members of class/object), Inheritance and Polymorphism, Introduction of UML class diagram	1
Member functions; class level and instance level members (data/functions); nameless objects	1
Information Hiding: private data members, getters and setters, properties; read only and write only properties/data members; constructors, <code>__init__</code> (also <code>__new__</code>); destructor (<code>__del__</code>)	1
Static members; Function overloading, variable number of arguments, keyword arguments;	2
Magic function as members of classes	1
Aggregation and Composition; has a relationship	2
MIDTERM EXAM	
Inheritance and Polymorphism; is a relationship; <code>super()</code>	2
Multiple inheritance	1
Abstract base classes, interfaces; standardization	1
Several case studies including Stack, Queue, Tree and Graph	2
Strings, Lists, Tuples, Sets, and Dictionaries in Python; Serialization/Deserialization	2
GUI programming; event driven programming	2
Concurrency and threads; network programming	1
Database vs files; simple QL; Connectivity to databases	2
Missed/Misc. topics; Revision	1
FINAL EXAM	