Course: CSE110 Object Oriented Programming (Sections: 3 and 4)

Credits and Teaching Scheme

	Theory	Laboratory	Total
Credits	3	1.5	4.5
Contact Hours	3 Hours/Week for 13 Weeks + Final Exam in the 14th Week	3 Hours/Week for 13 Weeks	6 Hours/Week for 13 Weeks + Final Exam in the 14th Week

Prerequisite

CSE106 Discrete Mathematics

Instructor Information

Instructor: Tanni Mittra
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GTA/UTA: TBA

Class Routine and Office Hour

Day	10:10-11:40	11:50-1:20	1:30-3:00	3:10-4:40
Sunday	CSE110 (3) Room: AB3-201	Office Hour	CSE207 (8) Room: AB3- 302	
Monday	CSE110 LAB (4) Room: 637		CSE110 (4) Room: FUB-301	Office Hour
Tuesday	CSE207 LAB(8) Room: 534	Office Hour	CSE207 (8) Room: AB3- 302	Office Hour
Wednesday	CSE110 LAB (3) Room : 616		CSE110 (4) Room: FUB-301	Office Hour
Thursday	CSE110 (3) Room: 107	Office Hour		

Course Objective

This course presents a conceptual and practical introduction to object-oriented programming (OOP). The course will cover general principles of programming in object-oriented frameworks to enhance transferable skills, such as programming, designing, and problem-solving skills. This course introduces object-oriented concepts and develops OOP programs which provide solutions to real-world object-oriented problems. Java is primarily chosen as the programming language in this course. Knowledge of this course will be needed as prerequisite knowledge for CSE207 Data Structures.

Knowledge Profile

K2: Conceptually-based mathematics, numerical analysis, statistics, and formal aspects of computer and information science

Learning Domains

Cognitive – C2: Understanding, C3: Applying

Psychomotor – P2: Manipulation, P3: Precision

Affective – A2: Responding

Program Outcomes (Pos)

PO1: Engineering Knowledge

Complex Engineering Problem Solution

None

Complex Engineering Activities

None

Course Outcomes (Cos) with Mappings

After completion of this course students will be able to:

CO	CO Description	PO	Learning Domains	Knowledge Profile	Complex Engineering Problem Solving/ Engineering Activities

CO1	**Understand** and **apply** the basics of object-oriented programming of the target language for writing object-oriented programs.	PO1	C2, C3	K2	
CO2	**Understand and apply** the principles of OOP for implementing object-oriented solutions of simple use cases.	PO1	C2, C3	K2	
CO3	**Apply** advanced OOP constructs, file and thread management for implementing object-oriented applications.	PO1	C3	K2	
CO4	**Use** appropriate language constructs to design OO-based solution of a moderately complex problem; **Perform** and **demonstrate** the acquired skills; and **write** reports to develop programs for solving OOP-related problems.	PO1	C3 P2, P3 A2	K2	

Course Topics, Teaching-Learning Method, and Assessment Scheme

Course Topic	Teaching-Learning Method	CO	Mark of Cognitive Learning Levels		CO Mark	Exam (Mark)
			C2	C3		
Principles of Object-Oriented Programming and Basics of Elementary Programming in target language (conditional branching, looping, methods and arrays)	Lecture, Class Discussion, Discussion outside class with Instructor/TA	CO1	5	5	10	**Midterm Exam I** **(15)**
Introduction to Classes and Objects (Classes, Objects, Instance variables and instance methods, Constructors)	Do	CO1	5		5	
Inheritance and Polymorphism in OOP (super class, sub class, multiple-level inheritance, late binding)	Do	CO2	5	5	10	**Midterm Exam II** **(17)**
Abstract Class and Interfaces (differences, applicability and implementation)	Do	CO2	7		7	

Exception Handling in OOP and File handling using Text and Binary I/O	Do	CO3		10	10	**Final Exam** **(20)**
Implementation of Generics and GUI, Multi-threaded Programming, JDBC and other advanced topics	Do	CO3		10	10	

Laboratory Experiments and Assessment Scheme

Experiment	Teaching-Learning Method	CO	Marks of Cognitive Level	Mark of Psychomotor Level		Mark of Affective Level	CO Mark
			C3	P2	P3	A2	
Java Basics of Elementary Programming, Conditional Statements	Lab Experiment and Result Analysis and Discussion with Instructor, Post-Lab Report	CO4					
Looping, Nested Looping, Arrays	Do	CO4					
Java Methods and library functions	Do	CO4					

Designing and Implementing simple Classes and Objects, Arrays of Objects etc.	Do	CO4					
Implementing associations of Classes	Do	CO4					
Designing and Implementing Inheritance and Polymorphism	Do	CO4					
Designing and Implementing Abstract Class and Interfaces	Do	CO4					
Understanding and Implementing Exceptions and File management	Do	CO4					
Lab Exercises (Total)		CO4	12	2	2	1	17
Viva	Individual Exam	CO4	4	0	0	1	5
Total			**16**	**2**	**2**	**2**	**22**

Mini Projects

Mini Project	Teaching-Learning Method	CO	Mark of Cognitive Learning Level	Mark of Psychomotor Learning Levels		Mark of Affective Learning Level	CO Mark
			C3	P2	P3	A2	
Lab-based Mini Project including Report and Presentation	Group-based moderately complex digital circuit design project with report writing and oral/poster presentation	CO4	8	1	1	1	11

Overall Assessment Scheme

Assessment Area	CO				Other	PO Marks
	CO1	CO2	CO3	CO4		PO1
Class Participation and Performance					5	5
Class Test/Quiz					10	10
Midterm-I Exam	15	0	0	0		15
Midterm-II Exam	0	17	0	0		17
Final Exam	0	0	15	0		20

Laboratory Performance and Lab VIVA	0	0	0	22		22
Mini Project	0	0	0	11		11
Total	**15**	**15**	**15**	**33**	**15**	**100**

Teaching Materials/Equipment

Text Book:

Y. Daniel Liang, *Introduction to Java Programming, Comprehensive Version*, 10th edition, Pearson (2015)

Reference Book:
- Walter Savitch, *Absolute Java*, Pearson (5th edition)
- Bert Bates and Kathy Sierra, *Head First Java*, O'Reilly Media (2nd edition)
- Paul Deitel and Harvey Deitel, *Java How to Program,* Prentice Hall (9th edition)
- Herbert Schildt, *Java: The Complete Reference*, 10th edition, McGraw-Hill Education (2017)

Software/Tools:
- Java Development Kit (JDK 1.8)
  https://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html
- Any Integrated Development Environment (IDE) supporting Java preferably Eclipse
  https://www.eclipse.org/downloads/,
- NetBeans

Exam Dates

Section	Term I	Term II	Final
3	13 July 2023	10 August 2023	14 September 2023
4	12 July 2023	09 August 2023	13 September 2023

Grading System

Marks (%)	Letter Grade	Grade Point	Marks (%)	Letter Grade	Grade Point
97-100	A+	4.00	73-76	C+	2.30
90-96	A	4.00	70-72	C	2.00
87-89	A-	3.70	67-69	C-	1.70
83-86	B+	3.30	63-66	D+	1.30
80-82	B	3.00	60-62	D	1.00
77-79	B-	2.70	Below 60	F	0.00