SECOND SEMESTER 2015-16

In addition to the Part-1 (general Handout for all courses appended to the timetable) this portion gives further specific information regarding the course.

Course Number	:	**CS/IS F213**
Course Title	:	**Object Oriented Programming**
Instructor In-Charge	:	**SUNITA SINGHAL**
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Scope and Objective:

This course gives an in-depth understanding of object-oriented programming using the java programming language, object oriented design, and design patterns. The course will be taught with live demonstrations, running and debugging several examples on tools like Eclipse. The later part of the course focuses on designing object oriented software. After the completion of this course a student should be able to effectively realize and implement real world problems using object oriented principles and techniques.

Text Book

T1: Object Oriented Design & Patterns, Cay Horstmann, John Wiley & Sons, 2006

References

R1: The complete Reference Java 2, 8th Edition, Herbert Schildt, Tata McGraw Hill
R2: Java™ Design Patterns – A Tutorial, James W. Cooper, Addison-Wesley, 2000

Lecture Schedule

Lec#	Learning Objectives	Topics to be covered	Chapters
PART I (Basics of Object Orientation and Java Programming Fundamentals)			
1	Introduction to Object Oriented Programming	- Class, Attributes, Operations - Objects as a physical instance of Class - Pillars of OOP	<<Class Notes>>
2	Programming Basics	- Compilation and Execution of Java Programs o Command Line Execution - Introduction to Java API Classes & Packages	T1(Ch1 - 1.7 ; Ch7 - 7.1) <<Class Notes>>
3		- Primitive Type(s) - Java Type vs. Java Value - Differences in C and Java - Sample Java Application o Command Line Arguments o Reading input from standard input	T1(1.3, 1.4, 1.10), R1(Ch3, Ch4, Ch5)
4	Class definition	- Adding Attributes, Methods and Method Overloading - Access Modifiers (public & private) - Object Creation (Role of constructors) - Encapsulation - final, static, and static block - Representation in UML	T1(1.5), R1(Ch 6)
5	Packages	- Role of Packages - Create and Define Packages	T1(Ch 1 – 28), R1(Ch 7)

		- Access Modifier (protected) - final and static keywords	
6 – 7	Inheritance	- Inheritance - Instance variable hiding - Representation in UML	R1 (Ch8), T1 (Ch 6)
8 - 9	Polymorphism	- Polymorphism - Method Overloading vs. Method Overriding - Constructor overloading, Object as Parameters - Abstract classes	T1(Ch 4)
10 – 11	Arrays and Strings	- Single and Multi dimensional arrays - Strings, StringBuffer, & StringTokenizer	T1(Ch 1 – 1.9, 1.12) R1(Ch 4, Ch 13)
12 – 13	Interfaces and Inner Classes	- Interfaces ✓ Comparator interfaces ✓ Comparable interfaces - Representation in UML - Inner classes and Anonymous Inner classes - Representation in UML	T1(Ch 4), R1(Ch 9)
14 – 15	Exception Handling	- Exception classes - Checked vs. Unchecked Exception - Throw vs. Throws clause	T1 (Ch 1 – 1.8) R1 (Ch 10)
16 – 17	Collection Framework	- Collection Classes & Interfaces - List ✓ ArrayList ✓ Iterator ✓ ListIterator ✓ Linked List	R1 (Ch 15), T1 (Ch 8 – 8.3)
18 – 19	Object Model	- The Java Type System, Type Inquiry, Object Class, Shallow and Deep Copy	T1(Ch 7 – 7.1, 7.2, 7.3, 7.4)
20 – 21	GUI Programming	- AWT Hierarchy of classes - Introduction to Swing Package	T1(Ch 4 – 4.7; Ch6 – 6.6) << Class Notes>>
22 – 23	Event Handling	- Event Classes: ActionEvent, MouseEvent - Listener Interfaces: ActionListener, MouseListener	R1 (Ch 20), T1(Ch 4 – 4.7)
24	File Handling	- Text and Binary Files ✓ Input and Output Streams ✓ Reading and Writing to/from Files	<<Class Notes>>
25 – 28	Multithreading	- Overview of concurrent programming ✓ Creating and starting threads ✓ Race conditions and critical sections ✓ Thread safety and shared resources ✓ Thread safety and immutability ✓ Synchronized blocks ✓ Thread signaling	<<Class Notes>>
PART II (Object Oriented Design Process)			
29	Object Oriented	Understanding Class Relationships, Multiplicities (Cardinality)	T1 (Ch 2 – 2.3, 2.4)
30		Identifying Use cases , actors from a given Software Requirement Specifications, Use Case Realization	T1 (Ch 2 – 2.6)

31	Designing	Identifying Classes , Attribute(s), Methods [Both by using Noun Phrase Analysis and CRC Cards]	T1 (Ch 2 -2.3, 2.4, 2.7)
32		Drawing Class Diagram [Dependency Diagram , and Relationship diagrams]	T1 (Ch 2 – 2.8)
33		Sequence Diagrams	T1 (Ch 2 – 2.9, 2.10)
		PART III (Object Oriented Design Patterns)	
34	Design Patterns	Pattern Basics & Creational Patterns – - Singleton, Factory	R2 (Ch 1) <<Class Notes>>
35 – 37		Structural Patterns – - Composite, Decorator, Adapter	R2 (Ch 3) <<Class Notes>>
38 – 40		Behavioral Patterns – - Iterator, Strategy, Observer	R2 (Ch 4) <<Class Notes>>

Evaluation Scheme

Component	Duration	Date & Time	Weight	Nature
Mid Semester Test	90 Min	-	25%	CB
Test-2	90 Min	TBA	30%	OB
Labs	120 Min	Weekly	05%	OB
Comprehensive	180 Min	3/5 FN	40%	CB

Chamber Consultation: **Will be announced in class.**

NO MAKE UP IN ANY COMPONENT

Notices:

All notices related to the course will be put up on the CSIS Notice Board only.

Instructor-in-Charge
CS/IS F213