

COP4331 – Object Oriented Design and Programming

Credits: 3

Text book, title, author, and year: Cay Horstmann, “Object Oriented Design & Patterns”, 2nd Ed., Wiley, 2005 ISBN 0-471-74487-5

Textbook webpage: http://www.horstmann.com/design_and_patterns.html

a. **Supplemental materials:**

1. Textbook problem solutions:

<http://www.horstmann.com/oodp2/solutions/solutions.html>

2. Java Tutorial from Oracle: <http://docs.oracle.com/javase/tutorial/index.html>

3. Craig Larman, “Applying UML and Patterns”, 3rd edition, Prentice Hall, 2004. (still a great reference for UML and patterns)

4. Erich Gamma et al. “Design Patterns”, Addison-Wesley Professional; 1st edition, 1995

Specific course information

a. **Catalog description:** Brief introduction to Java; software development process; functional specification and use cases; Unified Modeling Language diagrams; design methodology; OO design principles; implementation in Java; design patterns; Java applet framework; advanced Java topics: reflection, serialization, multithreading, generics.

b. **Prerequisites:** COP 3530

c. **Required, elective, or selected elective:** elective

Specific goals for the course

a. **Specific outcomes of instruction:**

1. understand and apply the methods of object-oriented design and programming in the context of the software development cycle (a,b,c,d,e,f,i)

2. demonstrate the use of Unified Modeling Language (UML) diagrams for analysis and design of object-oriented software (a,c,d,i)

3. learn elements of the Java programming language and implement object-oriented designs in Java (a,c,i)

4. understand the basic concepts for design patterns and apply several common design patterns to improve the quality of software architectures (a,b,c,i)

5. write programs using advanced features of the Java programming language, such as reflection, multithreading, and generics (a,b,c,i)

Brief list of topics to be covered:

- Introduction to Java
- Object Oriented Design Process
- Class Design
- Interfaces and Polymorphism
- Patterns and GUI Programming
- Inheritance and Abstract Classes

- The Java Object Model
- Frameworks
- Multithreading