CSYE 6200 Concepts of Object-Oriented Design
Instructor: Daniel Peters
Office Hours: Before class
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Class Time: 6:00 PM - 9:30 PM
Text:

1. Java The Comploete Reference by Herbert Schildt, 9th Edition, McGraw-Hill Professional Publishing (ISBN-10: 0071808558 ISBN-13: 9780071808552)
2. *Thinking in Java* by Bruce Eckel, 4th Edition, Prentice Hall (ISBN-13: 978-0131872486 ISBN-10: 0131872486)
3. *Effective Java* by Joshua Bloch, 2nd Edition, Addison-Wesley (ISBN-13: 860-1300201986 ISBN-10: 0321356683)
4. *Head First Design Patterns* by Eric Freeman, Bert Bates, Kathy Sierra, Elisabeth Robson, 1st Edition, O'REILLY (ISBN-13: 000-0-596-00712-4 ISBN-10: 0-596-00712-4)

Course Description:
Concepts of Object-Oriented Design is a graduate level course focused on mastering techniques and skills used in industry to develop extensible, scaleable, robust and maintainable software products and solutions. The course utilizes the Java programming language and both the Eclipse and NetBeans Integrated Design Environments (IDE) as the primary software development tools. Upon successful completion of the course, the student will gain a working knowledge of software reuse, Data Abstraction, Data Encapsulation, Polymorphism, NetBeans Rich Client Platform (RCP) Framework and Swing Graphical User Interface components as well as functional-style operations using Java 8 Stream API and Lambda Expressions.

Course Objectives:
1. Understand the pragmatic use and benefits of Objects Oriented Design.
2. Gain a working knowledge of Encapsulation, Data Abstraction and Polymorphism.
3. Learn design decomposition for distributed and managed software development.
4. Learn the use of Design Patterns and SOLID design principles.
5. Understand GUI programming with Swing components.
6. Learn Network Programming with Sockets.
7. Develop familiarity with Eclipse IDE and NetBeans RCP Framework.
8. Learn Java 8 **features** including Lambdas, Stream API and Date/Time API

Prerequisite:
TBD

Grading:
- **Attendance and Participation:** **10%**
- **Quizzes/Assignments:** **40%**

- **Mid-term Exam:**   **25%**
- **Final Exam:**   **25%**

Academic Honesty:
All students are expect to adhere to the Northeastern University Academic Integrity Policy which applies to all work submitted in this course. For information regarding the Northeastern University Academic Integrity Policy, please visit the following website:

http://www.northeastern.edu/osccr/academic-integrity-policy/

Attendance Policy:
The Information Systems Department has a strict attendance policy. Students who miss two classes will automatically receive a reduction (one letter grade lower) in their final grade. Students who miss three classes will receive an automatic "F" grade for the class. There are no exceptions allowed for this rule.

Individual Assignments:
There will be multiple individual assignments. These assignments are to be completed individually, submitted to blackboard **on time and as a complete executable project**. **Incomplete or late assignments will receive an automatic 1/3 deduction in assignment grade.** Assignments may presented in class. Submittals consist of a presentation slide and a written report.

Group Project Assignments:
The group projects will be completed by a team of 2 - 5 students. The group project affords students an opportunity to exercise creativity in application of knowledge gained in the course to real world scenarios.

Final Team Project Assignment:
The final project will be completed by a team of 2 - 5 students. The project details will be provided during the second week of the course. Students are encouraged to choose their topic of choice either from healthcare, business and/or technology related fields.

Course Schedule (subject to change):

WEEK	TOPIC
1	INTRODUCTION • Software Development Environment and Tools • Unix Command Line • Java run-time, JDK (java, javac)
2	CLASSES AND OBJECTS • Variables, String, Arrays, Object vs Class instance • Encapsulation, Method Overloading • UML

3	DATA STRUCTURES AND ALGORITHMS • Collections • Algorithms and Sort
4	EXCEPTION HANDLING • Loops • Try with Resources • File Handling • Java 8 Date/Time API
5	POLYMORPHISM AND INHERITANCE • Super and Derived sub classes • Abstract and Concrete classes • Interfaces
6	DATA ABSTRACTION AND INTERFACES • Data Hiding • SOLID Design Principles • Java 8 Lambda Expressions
7	DESIGN PATTERNS • Design Clarity • Code Readability • Robustness • Factory Design Pattern
8	MIDTERM EXAM
9	GENERICS AND COLLECTIONS
10	THREADS AND NETWORK PROGRAMMING • UDP • TCP • Performance Scalability, Extensibility, Distributed Functional Flexibility
11	JAVA 8 LAMBDA • Anonymous Inner Classes • Functional Interface •
12	JAVA 8 STREAM API •
13	NETBEANS RICH CLIENT PLATFORM • Java Swing •
14	GRAPHICAL USER INTERFACE COMPONENTS • Frames • Panels • Text Fields, Text Areas • Buttons • ComboBoxes • Tables

15	Review
	• Review for final exam
16	FINAL EXAM