Computing Science Course Outlines                               2018 Spring

CMPT 213 - D100 Object oriented design in Java

Instructor(s): Brian Fraser

SFU Surrey

Calendar Objective/Description:
An introduction to object oriented design using Java. The Java programming language is introduced, with an emphasis on its advanced features. The course covers the building blocks of object oriented design including inheritance, polymorphism, interfaces and abstract classes. A number of object oriented design patterns are presented, such as observer, iterator, and singleton. The course also teaches best-practices in code construction. It includes a basic introduction to programming event driven graphical user interfaces.

Instructor's Objectives:
Throughout the course, students will learn and use Java to solve interesting problems but no background in Java is expected. The course will cover a number of design patterns which students will use in the assignments. There will be a focus on designing and writing good maintainable code, as such all code submitted will need to conform to a coding standard which will be discussed in class.

Prerequisites:
CMPT 225: Data Structures and Programming. Students with credit for CMPT 212 cannot take this course for further credit.

Topics:
- Introduction to Java, including advanced features such as enum, generics, and mutable vs immutable.
- Inheritance, polymorphism, interfaces and abstract classes.
- Introduction to object oriented design (OOD) and some UML diagrams.
- Code construction, best practices and coding standard.
- Basic software design patterns such as iteration, singleton, observers, or template methods.
- Introduction to refactoring.
- Basic introduction to event driven user interface programming, and use of threads.
- Software development tools, such as advanced IDE features, build tools, debuggers, and JavaDoc.

Grading:
35% assignments and project, 20% midterm, 45% final exam. Grading will be confirmed in the first week of class.

Students must attain an overall passing grade on the weighted average of exams in the course in order to obtain a clear pass (C- or better).

Reference Books:
Head first design patterns, Freeman and Freeman, O'Reilly, 2004, 9780596007126
Patterns in Java (Volume 1), Mark Grand, Wiley, 2002, 9780471227298
Object-Oriented Design & Patterns, 2nd ed, Cay Horstmann, Wiley, 2006, 9780471744870

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