Object Oriented System Design

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Syllabus

- Introduction (1 session)
- Object oriented computing concepts (2 sessions)
    - Abstract data types, classes, methods
    - Message passing
    - Inheritance, Polymorphism, Dynamic binding
- A review of UML (1 session)
- Software Development Methodologies (2 sessions)
- Principle of object-oriented design (3 sessions)
    - Basic principles
    - GRASP patterns
    - Design by Contract
- GoF patterns and MVC pattern (5 sessions)
    - Creational patterns
    - Structural patterns
    - Behavioral patterns
- Software testing (4 sessions)
    - Acceptance testing, Integration testing
    - Unit testing, Functional testing
    - Performance testing, Stress testing, Usability testing
- Refactoring and Code Reviews (3 sessions)

Syllabus

- Pre-defined data structures in the C# and Java
- Main concepts of OOP in the C# and Java
- Object-Relational Mapping
- REST
- Serialization
- Unit testing
- Mockito mock

References

- Design Patterns: Elements of Reusable Object-Oriented Software by Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides
- Software Engineering at Google: Lessons Learned from Programming Over Time
- The Unified Modeling Language Reference Manual, J. Rumbaugh, I.Jacobson and G. Booch, Addison Wesley
- IBM
- https://refactoring.guru/
- https://www.sei.cmu.edu/

Grading Policy

- 30% Midterm
- 30% Homeworks (2 or 3)
- 40% Final Exam