NYU School of Continuing and Professional Studies
Course Title: Object Oriented Analysis and Design
Course Number: X52.9267-001

Course Description:
This course introduces the fundamental concepts of object-oriented analysis (OOA) design (OOD) and programming (OOP).

Over the lifetime of the course, the following topics will be covered:
- Introduction to OOA, OOD and OOP.
- Discussion of what makes a language or development method object oriented.
- Evolution of OO methodology and languages
- Comparison of OO and procedural languages
- Benefits and drawbacks of OO
- Introduction to classes: structure and interactions/relationships
- Introduction to objects: structure and interactions/relationships
- Introduction to the main elements of OO: Inheritance, Encapsulation and Polymorphism, applications and benefits. Will include a discussion of Inheritance vs. Composition.
- OO modeling and notation: benefits and modeling languages such as UML.
- OOD: class design guidelines and designing with objects (OO software development process)
- OO frameworks and advanced concepts

Throughout the class, examples will be used to supplement presented material. Class discussions will be encouraged to assist students' understanding.

Prerequisites:
Modern general-purpose high-level language experience (Java, C, C++, Smalltalk, etc.)

Course Objectives:
At the completion of this course, the student will be able to apply an object-oriented approach in system development.

Recommended Readings:
"Object Oriented Analysis and Design with Applications", Grady Booch, Benjamin/Cummings Publishing Company, Inc., Second Edition, ISBN: 0-8053-5340-2

"Fundamentals of Object-Oriented Design in UML", Meilir Page-Jones, Addison-Wesley, ISBN: 0-201-69946-X

"The Unified Modeling Language User Guide", Grady Booch, James Rumbaugh, Ivar Jacobson, Addison-Wesley, ISBN: 0-201-57168-4

" UML Distilled", Martin Fowler, Kendall Scott, Addison-Wesley, ISBN: 0-201-65783-X

"The Object-Oriented Thought Process", Matt Weisfeld, SAMS, ISBN: 0-672-31853-9

Required Text
Copies of the text used for class will be issued to all students.

Assignments
Weekly homework assignments will be given.

Past due assignments without the proper PRIOR arrangements, will be considered late and will be penalized.

Grading
Homework assignments will account for 100% of the final grade.

Session Outline

Session 1:
- Introduction to OOA, OOD and OOP.
- "Analysis" and "Design" defined
- "Object-oriented" defined
- Software requirements

Reading: Chapter 1

Session 2:
- What is a class?
- What is an object?
- Class modeling
- Introduction to modeling notation – UML

Reading: Chapter 2

Session 3:
- Class selection criteria
- Class structure, relationships and interactions
- Relationship of objects to classes
- Class structure, relationships and interactions continued
- Inheritance and polymorphism
- Composition and aggregation vs. inheritance
- UML notation

Reading: Chapters 3, 4

Session 4:
- Object structure, relationships and interactions
- Interfaces and implementation
- UML notation

Reading: Chapter 5

Session 5:
- Designing with classes and objects
- Guidelines of good design
- Frameworks and reuse
- UML notation

Reading: Chapter 6

Session 6:
- Object-oriented architecture formalized
- Components
- Distributed architecture
- UML notation

Reading: Chapters 8, 9

Session 7:
- Design Patterns and ORM

Reading: Class handout

Session 8:
- OO software development lifecycle

Reading: Chapter 7

Session 9:
- Re-Factoring

Reading: Class handout

Session 10:
- Class review/summary
- Industry support for OO methodology
- Further readings.

Reading: Chapter 10, class handout