

Object-Oriented Analysis and Design
© J.W. Schmidt, F. Matthes, TU Hamburg-Harburg

Object-Oriented Analysis and Design

Lecturer:

Prof. Dr. J.W. Schmidt
Software Systems (STS)
Harburger Schloßstraße 20
Phone: 040 / 7718 - 3460

Schedule:

Tuesday, 12-14h, ES38 - 007

Subject:

- Object-Oriented Development in Java
- Object-Oriented Analysis and Design using UML

Cross-linked courses:

Software Architectures, F. Matthes, summer 1999

<http://www.sts.tu-harburg.de/Teaching/ws-98.99/OOA+D/entry.html>

Literature and recommended readings (1)

Martin Fowler with Kendall Scott:

UML Distilled, Addison-Wesley, 1997

Craig Larman

Applying UML and Patterns, Prentice-Hall, 1997

H. Rumbaugh, M. Blaha, W. Premarlani, F. Eddy, W. Lorensen:

Object-Oriented Modelling and Design, Prentice-Hall, 1995

I. Jacobson et.al.:

Object-Oriented Software Engineering - A use case driven approach,
Addison-Wesley 1996

G. Booch:

Object-Oriented Analysis and Design with Applications,
Addison-Wesley, 1994 (2nd ed.)

I. Sommerville:

Software Engineering, Addison-Wesley 1995 (5th ed.)

Literature and recommended readings (2)

Bruce Eckel:

Thinking in Java. Prentice-Hall 1998.

Bertrand Meyer:

Object-oriented Software Construction, Prentice Hall, 1988

Frederick P. Brooks, jr:

The Mythical Man - Month, Addison-Wesley, 1972

Additional information on literature will be given during each lecture.

Prerequisites

System experience

- application systems (Microsoft Office, ...)
- operating systems (Unix, ...)
- programming tools (compiler, editor, ...)

Programming experience

- small projects (at least one week of work, approx. 500 lines of code)
- in any programming language (Pascal, Modula-2, C, LISP, ...)

Basic object-oriented knowledge

- classes, methods, inheritance
- in any programming language (Java, C++, Eiffel, ...)

will be taught in this course

Overview

Object-Oriented Development in Java

- Language Fundamentals
- System Fundamentals
- Information Hiding
- Reusing Classes
- Polymorphism

+ Exercises

Object-Oriented Analysis and Design using the Unified Modeling Language (UML)

- Software Development Process
- Modeling the System Usage
- Modeling the Static Structure
- Modeling the Dynamic Behavior
- Structuring the System

Object-Oriented Development in Java

Language Fundamentals

- Base types
- Variables
- Control structures

System Fundamentals

- Main method
- Working with the JDK

Information Hiding

- Class Definition
- Data Members & Methods
- Object Creation
- Packages, Scopes
- Modifiers

Reusing Classes

- Composition and Inheritance
- Constructors and Subclasses
- Method Overriding

Polymorphism

- Substitutability
- Abstract Classes
- Interfaces
- Inner Classes

Object-Oriented Analysis and Design using UML

UML = Unified Modeling Language

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| <ul style="list-style-type: none"> ○ Software Development Process <ul style="list-style-type: none"> • Inception • Elaboration • Construction • Iteration ○ Modeling the System Usage <ul style="list-style-type: none"> • Actors • Use Cases ○ Modeling the Static Structure <ul style="list-style-type: none"> • Classes and Attributes • Inheritance • Association | <ul style="list-style-type: none"> ○ Modeling the Dynamic Behavior <ul style="list-style-type: none"> • Methods • States • Activities • Interactions ○ Structuring the System <ul style="list-style-type: none"> Packages Patterns |
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Exercises

We will be

- programming Java and
- modeling UML

in the exercises.

The exercises are an excellent preparation for the **exam** at the end of the semester.

Where are two hours left in your timetable for the exercises?

We have to book a CIP pool - so please tell us some alternative slots.