



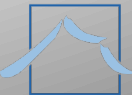
Informatics II for Engineering Sciences (MSE)

Recap



17/07/15

Bernd Brügge Ph.D. , Jan Knobloch, Emitzá Guzmán



Session 1-2

An Introduction into Object Oriented Programming:

- Primitive datatypes
- Simple Inputs / Outputs
- Classes in Java / constructors
- Information hiding
- Method signatures



Session 3-5

An Introduction into Object Oriented Programming:

- Generics
- Inheritance vs. Polymorphism
- Abstract Classes
- Interfaces
- (Exception Handling – not covered)



Session 3-5

Software Engineering, Principles, Tools, Lifecycles

- Complexity, Communication and Change
- Problem Solving Activities
 - Analysis
 - Synthesis
- The Software Lifecycle and its Activities
- Decomposing Problems
 - Functional and Object Oriented



Session 3-5

Software Engineering, Principles, Tools, Lifecycles

- UML
 - Use-case diagrams
 - Class diagrams
 - Communication diagrams
 - Statechart diagrams
 - (Component diagrams not covered)
 - (Deployment diagrams not covered)



Session 6 - 7

Design Patterns

- Adapter Pattern as Interface to Legacy systems
- Composite Pattern for structured data
- Observer Pattern for consistency among objects
- State Pattern for keeping context of different states
- Strategy Pattern for changing functionality but staying decoupled
- Command Pattern for abstract functionality by introducing commands



Session 8 - 10

Databases:

- Relational Models
- Primary and Foreign Keys
- Associations between Entities (1-1, 1-n, n-n)
- Normal Forms
- SQL (Insert, Update, Delete, custom queries)
- Manual Mapping of Entities to Java Objects
- (Automated Mapping using Object Relational Mappers (ORM) not covered)
- (NoSQL Databases and its ORM not covered)



Further Questions



Seminar vs. Workshop “in-depth” programming?

- Some of you asked for more “in-depth” programming.
- There was feedback on how to apply the learned paradigms this semester onto real project, or actually you wanted to write your own little application.
- Two options:
Seminar (1Week + ECTS) vs. Workshop(flexible dates, no ECTS)

Who would be interested in a Seminar / Workshop?

