

Introduction to Design Patterns and UML

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| Objectives | The aim of the course is to give the participants a solid introduction to design patterns, practical experience with a selection of central patterns. Emphasis will be put on the concepts <i>role</i> , <i>responsibility</i> and <i>delegation</i> that are central, underlying, principles of patterns. Patterns will be described using UML 2.0 and central diagram types will be presented: Class diagrams, sequence diagrams, and deployment diagrams. In addition, CRC cards will be introduced for recording responsibilities. |
| Prerequisites | Programming experience in a modern object-oriented programming language like Java, C# or C++. Exercises will be in C# so some proficiency in C# is an advantage. Access to computers for exercises (one machine for each 2-3 students) (C# compiler and environment + editor will be provided). |
| Contents | <ul style="list-style-type: none">• Background of design patterns.• Central design patterns: Strategy, Observer, Mediator, Composite, Null Object, Decorator, Abstract Factory, Factory Method, State, Visitor (these are examples, exact contents to be decided)• Underlying principles of design patterns: Interfaces, delegation, commonality-variability analysis, roles, responsibility-driven design.• UML 2.0 Notation: Class diagram, interaction diagrams, package diagrams, and deployment diagrams. CRC cards. Fowler's perspectives on UML.• (Time permitting) Outlook: Design patterns in perspective – distributed computing, software architecture qualities, frameworks, test-driven development. |
| Form | The course alternates between lectures and discussions of central concepts, hand-on exercises and reflections over these. |
| Duration | 3 days. |
| Literature | Design Patterns Explained 2 nd ed.. Shalloway and Trott. Addison-Wesley 2005. UML Distilled 3 rd ed. Martin Fowler. Addison-Wesley 2004. |
| Lecturer | Henrik Bærbak Christensen, Associate Professor, Department of Computer Science. Henrik has been teaching patterns, reuse, and frameworks since 1999, mostly for part-time education students (professional developers). He has written and presented a number of research papers within the field of teaching, software architecture, and frameworks. He has been invited speaker at a number of occasions, and has made a number of mini-courses for TDC, Efteruddannelsescenteret for datamatikerlærer, and Alexandra Instituttet. |