Module title: Model-Driven Development

<table>
<thead>
<tr>
<th>Module ID</th>
<th>Workload</th>
<th>Credits</th>
<th>Semester</th>
<th>Frequency of Offering</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI14</td>
<td>150 h</td>
<td>5</td>
<td>1</td>
<td>yearly</td>
<td>1 semester</td>
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<tr>
<th>Workload</th>
<th>Attendance</th>
<th>Preparation and Follow-Up</th>
<th>Private Study</th>
<th>Preparation for Exam and Exam</th>
<th>Total</th>
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<tbody>
<tr>
<td>SU</td>
<td>30 h / 2 SWS</td>
<td>15 h</td>
<td>20 h</td>
<td>25 h</td>
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<tr>
<td>P</td>
<td>30 h / 2 SWS</td>
<td>30 h</td>
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<td>Total</td>
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<td>45 h</td>
<td>20 h</td>
<td>25 h</td>
<td>150 h</td>
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1 Scheduled Group Size: SU: 35 students, P: 15 students

2 Subject Knowledge / Skills

Students understand the process of model-driven development. They are able to apply and customize it (including development and customization of according tools). Hence they follow the historic paradigm shift: moving from the idea that everything is an object to the more abstract idea that everything is a model.

In detail they are able to:

- explain the significance of preciseness and completeness of models.
- define and work with visual as well as textual domain specific languages,
- develop model transformations and implement code generation
- apply and implement refactorings in different development stages
- work with complex original specifications

3 Content / Syllabus

- Object Constraint Language (OCL)
- Definition of concrete and abstract syntax of visual as well as textual domain specific languages, i.e. meta modeling, (meta) EBNF
- Customizing a general purpose modeling language (UML profiles)
- Formal and endogeneous approaches to define semantics of modeling languages
- Modeling spaces as a general underlying framework
- Model transformations using frameworks like QVT
- Code generation using frameworks like Xpand and/or JET
- Usage and implementation of refactorings on the level of OCL, model and code
- Model exchange standards like XMI

4 Teaching Format

Lecture with integrated exercises, accompanying practical work (group work with individual preparations), partially performed in a laboratory

5 Prerequisites

None
6 | **Recommended Qualifications for the Participation**

*Experienced in modeling (using UML, E/R or process modeling); basic knowledge of formal language theory; profound knowledge of object-oriented programming in Java and object-oriented design*

7 | **Assessment**

*Written exam*

8 | **Prerequisites for Granting ECTS Credits**

*Exam passed*

9 | **Usage of this Module in Other Degree Courses**

*None*

10 | **Contribution to Final Score**

*5.56 %*

11 | **Convenor**

*Professor of Automata Theory and Formal Languages*

12 | **Language of Instruction**

*English*

13 | **Reading List**

*The course relies on the current version of established specifications of the OMG:*


*Further references will be provided in class.*