App development

Offered by: Department of Mathematics and Computer Science
Language: English
Primarily interesting for: All majors other than Web Science
Prerequisites: none
Contact person: Dr. R. Kuiper (R.Kuiper@tue.nl)

Content and composition
This package covers the essentials of programming on the one hand, and the basics of user interfaces and web-based applications on the other hand, that are to be integrated during the development of a real-life app.

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Scheduled (Quarter/slot)</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>2IS60</td>
<td>App programming (*)</td>
<td>Quarter 4/ Slot E</td>
<td>1</td>
</tr>
<tr>
<td>2ID60 or</td>
<td>Web technology (**)</td>
<td>Quarter 2/ Slot C</td>
<td>2</td>
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<tr>
<td>2ID40</td>
<td>Human-technology interaction(***)</td>
<td>Quarter 4/ Slot C</td>
<td>1</td>
</tr>
<tr>
<td>2IS70</td>
<td>DBL App development</td>
<td>Quarter 3/ Slot C (****)</td>
<td>2</td>
</tr>
</tbody>
</table>

(*) students that are skilled in object-oriented programming and/or app programming do not take 2IS60 but take the other three courses

(**) Web technology will be offered regularly for the last time in 2017/2018. To facilitate the last examination opportunity in 2018/2019, the course will be offered again, as an extra service, in 2018/19 in Q2. Enrollment required!

(***) HTI is offered regularly for the last time in 2016/2017. To facilitate the last examination opportunity in 2017/2018, the course will be offered again, as an extra service, in 2017/18 in Q1, slot C. Enrollment required!

(****) DBL App development will be offered in time slot D from 2018/19 on.

Course descriptions

App Programming
This course targets the essentials of the object-oriented programming language. We start with simple imperative programs like currency converters or number-guessing games. Next structuring is considered, leading to the central concept of an object that groups data and functionality. This enables to handle the complexity of larger programs, like managing multiple banking accounts. Finally, ways to change and re-use the classes that define the objects are introduced. This supports the use of pre-defined classes with complex functionality rather than to have to program these from scratch. The programming skills acquired are applied to app development on the android. Using the drag-and-drop facilities of Eclipse, simple apps are developed, e.g., a reaction test or the naughts and crosses game.
**Web Technology**

The web has become the major source of information retrieval and is playing an increasing role in interpersonal interaction. Over the past years the web has been the principal driver for innovation, for a large part related to content. Web technology that supports this is a rapidly expanding field though. This course provides an overview of technologies that are relevant to the design and construction of web services, including scripting languages, XML, the Semantic Web, and dynamic web applications.

**Human-Technology Interaction**

User-interfaces are is a major connection of virtual and physical world. Designing and implementing a usable and user-friendly interface is by no means a trivial task. This course deals with the design, implementation and evaluation of the interaction of users and devices. In project work it teaches how high-level concepts stemming from behavioral sciences can be made concrete in the setting of computer systems. The course covers general principles of ergonomically sound graphical user interfaces, methods for the design of user interfaces and their prototypes, the evaluation of user interfaces (with and without user involvement) and the implementation of user interfaces that are pleasant, effective and efficient.

**DBL App Development**

In small groups students will bring their proficiency to develop apps to the next level by developing a larger app in a supervised project setting. The group members will be matched to provide complementary skills regarding the design of the user interface, the design of the algorithm, programming, etc. The interface and functionality of the app are to be specified, the app is to be developed, implemented and tested, and a user guide is to be supplied. Options to choose from or/and descriptions that may serve as inspiration will be provided. However, imaginative proposals from student groups themselves are encouraged. For facilitating group work each group will be assigned a room in MetaForum for two time slots including slot B. The second time slot is to be chosen by the student when enrolling for this DBL in OASE.