Software Development (B-KUL-T2SDE2)

4 ECTS | English | 48 | Second term | Cannot be taken as part of an examination contract

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OC Elektronica-ICT - Campus Groep T Leuven

Aims

Learning outcomes

- K1: Basic scientific-disciplinary knowledge and comprehension
- I1: Problem analysis and solving
- I2: Design and / or development
- I3: Application-oriented research
- G1: Information gathering and processing
- G2: Communication with engineers and non-engineers
- G4: Working in a team in different roles

Explanation

- The skill to solve software problems with an iterative-incremental development methodology, with user stories, domain models, class diagrams, sequence diagrams. (K1, I2)
- Learn (parts of) UML and use them to communicate the design. (K1)
- Learn to implement this solution in an object-oriented programming language (Java). (I1, G4)
- Spontaneously apply "clean code" and refactoring techniques. (K1, I2, G1)
- Know about and sponaneously recognize a limited amount of Design Patterns. (K1, I2, G1)
- Build a working program, with a well thought-out and intuitive user interface. We encourage the use of an unknown technology (f.i. export to pdf, network communication, ...). (I1, I2, I3, G2)
- Spontaneously use the technical jargon (inheritance, overriding, interface, ...). (K1, G2)

Previous knowledge

Basic knowledge Object-oriented Programming (if possible in Java).
See course Object-oriented Programming 2nd phase.
Basic knowledge Relational Databases and SQL.

Order of Enrolment

Mixed prerequisite:
You may only take this course if you comply with the prerequisites. Prerequisites can be strict or flexible, or can imply simultaneity. A degree level can be also be a prerequisite.
Explanation:
STRICT: You may only take this course if you have passed or applied tolerance for the courses for which this condition is set.
FLEXIBLE: You may only take this course if you have previously taken the courses for which this condition is set.
SIMULTANEOUS: You may only take this course if you also take the courses for which this condition is set (or have taken them previously).
DEGREE: You may only take this course if you have obtained this degree level.

SIMULTANEOUS(T2OGPD) OR SIMULTANEOUS(T2OOPD) OR SIMULTANEOUS(T2OGP0) OR SIMULTANEOUS(T2OGPE) OR SIMULTANEOUS(T2OGDE)

The codes of the course units mentioned above correspond to the following course descriptions:
T2OGPD : Object-georiënteerd programmeren en databanken
T2OOPD : Object-Oriented Programming and Databases
T2OGP0 : Object-georiënteerd programmeren (No longer offered this academic year)
T2OGPE : Object-Oriented Programming (No longer offered this academic year)
T2OGDE : Object-Oriented Programming and Databases (No longer offered this academic year)

This course unit is a prerequisite for taking the following course units:
T34SP0 : Systeemprogrammatuur
T34SPE : System Software

Identical courses

This course is identical to the following courses:
T2SD02 : Software development

Is included in these courses of study

Bachelor of Engineering Technology (Programme for students started before 2020-2021) (Leuven) (Specialisation: Electronics Engineering) 180 ects.
Bachelor of Engineering Technology, 2+2 Module (Programme for students started before 2021-2022) (Leuven) (Specialisation: Electronics Engineering) 180 ects.

Activities

1.5 ects. **Software Development: Lectures** (B-KUL-2hSDE2)

1.5 ECTS English **Format: Lecture** **Second term**

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Content

Software development follows an iterative and incremental methodology, uses a specific notation to communicate the design and is implemented and tested with an object-oriented programming language. This course deals with (parts of) an iterative/incremental design methodology and UML, with an implementation in Java. Within the discussion of implementation, Design Patterns and Refactoring are heavely used. As is always the case with this kind of agile software development.

These are the main topics:

- Introduction to Software engineering
- UML
- Object-oriented features of Java
- Clean Code
- Collections
- Lambda expressions and streams
- Design patterns and refactoring

Course material

For this course we use the following book: Objects First with Java, David J. Barnes & Michael Kölling, 6th ed., Pearson, 2016 (ISBN:978-1-292-15904-1).

During the lectures slides and if possible, course texts, (available on Toledo) will be used.

During the lectures example programs will be used.

2.5 ects. **Software Development: Lab Sessions** (B-KUL-2pSDE2)

2.5 ECTS English **Format: Practical** **48** **Second term**

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Content

The first part of the semester we use small excercises to master the different software engineering techniques learned during the lectures.

The second part of the semester these software engineering techniques will be used to develop and build an Android app. The student is free to choose a subject. We expect the full development (iterative and incremental) and a full working program with a nice user interface and a database (embedded or through a web interface). A full finished product is preferred above a large non-finished program. The implementation of previously unknown technologies will be awarded. Students may work in groups of two.

Course material

On-line documentation: API's, tutorials, ...
Documents and assignments on Toledo.
IDE: Eclipse, NetBeans or IntelliJ and Android Studio

Evaluation

Evaluation: Software Development (B-KUL-T71780)

Type : Partial or continuous assessment with (final) exam during the examination period

Description of evaluation : Written, Project/Product

Type of questions : Multiple choice, Open questions, Closed questions

Learning material : Course material, Computer, Reference work

Explanation

If the university decides that it is confronted with situations of general force majeure or situations where the safety and health of members of the academic community of KU Leuven may be endangered and changes to the teaching and evaluation activities occur as a result, these changes will be communicated via Toledo.

1. Calculation of the final mark

The final mark of this course is calculated based on the published component marks with the following weighting factors:

Component mark for Lectures: 55%
Component mark for Lab Sessions: 45%

The only exception to this rule is described in the complementary regulation of the Faculty of Engineering Technology to article 66 in the Regulations on Education and Examinations (579-rule).

2. Calculation of the published component marks

The component mark for 'Lectures' is a whole number between 0 and 20.

The Lectures' exam (1st, 2nd and 3rd exam period) is a written exam.

Students may use a self-made hand-written synopsis of maximum 2 pages (or 1 A4 double-sided) and get the necessary Java SE API documentation.

The component martk for the 'Lab Session' is a whole number between 0 and 20.

The lab session are evaluated by continuous assessment and a project, that has to be presented during the last week of the semester. A bonus/malus is applied for the continuous assessment part, i.e. the finished excercises during the first half of the semester before the final project started.

3. Absences

Unauthorized absence during the exam leads to NA as a component mark for Lectures.
Unauthorized absence during three or more Lab Sessions leads to NA as a component mark for the Lab Sessions.

For absences during the teaching weeks, please contact the education ombuds on the first day of your absence. If you missed one or more obligatory sessions, please contact your professor as soon as possible and certainly within a week. For absences within the exam period, please contact the exam ombuds on the first day of your absence.

4. Partial transfers and re-examinations

Component marks of at least 10/20 published in the academic progress file are transferred to the next examination period within the same academic year and to the following academic years, except for temporary marks and marks for intermittent tests.

When needed, additional information on the evaluation activities is provided during the lessons and/or made available on the Toledo pages of the course.

Information about retaking exams

This course unit allows partial mark transfers in case of partial pass mark:

- 2hSDE2 - Software Development: Lectures (during and beyond academic year)
- 2pSDE2 - Software Development: Lab Sessions (during and beyond academic year)

Lab Sessions: together with the lab session lecturer we will decide if you can extend the Android app or start a new one. The lecture exam is organized in the same way as in the previous exam period.

Required in stage	Optional in stage	First term	Second term	Both terms
This year	Next year	Alternating years	External	Prerequisites
Taught by	Language of instruction	Duration		

- Doctoral students
- Reseachers
- Short-term study visits
- Prepare your stay

QUICKLINKS

- Alumni
- International Office
- Student Services
- Pangaea
- LRD
- UZ Leuven
- Jobs and Careers
- Libraries
- News and press
- Agenda
- Culture
- Sports
- KU Leuven shop
- Contact

INTERNAL TOOLS

- Toledo
- KU Loket
- Webmail
- Intranet
- Who's who
- Organisational chart

OTHER LANGUAGES

- Nederlands
- Français
- Deutsch
- Español
- 中文版
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