University of St.Gallen

Course and Examination Fact Sheet: Spring Semester 2019

4,588: Applications in Object-oriented Programming and Databases

ECTS credits: 3

Overview examination/s
(binding regulations see below)
Decentral - Group examination paper (all given the same grades) (65%)
Decentral - examination paper written at home (individual) (35%)

Attached courses
Timetable -- Language -- Lecturer
4,588,1.00 Applications in Object-oriented Programming and Databases -- Englisch -- Binswanger Johannes

Course information

Course prerequisites
There are no specific prerequisites for this course except for enthusiasm about data and programming, and a high willingness to work hard. On a weekly basis, you will be needing about 8 hours to get through the workload. Weekly attendance and being up-to-date is of high importance for completion of this course. During the course, you are going to work on your own laptop. Any standard Mac or Windows device that is not older than 3 years will suffice. Windows, Mac OSX or Linux are all fine as operating systems. iPads (iOS) or Android devices are not suitable.

Course content

In this course, you will be introduced into the basic concepts of object-oriented programming (OOP) and into relational databases. In fact, we will combine the two by having objects interact and store them by means of object-oriented programming in relational databases. The focus is on the programming languages Python and SQL, which are standard for this task. As for databases, we will focus on MySQL/MariaDB. Further elements of the course are the basic architecture of a Data Warehouse; and how to use Application Programming Interfaces (APIs). Although for many businesses, data has become the key for success, data is often not adequately stored. With relational databases you will learn how to properly normalize and store data. Through OOP, you will be able to properly interact with and handle the data.

Within the OOP part of the course, you will learn:

- the different datatypes (integer, string, Boolean etc…); what classes are and why they are important to OOP; why you need constructors; what is meant by an object and how is it initialized; how objects can interact through methods; what the keywords public, private and static mean; what is inheritance within OOP and why interfaces are an important feature of it; how to write good and readable code; how to design an application for a given business case; under what conditions OOP can be applied and in which cases another programming architecture is better suited; how to interact with an API.

Within the part of relational Databases, you will learn about:

- how to design a database for a given use case; DDL commands (create, drop, alter); DML commands (select, insert, update, delete); data relations (one-to-one, one-to-many, many-to-many); what a primary key and a foreign key is; the normalization of data; how to design a database for a given use case.

At the end of this course, you will be able to design and program your own small applications which can access data on the internet, handle the data according to your needs and then correctly store it in a database. The programming skills that you will acquire will be generic and also help you to get ahead with other programming languages (even languages from other domains, e.g. functional or procedural).

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The course will be moderated by Ruben Zürcher who has previously worked in a data warehouse in a large Swiss company, from which he has first-hand experience with the topics of this course.

Course structure

Note that this course takes place in a number of workshop sessions on Saturdays!

The course provides a mix between lecture and hands-on work. For every topic, there will be an introductory lecture part. After that, you will be asked to implement what you have learned and code on your own.

You will also have to work on a project in groups of 3 - 4 students. You are going to present the results of your project during the last class. During the last class, you will also work on a written assignment.

Course literature
The course is mainly based on online material. This will be announced in class.

Additional course information

Note that the course takes place in a number of workshop sessions on Saturdays.

If you have specific questions about this course, you can send an email to Johannes Binswanger (johannes.binswanger@unisg.ch).

Examination information

Examination sub part/s

1. Examination sub part (1/2)

Examination time and form
Decentral - Group examination paper (all given the same grades) (65%)

Remark
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Examination-aid rule
Term papers

- Term papers must be written without anyone else's help and in accordance with the known quotation standards, and they must contain a declaration of authorship.
- The documentation of sources (quotations, bibliography) has to be done throughout and consistently in accordance with the APA or MLA standards. The indications of the sources of information taken over verbatim or in paraphrase (quotations) must be integrated into the text in accordance with the precepts of the applicable quotation standard, while informative and bibliographical notes must be added as footnotes (recommendations and standards can be found, for example, in METZGER, C. (2017), Lern- und Arbeitsstrategien (12th ed., Cornelsen Schweiz).
- For any work written at the HSG, the indication of the page numbers both according to the MLA and the APA standard is never optional.
- Where there are no page numbers in sources, precise references must be provided in a different way: titles of chapters or sections, section numbers, acts, scenes, verses, etc.
- For papers in law, the legal standard is recommended (by way of example, cf. FORSTMOSER, P., OGOREK R. et SCHINDLER B. (2018, Juristisches Arbeiten: Eine Anleitung für Studierende (6. Auflage), Zürich: Schulthess, or the recommendations of the Law School).

Supplementary aids

Open book, including all online ressources.

Examination languages
Question language: English

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Answer language: English

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2. Examination sub part (2/2)

Examination time and form
Decentral - examination paper written at home (individual) (35%)

Remark
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Examination-aid rule
Term papers

- Term papers must be written without anyone else's help and in accordance with the known quotation standards, and they must contain a declaration of authorship.
- The documentation of sources (quotations, bibliography) has to be done throughout and consistently in accordance with the APA or MLA standards. The indications of the sources of information taken over verbatim or in paraphrase (quotations) must be integrated into the text in accordance with the precepts of the applicable quotation standard, while informative and bibliographical notes must be added as footnotes (recommendations and standards can be found, for example, in METZGER, C. (2017), Lern- und Arbeitsstrategien (12th ed., Cornelsen Schweiz).
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Supplementary aids

Open book, including all online resources, but excluding any form of assistance by third persons, including posting questions on stackoverflow etc.

Examination languages
Question language: English
Answer language: English

Examination content

For the group assignment, you are going to write your own application which can access data on the internet, handle the data according to your needs and then correctly store it in a database.

Examination relevant literature

No specific literature required.

Please note

We would like to point out to you that this fact sheet has absolute priority over other information such as StudyNet, faculty members' personal databases, information provided in lectures, etc.When will the fact sheets become binding?

- Information about courses and examination time (central/decentral and grading form): from the start of the bidding process on 24 January 2019
- Information about decentral examinations (examination-aid rule, examination content, examination relevant literature): after the 4th semester week on 18 March 2019
- Information about central examinations (examination-aid rule, examination content, examination relevant literature): from the start of the enrolment period for the examinations on 08 April 2019

Please look at the fact sheet once more after these deadlines have expired.