

Server-side application frameworks (E761038)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size (nominal values; actual values may depend on programme)
Credits 6.0 Study time 180 h Contact hrs 60.0 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 1)	Dutch	Gent	seminar: practical PC room classes	36.0 h
			lecture	24.0 h

Lecturers in academic year 2020-2021

Ongenaë, Veerle TW05 lecturer-in-charge

Offered in the following programmes in 2020-2021

	crdts	offering
Bachelor of Science in Engineering Technology (main subject Information Engineering Technology)	6	A
Linking Course Master of Science in Information Engineering Technology	6	A
Preparatory Course Master of Science in Information Engineering Technology	6	A

Teaching languages

Dutch

Keywords

Web applications, .NET-platform, J2EE, MVC, REST, AJAX, nodeJS, HTTP, XML-technologies, Database access, XML, DTD, XMLSchema, JAXB, ADO.NET, JDBC, API contracts, ORM, Securing webapplications, Computer science (P170), Informatics (P175), Computer technology (T120)

Position of the course

The objective of this course is to understand the basic principles of the architecture and the functioning of the backend of a mobile or web application. The students learn to develop web applications and web services that manipulate data in a database.

Contents

- Communication with the server
 - The operation of the HTTP protocol and the structure of HTTP messages
 - Handling of HTTP messages
 - Interface definitions: specification via contracts (OAS) and schemas
 - REST API and services: concepts and development
 - Security aspects of web applications: OAuth, SQL-injection, XSS, CSRF
 - Architecture of web applications: multilayer model, MVC server side: principles f.o. request routing and handling dynamic generation of webpages, dependency injection
 - ORM: concepts, basic principles and functioning of ORM frameworks
 - Crosscutting concerns like logging, authentication: principles and implementation using aspects
- Frameworks: .NET focus on ASP.NET MVC and Web API, Spring: JPA, REST, gateways, nodeJS

Initial competences

- Being able to program and design in an object oriented way on an advanced level (in Java and C#)
- Basic knowledge of databases
- To master the operation and principles of user interfaces that use a backend

Final competences

- 1 Being able to design, write and validate an interface contract for services.

- 2 Being able to develop REST web services using different frameworks
- 3 Being able to develop a web application with dynamically generated pages
- 4 To have insight into the architecture and the basic principles of a backend and the protocols used
- 5 Being able to use dependency injection and annotations to realize easily maintainable, testable, ... backends.
- 6 Knowing the MVC principle and being able to use it in a web application (serverside).
- 7 Knowing the basics of ORM and being able to design and implement a data layer.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Lecture, seminar: practical PC room classes

Extra information on the teaching methods

- Lectures (24 hrs)
- Labs (36 hrs): individual work on PC and teamwork (extensive computer lab)

Learning materials and price

Syllabi, supplemented with the presentation material (slides and sample applications) used during the lectures, tutorials on the internet.

Software: Visual Studio 2019 Community Edition, IntelliJ, ...

References

"Programming Web Applications with Node, Express and Pug", Jörg Krause, Apress, 2017

"Securing PHP Apps", Ben Edmunds, Apress, 2016

"Professional Java for Web Applications", Nicholas S. Williams, Wrox, 2014

"Professional ASP.NET MVC 4", Jon Galloway, Phil Haack, Brad Wilson, K. Scott Allen, Wrox, 2012

"Professional ADO.NET 3.5 with LINQ and the Entity Framework", Roger Jennings, Wrox, 2009

"XML in a Nutshell - A Desktop Quick Reference", Harold Elliotte Rusty, Means W Scott, O'Reilly, 2001

The Java EE Tutorial, Eric Jendrock, Ricardo Cervera-Navarro, Ian Evans, Kim Haase, William Markito, Oracle, 2014

Course content-related study coaching

The student can always make an appointment with the teachers.

Evaluation methods

end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Written examination, skills test

Examination methods in case of periodic evaluation during the second examination period

Written examination, skills test

Examination methods in case of permanent evaluation

Assignment, skills test

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

During the labs several tests are organized on the computer. The score on the NPE is the combination of tests on the labs (5/6) and the group assignment (1/6).

The exam is a combination of a written exam and computer exercises.

Calculation of the examination mark

Exam: 60% (written exam and computer exercises)

Labs: 40% (tests and group assignment)

In the second examination period: score = maximum (E, 40% L + 60% E), where L is the score of the lab and E the score of the exam in the second examination period.