

# Course Specifications

Valid in the academic year 2023-2024

## Web Technologies (E755080)

| Course size  | (nominal values; actual values may depend on programme) |                |   |                    |          |  |
|--|---|----------------|---|--------------------|----------|--|
| Credits 3.0  | Study time 90 h   |                |   |                    |          |  |
| Course offerings and te  | aching methods in academic                              | year 2023-2024 |   |                    |          |  |
| A (semester 1)   | Dutch   | Dutch Gent     |   | lecture            |          |  |
|  |   |                |   | seminar            |          |  |
| Lecturers in academic y  | year 2023-2024  |                |   |                    |          |  |
| Ongenae, Veerle TWOS   |   |                | 5 | lecturer-in-charge |          |  |
| Offered in the following programmes in 2023-2024   |   |                |   | crdts              | offering |  |
| Master of Science in Electrical Engineering Technology(main subject Automation)                |   |                |   | 3                  | А        |  |
| Master of Science in Electrical Engineering Technology(main subject Electrical<br>Engineering) |   |                |   | 3                  | А        |  |
|  |   |                |   |                    |          |  |

## Teaching languages

Dutch

## Keywords

Web applications, .NET platform, REST, AJAX, ORM, Entity Framework, javascript, HTML, websockets, MQTT, node-red

#### Position of the course

The objective of this coure is to learn the basis principles of the architecture, the operation and the development of a web appcliation.

## Contents

- Communication with the server: the fundamentals of the HTTP protocol and the structure of HTTP messages
- Develop web pages
- Reacting to user input: events, eventhandlers, observer pattern
- Communication with the backend
- REST API and web services: concepts and operation
- ORM: concepts, basic principles and working
- Two way communication between client and server
- Messaging

## Technologies

Technologies used: HTML5, ECMAscript (javascript), AJAX, Web API, Entity Framework (.NET), websockets, MQTT, node-red

#### Initial competences

The following competences must be acquired in advance, for example by passing the course 'Object-oriented programming in C#':

- Object oriented programming in C#
- Communication with a database in a C# program (ADO.NET)

#### Final competences

- 1 Develop a REST web service in Web API
- 2 Develop dynamic web pages.
- 3 Explain and illustrate the basics of ORM through an example and implement a data layer using the Entity framework.
- 4 Explain and implement the basic principles of two-way communication and messaging in an application.

## Conditions for credit contract

#### Conditions for exam contract

This course unit cannot be taken via an exam contract

## **Teaching methods**

Seminar, Lecture

#### Extra information on the teaching methods

During the lectures, the theory is explained step by step, partly on the basis of examples. During the labs, the student works independently on a PC or laptop.

#### Learning materials and price

Slides and examples are available on the electronic learning environment. The following software is used: Visual Studio 2022

#### References

- 1 Advanced Game Design with HTML5 and JavaScript, Rex van der Spuy, Apress, 2015
- 2 Pro HTML5 with CSS, JavaScript, and Multimedia Complete WebsiteDevelopment and Best Practices, Apress, 2017
- 3 Head First JavaScript Programming, Eric T. Freeman, Elisabeth Robson, O'ReillyMedia, 2014
- 4 Javascript Tutorials, https://developer.mozilla.org/nl/docs/Web/JavaScript
- 5 Create a web API with ASP.NET Core, https://docs.microsoft.com/enus/aspnet/core/tutorials/first-web-api
- 6 ASP.NET documentation, https://docs.microsoft.com/en-us/aspnet/core/
- 7 Entity Framework Core, https://docs.microsoft.com/en-us/ef/core/

## Course content-related study coaching

Teachers are available for extra explanation during the labs, before or after the theory lessons and possibly at other times by appointment

#### Assessment moments

#### end-of-term assessment

#### Examination methods in case of periodic assessment during the first examination period

Skills test, Written assessment

#### Examination methods in case of periodic assessment during the second examination period

Skills test, Written assessment

#### Examination methods in case of permanent assessment

#### Possibilities of retake in case of permanent assessment

not applicable

#### Extra information on the examination methods

The exam consists of two parts: a written part on paper and exercises on the computer. The exercises on the computer are open book.

#### Calculation of the examination mark

written exam (50%); exercises on the computer (50%)