

## Web Technologies (E755080)

**Course size** *(nominal values; actual values may depend on programme)*

**Credits 3.0**

**Study time 90 h**

**Course offerings and teaching methods in academic year 2023-2024**

A (semester 1)

Dutch

Gent

lecture

seminar

**Lecturers in academic year 2023-2024**

Ongenaë, Veerle

TW05

lecturer-in-charge

**Offered in the following programmes in 2023-2024**

[Master of Science in Electrical Engineering Technology\(main subject Automation\)](#)

**crdts**

3

**offering**

A

[Master of Science in Electrical Engineering Technology\(main subject Electrical Engineering\)](#)

3

A

**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 course is to learn the basic principles of the architecture, the operation and the development of a web application.

**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**

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**

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 Website Development 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/en-us/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%)