UNIVERSITY OF BORÅS

Development of Web Applications
Utveckling av webbapplikationer
7.5 credits
7.5 högskolepoäng

Ladok Code: C1UTIB
Version: 1.0
Established by: Committee for Education in Librarianship, Information, and IT 2023-11-07
Valid from: Spring 2024

Education Cycle: First cycle
Main Field of Study (Progressive Specialisation): Informatics (G1F), Computer Science (G1F)
Disciplinary Domain: Natural sciences
Prerequisites: General entry requirements for university studies.
Completed courses comprising at least 22.5 credits in programming and database technology, including knowledge and skills in the C# programming language.
Subject Area: Informatics/Computer and Systems Sciences
Grading Scale: Seven-degree grading scale (A-F)

Content

This course aims to provide a good understanding of distributed systems over the Internet and an applied skill in developing web applications. These distributed applications can be mainly divided into user interface-oriented and server-oriented processing. Furthermore, knowledge of the most important technologies and frameworks for the realisation of web applications is gained. The programming language Javascript with a base in CSS (Cascading Style Sheets) and HTML (HyperText Markup Language) is used for user interface oriented processing. For development for server-oriented processing, the C# programming language is applied with the .NET framework with the aim of achieving effective integration with databases for persistent storage. For the separation of program code into parts regarding logic and graphics, the Model-View-Controller (MVC) design pattern is applied. In addition to the .NET framework, there is the possibility of individual specialising within other modern frameworks such as Angular or React.

Learning Outcomes

After completing the course, the student will be able to:

Knowledge and understanding
1.1. describe basic principles in various established programming-based technologies for the generation of dynamic web pages at both the local and server level,
1.2. describe basic theories and principles for developing user interfaces for web applications,
1.3 describe basic protocols and technologies intended for the Internet and the World Wide Web application area,
1.4. describe basic constructions and principles within the programming language Javascript and the standards CSS and HTML,
1.5 describe basic constructions and principles within the ASP.NET Core MVC framework, as well as
1.6 describe standard techniques for responsive design.

Competence and skills
2.1 design and implement web applications using technologies intended to be executed on browsers as clients (user interface-oriented processing),
2.2 design and implement web applications using technologies intended to be executed on the web server (server-oriented processing),
2.3 apply constructions for graphic interface construction with the programming language Javascript and the standards CSS and HTML,
2.4 apply designs for graphical interface construction with the C# programming language and the ASP.NET Core MVC framework,

2.5 apply constructs for database communication in C# and ASP.NET Core MVC through object-relational mapping, as well as

2.6 apply web-oriented methods for secure data transfer and the verification of user rights.

Judgement and approach
3.1. independently choose appropriate standards and techniques for application in the field of web application development, as well as

3.2. independently collect, compile, critically evaluate and present information about in writing and orally about standards and technologies in the field of web application development

Forms of Teaching

The course consists of:
- lectures
- supervision in the form of workshops
- supervision of laboratory sessions
- seminars

The language of instruction is English.

Forms of Examination

The course will be examined through the following examination elements:

Individual written exam
Learning outcomes: 1.1-1.6
Credits: 3
Gradingscale: Seven-degree grading scale (A-F)

Laboratory session 1: Web-based application in Javascript, CSS and HTML (group assignment)
Learning outcomes: 2.1, 2.3, 2.6, 3.1
Credits: 1.5
Gradingscale: Fail (U) or Pass (G)

Laboratory session 2: Web-based application in ASP.NET Core MVC and Entity Framework (group assignment)
Learning outcomes: 2.2, 2.4-2.6, 3.1
Credits: 1.5
Gradingscale: Fail (U) or Pass (G)

Assignment: individual in-depth study with implementation
Learning outcomes: 2.1–2.2, 3.1-3.2
Credits: 1
Gradingscale: Fail (U) or Pass (G)

Seminar: individual presentation of in-depth study
Learning outcomes: 3.1-3.2
Credits: 0.5
Gradingscale: Fail (U) or Pass (G)

For a passing grade (E-A) on the entire course, the grade E at a minimum is required on *Individual written examination* and Pass (G) on the other examination components. A higher grade on the whole course is then determined by the grade on the I*ndividual written exam.*

If the student has received a decision/recommendation regarding special pedagogical support from the University of Borås due to disability or special needs, the examiner has the right to make accommodations when it comes to examination. The examiner must, based on the objectives of the course syllabus, determine whether the examination can be adapted in accordance with the decision/recommendation.

Student rights and obligations at examination are in accordance with guidelines and rules for the University of Borås.

Literature and Other Teaching Materials

The course literature is in English.

McGrath, Mike. (2020). HTML, CSS and Javascript in easy steps. In Easy Steps Limited.

Troelsen, Andrew and Japikse, Philip. (2022 or later edition). Pro C# 10 With .NET 6. Apress.

Scientific articles and other material may be added according to the teacher's instructions.

Student Influence and Evaluation

1. The course is evaluated in accordance with current guidelines for course evaluations at the University of Borås in which students' views are to be gathered. The course evaluation report is published and returned to participating and prospective students in accordance with the above-mentioned guidelines, and will be taken into consideration in the future development of courses and education programmes. Course coordinators are responsible for ensuring that the evaluations are conducted as described above.

Miscellaneous

The course i given as a freestanding course.

This syllabus is a translation from the Swedish original.