Course title	***Web and Databases for Cyber Operations***
Course code	
Branch of science	Computer Science
Credit points	2
ECTS credit points	3
Total number of auditory hours	**32**
Number of practical classes	32

Course developer (s)

Background knowledge

Course summary

The course covers basic web-based application development with a database back-end, with a focus on security. Topics include client side and server side web applications development, the SQL language for relational databases, web authentication, secure web protocols, attack and defense of web-based applications with a database back-end.

Learning outcomes

Course the students learned and were able to demonstrate:
knowledge and understanding of:

1. Develop static and interactive client-side web applications.
2. Query relational databases to satisfy user requirements.
3. Develop database-backed web applications, for a given database.
4. Implement data access control mechanisms for database security.
5. Implement application-level security measures to prevent unauthorized access to data.
6. Understand the principles of common web-based attacks such as cross-site scripting, cross site request forgery, SQL injections

Course plan

Course structure: practical work – 32 hours
Practical work themes:

1. Introduction to HTML and HTML5;
    - HTML document and HTML page structure;
    - HTML tags;
    - HTML5 special tags;
2. Introduction to CSS;
    - CSS styles;
    - CSS templates;
3. Introduction to JavaScript;
    - JavaScript language structure;
    - JavaScript functions and classes;
4. Server-side programming with Python
5. Web protocols - http, https
6. Authentication: HTTP Basic authentication, digest, form-based authentication
7. Cookies, sessions
8. Relational database model and SQL
    - SQL language
    - Management of scheme objects
    - Tables, queries, views

Storage functions and creation of procedures
- SQL optimisation.

9. Web applications with a database back-end
10. Database security
    - Configuration of database network environment;
    - Administration of users' safety parameters;
11. CSRF, XSS attacks
12. SQL injections

Requirements for acquiring credit points

During the study course test forma - examination.

Requirements for the acquisition of a study course:
• regular class attendance and active participation therein;
• independent work tasks;
• creation of a database and its presentation, where the database management must take place through the main form.

Contents of the course

1. Introduction to HTML and HTML5;
2. Introduction to CSS;
3. Introduction to JavaScript;
4. Server-side programming with Python
5. Web protocols - http, https
6. Authentication: HTTP Basic authentication, digest, form-based authentication
7. Cookies, sessions
8. Relational database model and SQL
9. Web applications with a database back-end
10. Database security
11. CSRF, XSS attacks
12. SQL injections

Course textbooks

1. https://www.w3schools.com
2. Jon Ducket “HTML & CSS Design and Build Websites” ISBN: 978-1-118-00818-8 Published by John Wiley & Sons, Inc. (https://goo.gl/hZZdCd)
3. „The Modern JavaScript Tutorial” (https://javascript.info/)
4. “Python server side scripting” (https://pythonschool.net/server-side-scripting/introduction-to-server-side-scripting/)
5. Cross Site Request Forgery (CSRF) (https://teamultimate.in/csrf-explained-tutorial-beginners/)
6. „What is XSS?” (https://excess-xss.com/)
7. SQL Injection (https://www.guru99.com/learn-sql-injection-with-practical-example.html)
8. „MySQL™ Workbench Reference Manual” (https://dev.mysql.com/doc/workbench/en/)
9. “IIS Web Server Configuration Guide”, EventTracker, 2014 (https://goo.gl/T1xhCm)
10. Kamars Andris. Tīmekļa lapu veidošana : HTML un CSS / A. Kamars. - Rīga : Zvaigzne ABC, 2008. - 320 lpp. : il. ISBN 9789984408866 2.Дарнелл Рик. HTML 4 : энциклопедия пользователя : пер. с англ. / Рик Дарнелл и др. - Киев : ДиаСофт, 1998. - 685 с. : ил. ISBN 966-7033-25-2 2. w3schools.com – HTML un CSS sadaļas

Additional literature

Periodicals and other sources of information

1. http://www.functionx.com/sqlserver
2. http://technet.microsoft.com/en-us/library/bb545450.aspx1.
3. World Wide Web Consortium. W3 Consortium: http://www.w3.org/