BAKI ALİ NEFT MƏKTƏBİ
BAKU HIGHER OIL SCHOOL

Process Automation Engineering Department

Web Programming and Security

Course Syllabus

Fall, 2023

Instructor : Assoc. Prof. Mahammad Sharifov

Course code: Course credit : 5

Office : 412, BHOS Campus Office hours : M-F 09.00-16.00

Prerequisites:

Language of instruction: English

Schedule :

- IT 21.1: Lecture
- IT 21.1: Laboratory

Web site : http://www.bhos.edu.az/en/staff/214-mahammad-sharifov-associate-professor/20

Email : mahammad.sharifov@bhos.edu.az

Description about course

This course covers main principles of Web Application development and security. By learning Back-End principles and Application Security, students will be able to write Web apps by following core security issues and defend applications against very specific exploits.

Course objective section

The problems and technologies that will be touched on includes Web/Mobile Application Architecture, Back-End Principles, Node, Express Framework, Express API, Server-Side Validation/Sanitization issues, Hacking of Web Applications, Securing Modern Web Applications. Vulnerability Discovery, Management and Defense.

Learning outcomes section

- Learn main Web Application Development and Security issues;
- Write well-structured, easily maintained JavaScript code;
- Use cutting-edge ES6/ES7 JavaScript features and asynchronous programming;
- Learn Back-End Principles;
- Write Server-Side Apps using Node, Express, MongoDB and MySQL databases;
- Learn API analysis. Identifying third-party dependencies and weak points of Web Applications;
- Learn Vulnerability Discovery, Management and Defense of Web Applications;
- Learn various attacking principles and defense

Assessment methods

The exams are done using computers. Some part of exams is written examination. All questions must be answered.

Grading:

Exam	Weight	Date	Exam minutes
Final	40%	TBA (to be announced)	120
Activity	10%	during semester	
Lab/Quiz	20%	4 lab/quiz per semester	deadline
Project	20%	see tentative schedule	deadline
Tutorial	10%	see tentative schedule	deadline

Reset Exam grading:

40% of total score. Total score after reset = labs (20%) + project (20%) + tutorial (10%) + activity (10%) + reset score (40%)

Area grading scale

A 91-100

B 81-90

C 71-80

D 61-70

F ≤ 60

Rules

Exams

In order to be excused from the exam, the student must contact the dean and the instructor before the exam. Excuse will not be granted for social activities such as trips, cruises and sporting events (unless you are participating). The exams will all be cumulative. Most of the questions on each exam will be taken from the chapters covered since the last exam.

But some will come from the earlier chapters. In general, the coverage will reflect the amount of the time spend in class on the different chapters.

Withdrawal (pass / fail)

This course strictly follows grading policy of the Process Automation Engineering Department. Thus, a student is normally expected to achieve a total mark (preexam score + exam score) of at least 61 to pass. In this case of failure, he/she will be referred or required to repeat the course the following term or year.

Late policy

Late assignment submissions won't be accepted for grading. The grade for this assignment will be zero.

Teaching resources

Textbooks:

[1] JavaScript. The Definitive Guide by David Flanagan, Seventh Edition, Published by Oreilly, 2020. **(**Main textbook, available in PDF version)

[2] Beginning Node.js, Express & MongoDB Development by Greg Lim, independently published, July 10, 2019. **(**Main textbook, available in PDF version)

[3] Web Application Security. Exploitation and Countermeasures for Modern Web Applications by Andrew Hoffman. OReilly Publication, 2020. (Main textbook, available in PDF version)

[4] Web Security for Developers. Real Threats, Practical Defense. By Malcolm Mcdonald. William Pollock Publisher, 2020. (Main textbook, available in PDF version)

For class presentations and discussions, the student should utilize journal and internet materials. Moreover, the course does not limit the use of learning materials available at BHOS library.

Attendance

The students are required to attend all classes as a part of their studies and those having legitimate reasons for absence (illness, family bereavement, etc.) are required to inform the instructor.

Professionalism and Participation

1. Attend class regularly, arrive on time, leave only when dismissed

2. Attend class with all materials required, be prepared to listen and work

3. Be well prepared for class, read all required materials, and complete all necessary preparation

4. Be attentive in class, take notes, contribute to discussion and ask intelligent questions

5. Demonstrate professional and respectful interpersonal relationships with peers and instructor: ATTITUDE COUNTS, AND whining is unacceptable

6. Take responsibility for your actions, and your results

Plagiarism

Honesty requires that any ideas or material taken from another source for written, visual, or oral use must be fully acknowledged. Offering the work of someone else as one's own is plagiarism. The language or ideas thus taken from another may range from isolated formulas, images, sentences or paragraphs to entire articles copied from books, periodicals, speeches, or the writings and creations of other students. The offering of materials assembled or collected by others in the form of projects or collections without acknowledgment also is considered plagiarism. Any student who fails to give credit for ideas or materials taken from another course is guilty of plagiarism.

Week	Topics	Textbook/Assignments
1	**Introduction to Web Programming and Security** **HTTP request and response procedure.** **Web Application architectures.** **Fundamentals of Front-End Programming: HTML, CSS, and JavaScript.**	To be provided
2	**JavaScript fundamentals. Functional programming in JS**	To be provided
3	**DOM manipulation and events. DOM Projects**	To be provided
4	**JavaScript advanced: OOP in JS. Asynchronous Programming in JS. APIs**	To be provided
5	**Working with APIs**	To be provided
6	**Back-End Concept. Node JS. Express Framework**	To be provided

8	**REST API in Node, MySQL, and MongoDB. Testing API's with Postman.**	To be provided
9	**Server-side validation/sanitization. Authentication methods. Sessions, Cookies. JWT Tokens.**	To be provided
10	**Introduction to Hacking Web Applications. XSS attacks. CSRF attacks. Injection attacks. DoS, DDoS attacks.**	To be provided
11	**Securing Modern Web Applications. Vulnerability Discovery, Management and Defense.**	To be provided
12	**Final Project Presentation** Final Project due!	To be provided
	Final Exam	

Signature: _____