

International Information Technology University JSC

Faculty of Information Technology

Department of Computer Engineering and Information Security

Approved

Vice-Rector for Academic and
Educational Affairs of IITU JSC, PhD

Umarov T.F.

20__



SYLLABUS (ACADEMIC PROGRAM)

Course: PDKV6 3309 SWD5: Web-technologies (c.w.)

Major: 5B070400 Computer Systems and Software Engineering

Year: 3, **Semester:** 5; **Number of ECTS credits:** 6

Lectures: 15 hours

Laboratory classes: 30 hours

Practical classes: 15 hours

T/SIS: 120 hours

Total: 180 hours

Final assessment form: Course project

Rup
ES/08/2020


Almaty 2020

Academic Program of the course «PDKV6 3309 SWD5: Web-technologies (c.w.)» has been developed on the basis of the State Standard for Higher Education and the Curriculum of the major.


Academic program has been reviewed at the meeting of «Computer Engineering and Information Security» department.

Minutes № 1 dated «21» August 2020

Acting Head of the
Department

 c.t.sc., assoc. prof. M.T. Ipalakova

Author

 PhD, assistant. prof. N.K. Mukazhanov

The academic program was approved at the meeting of the Educational and Methodological Council of the IITU

Minutes № 1 dated «28» August 2020

Head of the Department
for Academic Affairs

 A.K. Mustafina

1. GENERAL INFORMATION	
Faculty	Information Technology
Major code and title	5B070400- Computer Science and Software Engineering
Year, semester	3 year, 5 semester
Subject category	Elective
Number of Credits	6 ECTS
Language of Delivery:	English
Prerequisites:	Computation and Problem Solving (SDP1), Programming technologies, Database design
Postrequisites	"Advanced web-applications", Diploma project
Lecturer	Assistant-professor, PhD, MukazhanovNurzhan, office 409, email- mukazhanovn@gmail.com
Instructors	Assistant-professor, PhD, MukazhanovNurzhan, office 409

2. GOALS, OBJECTIVES AND LEARNING OUTCOMES OF THE COURSE

Course goal is to familiarize students with the core web-technologies and learn to develop front-end and back-end web developments using modern tools

The **objectives** of the course are to:

- Explain the students basic concepts of web technology,
- Explain the students how to create usable web design and to efficiently use front-end tools,
- Learn to develop back-end applications using PHP, including Web 2.0 elements
- Acquire basic principles of object-oriented PHP,
- Learn to create web databases using relational data models (MySQL DBMS).

Learning outcomes of the course:

Students successfully completing this course will be able to:

- analyze web technologies for solving various types of tasks,
- explain and justify of using web development tools for certain purposes,
- optimize works of web-sites and applications,
- develop back-end applications using server scripting language and Web 2.0 tools,
- use principals of object-oriented programming in web
- design and create web databases.

Students successfully completing this course will qualified in:

- Front-end web developer, Back-end web developer and Web server administrator

3. COURSE DESCRIPTION:

Students will learn front-end development from defining functionality of web sites to layout of web pages and back-end development using modern web technologies. Content of the course covers following web technologies:

- for front-end development and creating usable web design of web-sites are provided to create sitemap, wireframe, web design and layout of web pages in modern front-end tools, like Javascript, JQuery, CSS3, XML;
- for back-end development is used PHP server scripting language, object-oriented programming in PHP and as a web server is used Apache.
- Moreover, this course includes creation of web databases for storing data, media files and other resources of web-sites. In this part of course, students will learn from designing of web-databases to practical experiences in MySQL, MongoDB and Cassandra database management systems.

During the course students develop web-projects (web-sites, web-applications and others) using web tools provided above and also they can use frameworks like Laravel, Django, Bootstrap. The assignment of project involves tasks like develop user friendly web-design, administrator panel, full data processing functions using back-end programming, the creation of an e-commerce E-store, which must support the ability for users to register themselves, search content, place and track orders, change personal settings and others.

4. COURSE POLICY

Students are not allowed to use cell phones during classes, browse the social networks and play on-line games. Cheating will not be tolerated. Students caught cheating will receive a "0" for the assignment.

Attendance/participation is assessed based on the number of lessons attended and participated in by students. Each student has to visit 80% of lessons differently he won't be allowed to final exam. After of absent of lesson he should present for teacher permission for access to lessons from dean. There are no additional lessons or workshops for students who missed lecture or laboratory class. Late submission of written assignments will be penalized 2% (minus two percents) for every day late. Students may come to see Tutor only at Office Hours time or by appointment. Deadline for each task given in the task files. During distance learning are used following online platforms: MS Teams, Moodle (dl.iitu.kz) and others

5. LITERATURE

Basic literature:

1. PHP and MySQL Web Development / Luke Welling, Laura Thomson - Fifth-Edition- 2016
2. Learning PHP, MySQL & JavaScript with jQuery, CSS & HTML5 / Robin Nixon, Published by O'Reilly Media, 2015
3. Modern PHP New Features and Good Practices / Josh Lockhart, Published by O'Reilly Media, USA 2015
4. Visual QuickStart Guide, PHP for the Web / Larry Ullman, 5th Edition, 2016
5. Eloquent JavaScript. A Modern Introduction to Programming / Marijn Haverbeke, 2014
6. References to the multimedia materials (lecture, laboratory works, practice tasks, SIS and etc) of the course: <http://dl.iitu.kz>, Teams of the course in MS Teams (files)

Supplementary literature:

7. JavaScript: The Definitive Guide / David Flanagan, Published by O'Reilly Media, 6th Edition, 2011
8. PHP 6 and MySQL. 6 Bible / Steve Suehring, Tim Converse, Joyce Park, Published by Wiley Publishing, Inc., 2009
9. Learning Web Design. A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics / Jennifer Niederst Robbins, Published by O'Reilly Media, Fourth Edition

Course calendar

Lecture, practical/seminar/laboratory session plans

Abbreviation	Meaning
TSIS	Teacher-supervised independent study (TSIS)
SIS	Students' independent study (SIS)
P	Project
PA	Practical assignment
LW	Laboratory Work
MCQ	Multiple choice quiz

Week No	Course Topic	Reference Materials	Lab. Sessions (1 h/w)	Practice Classes (1h/w)	TSIS (1 h/w)	SIS (h/w)
1	Course Introduction, Front-end web development	BL, SL	LW 1	defence	CW	Readings
2	Features of HTML5 & CSS3	BL, SL	LW 1	defence	CW	Readings
3	Bootstrap and Themes	BL, SL	LW2	defence	CW	Readings
4	Back-end programming languages. Introduction to PHP. Expressions and Control Structures	BL, SL	LW 2	defence	CW	Readings
5	PHP arrays, strings and files.	BL, SL	LW 3	defence	CW	Readings
6	Web form processing. Cookies and Sessions.	BL, SL	LW3	defence	CW	Readings
7	Object-oriented PHP	BL, SL	CQ	defence	CW	Readings
8	Web databases. MySQL, MongoDB, Cassandra. Creating web database	BL, SL	LW 4	defence	CW	Readings
9	Accessing MySQL Database from the Web with PHP	BL, SL	LW 4	defence	CW	Readings
10	PHP - frameworks	BL, SL	LW 5	defence	CW	Readings
11	Introduction to Laravel	BL, SL	LW 5	defence	CW	Readings
12	Laravel: Routing and Controllers	BL, SL	LW 6	defence	CW	Readings
13	Laravel: Views	BL, SL	LW 6	defence	CW	Readings
14	Laravel: Blade templating	BL, SL	LW 7	defence	CW	Readings
15	Laravel: Models & Migrations	BL, SL	LW 7	defence	CW	Readings
Total hours:	15		30	15	15	105
Total		180				

List of topics/ assignments for laboratory classes

No	Topic Title	Number of hours	References	Form of reporting	Deadline
1	2	3	4	5	
1	Laboratory work 1. Web site layout	4	BL, SL	Program report and	1-2 weeks
2	Laboratory work 2. Bootstrap templates	4	BL, SL	Program report and	3 weeks
3	Laboratory work 3. Basic syntax of PHP programming	2	BL, SL	Program report and	4 weeks
4	Laboratory work 4. Creating and Processing Web Forms	4	BL, SL	Program report and	5 weeks
5	Laboratory work 4. Sessions and cookies	4	BL, SL	Program report and	6-7 weeks
6	Laboratory work 6. Web	6	BL, SL	Program report and	8-9 weeks

	database and Web application with PHP			report	
7	Laboratory work 7. Creation web sites using PHP frameworks (Laravel)	6	BL, SL	Program and report	10-15 weeks
					Total hours: 30

List of topics/ assignments for practical classes

No	Topic Title	Number of hours	References	Form of reporting	Deadline
1	2	3	4	5	
1	Front-end development and job market analysis	1	BL, SL	Report	1 week
2	Features of HTML5 & CSS3	1	BL, SL	Program and report	2 week
3	Bootstrap and Themes	1	BL, SL	Program and report	3 week
4	Front-end frameworks. Vue.JS	1	BL, SL	Program and report	4 week
5	Using Vue.JS	1	BL, SL	Program and report	5 week
6	Storing and Retrieving Data	1	BL, SL	Program and report	6 week
7	Choosing File Modes	1	BL, SL	Program and report	7 week
8	Arrays with Different Indices	1	BL, SL	Program and report	8 week
9	Performing Array Manipulations with special functions	1	BL, SL	Program and report	9 week
10	Creating a Sample Application: Smart Form Mail	1	BL, SL	Program and report	10 week
11	The Advantages of Reusing Code	1	BL, SL	Program and report	11 week
12	Creating Classes, Attributes, and Operations in PHP	1	BL, SL	Program and report	12 week
13	Error and Exception Handling	1	BL, SL	Program and report	13 week
14	Web database	2	BL, SL	Program and report	14-15 week
					Total hours: 15

List of assignments for Student Independent Study

N ^o	Assignments (topics) for Independent study	Hours	Recommended literature and other sources (links)	Form of submission
1	2	3	4	5
1	Advanced CSS3, HTML5, bootstrap templates, front-end frameworks	55	BL, SL	Presentation and report
2	AJAX Technology	10	BL, SL	Presentation and report
3	PHP – programming and frameworks	55	BL, SL	Presentation and report
				Total 120

Student performance evaluation system for the course

Period	Assignments	Maximum score	Coefficient	Total
1 st attestation	laboratory works:	50	0.5	100
	1 LW,	10	0.1	
	2 LW,	10	0.1	
	3 LW	15	0.15	
	4 LW	15	0.15	
	Practical tasks	10	0.1	
	Mid term	10	0.1	
	Student Independent Study	10	0.1	
	1 Student's Independent work	10	0.1	
	1-st part of the course work (front-end of the c.w.)	20	0.2	
2 nd attestation	laboratory works:	30	0.3	100
	5 LW,	10	0.1	
	6 LW,	10	0.1	
	7 LW,	10	0.1	
	Practical tasks	15	0.15	
	Mid term	10	0.1	
	Student Independent Study	15	0.15	
	Course project (Back-end)	30	0.3	
Final exam	Exam			100
Total	0,3*1stAtt+0,3*2ndAtt+0,4*Final			100

*If the number of absences exceeds 20%, student will be automatically scheduled for a Retake (summer semester)

Evaluation criteria

Achievement level as per course curriculum shall be assessed according to the evaluation chart adopted by the academic credit system:

Letter Grade	Numerical equivalent	Points (%)	Traditional system assessment	General description of grading criteria
A	4,0	95-100	«Excellent»	The student has knowledge of the subject in the full scope of the curriculum understands the discipline deeply enough, shows high level of knowledge that exceeds the volume provided by the syllabus , gives an exhaustive
A-	3,67	90-94		The student has knowledge of the subject in the full scope of the curriculum understands the discipline deeply enough, gives an exhaustive answer
B+	3,33	85-89	«Good»	The student shows a complete, well-founded knowledge of the subject, but not answer always highlight the main idea relational methods of calculation were not always used the answers were mostly brief and sometimes unclear
B	3,0	80-84		
B-	2,67	75-79		
C+	2,33	70-74		
C	2,0	65-69	«Satisfactory»	The student demonstrate sufficient knowledge of the subject, but without proper depth and justification, the answers are unclear and without proper logical sequence
C-	1,67	60-64		
D+	1,33	55-59		
D	1,0	50-54		
F	0	0-49	FX (25-49) «Fail» with re-exam	The student demonstrate insufficient knowledge of the subject, positive answers were not given to individual questions
			F (0-24) «Fail»	The student demonstrates a very low level of knowledge of the subject

List of questions for controlling knowledge:

1. What tag is used to cause PHP to start interpreting program code?
2. What are the two types of comment tags?
3. Which character must be placed at the end of every PHP statement?
4. Which symbol is used to preface all PHP variables?
5. What can a variable store?
6. What is the difference between `$variable = 1` and `$variable == 1`?
7. Why do you suppose that an underscore is allowed in variable names (`$current_user`), whereas hyphens are not (`$current-user`)?
8. Are variable names case-sensitive?
9. Can you use spaces in variable names?
10. What actual underlying values are represented by `TRUE` and `FALSE`?
11. What are the simplest two forms of expressions?
12. What is the difference between unary, binary, and ternary operators?
13. What is the best way to force your own operator precedence?
14. What is meant by operator associativity?
15. When would you use the `===` (identity) operator?
16. Name the three conditional statement types.
17. What command can you use to skip the current iteration of a loop and move on to the next one?
18. Why is a for loop more powerful than a while loop?
19. How do if and while statements interpret conditional expressions of different data types?
20. What is the difference between a numeric and an associative array?

21. What is the main benefit of the array keyword?
22. What is the difference between foreach and each?
23. How can you create a multidimensional array?
24. How can you determine the number of elements in an array?
25. What is the purpose of the explode function?
26. How can you set PHP's internal pointer into an array back to the first element of the array?
27. How would you create a new MySQL user on the local host called newuser with a password of newpass and with access to everything in the database newdatabase?
28. How can you view the structure of a table?
29. What is the purpose of a MySQL index?
30. What benefit does a FULLTEXT index provide?
31. What is a stopword?
32. Both SELECT DISTINCT and GROUP BY cause the display to show only one output row for each value in a column, even if multiple rows contain that value.
33. What are the main differences between SELECT DISTINCT and GROUP BY?
34. Using the SELECT...WHERE construct, how would you return only rows containing the word Langhorne somewhere in the author column of the classics table used in this chapter?
35. What needs to be defined in two tables to make it possible for you to join them together?
36. Why must a cookie be transferred at the start of a program?
37. Which PHP function stores a cookie on a web browser?
38. How can you destroy a cookie?
39. Where are the username and password stored in a PHP program when you are using HTTP authentication?
40. What are the main differences between an Ajax GET and POST request?

Form of final exam: Course project

Course project requirements

A course project is a research paper written by students over an academic term, accounting for a large part of a grade. Course projects are generally intended to describe an event, a concept, or argue a point. A Course project is a written original work discussing a topic in detail, usually several typed pages in length and is often due at the end of a semester. Description of the course project should contain at least 15 pages.

Course project consists of three main parts and should occupies main web-technologies (css, php, MySQL, jquery, java script , PHP scripts and others):

1. Theoretical part (3-5 pages). General description of the subject area and technologies that are used for the project.
2. Design (4-5 pages).
 - 2.1. Architecture of website (web application) and short description of the architecture,
 - 2.2. Site map,
 - 2.3. Wireframe of web pages
 - 2.4. Web design
 - 2.5. Database models. ER or relational diagram of the web database and to give short description of the DB structure (if you use relational database you need to provide ER or relational diagram of DB, if you use other data model, provide logical model of that database).
3. Creation website.
 - 3.1. Web pages. Create web pages using html, css, java script, vue.js, php, jquery and other front-end tools.
 - 3.2. Server scripts (use PHP and Python server scripting languages).
 - 3.3. Creation web database for your websites. You can use MySQL, MongoDB, PostgreSQL DBMSs

For defense should be presented whole completed project from analysis of requirements to product (Application). You should provide following documents for course project defense:

1. Explanatory note (20-30 pages);
2. Web project;
3. Presentation.

List of topics for course project

№	Topics
1	Student Government website
2	Admission committee website*
3	Grant distribution system*
4	University website
5	Module Research works
6	Advisor module
7	Schedule module*
8	Employment of students and graduates
9	Professional Practice Module
10	Registration for an individual curriculum*
11	Development of the module "Military Accounting"

*-for students who have experience in web development before