Faculty of Information Technology
Department of Information Systems

Approved
Vice-Rector of Academic and Educational Affairs of
IITU JSC
_____Umarov T.F.
«_ _» _____ 2020

SYLLABUS
(ACADEMIC PROGRAM)

Course (code, title): RWP 3306 «Development of Web Applications based on Framework»
(code, title):

Major (code, title): _____5B070300 «Information System»_____
(code, title):

Educational program _____5B070300 «Information System»_____
(code, title)

Year: 4 **Semester:** 7 **Number of credits**: 5 ECTS

Lectures: 15 hours

Laboratory classes: 30 hours

T/SIS: 105 hours
Total: 150 hours

Final assessment form: Examination

Almaty 2020

Academic program of the course (code, title) RWP 3306 «Development of Web Applications based on Framework» has been developed on the basis of Standard Academic Program.

Academic program has been reviewed at the meeting of Information Systems department.

Minutes №. 1 dated «17» August 2020

Head of the Department _____ Kassymova A.B., PhD, assoc.prof.
signature full name, title, degree

Author _____ Seitkulov Zh. S., MSc, senior-lecturer
signature full name, title, degree

The working academic program was approved at the meeting of the Educational and Methodological Board of JSC "IITU"

Minutes № 1 dated "28 August 2020.

Director of the Department _____ A. Mustafina
Signature
for Academic Affairs

1. GENERAL INFORMATION	
Faculty	Information Technology
Major code and title	5B070300 Information System
Educational program code and title	5B070300 Information System
Year, semester	4 year, 7 semester
Subject category	Elective
Number of credits (ECTS)	5
Prerequisites	Development of the web components on the Java EE Platform
Postrequisites	Diploma Project
Lecturer	Seitkulov Zhanbolat, senior-lecturer, MSc in Computer Science, office 802, zhanbolat.iitu@gmail.com, office hours 13.00-15.00 Saturday, 17.00-19.00 Monday, 17.00-19.00 Wednesday

2. GOALS, OBJECTIVES AND LEARNING OUTCOMES OF THE COURSE

The course goal is to prepare students to create web services based on the business beans. So they will be able to create an enterprise application with powerful business modules. And will learn how to use available web Services such as Google Maps API, Amazon WS

The objective of the course to introduce the student to the principles of creating Java web services. This course is designed for students majoring in Information Systems, Computer Science, Computer Science and Software Engineering or in areas having a strong emphasis in Software Engineering. This course discusses JAX-WS JAX-RS and other technologies of web services in great technical depth. The focus of this course is on the "Oracle Certified Professional, Java Web Service Developer" certification exam objectives.

Learning outcomes of the course:

1. Understand how to generate user friendly web application
2. Understand the concept of front end and back end of a real functional web application

Students successfully completing the course will be able to:

1. practice JAX-RS and JAX-WS
2. demonstrate REST web services
3. examine SOAP web service
4. sparse JSON and XML

3. Course description

This course was designed to introduce the student to Web Services over Business Applications. Enterprise Java Beans(EJB), Hibernate, WSDL, Rest Services, JAX-WS will be studied in this course.

4. COURSE POLICY

Students are forbidden to:

- submit any tasks after the deadline. Late submissions are graded down.
- cheat. Plagiarized papers shall not be graded;
- be late for classes. Being tardy three times amounts to one absence;
- retake any tests, unless there is a valid reason for missing them;
- use mobile phones in class;
- chew gum in class.

Students should always

- be appropriately dressed (formal/semi- formal styles are acceptable);
- show consideration for and mutual support of teachers and other students;
- let the teacher know of any problems arising in connection with their studies.

During classes students can use online platforms like MS teams, DL, Zoom, etc.

5. LITERATURE

Basic literature:

1. SCDJWS Study Guide 2016
2. Java Web Services: Up and Running. Martin Kalin (O'Reilly, 2015)
3. Video course of lectures and practical classes in https://teams.microsoft.com/l/team/19%3a5678b0ad379c40c685ca616e9c4987c0%40thread.tacv2/conversations?groupId=bc590f44-b05d-46b2-8d0c-251abd1f75f0&tenantId=70c1157a-941c-4b39-98e6-a0634f2759e7

6. Course schedule

Week/ date	Course topics	References	Lectures (h/w)	Practical sessions (h/w)	Lab. sessions	TSIS (h/w)	SIS (h/w)
1	Introduction to Web Services	[1], [2]	1		2	1	6
2	XML Web Service Standards	[1], [2]	1		2	1	6
3	SOAP 1.2 Web Service Standards 1. SOAP Message Encoding Types SOAP Processing and Extensibility Model	[1], [2]	1		2	1	6
4	SOAP 1.2 Web Service Standards 2. SOAP Message Construct and SOAP Messages with Attachments WS-I Basic Profile on SOAP	[1], [2]	1		2	1	6
5	Describing and Publishing (WSDL and UDDI) 1. WSDL in Web Services 2. WSDL Abstract vs Concrete WSDL Component Model	[1], [2]	1		2	1	6
6	JAX-WS 1. JAX-WS Technology 2. Developing JAX-WS Web Services 3. The I-Stack	[1], [2]	1		2	1	6
7	JAX-WS 4. JAX-WS Development Approaches 5. JAX-WS Features 6. JAX-WS Architecture	[1], [2]	1		2	1	6
8	JAX-WS 7. JAX-WS Client Communications Models 8. JAX-WS Web Service Clients Clients of Stateful Web Services	[1], [2]	1		2	1	6
9	REST, JSON, SOAP and XML Processing APIs (JAXP, JAXB and SAAJ)	[1], [2]	1		2	1	6
10	REST Web Services JSON Web Services	[1], [2]	1		2	1	6
11	SOAP vs. REST Web Services SOAP vs. JSON Web Services	[1], [2]	1		2	1	6
12	JAXP APIs	[1], [2]	1		2	1	6
13	JAXB	[1], [2]	1		2	1	6
14	JAXR	[1], [2]	1		2	1	6

15	Java EE Web Services Security End-Term-Exam	[1], [2]	1		2	1	6
	Total hours		**15**	**0**	**30**	**15**	**90**

7. List of topics/ assignments for laboratory classes

№	Topic Title	Number of hours	References	Form of reporting	Deadline
1	2	3	4	5	6
1	Basic Spring Boot Application	4	[1] , [2]	Report and implementation	Week 3
2	SOAP Web Service Standards	6	[1] , [2]	Implementation	Week 5
3	WSDL in Web Services	6	[1] , [2]	Report and implementation	Week 7
4	JAX-WS	6	[1] , [2]	Report	Week 10
5	REST / JSON Web Services	6	[1] , [2]	Report and Implementation	Week 12
6	JAXP API	6	[1] , [2]	Report and Implementation	Week 14

8. List of topics/ assignments for practical classes

№	Topic Title	Number of hours	References	Form of reporting	Deadline
1	2	3	4	5	6

9. List of topics/assignments for Student Independent Study

Proper organization of students' independent study is the key to the formation of skills in mastering, learning, assimilation and systematization of acquired knowledge, ensuring a high level of academic performance in the learning process

№	Topic/Assignment title	Number of hours	References	Form of reporting	Deadline
1	2	3	4	5	6
1	*Laboratory Work #1: Create own Web-Service using JAX-WS technology.*	6		Project #1	Week 3
2	*Laboratory Work #2: Refreshing content without overloading whole page. Use of REST web services*	8		Project #2	Week 6
3	*Laboratory Work #3: Google API*	8		Project #3	Week 10
4	*Laboratory Work #4: Payment system based on security and all technologies for webservices*	8		Project #4	Week 13

10. System for evaluating student performance in a discipline:

Period	Assignments	Score	Total
1st attestation	laboratory works: 1 LW, 2 LW, 3 LW,	**40** 6 6 6	**100**

	4 LW, 5 LW, **Practice:** 1 Exercise, 2 Exercise, 3 Exercise, 4 Exercise, 5 Exercise, **Mid term** **Student Independent Study**	6 6 **25** 5 5 5 5 5 **30** **15**	
2nd attestation	laboratory works: 1 LW, 2 LW, 3 LW, 4 LW, 5 LW, **Practice:** 1 Exercise, 2 Exercise, 3 Exercise, 4 Exercise, 5 Exercise, **End of term** **Student Independent Study**	**40** 6 6 6 6 6 **25** 5 5 5 5 5 **30** **15**	**100**
Exam			**100**
Total	**0,3*1stAtt+0,3*2ndAtt+0,4*Final**		

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

The point-rating letter system for assessing the educational achievements of students with their interpretation in the traditional grading scale:

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 a high level of knowledge that exceeds the volume provided by the syllabus, gives an exhaustive answer
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 the answers did not always highlight the main idea, rational 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 demonstrates 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		
FX	0,5	25-49	Unsatisfactory	The student demonstrates insufficient knowledge of the subject, positive answers were not given to individual questions.
F	0	0-24		The student demonstrates a very low level of knowledge of the subject.

11. Assessment and evaluation materials (exam questions)

Final Project Requirements
Requirements: In your final project you are required to demonstrate all the configured microservices from all the assignments (from 1 to 6) with a simple Client User Interface (Separate Client Application).

Assessment: Each of you will have a maximum of 10 minutes to demonstrate your system.

Add at least one more microservice with distinct functionality to your current architecture! Complete client-side for that functionality!

During the demo, you will be asked to describe:

System architecture to show all new microservices and how they communicate,
The report with a brief description of all microservices,
Java back-end source code
Front-end source code,
The system architecture,
The report with a brief description.
How you configured Hystrix and applied bulkhead pattern,
Show how microservices communicate and how did you secure those communications,
How you applied Messaging Pattern for communication between microservices,
Containerize your application with Docker,
After the demo, you need to submit the following products here before FINAL:

The link to your GIT repo containing
Java back-end source code
Front-end source code,
The system architecture,
The report with a brief description.
The final assessment will be based on the demo and the quality of the products submitted here.

Deadline: The demonstration will take place during the final project time on Wednesday. Please compile and run your system beforehand and make relevant documents ready for submission. You will be randomly allocated a 8-10 minute slot as usually, but swaps are ok.