الجامعة الافتراضية السورية
SYRIAN VIRTUAL UNIVERSITY

Course definition

Network Application Programming

Information

Technology

Engineering

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Syrian Arab Republic		الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالـــي
Syrian Virtual University		الجامعة الافتراضية السورية

1. Basic Information:

Course Name	Network Application Programming
Course ID	NNP601
No. of Recorded Sessions*	12
No. of Synchronized Sessions*	18
No. of Quizzes (hrs.)	
Exam (hrs.)	
Registered Sessions Work Load (hrs.)	36
Synchronized Sessions Work Load (hrs.)	36
Credit Hours	6

* The duration of each session 1.5 hr

2. Pre-Requisites:

Course	ID
Programming (2)	BPG402
Computer Networks (1)	BNT501
Intelligent algorithms	BIA601

3. Course Objectives:

The course aims to introduce some network application programming techniques such as Threads and their use in programming multi-threading applications, client-server applications programming, and RPC technology, in addition to the ability to deal with AAA servers and programming within the Internet.

In particular, the student will be able to:

1. Understand the basic concepts of threads and the associated technologies for programming multithreading applications.
2. Understand the basic concepts of client/server applications and associated technologies and protocols.
3. Introducing RPC, SOAP and REST techniques and how to benefit from them.
4. Understand the basic concepts of web services and associated technologies for programming multiple web applications.

4. Learning Outcomes (LO):

By the end of this course the learner is expected to:

- Have an overview of how to program client-server applications.
- Possess the ability to raise the performance of network work through the use of embedding techniques.
- Understand how to do HTTP programming for the Internet.
- Process, design and understand mail and file transfer software on networks.
- understand how to program Internet applications.

5. Assessment Results:

Chapter No.	Chapter Title	Intended Objectives	Assessment Type				
			Developed content/ Recorded Sessions	Practical Activities (Synchronized Sessions)	Quizzes and Exams	Presentations And Interviews	Reports
CH1	Multithreading	Comprehension –Analytical Thinking	X	X	X		
CH2	Client/server network application programming	Comprehension –Analytical Thinking – Tools And Application Hands– On	X	X	X		X
CH3	Web services	Comprehension –Analytical Thinking – Tools And Application Hands– On	X	X	X		X

6. Course Syllabus

Chapter No.	Chapter Title	Chapter Content (Syllabus)	No. of Theoretical Learning Units	No. of Practical Learning Units)
CH1	Multithreading	• Thread States: Life Cycle of a Thread • Thread Priorities and Scheduling • Creating and Executing Threads • Thread Synchronization • Producer/Consumer Relationship without Thread Synchronization • Producer/Consumer Relationship with Thread Synchronization • Producer/Consumer Relationship Circular Buffer • Multithreading in GUIs	4	4
CH2	Client/server network application programming	• Connection Oriented vs. Connectionless Communication • Data transfer protocols • Building TCP server using stream sockets • Building TCP client using stream sockets • Client/server interaction using stream sockets communication • Connectionless Client/Server Interaction with Datagrams • Building client/server application using multithreading server • Web browser	4	4

		• Remote networking		
CH3	Web services	• Web services • Simple Object Access Protocol (SOAP) • Publishing and Consuming Web Services • Using web services within web forms • Defined types within web services	4	4

7. Practical Activity:

- Tools and Labs:

Tool Name	Description
Visual studio .Net	Programming framework

- Practical Activities per Chapters:

Chapter	Practical Activity	Remarks
CH1	☒ Exercises ☒ Homework ☐ Webinars ☐ Project ☐ Experiment ☐ Other	Homework
CH2	☒ Exercises ☒ Homework ☐ Webinars ☐ Project ☐ Experiment ☐ Other	Homework
CH3	☒ Exercises ☒ Homework Webinars	Homework

	☐ Project ☐ Experiment ☐ Other	

References:

- Wang, K. C. *Systems Programming in Unix/Linux*. Springer, 2018.
- Edelman, Jason, Scott S. Lowe, and Matt Oswalt. *Network Programmability and Automation: Skills for the Next-Generation Network Engineer*. " O'Reilly Media, Inc.", 2018.
- Meier, Burkhard A. *Python GUI Programming Cookbook*. Packt Publishing Ltd, 2017