Jordan University of Science and Technology

FIT-SE 471: Client Server Architecture

Syllabus – 2010-2021

Dr. Mohammad Malkawi

**Course Number**: SE 471

**Course Name**: Client Server Architecture

**Instructor Name: Dr. Mohammad Malkawi**

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**Teaching Assistance**: Karam Al-Xoubi

**Office Hours**: Sunday, Tuesday, Thursday 10:00 am – 12:00 am;

**Grading:**

**Project 15% - Required for passing**

**Assignments and Quizzes 15%**

**Exams 20%**

**Final 50%**

**Course Description:**

This course covers several aspects for client-server systems, including: client-server models, transaction processing, communications, programming, security, middleware, developments. The course builds on socket programming to develop client server applications.

**Course Outcome:**

Student are expected to

1. learn and use socket programming to build client server applications.
2. The students will acquire the knowledge of inter-process communication through program development.
3. The students will be able to understand the performance metrics for designing client server models
4. The students are expected to work in groups to solve complex distributed systems using client server models
5. Apply various skills developed throughout the software engineering discipline to solve advance client server problems

Course Outline (Detailed):

1. **Introduction**
   1. What is client server architecture
   2. Why we need client server architecture
   3. Application of client server architecture
   4. How components interact
   5. What is network protocol
   6. Limitations

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[D:\Personal\JUST\Courses\Client Server\IntroductiontoServerclient 1b.ppt](file:///D:\Personal\JUST\Courses\Client%20Server\IntroductiontoServerclient%201b.ppt)

1. **Client Server Paradigm**
   1. **Client-server applications and services**
   2. **Terms and Definitions**
   3. **Sessions & Protocols**
   4. **Addressing and service location**
   5. **Interprocess Communication**
   6. **Implementation of services**
   7. Examples: Telnet; Ftp
   8. **Client-Server Protocol Data Representation**
   9. **Software Engineering for a Service (Connectionless and Connected)**
      1. **Client side – architecture and code**
      2. **Server side – architecture and code**

[Introduction to Client Server Lecture](D:\\Personal\\JUST\\Courses\\Client Server\\ClientServer 2.ppt)

1. Client Server Architecture
   1. Applications Programming Interface (API)
   2. Client
   3. Middleware
   4. Relational Database
   5. Server
   6. Structured Query Language (SQL)

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[D:\Personal\JUST\Courses\Client Server\client\_server\_architecture 3a.ppt](file:///D:\Personal\JUST\Courses\Client%20Server\client_server_architecture%203a.ppt)

1. Designing Web Applications – A Client Server Model and Application
   1. client server architectures
   2. design patterns
   3. model 2 web applications
   4. Example: Computer Monopoly Game

[D:\Personal\JUST\Courses\Client Server\Design Web Applications - Client Server Example.ppt](file:///D:\Personal\JUST\Courses\Client%20Server\Design%20Web%20Applications%20-%20Client%20Server%20Example.ppt)

1. **Distributed Databases and Client-Server Architecture**
   1. Distributed Databases
   2. Types of Applications
   3. Homogeneous and Heterogeneous & Federated databases
   4. Synchronous & Asynchronous Distributed Database
   5. Data Fragmentation
   6. Data Allocation
   7. Query Processing in DDBs
   8. Concurrency Control
   9. Client Server Architecture
   10. **Client–server model**
   11. ORALE Example

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<http://pic.dhe.ibm.com/infocenter/wxsinfo/v7r1/index.jsp?topic=%2Fcom.ibm.websphere.extremescale.prog.doc%2Fcxsprcliauth.html>

1. Cookies and Sessions
   1. Create and validate a login form
   2. Define a function for redirecting the browser
   3. Use includable files and functions to simplify development
   4. Validate the user’s credentials against those previously stored in a database
   5. Log a user in
   6. Log a user out
   7. Send a cookie to the browser
2. Security Methods
   1. Recognize potentially problematic characters used to send spam
   2. Prevent spam being sent through PHP’s mail() function
   3. Validate data by expected type
   4. Typecast variables
   5. Validate a file by MIME type using the Fileinfo extension

**Detailed Course Outline**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Week | Module | Comments | link |  |
| 1 | Introduction to Client Server | 1-client server introduction.ppt | [F:\Client Server\1- client server introduction 1.ppt](file:///F:\Client%20Server\1-%20client%20server%20introduction%201.ppt) |  |
| 2 | JAVA Recap | Data streaming, socket programming; both UDP and TCP | <http://www.javaworld.com/article/2077322/core-java/sockets-programming-in-java-a-tutorial.html?page=2>  <http://www.cise.ufl.edu/~amyles/tutorials/tcpchat/>  [F:\Client Server\3- Client\_server architecture 3.ppt](file:///F:\Client%20Server\3-%20Client_server%20architecture%203.ppt); [F:\Client Server\3a- client\_server\_architecture 3a](file:///F:\\Client%20Server\\3a-%20client_server_architecture%203a.ppt)  [ppt](file:///F:\\Client%20Server\\3a-%20client_server_architecture%203a.ppt) |  |
| 3 | Client server architecture | Discuss also TCP primitives, TCP ack. | [2- ClientServer 2.ppt](file:///F:\Abu%20Talha%20HP%20Laptop%202019\TEMP\JUST\Just%20Courses\Client%20Server\2-%20ClientServer%202.ppt)  [3- Client\_server architecture 3.ppt](file:///F:\Abu%20Talha%20HP%20Laptop%202019\TEMP\JUST\Just%20Courses\Client%20Server\3-%20Client_server%20architecture%203.ppt) |  |
| 4 | Sockets and Client Server | More on socket programming for client server | [F:\Client Server\5- Socket and Client Server.odp](file:///F:\Client%20Server\5-%20Socket%20and%20Client%20Server.odp)  [F:\Client Server\6-Sockets programming in Java.pptx](file:///F:\Client%20Server\6-Sockets%20programming%20in%20Java.pptx) |  |
| 5 | Socket programming in Java | Examples of client/server using sockets;  Learn how to measure communication time between client and server | [7-Sockets programming in Java-threads.pptx](file:///F:\Abu%20Talha%20HP%20Laptop%202019\TEMP\JUST\Just%20Courses\Client%20Server\7-Sockets%20programming%20in%20Java-threads.pptx) |  |
|  | Assignment | Write a simple client/server echo program |  |  |
| 6 | Design Web Applications Using Client Server Architecture |  | [F:\Client Server\8A-Design Web Applications - Client Server Example.ppt](file:///F:\Client%20Server\8A-Design%20Web%20Applications%20-%20Client%20Server%20Example.ppt);  [F:\Client Server\8-client server Dec-17-2013.pdf](file:///F:\Client%20Server\8-client%20server%20Dec-17-2013.pdf) |  |
| 9 | SQL Client Server Architecture | Client servers in DB designs | [F:\Client Server\9B- client server SQL.docx](file:///F:\Client%20Server\9B-%20client%20server%20SQL.docx)  [F:\Client Server\9C- client server SQL.docx](file:///F:\Client%20Server\9C-%20client%20server%20SQL.docx) |  |
| 10 | Distributed Database Design | Client Servers for Distributed DB | [F:\Client Server\9-Distributed\_Databases\_and\_Client-Server\_Architecture 5.ppt](file:///F:\Client%20Server\9-Distributed_Databases_and_Client-Server_Architecture%205.ppt) |  |
| Assignment 2 | Puzzle |  | [F:\Client Server\Assignment 2.docx](file:///F:\Client%20Server\Assignment%202.docx) |  |
| 11, 12, 13 | Multithreaded Client Server |  | [F:\Client Server\10- java\_multithreading.pdf](file:///F:\Client%20Server\10-%20java_multithreading.pdf);  [F:\Client Server\10a- Multithreading Client Server.docx](file:///F:\Client%20Server\10a-%20Multithreading%20Client%20Server.docx);  [F:\Client Server\10b- Multithreading example - no synchronization.docx](file:///F:\Client%20Server\10b-%20Multithreading%20example%20-%20no%20synchronization.docx)  [F:\Client Server\13-Java Socket Programming Examples.docx](file:///F:\Client%20Server\13-Java%20Socket%20Programming%20Examples.docx) |  |
| 14 | Application | RPC | [F:\Client Server\11- rpc definition.pdf](file:///F:\Client%20Server\11-%20rpc%20definition.pdf) |  |