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| Untitled-1 | An-Najah N. University  Faculty of Information Technology  Computer Information Systems Dept.  Distributed Systems Applications – 2nd Semester 2009/2010 |

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**Course Syllabus – CIS 133480**

**Objective:**

This course is intended to illustrate the distributed systems architectures for the students. It discusses the different aspects that each distributed system must have. It also describes what middleware roles like CORBA and RMI (java) for the distributed architectures. Students will learn how to build simple distributed systems using JAVA programming Language using JDK. Testing the performance for a distributed system will be discussed and the role of distributed operating systems

**Covered Topics:**

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| **Week** | **Topic** |
| **Week 1** | 1. Java Programming Language, how to use the JDK to build Java programs. |
| **Week 2, 3** | 1. Introduction: what is distributed system, distributed computing, distributed control? Goals and advantages of D.S.: Openness, Monotonicity, Pluralism, scalability and its types (load, geographic, administrative scalabilities), Heterogeneity, Security, Failure Handling, Concurrency, Transparency and its types (access, location, migration, relocation, concurrent, failure, persistent, security transparencies).   Multiprocessor Systems, Multicore Systems, MultiComputer Systems, Computing Taxonomies (SISD, MISD, SIMD, MIMD),Computer Clusters and Grid Computing |
| **Week 4, 5** | 1. Architectural Models, Software Layers, Middleware, System Architectures, Interfaces and Objects, Design requirements for D.S., Fundamental Models. |
| **Week 6, 7** | 1. Networking and Internetworking, types of networks, Network principles, Routing, Internet Protocols. |
| **Week 8,9,10,11** | 1. Distributed Object and remote invocation: Introduction, Middleware, Interfaces, communication between distributed objects, the object model, distributed objects, distributed object model, remote object interfaces, garbage collection, exceptions, design issues for RMI, transparency, implementation of RMI, communication model, remote reference model, RMI software, Server and client Programs, The binder, server threads, activation of remote objects, persistent object stores, object location, Distributed garbage collection, Remote Procedure Call, Events and Notifications. |
| **Week 12,13** | 1. Programming examples using RMI. |
| **Weeks 14** | 1. Performance Engineering: Introduction, Objectives, Phases (Inception, Elaboration, Construction, Transition). |
| **Week 15** | 1. Distributed Operating Systems ( the role of kernel with middleware). |
| **Week 16** | 1. Projects Discussion and Finalizing. |

**Applications and projects ideas:**

1. Patient Care Applications.

2. Management and Enterprise Systems.

3. E-Health Applications.

4. Strategic Decision-Support Application.

5. Any other projects suggested by students by brainstorming.

**Assessment:**

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| **Exam** | **Weight** | **Date** |
| **First Exam** | 20% | Mar, 1, 2010 |
| **Second Exam** | 20% | Apr, 5, 2010 |
| **Project** | 10% | Last week of the semester |
| **Homework and Attendance** | 10% |  |
| **Final** | 40% | As arranged by the university |

**Resources:**

1. Distributed Systems Concepts and Design, 4th edition, George Coulouris.
2. Different subjects from the web.