ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Computer Science)

WARNING

1. **PLAGIARISM OR HIRING OF GHOST WRITER(S) FOR SOLVING THE ASSIGNMENT(S) WILL DEBAR THE STUDENT FROM AWARD OF DEGREE/CERTIFICATE, IF FOUND AT ANY STAGE.**
2. **SUBMITTING ASSIGNMENTS BORROWED OR STOLEN FROM OTHER(S) AS ONE'S OWN WILL BE PENALIZED AS DEFINED IN "AIOU PLAGIARISM POLICY".**

Course: Software Architecture (3482)   **Semester: Spring, 2014**

Level: Graduate   **Total Marks: 100**

ASSIGNMENT No. 1
(Units 1–4)

Note: All questions carry equal marks.

Q.1   a)   How requirements lead to architecture? Discuss the role of architecture in producing a system that suggests new organizational capabilities and requirements.

     b)   What is the effect of organizational goals on re4quirements and development strategy?

Q.2   a)   Discuss the qualities that can be provided to a system with the help of system architecture.

     b)   Quality attribute scenarios are the mean of characterizing quality attributes. Describe the features of different quality attribute scenarios.

Q.3   a)   Describe the characteristics of Module, Component-and-Connector and Allocation structures of software architecture.

     b)   What is the difference between reference architecture and an architectural pattern?

Q.4   a)   What is the difference between architecture qualities and business qualities of a system? Describe the different scenarios for business qualities.

     b)   Define tactic. How a tactic as a design decision influences the control of a quality attribute response?

Q.5   Write note on the following:
1)   Modifiability Tactics
2)   Performance Tactics
3)   Security Tactics

ASSIGNMENT No. 2

(Units 5–8) **Total Marks: 100**

Note: All questions carry equal marks.

Q.1 a) Describe a method for designing architecture to satisfy both quality requirements and functional requirements.

b) Discuss the techniques for creating an initial version of software or system architecture. How functional and business requirements can be achieved in a system?

Q.2 a) What is documentation? What type of information is required for architecture documentation?

b) Describe the different uses and views of architecture documentation.

Q.3 a) What type of information could be extracted from the source code to prove that a system is layered system?

b) What is analysis? Why we need to analyze system architecture?

Q.4 a) What is performance analysis? Discuss the type of documentation required for performance analysis.

b) What is maintenance? How do you maintain a system? Describe the necessary information required to maintain a system.

Q.5 a) What there is a need to analyze system architecture? Describe the methods to analyze the architecture.

b) Define software product lines. When an organization produces multiple similar systems and re-uses the same architecture?

3482 Software Architecture   **Credit Hours: 4(4 + 0)**

Recommended Book: Software Architecture in practice by Len Bass, Paul Clements, Rick Kazman

Course Outline:

Unit 1 Introduction to Software Architecture
Software Processes and the Architecture Business Cycle, Software Architecture Architectural Patterns and Structures, Reference Models and Reference Architectures, Case Study.

Unit 2 Quality Attributes
Functionality and Architectures, Quality Attributes, System Quality Attributes, Business and Architecture Qualities

Unit 3 Quality Tactics
Introducing Tactics, Availability and Modifiability Tactics, Performance and Security Tactics, Testability and Usability Tactics, Case Study

Unit 4 Architecture Design
Life Cycle Architecture, Designing the Architecture, Formatting the team structure, Skelton System, Case Study

Unit 5 Architecture Documentation
Uses of Architecture Documentation, Views, Documenting a view, Unified Modeling Language

Unit 6 Architecture Reconstruction
Information Extraction, Database Construction, View Fusion, Reconstruction,

Unit 7 Analyzing Architecture
Overview, Analysis Methods, Architecture Evaluation, Architecture Design Decision making, Case Study

Unit 8 Software Product Lines
Overview, Software Product Lines, Scoping, Architecture for Product Lines, Case Study

Unit 9 Software Architecture in future