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| **Course Title** | **Software Architecture and Design** |
| **Course Code** | SEng3052 |
| **CP** | 5 (2hr Lecture, 3hr Laboratory) |
| **Pre-requisites** | SEng2051 |
| **Year** | III |
| **Semester** | II |
| **Instructor Name** | Mezgebu A. |
| **Email** | mezgae@gmail.com |

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**Woldia University**

**Institute of Technology**

**School of Computing**

**Department of Software Engineering**

**Course Description**

Involves analyzing and designing large scale software and apply different architecture styles to Software design and to provide practical knowledge in software architecture.

**Learning Outcomes**

Up on the successful completion of the course the students will be able to:

* Understand the mechanisms and methods of software design principles
* Differentiate types of design patterns
* Apply the different types of design patterns in software development
* Understand Architectural styles and Quality Attributes.
* Understand common tools and terminology related to software architecture.
* Understand the role of the Software Architect with a development project.
* Use methods for constructing and evaluating architectures.

**Course Content**

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| **Week** | **Lecture Topics** | |
| 1-3 | **Chapter 1: Introduction to software design** | |
| * 1. What is software design?   2. Objective of software design   3. Software Design Activities | * 1. Design considerations   2. Design principles   3. Introduction to User Interface Design |
| 4-5 | **Chapter 2: Design Patterns** | |
| * 1. What are design patterns   2. Creational design patterns | * 1. Structural design patterns   2. Behavioral design patterns |
| 6 | **Chapter 3: Envisioning Architecture** | |
| * 1. The Architectural Business Cycle   2. What is Software Architecture? | **3.3.**Architectural structures and views |
| 7-9 | **Chapter 4: Quality Attributes** | |
| * 1. Understanding Quality Attributes   2. Achieving Qualities (Tactics) | **4.3.**Architectural style |
| 10-11 | **Chapter 5: Architecture In The Life Cycle** | |
| * 1. Architecture in the agile projects   2. Architecture and requirements   3. Designing and documentation | * 1. Implementation and testing   2. Architecture reconstruction and conformance |
| 12-13 | **Chapter 6: Architecture And Business** | |
| * 1. Economic analysis of Architecture   2. Architecture competence | **6.3.**Architecture and Software product lines |
| 14-15 | **Chapter 7: Architecture in Advance** | |
| 7.1.Cloud Definition | **7.2.**Architecture in Cloud |
| 16 |  | |

**Teaching Learning Methods**

Lecture, Demonstrations, Tutorials, Reading assignments and Group Discussions

**Method of assessment**

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| **Assessment** | **Weight** |
| Mid exam | 20% |
| Test | 10% |
| Group Project and Presentation | 20% |
| Final Exam | 50% |

**References**

1. Len Bass, Paul Clements, Rick Kazman, ―Software Architecture in Practice‖, 3rd edition Pearson, 2013.**(Text Book)**
2. Mary Shaw, David Garlan, ―Software Architecture: Perspectives on an Emerging Discipline‖, Prentice Hall, 1996.
3. Partha ,Kuchana, ―Software architecture design patterns in Java‖, AUERBACH PUBLICATIONS, 2004.
4. Len Bass, Paul Clements, Rick Kazman, -Software Architecture in Practice,2nd edition Addison-Wesley, 2003.
5. Booch G, Rumbaugh J, Jacobson I, ―The Unified Modeling Language User Guide‖, Addison-Wesley, 1999.
6. Taylor R.N, Medvidovic N, Dashofy E. M, ―Software Architecture: Foundations, Theory, and Practice‖, Wiley, 2009.

Signature

Instructor Name: Mezgebu A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Department Head: Zeleke C. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Department Quality: Demeke G. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_