



Wollo University (KiOT)
Department of Software Engineering

Course Title	Software Evolution and Maintenance
Course Code	SEng4144
CP	6 (3hr Lecture, 3hr Tutorial)
Module Title:	Basics of Programming
Module Number	14
Pre-requisites	SEng2054
Target group	Year 4 Semester II
Semester	II
Status of Course	Compulsory
Instructor information	Name Fekerte B. Email fekerlight@gmail.com Office : College of informatics building

Course Description

The course focuses on the basic concepts of maintenance and how the concept of system evolution fits into maintenance; different technical and managerial problems of maintenance; the formal types of maintenance, and standard maintenance processes.

Learning Outcomes

At the end of the course students will be able to:

- Understand the maintenance process and system evolution, and apply metrics to manage maintenance;
- Apply configuration management;
- Know the problem management process;
- Know the basic techniques for managing organizational issues; and
- Understand software reuse

<u>Prepared by:</u>	<u>Approved by</u>	
	<u>QA Focal person</u>	<u>Department Head:</u>
Name: Fekerte B.	Name: Samuel T.	Name: Leul A.
Signature:	Signature	Signature
Date:	Date:	Date
NB ✓ The course outline must be approved and have the department stamp before duplication ✓ Should be submitted to the QA focal person, batch/section advisor and the department		

Course contents and schedule

Week	Lecture Topics	References	Learning outcomes
1	Chapter 1: Software Evolution and Maintenance Concepts	Reference book and Handout	After completing this chapter students are expected to: • Know the concepts of software evolution and maintenance • Identify the difference between software evolution and maintenance
2	Chapter 2: Maintenance Support Processes: Maintenance Planning, Evolution and Maintenance Testing, Configuration Management, Problem Management, Maintenance supporting tools.	Reference book and Handout	After completing this chapter students are expected to: • Know maintenance support process • Apply configuration management
3	Chapter 3: Maintenance Measurements: Maintenance Metrics, Maintenance Cost Estimation.	Reference book and Handout	After completing this chapter students are expected to: • Understand maintenance measurement • Identify Maintenance Process Metrics • Understand Maintenance Cost Estimation • Identify maintenance cost estimation factor and techniques
4-5 (Assignment 1)	Chapter 4: Management and Organizational Issues: Organization Aspect of Maintenance, Maintenance Activities and Role, Outsourcing IT Maintenance, Managing the Maintenance Function, Maintenance Teams.	Reference book and Handout	After completing this chapter students are expected to: • Know the basic techniques for managing organizational issues
6-7	Chapter 5: Maintenance Management Problems: Problems of Software Maintenance, Software Reuse, Legacy Systems	Reference book and Handout	After completing this chapter students are expected to: • Identify problems that are associated with software maintenance • Understand software reuse and its problem • Know legacy system • Identify causes of system to become legacy
8-9	Chapter 6:		After completing this chapter students are

(Assignment 2)	Software Architecture Evolution	Reference book and Handout	expected to: • Understand software architecture evolution • Understand Component-Based Software Architecture
10-11	Chapter 7: Maintenance and Reengineering.	Reference book and Handout	After completing this chapter students are expected to: • Identify general model for software reengineering • Identify reengineering process
12-13	Chapter 8: Reverse Engineering: Program Analysis, Architecture Recovery, Software Complexity and Maintenance Metrics, Program Visualization	Reference book and Handout	After completing this chapter students are expected to: • Understand reverse engineering • Know techniques Used for Reverse Engineering • Identify Reverse Engineering Tools
14-16	Chapter 9: Forward Engineering: Refactoring, Code Transformation, Web-enabling. Software Reengineering Strategies and Management.	Reference book and Handout	After completing this chapter students are expected to: • Identify refactoring , code transformation and web enabling • Identify the difference between software reengineering and forward engineering

Summary of Teaching Learning Methods

The teaching-learning methodology will be student-centered with appropriate guidance of instructor/s during the students' activities .There will be Lecture, Demonstrations, Tutorials, Reading assignments and Group Discussions.

Assessment Methods

The assessment methods for the course will be as follow:

Assessment method	Weight	Schedule
Quiz	10%	At any time
Assignment 1	15%	We will arrange it
Mid examination	25%	Based on university Mid exam schedule
Assignment 2	15%	We will arrange it
Final examination	40%	Based on university final exam Schedule
Total	100%	

References

- Mens, T., Demeyer, S., 2010, Software Evolution, 1st Ed, Springer.
- April, A., Abran, A., 2008, Software Maintenance Management: Evaluation and Continuous Improvement, 1st Ed, Wiley-IEEE Computer Society.
- IEEE Std 1219-1998, IEEE Standard for Software Maintenance
- ISO/IEC FDIS 14764:2005(E), Software engineering - Software life cycle processes – Maintenance