Software Maintenance

Course Code	**:**	**SE 4203**	**Credits**	**:**	**02**
Credit Hours	**:**	**02/week**	**Exam Hours**	**:**	**03**
Class	**:**	**BSSE 01**			

Total 28 hours of class lecture is needed to conduct this within 14 weeks.

Prerequisite Courses:

- SE 1113 Introduction to Software Engineering
- SE 2112 Software Project Lab-I & SE 3112 Software Project Lab-II

Course Teacher:

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Content of the Course:

Topic	Lesson Plan	*Resources*
Introduction to Software Maintenance	Basics, Development And Maintenance Activities, Why Software Maintenance Is Needed, Maintaining Systems Effectively, Case Study-Air Traffic Control, Components Of Software Maintenance Framework: User, Environment, Operating Environment, Organizational Environment, Maintenance Process, Software Product, Maintenance Personnel, Relations Between The Maintenance Factors	Chapter 1 & 2 of Penny Gru…
Software Change	Classification of Changes, Corrective Change, Adaptive Change, Perfective Change, Preventive Change, Importance of Categorising Software Changes, Case Study - The Need to Support an Obsolete System, Lehman's Laws, Economic Implications Of Modifying Software, Limitations To Software Change, Solutions to Maintenance Problems	Chapter 3 & 4 of Penny Gru…
Software Maintenance Process	Maintenance Process Models, Code-Fix Model, Waterfall, Spiral, Quick-Fix Model, Boehm's Model, Osborne's Model, Iterative Enhancement Model, Reuse-Oriented Model	Chapter 5 of Penny Gru…
Program Comprehension	Aims Of Program Comprehension, Maintainers And Their Information Needs, Comprehension Process Models, Mental Models, Program Comprehension Strategies: Top-Down Model, Bottom-Up / Chunking Model, Opportunistic Model; Reading Techniques , Factors That Affect Understanding, Implications Of Comprehension Theories And Studies	Chapter 6 of Penny Gru…
Reverse Engineering	Abstraction: Function Abstraction, Data Abstraction, Process Abstraction; Purpose And Objectives Of Reverse Engineering, Levels Of Reverse Engineering: Redocumentation, Design Recovery, Specification Recovery; Supporting Techniques: Forward Engineering, Restructuring, Reengineering; Benefits: Maintenance,	Chapter 7 of Penny Gru…

	Software Reuse, Reverse Engineering And Associated Techniques In Practice, Case Study: US Department Of Defense Inventory	
Legacy Systems	Criteria of being Legacy Systems, Solutions for Legacy System, Wrapping, Types of Wrapping, Constructing of Wrapping, Migration, Migration Planning, Migration Methods	Chapter 5 of Priyadarsh…
Change Impact Analysis	Impact Analysis Process, Traceability based Impact analysis, Dependency-based analysis: call-graph, program dependency graph analysis, Ripple effect analysis	Chapter 6 of Priyadarsh…
Refactoring	Concept of Refactoring, Activities in a Refactoring Process: What to refactor, Determine which Refactoring should be applied, Refactoring and Preservation of software behavior, Applying refactoring, Evaluating impact of Refactoring, consistency of software artifacts; Formalisations for Refactoring: Assertions, Graph Transformation, Software Metrics, Examples of Refactoring; Initial Work on Software Restructuring	Chapter 7 of Priyadarsh…
Management And Organizational Issues	Management Responsibilities, Enhancing Maintenance Productivity: Choosing The Right People, Motivating Maintenance Personnel, Communication: Adequate Resources, Domain Knowledge; Maintenance Teams: Temporary Team, Permanent Team; Personnel Education And Training, Organizational Modes: Combined Development And Maintenance: Module Ownership, Change Ownership, Work-Type, Application-Type; Separate Maintenance Department	Chapter 10 of Penny Gru…
Configuration Management	Software Configuration Management, Version Control, Version Control, Documentation	Chapter 11 of Penny Gru…
Maintenance Tools	Source Code Control System (Sccs), Git, Github/Gitlab,	Chapter 14 of Penny Gru…