Tribhuvan University
Institute of Science and Technology

Course Title: Software Engineering   **Full Marks: 60+20+20**
Course No.: CSC-351   **Pass Marks: 24+8+8**
Credit hours: 3
Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)
Course Synopsis: Discussion on types of software, developing process and maintaining the software.
Goal: This course introduces concept of software development paradigm and implementing these in real world.
Course Contents:

S.N.	Chapter	Description	Hours
1.	1.1 Introduction to Software Engineering	-Definition of software (Characteristics & types) -Software Engineering -Comparing between other engineering and software engineering	2 hrs.
	1.2 System Engineering	-Introduction to system -System properties -System and their environment -System modeling (system component)	2 hrs.
	1.3 Software Process	-Introduction -Software Process Model -Process Iteration -Software Specification -Software design and implementation -Software validation -Software evolution	4 hrs.
	1.4 Project Management	-Introduction -Management activities -Project planning -Project scheduling (WBS, inter-task dependency, pert chart, CPM)	3 hrs.
2.	2.1 Software Requirements	-Introduction -Types of requirements (functional & non-functional) -Requirements engineering process (Feasibility study, requirements elicitation and analysis, requirement validation, requirement management)	6 hrs.
	2.2 Software Prototyping	-Introduction -Prototyping in the software process -Rapid prototyping techniques -User interface prototyping	3 hrs.

	2.3 Formal Specification	-Introduction -Formal specification in software process -Interface specification -Behavioral specification	3 hrs.
3.	3.1 Architectural Design	-Introduction -System structuring (repository, client-server, abstract with advantages & disadvantages) -Control models -Modular decomposition (object oriented: class diagram, structured: DFD) -Domain specific architecture	3 hrs.
	3.2 Object Oriented Design	-Introduction -Features of object oriented design -Design model (Use case, class diagram, Sequence diagram, Activity)	3 hrs.
4.	4.1 Verification & Validation	-Introduction -Verification and validation planning -Software inspection -Cleanroom software development (process component)	4 hrs.
	4.2 Software Testing	-Introduction -Types of Testing -Testing approaches: white box, black box -Types: unit, system, integration, validation -Testing work benches	4 hrs.
	4.3 Critical System Validation	-Introduction -Formal methods and critical systems -Reliability validation -Safety assurance -Security assessment	4 hrs.
	4.4 Software Cost Estimation	-Introduction -Productivity -Estimation techniques (Expert judgment, COCOMO 2nd, Functional Point, KLOC)	2 hrs.
	4.5 Software Re-engineering	-Introduction -Source code translation -Reverse engineering	2 hrs.

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Bachelor of Computer Science and Information Technology
Semester: Sixth
Course: Software Engineering
Course No.: CSC-351

Model Question Paper

Full Marks: 60   **Pass Marks: 24**

Attempt 10 questions only.

1. What is software engineering? Justify its importance.

2. Describe spiral model with its advantages?

3. What is risk in software development? List out the steps of risk management?

4. What is requirement engineering? Describe about requirement engineering process?

5. What is rapid prototyping technique?

6. Define repository model with example?

7. Prepare Use CASE diagram for ATM system?

8. Define V (Validation) and V (Verification) model for software testing?

9. Compare and contrast about white box and black box testing?

10. What is cost estimation? How cost can be estimated using COCOMO model?

11. Differentiate between forward and reverse engineering?

12. Write sort notes on any two:
    a) System Engineering
    b) Reliability Validation
    c) Functional Vs. Non-Functional Requirements