

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	<ul style="list-style-type: none"> -Introduction -Formal specification in software process -Interface specification -Behavioral specification 	3 hrs.
3.	3.1 Architectural Design	<ul style="list-style-type: none"> -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	<ul style="list-style-type: none"> -Introduction -Features of object oriented design -Design model (Use case, class diagram, Sequence diagram, Activity) 	3 hrs.
4.	4.1 Verification & Validation	<ul style="list-style-type: none"> -Introduction -Verification and validation planning -Software inspection -Cleanroom software development (process component) 	4 hrs.
	4.2 Software Testing	<ul style="list-style-type: none"> -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	<ul style="list-style-type: none"> -Introduction -Formal methods and critical systems -Reliability validation -Safety assurance -Security assessment 	4 hrs.
	4.4 Software Cost Estimation	<ul style="list-style-type: none"> -Introduction -Productivity -Estimation techniques (Expert judgment, COCOMO 2nd, Functional Point, KLOC) 	2 hrs.
	4.5 Software Re-engineering	<ul style="list-style-type: none"> -Introduction -Source code translation -Reverse engineering 	2 hrs.