Lok Jagruti Kendra University
University with a Difference

Diploma in Cloud Computing & Big Data

Course Code: 025100405

Software Engineering

Programme / Branch Name	Diploma in Cloud Computing & Big Data					
Course Name	Software Engineering				**Course Code**	025100405
Course Type	HSSC	BSC	ESC	PCC	OEC	PEC

Legends: HSSC: Humanities and Social Sciences Courses BSC: Basic Science Courses
ESC: Engineering Science Courses PCC: Program Core Courses
OEC: Open Elective Courses PEC: Program Elective Courses

1. Teaching and Evaluation Scheme

Teaching Hours / Week / Credits				**Evaluation Scheme**			
L	**T**	**P**	**Total Credit**	**CCE**	**SEE (Th)**	**SEE (Pr)**	**TOTAL**
3	0	2	4	50	50	50	150

Legends:
L: Lectures T: Tutorial P: Practical
CCE: Continuous & Comprehensive Evaluation
SEE (Th): Semester End Evaluation (Theory)
SEE (Pr): Semester End Evaluation (Practical)

2. Prerequisites

- ✓ Basic knowledge of the software.
- ✓ Understanding of basic programming.
- ✓ Good verbal and written communication skills.

3. Rationale

The software has become an integral & important part of any business or organization in the modern world. Due to this, software needs to be effective, efficient, and reliable. To accomplish this, the actual software development process needs to be planned & focused on. Software Engineering is the foundation for professional processes to be followed involving principles, techniques, and practices for software development. The course provides a framework for software professionals for building quality-assured software products. It enables students to blend the domain-specific knowledge with the programming skills to create quality software products.

4. Objectives

- ✓ The concepts, hands-on experiences, and relevant soft skills associated with this course are to be implemented so that the learner is able to,
  - Select a suitable software process model for software development.
  - Prepare software requirement specifications.
  - Identify and apply appropriate software architectures and patterns to carry out the high-level design of a system and be able to critically compare choices.
  - Will have experience and/or awareness of testing problems and will be able to develop a simple testing report.

5. Contents

Unit No.	Unit Name	Topics	Learning Outcomes	% Weightage	Hours
1	**Software Development Process**	1.1. Introduction 1.2. Basics of Software Engineering 1.3. Software Process 1.4. Software Development Life Cycle 1.5. Software Development Models	• Understanding of software and software engineering. • Software life cycle. • Various SDLC models and their use in project planning.	30	10
2	**Requirements Analysis and Specification**	2.1. Requirement Gathering and Analysis 2.2. Software Requirements Specification 2.3. Cohesion 2.4. Coupling	• Identify software requirement. • Analysis and design requirement. • Prepare software requirement specification documentation.	20	8
3	**Software Design with UML**	3.1. Design Process 3.2. Design Decisions Data Modeling 3.3. Function Orientated Software Design 3.4. Object Modeling using UML 3.5. Architectural Design Decisions	• Understanding of design process. • Basics of data modeling. • Various types of object modeling with UML. • Understanding of architectural design	20	10
4	**Software Project Management**	4.1. Responsibilities of Software Project Manager 4.2. Metrics for Size Estimation 4.3. Project Estimation Techniques 4.4. Project Scheduling 4.5. Risk Management	• Awareness of project manager's responsibilities. • Prepare and manage the schedule for different software development activities. • Understanding of project estimation techniques	20	8

5	**Software Coding and Testing**	5.1. Code Review Techniques 5.2. Software Documentation 5.3. Software Testing 5.4. Test Documentation	• In-depth knowledge of code review techniques. • Generate software documentation. • Prepare test cases and test the software.	10	6
				Total Hours	**42**

6. List of Practicals / Exercises

The practical/exercises should be properly designed and implemented in an attempt to develop different types of skills so that students can acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

Sr. No.	Practicals / Exercises	Key Competency	Hours
1	Prepare a brief presentation on software, types, software engineering terminologies, its applications in real life.	In-depth knowledge of software, software terminologies, and real-life applications.	2
2	Prepare an abstract document having features/needs and advantages of a software/system.	Understanding the need, features, and application of the software.	2
3	Prepare a case study covering the detailed problem, need, existing systems, viability of a software/system.	Detailed study of validity of software system.	2
4	Prepare a case study covering the detailed problem and feasibility of a software/system.	Detailed study of feasibility and validity of software system.	2
5	Prepare a document of requirement gathering for a software/system.	Summarized requirements that provide a base for the SRS document.	2
6	Prepare a document of requirement gathering for a software/system.	Summarized requirements that provide a base for the SRS document.	2
7	Identify the software development model for a software/system with proper explanation/reasons/scenarios.	Application of SDLC model.	2
8	Design Use-case diagrams for a software/system.	Illustration and application of use-case diagram for software.	2
9	Design Data Dictionary for a software/system.	Illustration and application of Data Dictionary diagram for software.	4

10	Design Data Flow diagram for a software/system.	Illustration and application of Data Flow diagram for software.	4
11	Design E-R diagram for a software/system.	Illustration and application of E-R diagram for software.	2
12	Prepare suitable test cases for testing a software/system.	Various testing techniques and test-case generation.	2
		Total Hours	**28**

7. Suggested Specification Table for Evaluation Scheme

Unit No.	Unit Name	Distribution of Topics According to Bloom's Taxonomy					
		R %	U %	App %	C %	E %	An %
1	Software Development Process	40	40	10	-	10	-
2	Requirements Analysis and Specification	30	30	20	10	5	5
3	Software Design with UML	25	25	20	20	5	5
4	Software Project Management	30	30	20	10	5	5
5	Software Coding and Testing	30	30	20	10	5	5

Legends: R: Remembering U: Understanding
App: Applying C: Creating
E: Evaluating An: Analyzing

8. Textbooks

1) Fundamentals of Software Engineering, Rajib Mall, Latest Edition, PHI Learning Private Limited.

9. Reference Books

1) The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Latest Edition, Pearson Education.
2) Software Engineering a practitioner's approach, Roger Pressman, Latest Edition, McGraw Hill Higher Education.

10. Open Sources (Website, Video, Movie)

1) http://www.rspa.com/spi/
2) https://nptel.ac.in/courses/106/105/106105182/
3) htttp://www.sei.cmu.edu/