COURSE TITLE	**SOFTWARE DEVELOPMENT AND PROJECT MANAGEMENT**
COURSE CODE	**01AL0502**
COURSE CREDITS	**4**

Objective:

1 To provide students with an understanding of software development processes, project planning, and cost estimation techniques, and to equip them with skills to manage, test, and maintain software systems effectively in real-world environments.

Course Outcomes: After completion of this course, student will be able to:

1 Explain the fundamental concepts of software development and different Software Development Life Cycle (SDLC) models.

2 Analyze software requirements and prepare basic project planning documents such as Software Requirement Specification (SRS), Work Breakdown Structure (WBS), and project schedules.

3 Apply software cost estimation techniques such as Lines of Code (LOC), Function Point Analysis (FPA), and basic COCOMO models for estimating project cost and effort.

4 Evaluate software quality using appropriate testing techniques and debugging methods.

5 Understand software maintenance, configuration management, and documentation practices used in software projects.

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Introduction to Software Development** Introduction to software and software systems, Characteristics of modern software systems, Software Development Life Cycle (SDLC) , SDLC models: Waterfall, Incremental, Spiral, Agile, Requirement analysis and specification, Software development tools and environments	8
2	**Software Project Planning and Management** Software project planning process, Project scheduling and task management, Work Breakdown Structure (WBS), Gantt charts and project timelines, Risk management in software projects, Role of project managers in software development	8

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Contents : Unit	Topics	Contact Hours
3	**Software Cost Estimation and Budgeting** Importance of cost estimation in software projects, Factors affecting software cost, Cost estimation techniques Lines of Code (LOC) based estimation, Function Point Analysis (FPA), Introduction to COCOMO model	8
4	**Software Quality and Testing** Software quality attributes, Software testing principles, Testing types: Unit testing, Integration testing, System testing, Debugging techniques, Software reliability and quality assurance, Documentation and version control	8
5	**Software Maintenance and Configuration Management** Software deployment and release management, Software maintenance types: corrective, adaptive, perfective, Software configuration management, Change management, Software project documentation, Case studies of real-world software projects	8
Total Hours		**40**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Practical 1** Study and comparison of different SDLC models.	2
2	**Practical 2** Preparing a Software Requirement Specification (SRS) for a small system.	2
3	**Practical 3** Developing a Work Breakdown Structure (WBS) for a project.	2
4	**Practical 4** Creating a Gantt chart for project scheduling.	2
5	**Practical 5** Risk identification and preparation of a risk management plan.	2
6	**Practical 6** Estimation of project size using Lines of Code (LOC) method.	2
7	**Practical 7** Software cost estimation using Function Point Analysis.	2
8	**Practical 8** Cost estimation using basic COCOMO model.	2
9	**Practical 9** Preparing a software project budget report.	2
10	**Practical 10** Writing test cases for a sample software application.	2
11	**Practical 11** Performing debugging and testing of a small program.	2

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
12	**Practical 12** Mini Project: Prepare a complete software project plan including cost estimation.	2
Total Hours		**24**

Textbook :

1 Software Engineering: A Practitioner's Approach, Roger S. Pressman, McGraw-Hill, 2014
2 Software Engineering, Ian Sommerville, Pearson, 2015
3 An Integrated Approach to Software Engineering, Pankaj Jalote, Springer, 2005
4 Software Engineering, K.K. Aggarwal, Yogesh Singh, New Age International, 2008
5 Fundamentals of Software Engineering, Rajib Mall, PHI Learning, 2018
6 Software Project Management, Bob Hughes, Mike Cotterell, Rajib Mall, McGraw-Hill, 2016

References:

1 Software Engineering Economics, Software Engineering Economics, Barry W. Boehm, Prentice Hall, 1981
2 Software Project Management: A Unified Framework, Software Project Management: A Unified Framework, Walker Royce, Addison-Wesley, 1998
3 Software Requirements, Software Requirements, Karl Wiegers, Joy Beatty, Microsoft Press, 2013
4 Effective Software Project Management, Effective Software Project Management, Robert K. Wysocki, Wiley, 2011

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
20.00	25.00	30.00	15.00	5.00	5.00

Instructional Method:

1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

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Instructional Method:

3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

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