INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

AGILE DEVELOPMENT AND SCRUM PRACTICES							
VI Semester: IT							

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
AITD16	**Elective**	3	0	0	3	40	60	100

Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil	Total Classes: 48

Prerequisite: There are no prerequisites to take this course

I. COURSE OVERVIEW:

This course provides an in-depth understanding of agile methodologies, with a primary focus on the Scrum framework. It covers the principles, practices, and tools essential for implementing Agile in software development and project management. The course emphasizes hands-on learning through case studies, simulations, and real- world projects, preparing students to become effective agile practitioners.

II. COURSES OBJECTIVES:
The students will try to learn
I. Agile methodologies, including the values, principles, and frameworks
II. Gain practical knowledge of the Scrum framework, Scrum Master, and Development Team
III. Master Scrum Roles, Events, and Artifacts.
IV. Apply Agile Tools and Techniques: Learn to effectively use agile tools and techniques.

III. COURSE OUTCOMES:
At the end of the course students should be able to
CO1   Develop and project management scenarios**.**
CO2   Effectively perform the roles of Scrum Master, Product Owner, and Development.
CO3   Develop and Manage Backlogs, Create and prioritize product and sprint backlogs.
CO4   Agile project management software to plan, track, and deliver projects.
CO5   Evaluate team performance using metrics like velocity and burn-down charts
CO6   Scale and customize Agile methodologies for complex Projects or organization.

IV. COURSE CONTENT:

MODULE I: INTRODUCTION TO AGILE DEVELOPMENT (10)

Agile Project Management: Agile and compare it with traditional project management approaches, Agile for managing change and delivering customer value, Origins of Agile methodologies. Agile Methodologies, Key Agile methodologies including Scrum, Kanban, Lean, and Extreme Programming (XP), Compare methodologies based on structure, roles, and delivery processes, Agile method based on project needs and team dynamics.

MODULE II: SCRUM FRAMEWORK (09)

Structure and roles of the Scrum team: Product Owner, Scrum Master, and Development Team, Scrum artifacts including the Product Backlog, Sprint Backlog, and Increment, Scrum events such as Sprint Planning, Daily Scrum, Sprint Review, and Sprint Retrospective.

MODULE III: AGILE PLANNING AND ESTIMATION (10)

Agile Planning and Estimating: Agile teams estimate work using story points and velocity, Understand user stories, epics, and themes in agile planning, Tools and techniques for release and iteration planning.

Agile Execution and Monitoring: Agile projects using burndown charts, task boards, and daily stand-ups, Transparency and adaptability through constant feedback and team collaboration, Manage team performance and maintain quality through continuous integration and testing.

MODULE IV: AGILE TOOLS AND PRACTICES (09)

Organizational support for Agile implementation and cultural transformation, Scaling frames and Disciplined Agile Delivery (DAD), Challenges and success factors for adopting Agile in complex environments. AGILE TOOLS: Kanban Boards, Test-Driven Development (TDD), Continuous Integration/Continuous Deployment (CI/CD), Agile Metrics

MODULE V: SCALING AGILE AND ADVANCED PRACTICES (09)

Scaling Agile: Scaling Frameworks Nexus, Agile in Large Organizations: Managing distributed teams, Coordinating multiple Scrum teams, Hybrid Agile Models: Combining Agile with Waterfall or other approaches, Common Challenges in Agile Adoption: Organizational culture and resistance, Lack of Agile training or buy-in, Case Studies and Industry Practices: Successful Agile transformations.

IV. TEXT BOOKS:

1. "Scrum: The Art of Doing Twice the Work in Half the Time", Jeff Sutherland, 2014.
2. "Agile Estimating and Planning", Mike Cohn, 2005.

VI. REFERENCE BOOKS:

1. "The Scrum Guide", Ken Schwaber and Jeff Sutherland, 2020 (Latest update).
2. "Agile Software Development: Principles, Patterns, and Practices", Robert C. Martin, 2002.
3. "Scaling Software Agility: Best Practices for Large Enterprises", Dean Leffingwell, 2007.

VII. ELECTRONICS RESOURCES:

1. https://scrumguides.org
2. https://www.agilealliance.org
3. https://www.scrum.org

VIII. MATERIALS ONLINE

1. Course template
2. Tutorial question bank
3. Tech-talk topics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I

8. Model question paper – II
9. Lecture notes
10. PowerPoint presentation
11. E-Learning Readiness Videos (ELRV)