NIRMA UNIVERSITY

Institute:	Institute of Technology
Name of Programme:	BTech All (Other than CSE)
Course Code:	4CS506IE25
Course Title:	Agile Software Development
Course Type:	Interdisciplinary Minor- Elective
Year of Introduction:	2025-26

L	T	Practical Component				C
		LPW	PW	W	S	
3	1	0	-	-	-	4

Course Learning Outcomes (CLO):

At the end of the course, the students will be able to:

1. implement continuous integration using essential design principles, refactoring, and version control (BL3)
2. examine customer needs and market conditions, ensuring that the software they develop remains relevant and valuable (BL4)
3. evaluate the significance of integrating agile methodologies and development practices within the business (BL5)
4. develop testing activities seamlessly within the framework of an agile project (BL6)

Unit	Contents	Teaching Hours (Total 45)
Unit-I	**Fundamentals of Agile:** The Genesis of Agile, Introduction and Background, Agile Manifesto and Principles, Overview of Scrum, Extreme programming, Feature-driven development, Agile project management, Design and development practices in Agile projects	09
Unit-II	**Agile Frameworks:** Introduction to Scrum, Project phases, Agile Estimation, Planning game, Product backlog, Sprint backlog, Iteration planning, User story definition, Characteristics and content of user stories, Acceptance tests and Verifying stories, Project velocity, burn down chart, Sprint planning and retrospective, Daily scrum, Scrum roles – Product Owner, Scrum Master, Scrum Team, Introduction of Kanban and compare it with Scrum	10
Unit-III	**Agile Testing:** The Agile lifecycle and its impact on testing, Test-Driven Development (TDD), Testing user stories - acceptance tests and scenarios, Planning and managing testing cycle.	09
Unit-IV	**Agile Software Design and Development:** Agile design practices, Role of design Principles including Single Responsibility Principle, Open Closed Principle, Liskov Substitution Principle, Interface Segregation Principles, Dependency Inversion Principle in Agile Design, Need and significance of Refactoring.	09
Unit-V	**DevOps in Agile:** Agile Metrics and Performance Measurement, CI/CD (Continuous Integration/ Continuous Development) Scaling Agile for Large Projects (SAFe, LeSS, etc. Agile in Distributed Teams, Agile in Industry Verticals (e.g., Agile in Healthcare)	08

Self-Study:

The self-study contents will be declared at the commencement of the semester. Around 10% of the questions will be asked from self-study content.

Suggested Readings/ References:
1. Ken Schawber, Mike Beedle, Agile Software Development with Scrum, Pearson
2. Lisa Crispin, Janet Gregory, Agile Testing: A Practical Guide for Testers and Agile Teams, Addison Wesley
3. Robert C. Martin, Agile Software Development, Principles, Patterns and Practices, Prentice Hall
4. Alistair Cockburn, Agile Software Development: The Cooperative Game, Addison Wesley
5. Mike Cohn, User Stories Applied: For Agile Software, Addison Wesley

Suggested List of Experiments: -NA-