AGILE METHODOLOGIES
(OPEN ELECTIVE)

Course Code: 19CS11P1

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Course Outcomes: At the end of the course the student should be able to
CO1: Explain fundamentals of Agile methodology.
CO2: Explain agile principles.
CO3: Apply Scrum principles.
CO4: Apply practices of XP and Incremental design.
CO5: Develop methods to eliminate waste.

UNIT-I   **8 Lectures**
LEARNING AGILE: Getting Agile into Your Brain, Understanding Agile Values, No Silver Bullet, Agile to the Rescue, Adding Agile Makes a Difference. A Fractured Perspective, How a Fractured Perspective Causes Project Problems. The Agile Manifesto, Purpose Behind Each Practice. Individuals and Interactions Over Processes and Tools, Working Software Over Comprehensive Documentation, Customer Collaboration Over Contract Negotiation, Responding to Change Over Following a Plan, Principles Over Practices. Understanding the Elephant, Methodologies Help You Get It All in Place at Once, Where to Start with a New Methodology.

Learning Outcomes: At the end of the unit, student will be able to
1. explain Agile methodology. (L2)
2. explain the purpose of each practice in Agile. (L2)
3. explain the first steps followed in the new methodology.(L2)

UNIT-II   **12 Lectures**
THE AGILE PRINCIPLES: The 12 Principles of Agile Software, The Customer Is Always Right...Right? , "Do As I Say, Not As I Said". Delivering the Project, Better Project Delivery for the Ebook Reader Project. Communicating and Working Together, Better Communication for the Ebook Reader Project. Project Execution—Moving the Project Along, A Better Working Environment for the Ebook Reader Project Team. Constantly Improving the Project and the Team. The Agile Project: Bringing All the Principles Together

Learning Outcomes: At the end of the unit, student will be able to
1. explain Principles of Agile software. (L2)
2. explain the purpose of effective communication in Agile.(L2)
3. explain the connections among the principles of Agile .(L2)

UNIT-III   **10 Lectures**
SCRUM AND SELF-ORGANIZING TEAMS: The Rules of Scrum, Act I: I Can Haz Scrum?, Everyone on a Scrum Team Owns the Project, The Scrum Master Guides the Team's Decisions, The Product Owner Helps the Team Understand the Value of the Software, Everyone Owns the Project, Scrum Has Its Own Set of Values ,Status Updates Are for Social Networks!, The Whole Team Uses the Daily Scrum, Feedback and the Visibility-Inspection-Adaptation Cycle, The Last Responsible Moment, How to Hold an Effective Daily Scrum. Sprinting into a Wall, Sprints, Planning, and

Retrospectives, Iterative or Incremental?, The Product Owner Makes or Breaks the Sprint, Visibility and Value, How to Plan and Run an Effective Scrum Sprint.

SCRUM PLANNING AND COLLECTIVE COMMITMENT: Not Quite Expecting the Unexpected, User Stories, Velocity, and Generally Accepted Scrum Practices, Make Your Software Useful, User Stories Help Build Features Your Users Will Use, Conditions of Satisfaction, Story Points and Velocity, Burndown Charts, Planning and Running a Sprint Using Stories, Points, Tasks, and a Task Board. Victory Lap, Scrum Values Revisited, Practices Do Work Without the Values (Just Don't Call It Scrum), Is Your Company's Culture Compatible with Scrum Values?

Learning Outcomes: At the end of the unit, student will be able to
1. explain Scrum and organizing Teams.(L2)
2. explain the Sprints. (L2)
3. apply the concept of User Stories.(L3)

UNIT-IV   **12 Lectures**
XP AND EMBRACING CHANGE: Going into Overtime, The Primary Practices of XP, Programming Practices, Integration Practices, Planning Practices, Team Practices, Why Teams Resist Changes, and How the Practices Help. The Game Plan Changed, but We're Still Losing, The XP Values Help the Team Change Their Mindset, XP Helps Developers Learn to Work with Users, Practices Only "Stick" When the Team Truly Believes in Them, An Effective Mindset Starts with the XP Values, The XP Values, Paved with Good Intentions. The Momentum Shifts, Understanding the XP Principles Helps You Embrace Change, The Principles of XP, XP Principles Help You Understand Planning, XP Principles Help You Understand Practices—and Vice Versa, Feedback Loops.

XP, SIMPLICITY, AND INCREMENTAL DESIGN: Code and Design, Code Smells and Antipatterns (or, How to Tell If You're Being Too Clever), XP Teams Look for Code Smells and Fix Them, Hooks, Edge Cases, and Code That Does Too Much. Make Code and Design Decisions at the Last Responsible Moment, Fix Technical Debt by Refactoring Mercilessly, Use Continuous Integration to Find Design Problems, Avoid Monolithic Design, Incremental Design and the Holistic XP Practices. Teams Work Best When They Feel Like They Have Time to Think, Team Members Trust Each Other and Make Decisions Together. The XP Design, Planning, Team, and Holistic Practices Form an Ecosystem Incremental Design Versus Designing for Reuse, When Units Interact in a Simple Way, the System Can Grow Incrementally, Great Design Emerges from Simple Interactions, Final Score.

Learning Outcomes: At the end of the unit, student will be able to
1. explain the primary practices of XP.(L2)
2. identify and find Design problems. (L3)
3. apply incremental design practice. (L3)

UNIT-V   **8 Lectures**
LEAN, ELIMINATING WASTE, AND SEEING THE WHOLE: Lean Thinking, Commitment, Options Thinking, and Set-Based Development, Creating Heroes and Magical Thinking. Eliminate Waste, Use a Value Stream Map to Help See Waste Clearly, Gain a Deeper Understanding of the Product, See the Whole, Find the Root Cause of Problems That You Discover. Deliver As Fast As Possible, Use an Area Chart to Visualize Work in Progress, Control Bottlenecks by Limiting Work in Progress.

KANBAN, FLOW, AND CONSTANTLY IMPROVING: The Principles of Kanban, Find a Starting Point and Evolve Experimentally from There. Stories Go into the System; Code Comes Out,

Improving Your Process with Kanban, Visualize the Workflow, Limit Work in Progress. Measure and Manage Flow, Managing Flow with WIP Limits Naturally Creates Slack. Make Process Policies Explicit So Everyone Is on the Same Page. Emergent Behavior with Kanban.

THE AGILE COACH: Coaches Understand Why People Don't Always Want to Change. The Principles of Coaching.

Learning Outcomes: At the end of the unit, student will be able to
1. make use of an area chart to visualize work in progress. (L3)
2. explain the principles of Kanban. (L2)
3. explain the principles of Coaching. (L2)

Text Book:
Andrew Stellman, Jill Alison Hart, *Learning Agile*, O'Reilly, 2015.

References:
1. Andrew stellman, Jennifer Green, *Head first Agile,* O'Reilly, 2017.
2. Rubin K, *Essential Scrum : A practical guide to the most popular Agile process,* Addison-Wesley, 2013.