BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
WORK INTEGRATED LEARNING PROGRAMMES

COURSE HANDOUT

Part A: Content Design

Course Title	Agile Software Process
Course No(s)	SE ZG544
Credit Units	4 (1 + 1 + 2) (Class Hour + Assignment Hour + Student Preparation Hours) / week (Avg.)
Course Author	K G Krishna
Version No	1.1
Date	18/02/2018

Course Objectives

No	Objective
CO1	To make software engineers trained in legacy software development practices adopt Agile Methodologies for rapid development and deployment of products and services
CO2	To expose various Agile Methods currently in practice and their applicability in various scenarios of software development and testing
CO3	To enable software engineers and project managers decide on the right tools and techniques considering the implementation challenges, pros and cons of each.

Course Contents

Introduction to Agile; Basics of Agile Software Development Approaches; Principles of Agile; Agile Methodologies; Release Planning; Roles and Artifacts in Agile; Agile Requirements; Iteration Planning and Ceremonies; Executing a Sprint; Agile Metrics; Agile Testing and Maintenance; Agile Pitfalls; Ensuring Agile Success

Text/Reference Books

T1	Agile and Iterative Development A Manager's Guide - Craig Larman / Pearson Education - 2004.
T2	Agile Project Management for Dummies - Mark C. Layton, John Wiley & Sons - 2012
R1	Agile Testing: How to Succeed in an Extreme Testing Environment - John Watkins, Cambridge University Press 2009
R2	Managing Agile Projects , Multi-Media Publications 2004

** Course-code specific to collaborating organization

Glossary of Terms

Module	**M**	Module is a standalone quantum of designed content. A typical course is delivered using a string of modules (typically 10 – 15). M2 means module 2.
Lecture Session	**LS**	A Module consists of several Lecture Sessions (LS) in sequence; Each LS covers a particular topic in its entirety; All Lecture Sessions are video recorded content and are available online for anytime-anywhere viewing by Students; LS1.2 denotes Lecture Session number 2 in Module 1
Video Segment	**VS**	Each Lecture Session (LS) may further be divided into several small (~10-20min) Video Segments (VS) illustrating one sub-topic or concept; LS 1.2 VS 3 (or LS1.2.3) indicates Video Segment number 3 of Lecture Session 2 of Module 1; There may be short-quizzes in between Video Segments to assess Students' understanding of the topic
Contact session	**CS**	Contact sessions refer to physical class-room sessions meant for elaboration of difficult-to-understand concepts, discussions on case-problems, case-studies, and Q&A session with students etc., to be taken up by the course instructor during the contact hours. A Contact Session is built by stringing a bunch of contact session topics. CS3.2 = Contact session sub-module 2 associated with Module 3 CS3.0 = Contact session associated with all sub-modules of Module 3
Case Problem	**CP**	Case problems/topics (experienced by practising Usability Professionals/Product Designers) to be discussed in the class
Self-Study	**SS**	Specific content assigned for self-study by the Student
Homework	**HW**	Specific problems/assignments/lab exercises assigned by Instructor as homework to Students

Teaching Methodology

Regular Model of Learning (Case-Studies/Tutorials in Contact Sessions)

Module Description/Topics

Module #	Module Title	LS #	Lecture Title	Text/Chap Ref *
1	Agile Methods - An Introduction	1.1	Traditional Software Development Practices	T2-Chap1
		1.2	Need for Agile Methods	
		1.3	Benefits of Agile Methods	
2	Agile Software Development	2.1	Iterative & Incremental Approaches	T1-Chap5 T2-Chap4
		2.2	Popular Agile Methods	
3	Agile Principles and Manifesto	3.1	Vision and Principles and Manifesto	T1-Chap3
4	Agile Methodologies	4.1	Overview of SCRUM Methodology	T1-Chap7,8
		4.2	Extreme Programming (XP)	
		4.3	Test-Driven Development (TDD)	
		4.4	Lean Software development	
		4.5	Kanban	
5	Agile Requirements	5.1	Requirements Management	T1-Chap5, T2-Chap7,11
		5.2	Effort Estimation	
6	Release Planning in Agile	6.1	Characteristics of Agile Planning	T1-Chap7, T2-Chap7,8
		6.2	Agile Release Planning	
7	Iteration Planning	7.1	Sprint as an Iteration	T2-Chap8
		7.2	Velocity and Capacity based Planning	
		7.3	Release Sprint Planning	
8	Executing a Sprint	8.1	Sprint Ceremonies	T2-Chap9,10
		8.2	Sprint Reviews and Retrospectives	
9	Agile Metrics and Tools	9.1	Overview of Agile Metrics	T2-Chap19, T1-Chap14
		9.2	Tools for Agile Project Management	
10	Quality Management in Agile	10.1	Managing Quality in Agile Project	T2-Chap14
		10.2	Managing Risks in Agile	
11	Agile Myths and Pitfalls	11.1	Common Mistakes and Myths in Agile	T1-Chap2,7,8,11
		11.2	Predictive Planning vs Adaptive Planning	
		11.3	Distributed Agile	
12	Ensuring Agile Success	12.1	Managing Change	T2-Chap16,17
		12.2	Evolution of Agile with Times	

** While effort is made to ensure the topics covered in this course are in alignment with referenced text-books, due to changing technologies and emerging practices in this field, it is strongly advised that students refer to their own sources on the net or their own organizations for comprehensive understanding of the concepts.*

Part B: Course Handout

Academic Term	First Semester 2024-2025
Course Title	Agile Software Process
Course No	SE ZG544
Lead Instructor	K.Ananthraman
Instructor(s)	

Learning Outcomes

LO1	Students to understand and adopt Agile Methods in their projects by understanding the benefits and challenges involved
LO2	Project Managers to be able to better estimate software projects using Agile Methods and manage changing requirements
LO3	Engineers involved in Testing and Maintenance projects to be able to implement Agile Test-Driven Development (TDD)

Course Introduction & Motivation

This course--consisting of lecture-videos, case-studies and tutorials --aims to introduce Agile Methods for development of software systems. Agile Methods are set of Practices, Techniques and Processes which are based on Iterative model of development with emphasis on continuous collaboration and communication to address the inherent limitations of traditional Waterfall-based software development methodologies. Beginning in the early 2000s, Agile Methodologies have started gaining traction and Scrum—one of the most popular Agile Process—has now become the de facto model of development in many IT organizations.

This course is highly recommended for all software engineers and project managers engaged in the design, development and testing of software products and services meeting time-to-market constraints in today's competitive environment accommodating changing customer requirements and time-to-market constraints. This course covers the follows the topics:

- Traditional Development Methodologies vs. Agile Methods
- Principles of Agile & Agile Manifesto
- Requirements Management in Scrum
- Product and Release Planning in Scrum
- Scrum Ceremonies
- Metrics for Agile Project Management
- Test-Driven Development
- Common Agile Myths and Pitfalls
- Emerging Practices using Agile

Course Delivery (by Instructor *via Regular Sessions*)

- There are 16 Sessions (2 hours each)--8 before mid-semester and 8 post-mid-semester over a period of 22 weeks.
- The 8th & 16th Regular Sessions are planned for review of topics pre-mid-semester and pre-end-semester examinations

Lecture Sessions

Module #	Module Title	LS #	Lecture Title	Text/Chap Ref *
1	Agile Methods - An Introduction	1.1	Traditional Software Development Practices	T2-Chap1
		1.2	Need for Agile Methods	
		1.3	Benefits of Agile Methods	
2	Agile Software Development	2.1	Iterative & Incremental Approaches	T1-Chap5 T2-Chap4
		2.2	Popular Agile Methods	
3	Agile Principles and Manifesto	3.1	Vision and Principles and Manifesto	T1-Chap3
4	Agile Methodologies	4.1	Overview of SCRUM Methodology	T1-Chap7,8
		4.2	Extreme Programming (XP)	
		4.3	Test-Driven Development (TDD)	
		4.4	Lean Software Development	
		4.5	Kanban	
5	Agile Requirements	5.1	Requirements Management	T1-Chap5, T2-Chap7,11
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		6.2	Agile Release Planning	
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		7.2	Velocity and Capacity based Planning	
		7.3	Release Sprint Planning	
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		11.2	Predictive Planning vs Adaptive Planning	
		11.3	Distributed Agile	
12	Ensuring Agile Success	12.1	Managing Change	T2-Chap16,17
		12.2	Evolution of Agile with Times	

Assignments

- Each student is given an individual assignment on any of the topics discussed in the class; Assignment Topics are based on practical problems experienced or part of work-items or tools used by collaborating organizations
- Assignments are take-home and deadline-driven (typically of 2-4 weeks duration) announced post Mid-semester examination
- Students to spend at least 16 hours of work in study, research, building prototypes, discussion and preparation of the model/report and presentation.
- As part of deliverables for evaluation, the student is expected to demonstrate or prepare a report and make a short-presentation in the class

Evaluation Scheme

EC #	Name	Type	Weight	Duration	Schedule
EC-1A	Quiz-1	Online	5%	1 Week	September 1-10, 2024
EC-1B	Quiz-2	Online	5%	1 Week	October 10-20, 2024
EC–1C	Assignment	Take-home	15%	2-4 Weeks	November 1-10, 2024
EC-2	Mid-Sem Exam.	Closed Book	35%	2 Hrs.	Saturday, 21/09/2024 (AN)
EC-3	End-Sem Exam.	Open Book	40%	2 ½ Hrs.	Saturday, 30/11/2024 (AN)

EC: Evaluation Component <TBA>: To Be Announced in the class/online

BITS-Pilani eLearn Site: All the recorded Lecture Sessions (LS) are accessible via BITS-Pilani eLearn.site (http://elearn.bits-pilani.ac.in/user/) for all registered students; All materials and communication regarding the course (announcements, assignment submission, online quizzes, and Instructor materials, Session Presentations, etc.) are provided on eLearn site only.

Communication Policy: Students are expected to use Q/A and Discussion Forums in the above eLearn site for all student-instructor communication; No personal emails or mobile calls to instructors will be entertained; Issues related to site access and other administrative issues to be directed to the specified WILP contacts on BITS-Pilani website

Closed Book: No reference material of any kind will be permitted inside the exam hall.

Open Book: Use of any printed Text/Ref Books and hand-written material (notebooks) will be permitted inside the exam hall. Loose sheets, Photocopies and Laser printouts of any material will not be permitted. Computers of any kind will not be allowed inside the exam hall. Use of calculators will be allowed in all exams. No exchange of any material will be allowed.

Self-Study: It shall be the responsibility of the individual student to be regular in maintaining the self-study schedule (watching of Recorded Lectures before the scheduled contact sessions) as given in the course handout.

Instructor