

**BOSTON UNIVERSITY  
METROPOLITAN COLLEGE**

**MET CS 634 Agile Software Development**

**Catalog Overview:**

This course provides students with a comprehensive overview of the principles, processes, and practices of agile software development. Students learn techniques for initiating, planning, and executing software development projects using agile methodologies. Students will obtain practical knowledge of agile development frameworks and be able to distinguish between agile and traditional project management methodologies. Students will learn how to apply agile tools and techniques in the software development lifecycle from project ideation to deployment, including establishing an agile team environment, roles and responsibilities, communication and reporting methods, and embracing change. We also leverage the guidelines outlined by the Project Management Institute for agile project development as a framework in this course. 4 credits.

This course cut teaches you the fundamental agile concepts that span a wide range of methodologies. It analyzes the key agile ideas, their benefits, their limitations, and how best to take advantage of them to enhance your software skills. Students will study various Agile concepts such as Scrum, Extreme Programming, Lean, and Kanban. With several hands-on exercises, students learn how to apply the Agile framework to their software development environment.

This course will provide you with a comprehensive overview of the principles, processes, and practices of agile software product management and development. Throughout the class, you'll gain an understanding of the drivers behind agility in software development and learn techniques for initiating, planning, and executing software development projects using agile methodologies. Over the next few weeks, you'll obtain practical knowledge of agile development frameworks and be able to distinguish between agile and traditional project management methodologies.

Our goal is to help you effectively apply and adapt agile tools and techniques in the software development lifecycle from project ideation to deployment, including establishing an agile team environment, roles and responsibilities, communication and reporting methods, and embracing change. Whether you're new to agile or are an experienced agile practitioner, you'll uncover ways to help your organization transition to agile or improve and advance agile capabilities.

The course covers several topics such as:

- Learning Agile: The Agile manifesto and the context of agile methods
- Understanding Agile Principles and Values: What key ideas underlie the agile movement?
- Scrum and Self-Organizing Teams: How does agile redefine traditional software jobs and tasks, in particular the manager's role and team's role?
- Scrum Planning and Collective Commitment: How do you scale agile projects?
- XP and Embracing Change: Why does XP represent simplicity, and how do I accommodate incremental Design?
- Lean, Eliminating Waste and Seeing the Whole
- Kanban
- Agile coaching

### **What you'll learn**

- a. Demonstrate an understanding of agile development philosophies and methodologies
  - Define agile development and the principles behind the Agile Manifesto
  - The difference between agile methodologies, such as Scrum, Extreme Programming (XP), and Lean Software Development
  - An understanding of when to use agile methodologies (and when not to) and how to tailor agile processes for specific scenarios
- b. Demonstrate applied knowledge of agile tools and techniques, such as:
  - Product visioning and road mapping
  - Agile architecture, analysis, and design
  - Methods for agile planning, monitoring, and adapting
  - Test-driven development
  - DevOps and the future of agile
  - Leverage tools and techniques of agile development, such as:
    - Design thinking
    - User-centric development
    - Agile frameworks and development practices
    - Communication and team development methods
    - Change leadership
  - Business Analysis and agile
- c. Apply agile software development and transformational agile concepts by working both individually and in teams
  - Implement the key agile ideas, principles, roles, practices, and artifacts using a real-world project
  - Write a paper that captures the above and documents the agile methods used

- Master scrum planning and collective commitment
- Leverage XP, Lean, and Kanban concepts where possible

Note: There are two groups of students in this course – MSSD and MSCIS ITPM. Both groups are expected to master agile principles and methods in detail. However, this course takes a customized approach – students in the software development concentration master HTML, CSS, JavaScript in considerable detail. They will put in more software development effort in the term project which develops mobile application competency.

The students in the IT PM concentration will obtain an objective view of agile methods, principles, and practices, and are expected to demonstrate leadership in the term project and additionally prepare for certifications such as CSM, PMI-ACP.

### **Recommended Books**

1. *The Art and Science of Project Management: Agile* by Roger Warburton (Paperback) - Lulu - <http://www.lulu.com/shop/roger-warburton/the-art-and-science-of-project-management-agile/paperback/product-24102027.html>
2. Agile Project Management by Marcus G and Raj Heda
3. *Essential Scrum: A Practical Guide to the Most Popular Agile Process* by Kenneth S. Rubin, Addison-Wesley Professional, 2012
4. Any book that will help you master HTML, CSS, JavaScript, and mobile application development, for example, *Beginners Guide to Building Mobile Web Apps* by Eva Holland, Chris Minnick, 2015, O'Reilly Media, Inc. (Must for MSSD students).

## Course Schedule

	Topics	Class activities
09/08	1. Introduction to Agile Software Development 2. Agile Development Frameworks	Appreciating Agile Values
09/15	3. Product Management 4. The Importance of User-Centric Design 5. Scrum – Roles, Events, and Artifacts	Build Product Backlog
09/22	6. Project discussion and tools (Backlog management and Collaboration)	Draft UI/UX, Tools – Dev/QA, High-level plan – Batch 1
09/29	7. Product Backlogs 8. User Stories 9. Story Estimation	Finalize UI/UX – Batch 1, Refine plan
10/06	10. Build Project Product Backlog 11. Project review 12. Scrum Roles and Quality and Testing	Team submission: Review (1-3) Mock Design from each team  Project timeline
10/13	13. Review team product backlog and project progress	Team submission: Review (1-3) Design from each team  Research Paper Presentation
10/20	14. Review team product backlog and project progress	Research Paper Presentation
10/27	15. Adaptive and Scaling Agile	Sprint Review and Sprint Planning  Individual team Sprint Retrospective  Research Paper Presentation
11/03	16. Review team product backlog and project progress	Research Paper Presentation
11/10	17. XP / Lean / Kanban	Sprint Review and Sprint Planning

		Individual team Sprint Retrospective
11/17	18. Agile leadership	
12/01	Prepare for Research, Project, and Final Exam  Research Paper Presentation	
12/08	19. Research Paper Presentation  20. Project presentations	
12/15	21. "FUN" Final Exam	

### Grading

a) Homework and Classroom Discussions	20%
b) Team Project Report and Presentation	30%
C) Mid-term exam	15%
c) Final "FUN" Exam	20%
d) Research Slides Presentation	15%

#### A) Homework and Classroom Discussion (20%)

Role Play, Web Application, and Mobile Development tutorials and Class participation.

#### B) Team Project (30%)

Students will develop a website application using HTML, CSS, JavaScript, and jQuery. They will use Scrum or a related approach. They will document their experience in a 6-7 slides report. They will present the results and demonstrate the website.

#### PowerPoint

- Vision
- Roadmap
- Team Structure
- Product Demo
- Communications
- Risk Management

- Retrospectives
- Learnings

**C) Mid-term exam – (15%)**

**D) “FUN” Final exam – case study (20%)**

**E) Research Paper Topics (15%)**

No more than 5 slides on a research topic approved by your instructor. Example: Agile Technical Debt. Additional topics will be approved based on your career goals (example – portfolio planning and benefits realization, hybrid agile practices, etc).