Mathematics, Statistics & Computer Science

University of Wisconsin-Stout
Jarvis Hall Science Wing 231
Menomonie, WI 54751-0790

COURSE NUMBER/TITLE: CS-458 ADVANCED SOFTWARE ENGINEERING

CREDITS: 3

COURSE DESCRIPTION: Semester-long software engineering project based on an applied real life problem. Advanced models of modern software development process. An in-depth exposure to the latest technologies and trends in software engineering: architecture, process, frameworks, methodologies, and tools. Software metrics, quality, management, reliability, testing, integration, verification, validation, deployment, and maintenance. Prerequisite: CS-448 Software Engineering


COURSE OBJECTIVES:
Upon successful completion of the course, the student will be able to:
1. Understand the concepts and methods for construction of large, medium, and small software system development projects.
2. Apply unified modeling language (UML) or other appropriate technology in the software development documentation.
3. Utilize a broad range of techniques and processes associated with complex software intensive systems.
4. Work as a team member of a software engineering project in an industrial setting.
5. Recognize the modern practice of software analysis, design and the unified process.
6. Identify the issues affecting the organization, planning and control of an integrated software-based systems development.
7. Acquire and apply the best practices in software development communication skills.
8. Communicate, document, manage, and schedule the software development process.
9. Understand and appreciate the discipline of software engineering.
10. Understand the state-of-the-art directions and advances in software engineering development.
11. Read and understand the professional and technical literature on software engineering.

COURSE OUTLINE:
1. Product Metrics for Software (Objectives 5, 7, 8, 10)
2. Web Engineering (Objectives 1, 2, 3, 4, 5)
3. Formulation and planning for Web Engineering (Objectives 5, 6, 7)
4. Analysis and Design Modeling for Web Applications (Objectives 5, 6, 7, 8)
5. Testing Web Applications (Objectives 5, 6, 8, 9)
6. Project Management Concepts, Process and Project Metrics (Objectives 5, 6, 7, 8, 9, 10)
7. Estimation for Software Projects (Objectives 1, 4, 6, 7, 11)
8. Software Project Scheduling (Objectives 6, 7, 8, 9)
9. Risk Management (Objectives 5, 6, 7, 8, 10)
10. Quality Management (Objectives 8, 9, 10, 11)
11. Change Management (Objectives 5, 8, 9, 10, 11)
12. Formal Methods (Objectives 10, 11)
13. Cleanroom Software Engineering (Objectives 9, 10, 11)
14. Component-Based Software Engineering (Objectives 3, 5, 8, 9, 10, 11)
15. Reengineering (Objectives 10, 11)
16. The Future of Software Engineering (Objectives 5, 10, 11)
17. Semester Long Team Project (Objectives 1 to 11)