

Class Syllabus for SWE 625

Spring 2017

Dr. Kenneth E. Nidiffer

**Better Way of Managing and Leading Software Projects
Software Engineering 625**

Volgenau School of Information Technology and Engineering

George Mason University



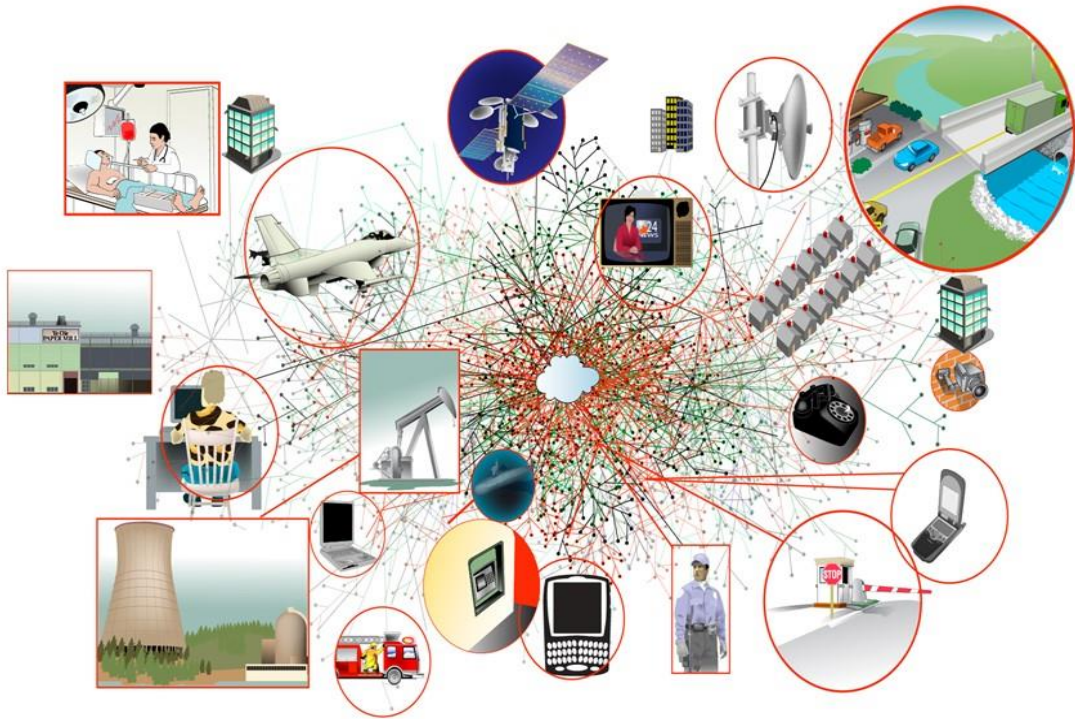
Overview of the Class Syllabus for SWE 625

- Scope
- Biography
- Administration
- Course Text
- Major Topics
- Course Background Requirements
- Course Evaluation Procedure
- Chapter Readings
- Lecture Topics
- Homework Schedule

Scope of Software Engineering Management

Includes all:

- o Systems and System of Systems
- o Networked Hardware/ Platforms
- o Infrastructure
- o Applications
- o Workforce: People who digitally connect to cyberspace



Biography

DR. KENNETH E. NIDIFFER, PMP
Director of Strategic Plans for Government Programs
Software Engineering Institute, Carnegie Mellon University

Dr. Nidiffer has over fifty-three years of experience in the marketing, research, development, support, maintenance, and acquisition of software-intensive systems. His 24-year career in the U.S. Air Force (where he retired as a full colonel) is marked by several firsts in the area of software implementations, such as, first space-based compiler, first command-hardware in the loop simulation, a series of development/process standards, etc. From 1983-1986 he helped establish several noteworthy contributions, such as, the Software Productivity Consortium; the Software Project Management Program at the Defense Systems Management College; the George Mason Software Engineering Program and the Software Engineering Institute. At the Software Productivity Consortium he launched the Consortium's business initiative in software process improvement, which became one of the largest programs in the world.

In 1991, Dr. Nidiffer left the Consortium to serve one of its founding members, Northrop Grumman, as Director of Systems Design and Development, Data Systems Division, and then as Director of Technical Operations, External Data Systems division, where he directed over 500 engineers and support personnel in the successful development of a variety of C4I, MIS/logistics, and high-speed computing applications.

In 1995, he joined Fidelity Investments Systems Company as Senior Vice President of Quality and Systems Assurance to lead a team of 165 professionals in implementing Total Quality Management, best-in-class software engineering processes, and the largest financial services test environment. He rejoined the Consortium in 1997 as Vice President for Business Development growing the membership from 50 to 100 members. In 2007 he joined the Software Engineering Institute to focus on promoting key software engineering technologies that support government programs.

Dr. Nidiffer has been widely published in the systems and software engineering community. He received his B.S. degree in Chemical Engineering in 1962 from Purdue University, Indiana, a M.S. degree in Astronautical Engineering in 1969 from the Air Force Institute of Technology, Ohio, a MBA degree from Auburn University, Alabama in 1975 and his D.Sc. degree from George Washington University, Washington D.C. in 1988. He is a member of the Program Management Institute (PMI); the International Council on Systems Engineering (INCOSE – Corporate Advisory Board (alternate)); Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and member of the IEEE Educational Activities Board (EAB) and a Member of the IEEE Curriculum Development Committee (CDC); Senior member of the American Institute

of Aeronautics and Astronautics (AIAA); member of the National Defense Industrial Association (NDIA Systems Engineering Steering Committee); and member of the NDIA/OSD (DDR&E) Industrial Software Experts Committee. He is a certified logistician; a Professor Emeritus of the Defense Systems Management College; industry advisor on two universities boards; a Project Management Professional; member of the Board of Governors for the National Military Family Association; and an adjunct engineering professor in graduate engineering at George Mason University for over 25 years.

Dr. Nidiffer is a Christian and a family-oriented person. He has been married for 53 years to the former Mary Emma Walsh of Havana, Florida and they have three daughters: Sheri, Kristi and Kathi and four grandchildren. In 2002 and in 2007, he was selected as the School of Information Technology's adjunct professor of the year in Software Engineering and received special recognition for his GMU adjunct teaching service in 2009 and 2013.

**GEORGE MASON UNIVERSITY
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DEPARTMENT OF COMPUTER SCIENCE**

COURSE OVERVIEW

SOFTWARE ENGINEERING PROJECT MANAGEMENT 625

- **COURSE TITLE:** Software Engineering Project Management (SWE 625)
- **INSTRUCTOR:** Professor Kenneth E. Nidiffer
- **SEMESTER CLASSES:** Spring 2017 (23 Jan to 17 May, including final)
- **SEMESTER EXAM:** 17 May, 2016 /1930 –2210 Innovation Hall Bld.
- **CLASS TIME/BLDG/ROOM:** 1920-2200/ Innovation Hall Bld., Rm 208

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- OFFICE HOURS: 1815 - 1900 Mondays; Room 5306 Nguyen Engineering Building (Academic IV, Research II)
- Meeting Arrangement Mechanisms:
 - By appointment in class
 - By the Internet – nidiffer@sei.cmu.edu – Best alternative
 - By note in my mail box – Suite 4300
 - By setting-up a conference call
 - By setting-up a video-teleconference (VTC)
 - Department Administration Assistant
 - Ms. Michele L. Pieper: 703-993-1530
- CONTACT INFORMATION:
 - Internet: nidiffer@sei.cmu.edu (Best Method)
 - Oral Communication Mechanisms
 - Method 1: (703) 455-4021(Home Phone Number) - Best Method
 - Method 2: (703) 217-0215 (Cell Phone) – Good Alternative
 - Method 3: (703) 247-1387 (Phone-Office Number Emergency)
 - Method 4: (703) 908-9235 (Fax-Office: Emergency Only)

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COURSE OVERVIEW

SOFTWARE ENGINEERING PROJECT MANAGEMENT 625

TEXT: Title: Managing and Leading Software Projects*

Dated: 2009

ISBN 987-0-470-29455-0

Author: Dr. Richard E. (Dick) Fairley

Publisher: John Wiley & Sons, Inc.

Options to Obtain:

1. Can Pick-up at University Bookstore (located in the George W. Johnson Center)
2. Order on-line
3. Obtained previously owned book

* Students are expected to study and understand the contents of the course text book

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SOFTWARE ENGINEERING PROJECT MANAGEMENT 625

Course Materials	Location*
1. Announcements	On-line Folder, In-class
2. Administrative Notes	On-line Folder, In-class
3. Presentation (Slides)	On-line Folder
4. Student Handouts	On-line Folder, In-class
5. Student Responses	On-line Folder, In-class
6. Graded Responses	On-line Folder, In-class
7. Student Presentation Mat'ls	In- Class
8. Student Final Responses	In-Class
9. Class Contributions	In-Class

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SOFTWARE ENGINEERING PROJECT MANAGEMENT 625

COURSE PREREQUISITES:

Undergraduate courses or equivalent knowledge in structured programming in a high-level language, data structures, discrete mathematics, and machine organization or assembly programming.

COURSE DESCRIPTION:

This course is concerned with processes involved in project planning; organizing; staffing; estimating; measuring and controlling; communication, coordination and leadership; and risk management. Topics covered include lifecycle delivery approaches; process and engineering product development models with special emphasis on the best practices contained in the Capability Maturity Model Integrated (CMMI©) constellations and product standards. The course also stresses the Program Management Institute's Program Body of Knowledge (PMBOK©) and the Software Engineering Body of Knowledge (SWBOK).

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SOFTWARE ENGINEERING PROJECT MANAGEMENT 625

COURSE OBJECTIVES:

Upon completion of this course, students will know how to develop a software project management plan for software intensive systems; how to set up monitoring and control mechanisms; how to allocate and reallocate project resources; how to track schedule, budget, quality, productivity, and progress; understand the CMMI© frameworks and how to plan for the installation and support phase of the system life cycle. They will understand the importance of the work breakdown structure and its relationship to the delivery lifecycle, resource planning and execution, and progress and product measures from both a project and enterprise perspective. In addition, they will understand the relationships among quality assurance, configuration management, verification and validation, and test and evaluation. They will also gain an understanding of the key issues in costing and pricing units of effort, motivation of workers, leading project teams, and total quality management.

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SOFTWARE ENGINEERING PROJECT MANAGEMENT 625

MAJOR TOPICS:

A taxonomy of management functions; corporate goals and objectives; system, project and product requirements; architectural frameworks; best practice frameworks, cost estimation techniques and models; software process development models with special emphasis on the CMMI© and software systems engineering delivery models; technical methods; documentation, quality assurance, configuration management, verification and validation, test and evaluation; staffing plans; monitoring and controlling mechanisms; standards (e.g. IEEE/EIA 12207 and IEEE Std. 16326™), policies and acquisition frameworks (i.e. Defense (e.g. DODI 5000.01, Defense Acquisition Guidebook (DAG) and Commercial (e.g. Infrastructure Service Provider (ISP) /Application Server Provider (ASP) frameworks), and procedures; work packages, schedules, budget, accounting systems, costing and pricing units of effort; risk management; post deployment software support; leadership, team building and total quality.

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Evaluation

Grades will be based on student class contributions, homework, , articles, student presentation and the final exam in the following proportions:

Class Contribution (Contributions In Addition to Six Articles)	10 %
Homework	10 %
Six Articles*	10%
Project	15 %
Student Project Presentations**	10 %
Final Exam***	45 %

Note: Final exam is scheduled for May 11, 2015 (7:30 – 10:10 pm)

- Articles are to be submitted in class. Students can submit their articles during any class period. Note: All articles will be accompanied with a one-page analysis of each article. Three articles are to be from refereed sources and three can be from any source.

** 1920 - 2200/ Innovation Hall Bld., Rm 208

*** 1930 - 2210/ Innovation Hall Bld., Rm 208

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Lecture Topics

SOFTWARE ENGINEERING PROJECT MANAGEMENT 625

Session	Topic
1	Introduction to Project Management
2	Process Models for Software Development
3	Establishing Project Foundations
4	Plans and Planning
5	Project Planning Techniques
6	Estimating Techniques
7	Measuring and Controlling Work Products
8	Measuring and Controlling Work Processes
9	Managing Project Risk
10	Teams, Teamwork, Motivation, Leadership and Communication
11	Organizational Issues
12	Student Presentations (1920 – 2200/ Innovation Hall Bld., Rm 208)
13	Student Presentations (1920 – 2200/Innovation Hall Bld., Rm 208)
14	FINAL EXAM (1930-2210/ Innovation Hall Bld., Rm 208)



The Better Way of Managing and Leading Software Projects