

**Dr. Kenneth E. Nidiffer**

**Managing and Leading Software Projects  
Software Engineering 625**

**Volgenau School of Information Technology and Engineering  
George Mason University**

**Class Syllabus for SWE 625  
Spring 2019**



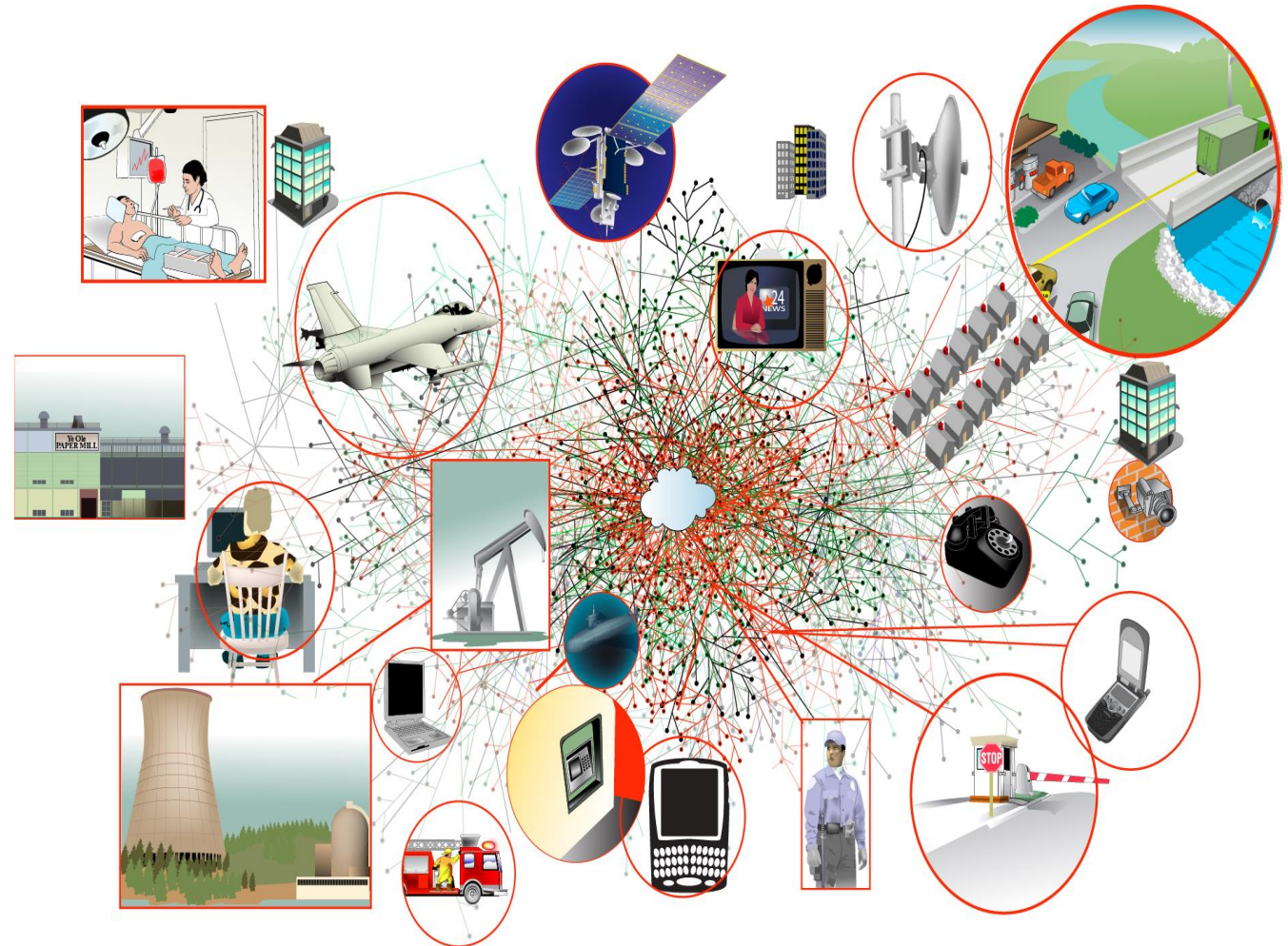
# Overview of the Class Syllabus for SWE 625

- Scope
- Biography
- Administration
- Course Text
- Major Topics
- Course Background Requirements
- Course Evaluation Procedure
- Lecture Topics and Homework Schedule
- Course Materials
- Blackboard Learn

# Scope of Software Engineering Management

## Mission Focused

- System of Systems – all types
- Networked Hardware/ Platforms
- Infrastructure
- Applications
- 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-six 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.

# Biography

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); the Air Force Association (AFA); Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and Member of the IEEE Professional and Activities Board (PAB); the Inter-National Committee for Information Technology Standards (INCITS)/Software and Systems Engineering (INCITS/SSE) Technical Committee, Senior member of the American Institute of Aeronautics and Astronautics (AIAA); member of the National Defense Industrial Association (NDIA Systems Engineering Division); Co-Chair of the NDIA/OSD (DDR&E) Industrial Software Committee and Co-Chair of the NDIA Systems Engineering Education and Training Committee.

# Biography

Ken is a certified logistician; a Professor Emeritus of the Defense Systems Management College; Industry Advisor on George Mason's Computer Science Education Committee; a Project Management Professional; and an adjunct engineering professor in graduate engineering at George Mason University for over 28 years.

Dr. Nidiffer is a man of faith and a family-oriented person. He has been married for 55 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 recognitions for his GMU adjunct teaching service in 2009, 2013, 2017, and 2018.

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**COURSE OVERVIEW  
SOFTWARE ENGINEERING PROJECT MANAGEMENT 625**

- **COURSE TITLE:** Software Engineering Project Management (SWE 625)
- **INSTRUCTOR:** Professor Kenneth E. Nidiffer
- **SEMESTER CLASSES:** Spring 2019 (28 Jan to 13 May, including final exam)
- **SEMESTER FINAL EXAM:** 13 May 2019, 1930 – 2210, IH, Room 206) \*
- **CLASS TIME/BLDG/ROOM:** 1920 – 2200; IH, Room 206

\*Note 1: The student will be provided a reading day to prepare for the final exam during the week of either 29 April or 6 May 2019

\*Note 2: IH = Innovation Hall

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**COURSE OVERVIEW**  
**SOFTWARE ENGINEERING PROJECT MANAGEMENT 625**

- **OFFICE HOURS:** 1815 - 1900 Mondays  
ENGR 5309, Nguyen Engineering Building (Academic IV, Research II)
- Meeting Arrangement Mechanisms:
  - By appointment in class
  - By the Internet – [nidiffer@sei.cmu.edu](mailto:nidiffer@sei.cmu.edu) – Best alternative
  - By note in my mail box – Suite 4300, Nguyen Engineering Bld.
  - By setting-up a conference call
  - By setting-up a video-teleconference (VTC)
  - Department Administration Assistant
    - Ms. Michele L. Pieper: 703-993-1530



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COURSE OVERVIEW  
SOFTWARE ENGINEERING PROJECT MANAGEMENT 625

- CONTACT INFORMATION:
  - Internet/E-mail: [nidiffer@sei.cmu.edu](mailto:nidiffer@sei.cmu.edu) (Best Method)
  - Internet/E-mail: [knidiffe@gmu.edu](mailto:knidiffe@gmu.edu) (Good Alternative Method)
  - Oral Communication Mechanisms
    - Method 1: (703) 455-4021 (Home Phone Number) - Best Method
    - Method 2: (703) 217-0215 (Cell Phone) or Text – Good Alternative Method
    - Method 3: (703) 247-1387 (Phone-Office Number Emergency Only)

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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**COURSE OVERVIEW  
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 sustainment 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, agile development, DevseOps, emerging technologies, leading project teams, and total quality management.

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## MAJOR TOPICS:

A taxonomy of management functions; corporate goals and objectives; system, project and product (functional and non-functional) 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 5000.02, Defense Acquisition Guidebook (DAG) and Commercial (e.g. Infrastructure Service Provider (ISP) /Application Server Provider (ASP) frameworks; Platform as a Service (PaaS), Software as a Service (SaaS), Cloud Services, Artificial Intelligence/Machine Learning Services) and procedures; work packages, schedules, budget, accounting systems, costing and pricing units of effort; risk management; post deployment software support/sustainment; leadership, ethics, team building and total quality. Also, Defense Innovation Board (DIB) and Defense Science Board (DSB) findings will be addressed.

## EVALUATION PROCEDURE:

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

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

Note: Final exam is scheduled for 13 May 2019 (7:30 – 10:10 pm)

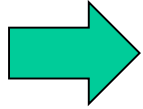
\* Articles are to be submitted in class. Students can submit their articles during any class period.

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 Building; Room 206

\*\*\* 1930-2210/Innovation Hall Building; Room 206

# Lecture Topics



Session	Date	Topic
1	28-Jan	Introduction to Project Management
2	4-Feb	Process Models for Software Development
3	11-Feb	Establishing Project Foundations
4	18-Feb	Plans and Planning
5	25-Feb	Project Planning Techniques
6	4-Mar	Estimating Techniques
	11-Mar	Spring Break

**Please Note #1: There is no class 11 March – Spring Break**

# Lecture Topics

Session	Date	Topic
7	18-Mar	Measuring and Controlling Work Products
8	25-Mar	Measuring and Controlling Work Processes
9	1-Apr	Managing Project Risk
10	8-Apr	Teams, Teamwork, Motivation, Leadership and Communication
11	15-Apr	Organizational Issues
12	22-Apr	Future of Software Engineering and It's Impact on Society
13	29-Apr	Student Presentations (1920 – 2200/ Innovation Hall, Rm 206)
14	6-May	Student Presentations (1920 – 2200/ Innovation Hall, Rm 206)
15	13-May	FINAL EXAM (1930-2210/ Innovation Hall Building, Rm 206)

\*Note: The student will be provided a reading day to prepare for the final exam during the week of either 29 Apr or 6 May 2019



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**COURSE OVERVIEW**  
**SOFTWARE ENGINEERING PROJECT MANAGEMENT 625**

<b>Course Materials</b>	<b>Location (Blackboard Learn) *</b>
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	In-class
6. Graded Responses	In-class
7. Student Presentation Mat'ls	In-Class
8. Student Final Responses	In-Class
9. Class Contributions	In-Class

*\* Some presentation slides, document templates and other supporting materials for class test book are also available at the following URL:  
[computer.org/book\\_extras/fairley\\_software\\_projects](http://computer.org/book_extras/fairley_software_projects) Please note that additional materials will be presented in class; thus, it is advisable to obtain the slides from the GMU Blackboard Learn web site for this course.*

## Blackboard Learn

- Blackboard Learn (previously the *Blackboard* Learning Management System) is a virtual learning environment and course management system developed by *Blackboard* Inc.
- Used by George Mason University
- SWE 625 Course information and assignments are contained on Blackboard Learn
- The key file is “Weekly Lectures”

# Blackboard Learn

The screenshot displays the Blackboard Learn interface for a specific course. The top navigation bar shows the course ID '201870.70344 SWE-625-001 (Fall 2018)' and the 'Home Page' breadcrumb. A green arrow points to the 'Home Page' breadcrumb. The left sidebar is highlighted in green, and a green arrow points to the 'Weekly Lectures' menu item. The main content area is divided into several sections: 'Home Page', 'Add Course Module', and 'Customize Page'. Below these are three main panels: 'Announcements', 'My Tasks', and 'To Do'. The 'Announcements' panel shows a message: 'No Course or Organization Announcements have been posted in the last 7 days.' with a link to 'more announcements...'. The 'My Tasks' panel shows 'My Tasks:' and 'No tasks due.'. The 'To Do' panel includes a user profile icon, 'Edit Notification Settings', 'What's Past Due' with an 'Actions' dropdown, 'All Items (0)', and 'What's Due' with a date selector set to '08/10/2018' and a 'Go' button.

# Blackboard Learn

The screenshot displays the Blackboard Learn interface for a course. On the left is a dark green navigation sidebar with the following items: 201870.70344 SWE-625-001 (Fall 2018), Home Page, Syllabus, Course Content, Assessments, Weekly Lectures, Discussion Board, Tools, Library Subject Guide, My Grades, Help, and a Course Management section at the bottom. A green arrow points to 'Weekly Lectures'. The main content area shows 'Lecture 1' with a dropdown arrow and a green arrow pointing to it. Below this are navigation tabs: Build Content, Assessments, Tools, and Partner Content. The content list includes: Retrospective View: Laws of Software Engineering, CMMI - V3, Lecture 1 Presentation (with a green arrow pointing to it), and SWE 625 Syllabus - Fall 2018.

201870.70344  
SWE-625-001 (Fall 2018)

Home Page  
Syllabus  
Course Content  
Assessments  
Weekly Lectures  
Discussion Board  
Tools  
Library Subject Guide  
My Grades  
Help

Course Management

Lecture 1

Build Content Assessments Tools Partner Content

Retrospective View: Laws of Software Engineering

CMMI - V3

Lecture 1 Presentation

SWE 625 Syllabus - Fall 2018