17-690, Seminar in Software Process
Course Description and Objectives

Instructor: Dr. Mark C. Paulk
Wean Hall 5101
Phone: +1 (412) 268-5176
Email: mcp@cs.cmu.edu
Office hours are by appointment

The Spring 2011 class meets Tue / Thur, 10:30-11:50, in 300SCR 265.

Course Description

The Seminar in Software Process course is a self-study and discussion course. Discussions center on how to implement effective and efficient software processes. The focus of the seminar is on systematic approaches to doing software development and maintenance better. A variety of process improvement and quality management strategies are discussed, including Total Quality Management, Baldrige Award, ISO 9001, ISO 15504 (SPICE), and others, but the course is primarily structured around the staged approach to improvement from the Capability Maturity Model. Specific topics include software project management, configuration management, quality assurance, organizational learning, process definition, training, peer reviews, team building, change management, measurement, and statistical thinking. These topics are addressed from a process management perspective.

Course Objectives

This course covers a broad variety of process, quality, management, and engineering topics. The learning outcomes desired cluster in three areas.

1) Students will be expected to apply critical thinking in evaluating the options and tradeoffs implicit in selecting from among a variety of management and engineering practices, including:
   ▪ comparing the strengths and relevance of different improvement strategies, such as analytic (Deming, Six Sigma) versus benchmarking (ISO 9001, CMMI)
   ▪ comparing project management styles, such as earned value versus agile versus critical chain
   ▪ comparing specific techniques, e.g., for peer reviews: inspections versus walkthroughs versus pair programming

2) Students will be expected to understand the implications of various improvement strategies, such as the staged representation for organizational maturity versus the continuous representation of process capability.

3) Students will be expected to predict the challenges in change management associated with organizational transformation and discuss how these challenges can be addressed.
Course Materials

This is a readings and discussion course. The text for the course is CMMI: Guidelines for Process Integration and Product Improvement, Second Edition by Chrissis, Konrad, & Shrum, but you may use the first edition or The Capability Maturity Model: Guidelines for Improving the Software Process instead if you already have a copy. The technical reports that are the basis for these books, particularly for CMMI-DEV, are freely available on the SEI website, and all class readings from the text may be taken from the on-line technical reports.

Please note that CMMI-DEV v1.3 has been released as technical reports, available on the SEI website, but the third edition of the book will not be released until March 2011. The preferred version of CMMI-DEV used in this course is v1.3, but you can use any version going back to the Software CMM and get the basic points.

You should expect to spend 8-10 hours per week on this class.

Multiple papers / articles / reports / chapters will be assigned to read each class. These readings will be made available through Blackboard. Discussion involving all students will range around the topic for that class. Everyone is expected to actively participate.
Grading Criteria

Grades

The percentage breakout for grades is:

- Homework 50%
- Project 1 (book) 20%
- Project 2 (question) 20%
- Discussions / Quizzes 10%

Homework

A homework assignment may be to write a critique, compare two standards or models, answer an interesting question(s), etc., in a 1-4 page double-spaced paper. All students will usually be assigned a common set of readings. Students may also have a semi-unique reading assignment. Students will do their homework individually and not as teams.

Homework assignments should be emailed to the instructor by midnight on its due date.

Homework assignments will be graded on a 10-point scale.

Most homeworks will be critiques, as described in the page on “Critiques”. They are to include two strengths and two opportunities for improvement. The rubric for grading a critique assigned for homework is:

- No summary -2
- Poor summary -1
- Missing rationale (2 strengths + 2 opportunities per critique) -2
- Poor rationale -1

Quizzes and Discussions

Many classes will begin with a brief (less than five minutes) quiz (usually the Thursday class). Quizzes will cover the reading assignments for that week. Quizzes will be graded on a 5-point scale. Quiz grades do not apply to Distance Education students.

Discussion topic will be periodically added to the Discussion Board on Blackboard. All students are expected to participate in the discussions. Discussion grades will be included with quiz grades. Discussion grades will be binary: participated (5 points) or not (0 points).

Projects

There will be two projects that will be graded on a 100-point scale.

Formatting Requirements

Include the assignment number (or the word “Project 1” or “Project 2” for projects), the topic of
the homework, and your name at the top of the assignment. For example,

- HW 1, Critique of Paulk’s “Using the Software CMM with Good Judgment”, John Doe
- Project 1, Critique of Treacy & Wiersma’s The Discipline of Market Leaders, Jane Roe

Failure to clearly include all required information in the title -5%.

All assignments should be received in either Word or RTF format. Failure to turn in assignments in Word or RTF format -5%.

The format of the file name should be “HWnn YourName” (where nn is the assignment number and YourName is a unique version of your name) for homework assignments. Replace “HWnn” with “P1” or “P2” for projects. Failure to use the file name format -5%.

Too long -5%. Too short (maybe) -5%. Not double-spaced -5%. Late penalty (per day) -5%, max of 50% off within term.
Projects

You will have two projects: the first a critique, the second a discussion.

Project 1 is to critique a book (or standard or model). A recommended set of books is listed on Blackboard, but you may also request approval of your own selection, so long as a reasonable relationship to software process can be drawn.

Only one student will be allowed to critique a specific work. Be aware that your choice may not be approved because someone else has already picked it! So do not buy books before getting your choice approved unless you really wanted to read that book anyway.

Project critiques are to be 5-10 pages long, but otherwise follow the general format for a critique.

The set of recommended books is quite diverse. Topics addressed range from agile methods to project management to management consulting to economics to … As part of your critique, you are required to connect your chosen book to software process improvement and demonstrate an understanding of why a theme or themes in the work is pertinent to the class. If you cannot do that, then you should choose another work! If the work is far afield from process, it may make sense to add a section after the summary of the book to specifically describe the relationship. Your observations about the strengths and opportunities for improvement in the work should be written from a software process perspective.

The book you will be critiquing for Project 1 should be selected, and your choice emailed to me and approved by January 27. Due Feb 8. You will also need to give a brief presentation in class (5-10 minutes) of what you learned in the critique in the week of Feb 8 and 10. Email your critiques to everyone in the class (use Blackboard).

Project 2 is a discussion of a topic that will be randomly assigned in class on Feb 15. Due April 26. The discussion is to be 5-10 pages long, double-spaced, and apply what you have learned about critical thinking, communication, coordination, and change management in this course. Email your discussion to everyone in the class.
Critiques

Critiques include criticism: strengths and weaknesses should come with a rationale for why a particular point is a strength or weakness. A rationale is NOT “in my opinion” or a restatement of the arguments made by the author of the paper. Rationales may be based on personal experience, published research, or logical argument. Published research should include citations.

A Word template is available for critiques on Blackboard (“HW0n YourName.doc”). Critiques should include four separate, clearly identified sections:

- a summary of the paper(s) or book,
- two or more points that you consider strong (agree with), and
- two or more points you consider weak (deficiencies, oversights, etc.)
- one or more points that you learned as a result of critiquing this work (this will not be graded but is in many ways the heart of the critique)

Be explicit! It is far better to write “The first strength is X. It is a strength because of the research reported in X... The second strength is Y. I consider it a strength because of my experience with Y...” than to expect them to be obvious. This may be a boring style, but over the years, many students have stumped me as to exactly what strengths and weaknesses they were trying to identify… and if I have trouble figuring them out, you’ll have trouble getting credit for them in your grades.
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<td>1 - Jan 18, 20</td>
<td>Software CMM® v1.1</td>
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<td>2 - Jan 25, 27</td>
<td>ISO 15504, ISO 12207, ISO 15288, CMM Integration</td>
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<td>3 - Feb 1, 3</td>
<td>TQM and ISO 9001</td>
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<td>People, Culture, Change Management Feb 8 – Project 1 due.</td>
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<td>5 - Feb 15, 17</td>
<td>Criticisms of Process Management</td>
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<td>Agile Methods</td>
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<td>Project Management, Customer Relationship Management</td>
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<td>Software Engineering, Support Processes (QA, CM)</td>
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