Credit. This is a 5 credit course.

Course contents. See attached research proposal.

Learning objectives. Upon successful completion of this course, the student will:
- Understand and be able to implement a CMMi software development process
- Understand and be able to implement a Scrum and XP development process
- Understand and be able to implement a CMMi software development process using an agile methodology

Deliverable. I will produce two papers and a final report. The first paper will be on CMM/CMMi, the second paper will be on Agile Development Methodologies, and the final report will be on the topic of integration of CMMi with Agile Development Practices. This report will include a summary on agile development processes as well as CMMi. The ultimate goal of the report will be to summarize the latest research on integrating Agile development processes with CMMi. I also plan that this report will include a summary on how one would implement Agile development processes within CMMi level 3. The final bibliography of this report will extend beyond the list of readings which I have currently as I get into the topic.

Grading. The student is expected to give regular project updates throughout the quarter. The final project report should be written in the form of a research paper. Grade computation:

CMM Paper: 25
Agile Paper: 25
Final Report: 35
Project updates: 15%

Research Proposal

Motivation:
As a Software Development Manager at Amazon.com, software development methodologies are of great practical interest to me. This independent study will provide me with a background on the CMMi development process, Agile Development Methodologies, as well as the use of them in combination. I would ideally take a course on this topic, but none is offered. I expect that what I learn in this course will contribute to my team and my professional development.

Proposed Approach:
CMM/CMMi is a “tried and true” development process originally created by the Software Engineering Institute to allow the government to rate contractors. The practices espoused in CMMi have been widely used across many software development organizations. Agile Development Methodologies have only existed explicitly as such for about a decade. There were created largely as a reaction to the lack of agility present in many CMMi implementations. As such these processes are often thought of as incompatible approaches to software design and development. Recent research suggests that they are indeed compatible and allow an organization to reap the best of both. That is the agility from Agile Development Methodologies which is needed for a fast-paced business environment as well as the predictability of a CMMi organization.

Per the below schedule, I will first become familiar with CMM and CMMi processes. Next, I will research two of the more prominent agile software development methodologies, scrum and XP. I will then do an investigation on the combination of CMMi and Agile Development. This will include early thinking on the topic about whether or not they are compatible, through to the latest research providing a means to integrate CMMi level 5 with agile processes.

Schedule:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Deliverables</th>
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<tbody>
<tr>
<td>1</td>
<td>CMM</td>
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<tr>
<td>2</td>
<td>CMMi</td>
<td>Progress Report</td>
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<tr>
<td>3</td>
<td>What is Agile Development</td>
<td>Paper on CMMi</td>
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<td>4</td>
<td>Scrum</td>
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<td>5</td>
<td>Extreme Programming(XP)</td>
<td>Progress Report</td>
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<tr>
<td>6</td>
<td>Early Thinking on CMMI With Agile</td>
<td>Paper on Agile</td>
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<tr>
<td>7</td>
<td>CMMI With Agile</td>
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<tr>
<td>8</td>
<td>Write Final Report</td>
<td>Draft of Final Report</td>
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<tr>
<td>9</td>
<td>Revise Final Report</td>
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</tr>
<tr>
<td>10</td>
<td>Revise Final Report</td>
<td>Final Report</td>
</tr>
</tbody>
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Initial Reading List:


Anderson, D.J.; , "Stretching agile to fit CMMI level 3 - the story of creating MSF for CMMI®
no., pp. 193- 201, 24-29 July 2005

Grigori Melnik and Frank Maurer. 2004. Introducing Agile Methods: Three Years of
Computer Society, Washington, DC, USA, 334-341.

Paul E. McMahon. 2010. Integrating CMMI and Agile Development: Case Studies and Proven
Techniques for Faster Performance Improvement(1st ed.). Addison-Wesley Professiona

Sean Cohan and Hillel Glazer. 2009. An Agile Development Team's Quest for CMMI\&
Society, Washington, DC, USA, 201-206. DOI=10.1109/AGILE.2009.24
http://dx.doi.org.offcampus.lib.washington.edu/10.1109/.2009.24

doi: 10.1109/Agile.2008.10

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I expect that this reading list will expand during the writing and research needed for each of
the papers and the final report.