Course Overview

This course introduces you to applying software measurement; from need identification through analysis and feedback into the process. Much of the course material used to demonstrate the concepts are based on how software measurement is used by managers and practitioners in industry today. The content of the course is taught within the framework of the software engineering process. The topics covered in this course are used broadly in other core courses in this program.

Course Objectives

As we cover topics which include process definition techniques, function point analysis, software measurement framework, measuring software quality, and goal-question-measurement, you will achieve specific learning objectives. Successful completion of this course will provide you with the knowledge and skills to:

- learn basic and advanced measurement concepts as applied to software engineering
- be prepared to apply measurement and make decisions based on the data in a software engineering environment
- be able to develop a measurement plan that can be implemented and used to improve an organization’s software engineering practice and management processes.

Organization

The course consists of a series of lectures conducted by faculty and staff from the School of Computer Science at Carnegie Mellon University. The lectures, captured on DVDs, lead the way through a series of assignments and chatroom discussions.

Your best approach to successfully complete the course is to follow three simple steps.

1. Do the assigned readings.
2. Watch the lecture.
3. Complete the assignments.

All course materials, with the exception of the DVDs, will be available on the Carnegie Mellon Blackboard System. Email with specific information about the course Blackboard site will be sent to you prior to the start of class.

Feedback and Support

Office hours and computer conferences will take place in the Virtual Classroom on the course Blackboard site. Your instructor for the course will conduct course discussions in the Virtual Classroom every week, specific time to be determined. Should your instructor decide to use another chat tool, they will notify you at the beginning of the course. Other times, your instructor will be available by email. In addition,
you should feel free to post questions and comments on the course electronic bulletin board at anytime to discuss the readings, the course, and issues related to software engineering with members of your class.

Readings

You are required to complete a series of readings related to each lecture. These weekly readings are used to stimulate discussion and as a way to expose you to course topics not covered directly in the lectures. For most lectures, you are assigned a few readings to complete before watching the lecture.

There is not a required textbook for this course.

Evaluation

The course grade will be determined by five factors.

- **Assignments**: There are three assignments. The purpose of the assignments is to give you practice in applying the concepts learned in class.

- **Project**: The final project is an aggregate of the homework assignments. Expanding on the output from your homework, you will develop a project that would be representative of a complete instantiation using the measurement process framework for a measurement goal.

- **Debate**: You will watch two debates and then write a critique.

- **Final**

- **Instructor judgement**: The instructor reserves the right to raise or lower your quantitatively determined grade based on their judgement of your mastery of course material; this judgement will be based in part on your ability to participate constructively in class discussions.

Schedule

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Topic</th>
<th>Reading Assignment</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction &amp; Software Measurement Principles</td>
<td>Rombach 89, Pfleeger 95, Rozum 94b</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Measurement Framework &amp; GQM</td>
<td>Dyes 99, Chillarege 92, Rozum 00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Software Measurement Definition 1</td>
<td>Goethert 92, Thomsett 95, Putnam</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Software Measurement Definition 2</td>
<td>Rozum 93, Rozum 92, Haynes 96, Roedler 96</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Quantitative Project Management</td>
<td>Assignment One</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Process Definition Techniques</td>
<td>Hanrahan 95</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Measuring Software Quality 1</td>
<td>Walrad 93, Smith 00</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Measuring Software Quality 2</td>
<td>Costello 95, Grady 94</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Measurement Indexes</td>
<td>Assignment Two</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Project Management Offices and Portfolio Management</td>
<td>Kemerer 90, Chatman 95</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Debates</td>
<td>Rozum 94, Kaplan 92, Kaplan 93, Kaplan 96</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Software Measurement and Statistical Process Control</td>
<td>Daich 95</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Measurement &amp; Software Process</td>
<td>Debate Critique</td>
<td></td>
</tr>
</tbody>
</table>

Final; Project
Bibliography


