Syllabus – SSW 533 Software Measurement and Estimation

CATALOG COURSE DESCRIPTION:
This course is an in-depth study of software measurement and estimation with an introduction to financial measurements. The successful student will learn to measure and predict the size, complexity, and quality of software development projects by a variety of methods. Commercially available tools are used, as well as engineering rules, benchmarks, and a variety of predictive/estimation methodologies.

PREQUISITES REQUIRE: This is a quantitative full credit Master’s course. It is quantitative. Basic probability and statistics, along with algebra and basic calculus, are required. Excel is used as a modeling tool. If you do not know how to use excel, some problems will be more difficult and time consuming for you.

DELIVERY METHODS: This course consists of lectures, readings, videos, quizzes, and projects. Webct is the delivery mechanism, with the exception of lectures for on-campus and modular courses.

COURSE OBJECTIVES: This purpose of this course is to provide the students with the following capabilities:
* The ability to define effective metrics for any software development situation
* To understand the factors and issues concerning software effort estimation
* The ability to successfully estimate the size of a software project
* The ability to simplify the design of the project in order to reduce the cost.
* The ability to successfully estimate/measure/predict the quality of a software project
* The ability to accurately track the progress of a software project
* The ability to understand basic financial measurements that relate to software projects


SOFTWARE: Excel, estimation tools
STUDENT PERFORMANCE ASSESSMENT:
In semester format, the course has quizzes (~130 points), projects (~120 points), and a final (~100 points). All are graded. The projects will follow the lectures as described below.

In modular format, the quizzes will be self-assessments. There will be 2 or 3 significant projects, encompassing the smaller projects given in the semester format (~120 points). There will be a final (~100 points).

GRADING AND CRITERIA FOR PASSING:
Final grades will be awarded in accordance with the following scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>88 - 100</td>
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<tr>
<td>B</td>
<td>75 - 87</td>
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<tr>
<td>C</td>
<td>65-74</td>
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<tr>
<td>F</td>
<td>&lt;70</td>
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Lesson Schedule for
SSW 533 Software Measurement and Estimation

1. Models, What to Measure
   • Project – Theater Tickets – What should you measure?
2. The Basics of Measurement Theory, Variation, Error
   • Project – Define a metric
3. Measuring Size – Length and Functionality (LOC and FPs)
   • Project – Counting FPs
4. Complexity
   • Project – Complexity Counting with Tools
5. Measuring OO Projects
   • Project – Use Case Estimation
6. Estimation 1
   • Project - Estimating Theater Tickets
7. Estimation 2: Algorithmic Models
   • Project – Estimation with Tools
8. Agile Estimation
9. Defects
   • Project – Predicting Delivered Defect Densities
10. Reliability
    • Project -- Evaluate Alternative Configurations and Designs
11. Availability, Presenting to Management
    • Project – Availability Metric
12. Measuring Progress
Project: Evaluation of Costs of Alternative Designs