Course: **SENG 691C – Software Engineering Economics**

**Semester:** Summer 2019

**Course Format and Credit hours:** 1 hr Live Class Discussion/Problem Solving, 1-2 hrs Video Lectures, 1 hr Discussion Board/Projects for total of 3 hours Course Credit

**Prerequisites:** SENG 510 or consent

**Instructor:** Dale G. Dzielski, Dale.Dzielski@mail.wvu.edu, Office phone: 304-293-9135

**Communication Plan:** Please use the eCampus Course Message feature to communicate with anyone in the class and myself. All course material and assignments will be provided using the eCampus features. The Instructor will attempt to respond to learner questions within 24 hours of receipt of inquiry on weekdays and 48 hours on weekends.

**Schedule:** Mondays 6:00 to 7:00 pm

**Location:** WVU eCampus, [https://ecampus.wvu.edu/](https://ecampus.wvu.edu/)

**Office Hours:** Upon Request

**Course Description:** This course covers the software engineering economics fundamentals to real-world software economic issues, software lifecycle economics, and concepts of risk and uncertainty to software development projects.

**Course Objectives:** Upon successful completion of the course, students will be able to:

1. **Understand** and **apply** the software engineering economic fundamentals to real-world software economic issues.
2. **Illustrate** through examples the key software lifecycle economics, including product and process aspects portfolios; proposals; investment decisions; pricing and costing, and earned value management (EVM).
3. **Relate** and **interpret** the “good-enough” principle; friction-free economy; ecosystems, leverage-point modeling, and outsourcing.
4. **Use** best-practice economic analysis methods.
5. **Apply** the concepts of risk and uncertainty to real world software development projects, including goals; estimates; prioritization and decision making.

**Required Textbooks:**

**Recommended Textbooks:**


Reading assigned from various Internet sources provided in eCampus by the instructor to include the body of knowledge from these areas:

http://resources.sei.cmu.edu/library/ - Software Engineering Institute Digital Library
https://lib.wvu.edu/ - WVU Library Collections

Technology Needed:
Students must have technology compatible with the standard requirements of the current platform with eCampus access, https://ecampus.wvu.edu/, and Windows Media Player. Student assignments are primarily required to be turned in using Microsoft Office Product Suite therefore reasonable proficiency in this product is required.

Materials Needed: Students must have a current University email account and WVUID with password.

Grades:

<table>
<thead>
<tr>
<th>Task</th>
<th>Total Grade (Points)</th>
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</thead>
<tbody>
<tr>
<td>Economic Problem (5 x 5 points)</td>
<td>250</td>
</tr>
<tr>
<td>Case Study 1 – Cash Flow</td>
<td>100</td>
</tr>
<tr>
<td>Case Study 2 – Risk Analysis</td>
<td>100</td>
</tr>
<tr>
<td>Discussion Board (5 x 20)</td>
<td>100</td>
</tr>
<tr>
<td>Cost Proposal Team Project</td>
<td>150</td>
</tr>
<tr>
<td>Online Exam 1</td>
<td>150</td>
</tr>
<tr>
<td>Online Exam 2</td>
<td>150</td>
</tr>
<tr>
<td><strong>Total Class Points</strong></td>
<td><strong>1,000</strong></td>
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Grading Scale (points):
- 900 – 1,000 A
- 800 – 890 B
- 700 – 790 C
- 600 – 690 D
- 0 – 590 F

Grading Policy:
A late assignment equals no assignment. Late economic problems, case studies, discussion board posts, and project assignments will not be graded and count as a zero for the portion of the paper or project that is late. Exam grading appeals must be in writing on the day the exam is returned. There are no make-up exams except by prior arrangement with the instructor.

Every attempt will be made to grade Exams, Economic Problems, and Discussion Board Posts, within seven days of the due date. Other assessment grades will be graded within the same length of time the student had been given to complete the assignment, e.g. case studies are given two weeks for the student to complete; therefore, the instructor will attempt to provide the grade within two weeks after the case study had been turned into the instructor.
<table>
<thead>
<tr>
<th>#</th>
<th>Module</th>
<th>Objectives - The student will:</th>
<th>Module Objectives – The student will be able to:</th>
<th>Related Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Software Engineering Economic (SEE) Concepts</td>
<td>Understand and apply the key software engineering economic fundamentals to real-world software economic issues.</td>
<td>Define key SEE concepts and terminology presented in the course. Apply methods to solve economic problems. Discuss basic SEE topics with other learners.</td>
<td>Reading Economic Problem Discussion Board Online Exam 1</td>
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<td>2</td>
<td>Software Engineering Methods &amp; Analysis</td>
<td>Illustrate through example the key software life cycle economics, including product and process life cycles; portfolios; proposals; investment decisions; pricing and costing, and earned value management (EVM).</td>
<td>Develop a cost proposal on a team. Discuss key software life cycle economics with other learners. Demonstrate knowledge of process life cycle and other economics using economic expressions.</td>
<td>Reading Economic Problem Discussion Board Team Project – Cost Proposal Online Exam 1</td>
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<td>3</td>
<td>Software Engineering Cash Flow</td>
<td>Relate and interpret the “good-enough” principle; friction-free economy; ecosystems; leverage-point modeling, and outsourcing.</td>
<td>Develop a cost proposal on a team. Discuss cash flow related to managing software engineering projects. Solve SEE problems related to ecosystems. Complete an exam related to SEE concepts, expressions, and other SEE ideas such as friction-free economy.</td>
<td>Reading Economic Problem Discussion Board Team Project – Cost Proposal Online Exam 1</td>
</tr>
<tr>
<td>4</td>
<td>Project Evaluation</td>
<td>Use best-practice economic analysis methods.</td>
<td>Discuss project evaluation techniques among other learners. Develop COCOMO project model using economic analysis methods.</td>
<td>Reading Economic Problem Discussion Board Case Study 1 – COCOMO Online Exam 2</td>
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<tr>
<td>5</td>
<td>Risk Analysis</td>
<td>Apply the concepts of risk and uncertainty to real world software development projects, including goals; estimates; prioritization and decision making</td>
<td>Describe your understanding of risk and uncertainly with other learners. Complete an exam related to Risk and Project Evaluation. Solve real world software project estimation problems.</td>
<td>Reading Economic Problem Discussion Board Case Study 2 - Risk Online Exam 2</td>
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Economic Problems:
The economic problems (analytical word problems) will be worth 50 points each with a total of 5 problems throughout the course for a total of 250 points of the grade. Each economic problem will focus on a specific area of software engineering economic. The learner will be expected to complete the computational quantitative analytical problem on their own based upon the instructions provided in the course by the instructor.

Discussion Board:
The discussion board is used to allow student to student interaction. Questions will be posed by the instructor on various topics related to Software Engineering Economics and the learners will be required to discuss the issues with the other class learners. Each discussion board will be worth 20 points of the grade.

Case Studies:
The case studies will provide a more in-depth software engineering economic problem to solve involving the use of various techniques and methods covered in the course. Each case study is worth 100 points. One will utilize current software engineering project management analytical techniques and the other will focus on applying Risk Analysis techniques.

Online Exams: The two online exams are designed to gauge the student’s understanding of topics covered in assigned reading, lectures, and homework assignments. Neither exam will be comprehensive although later knowledge may build upon earlier knowledge gained in class. The format will be using eCampus exam tools and may require proctoring services used by WVU Online with a small fee at the time of testing. No outside sources will be allowed. Online Exam Rubric will be provided on the exam and each exam is worth 150 of the class grade.

Academic Integrity: Students who practice academic dishonesty, such as cheating or plagiarism, will be penalized. Check the *MLA Handbook for Writers of Research Papers Seventh Edition* (ISBN: 9781603290241) for proper citation of others' work to avoid plagiarism in written assignments. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please visit the Office of Student Conduct Web page which has links to the WVU Campus Student Code and other relevant documents and forms.

If you have not already done so please go to the Plagiarism Avoidance Tutorial website, complete the Tutorial & Take the Test. Please e-mail your certificate for the test to the Software Engineering Program Coordinator, Dale.Dzielski@mail.wvu.edu. Please refer to the New Student Orientation Manual for Online Courses. The document provides information on eCampus, Mix, STAR, the Help Desk, billing policy, WVU Bookstore and important phone numbers.

Attendance Policy: Students are expected to attend every class. Archives are made available to review if missed due to personal or work related absence that should be communicated with the instructor when possible. Consistent with WVU guidelines, students absent from regularly scheduled examinations because of authorized University activities will have the opportunity to take them at an alternate time. Make-up exams for absences due to any other reason will be at the discretion of the instructor.

Inclusivity Statement: West Virginia University community is committed to creating and fostering a positive learning and working environment based upon open communication, mutual respect, and inclusion.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangement with Disability Services (293-6700). For more information on West Virginia University's Diversity, Equity, and Inclusion initiatives, please see http://diversity.wvu.edu.