Narrative Summary of this Course:

This course exposes graduate students to proficiencies in competencies necessary for determining problems, solutions, requirements, processes, and architecture — including theory, instruction, homework, projects, and tests. Quizzes are used to benchmark the student's familiarity with the subject as they pace themselves through study and learning. Feedback via quizzes is essential in keeping track of the student's work on assignments. As such, quizzes are not graded.

Without encouragement, the class will find it rather easy to be curious and thoughtful about the course materials. Individually, each student shall take care to keep notes on what questions they have, the answers to those questions, and the understanding they derive from thinking about the questions and their answers.

You are afforded the latitude to explore ideas without the fear of “grading”. There is a time and place for grades. Consequently, the quizzes become a focal point of discussion both inside and outside classes. A typical quiz might involve a short video on a topic related to a homework assignment or an upcoming test. It is a good learning environment for you to discuss the topic and your ideas with the class (the class includes the professor). The homework assignments are geared to provide a “limited” time span to think about the concepts presented in the classroom. Reminder: there are only 24 hours in a day. In many instances, the homework is the first time you will be exposed to certain concept. Unlike the quizzes, homework is provided with feedback as a benchmark of your progress through the material. The comments are formative as they will be used as topical guidelines for subsequent homework as well as other assignments. **All work in this course is individual work.** However, that is not to say
that you should ignore the work and thinking of other students in the class (again, remembering to think of your professor as a student in the class). Copy and use freely anything that can help you, but remember to cite the work of others to give just due to their efforts. All works of authorship are copyrighted the moment you or someone else writes them down, objectifying those thoughts. Borrow a thought, give credit.

For your Wall Project, you are expected to complete a beginning-to-end analysis of a set of designs, comprehensive architecture, including stakeholders and their needs, requirements, design parameters, measures of performance, development schedule, implementation risks, lifecycle planning issues, and means to test, verify, and validate your final chosen solution. The assigned project typically involves seemingly simple concepts that require the student to think through the reading and lectures so that the interrelatedness of the project aspects can be understood and made tractable for your final design concept. Planning your work to accomplish the design task is a primary focus for your work. As such, scenarios must be developed to perform appropriate tradeoffs to help determine the best plan. Very rapidly your ideas will diverge from your classmates as you develop your notions of what are acceptable solutions to satisfy your ideas. Typically, these differences will be amplified by differences in student backgrounds, biases, and interests. Consequently, each project report is unique. You can expect that individualized feedback will be time-consuming for both me and you (with your follow-up). The result is a personalized set of responses to assignments that supplement the student’s knowledge with specific items that are needed to extract a great amount of information from the classroom work. In this regard, I am your personal tutor with the agreed goal of assuring that you will understand and can demonstrate all of the learning objectives. The students taking this class seem to very much enjoy this approach of instruction and go on to apply the lessons learned in their professional careers. Please take advantage of this opportunity to engage in discussions with the professor and your classmates.

**Textbooks**

Mark W. Maier and Eberhardt Rechtin
*The Art of Systems Architecting*

Benjamin S. Blanchard and Wolter J. Fabrycky
*Systems Engineering and Analysis*
Homework Assignments

X-1 What is a principle? What are several principles of or related to architecting?
X-2 What is a problem? Describe and discuss a Problem whose symptom is homelessness.
X-3 What is a requirement? What are the requirements to solve the Problem you identified in X-2?
X-4 What are the procedures that should be used to determine that a solution to a problem is a new automobile?
X-5 What are the procedures that should be followed to determine the requirements for the new automobile you indicated in X-4?
X-6 Submit revised DRAFT of Wall Project, with a focus on architecture for your solution
X-7 Submit FINAL Wall Project

Reading Assignments

Due Dates for Readings in *The Art of Architecting*:

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<tr>
<th>Week #</th>
<th>Assignments</th>
<th>Page #s</th>
<th>Given</th>
<th>Due</th>
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<tr>
<td>Week 1</td>
<td>Part 1-Introduction and Ch. 1 1-27</td>
<td>26 June 6  July X-1</td>
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<td>Week 2</td>
<td>Ch. 2</td>
<td>29-55</td>
<td>3 July</td>
<td>13 July X-2</td>
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<td>Week 3</td>
<td>Ch. 3 and Preface</td>
<td>57-75</td>
<td>10 July</td>
<td>20 July X-3</td>
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<td>Week 4</td>
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<td>87-123</td>
<td>17 July</td>
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<tr>
<td>Week 5</td>
<td>Ch. 6 and Midterm Exam</td>
<td>147-194</td>
<td>24 July</td>
<td>3 August X-5</td>
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<td>Week 6</td>
<td>Ch. 7</td>
<td>195-215</td>
<td>31 July</td>
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<td>Week 7</td>
<td>Part III and Ch. 8</td>
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<td>Week 8</td>
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<td>Week 9</td>
<td>Final Examination</td>
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Grading Method

The student grade is based on a combination of the assignments, discussions, Project, and Two Examinations. The weighting for each category is as follows:

• Homework Assignments...25 points total for X-1, X-2, X-3, X-4, and X-5
• Homework Assignments...25 points total for X-6 and X-7
• Quizzes...0 points (always be prepared to take a quiz or answer a question)
• First Examination...10 points
• Final Project (X-8)...40 points
• Presentation...10 points
• Final Examination...10 points
• Notebook of your musings, questions, insights, and quips...15 points
• Extra Credit.............. Let’s discuss

It is my intention to work with you to build your knowledge in Systems Engineering so you have a superior understanding and proficiency. To that end, I will assist you with whatever you need to learn the materials. I commit my efforts to your success. Please take advantage of my offer.

Grading Scale & Points

A 93+
A- 90-92
B+ 88-89
B 82-87 B- 80-81
C+ 78-79 C 72-77
C- 70-71 D 60-69
F <60

Reach Back Policy

Portland State University can better serve its students (users) and student sponsors (customers) through continued communication between graduates and faculty. This policy formalizes the typical after-graduation communications and encourages
– Students to maintain contact with professors
– Faculty to remain in contact with former students
– Faculty to assist students in post-graduate activities
– Faculty to maintain currency with the DoD customer and its needs
– Students to keep up with the latest advances in systems engineering

With Kindest Regards, Gary Langford