Overview

This course will focus on dynamic and static models used in support of representation and simulation. The models will be looked at from the perspective of how they are utilized in the IT community and the software engineering process. Dynamic and static models play a growing and critical role in software engineering as well as the commercial and government world. Dynamic and static models are currently being utilized to analyze impacts associated to software changes, supply chains, battle field tactics, and safety of structures, just to name a few.

The course is focused on teaching a complete process in the use of dynamic and static models. Much like many IT areas, including the development of software, early implementations of dynamic and static model applications and tools were built in an ad hoc and experimental fashion lacking structure. The foundations of the course will be to provide the student with the skills required to design, develop, operate, and maintain dynamic and static models in a well defined process targeted at supporting defined mission objectives.

The course will start will a general backgound coverage of dynamic and static models to give the student proper terminology, concepts, and motivation to apply techniques that will follow. The course will look at both dynamic and static models and when best to utilize each as well as when to utilize simulations associated to the models. From there specific systems engineering approaches will be discussed that will provide insight and technique that will enable the student to select proper dynamic and static model candidates, apply sound engineering techniques, and build appropriate model-based products.

During the course the student will be responsible for assigned readings, information presented during lectures, group and individual assignments and exercises, and class discussion. The student is expected to have a basic understanding of software engineering technique and terminology.

Book

Applied Modeling and Simulation: An Integrated Approach to Development and Operation
David J. Cloud
Larry B. Rainey
ISBN 0-07-228303-3

Topics

Preliminaries and Context
- Introduction to Dynamic and Static Models
- Systems Science and Systems Engineering
- A Framework for Modeling and Simulation

Process Organization
- Defining a Need for Dynamic and Static Models with applied Simulations
- Creating a Model Baseline

Application
- A Conceptual Approach to Developing Dynamic and Static Models
- Designing Models
- Producing and Managing Data
Dynamic and Static Models

- Implementing Solutions in Hardware and Software
- Network Issues
- Information Security

Note: As time allows, the above topics will be covered. The listed topics may not necessarily be presented in the listed order and may be adapted to suit special interest areas of the class.

Grades

Each student will be required to complete the following:

<table>
<thead>
<tr>
<th>Task</th>
<th>% of Total Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm</td>
<td>35</td>
</tr>
<tr>
<td>Final</td>
<td>45</td>
</tr>
<tr>
<td>Assignments/Projects</td>
<td>20</td>
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</tbody>
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Tests

All tests are designed to gauge the student’s understanding of topics covered in assigned reading, lectures, and homework assignments. A midterm and final will be given. The final will be comprehensive.

I will make every attempt to grade and return all tests with comments by the following class. At which time the tests will be reviewed in class. Partial credit will be given as appropriate. All rational disputes over incorrect answers will be evaluated. The result may be a positive or negative adjustment to the problem. Points will be added if indeed warranted. However, if your argument identifies that you are less correct than I originally thought; additional points may be subtracted from the question not to exceed the maximum value of the question of course.

Grading Policy

A 100 – 90
B 89 – 80
C 79 – 70
D 69 – 60
F 59 –

Assignments with no name will not be graded and will be discarded.

Do not use a pen to take tests or assignments. If you elect to use a pen, a 20% deduction will be taken from the top of the grade.

Make-up Exams

Make-up exams may be given under special circumstances. It is your responsibility to arrange for a make-up prior to the examination.

Cheating

Any individual caught cheating will receive a 0% for the activity in question and may be removed from the course. Bottom-line, be smart and do your own work.
Late Assignments

Assignments may be handed in late under special circumstances. It is the student’s responsibility to negotiate the terms of an extension to an assignment.

Course policy is a reduction of 20% per class that the assignment is late.