Computer Engineering Department  
College of Engineering  
San José State University  

Enterprise and Application Frameworks  

(CmpE 296U -- Fall 2002)  

COURSE NUMBERS: CmpE 296U  

LOCATION: Engr. RM# 232  

TIME: Thursday 6:00 p.m. to 8:45 p.m. (check the time)  

INSTRUCTOR:  
Dr. M.E. Fayad  
Computer Engineering Department – RM#155  
College of Engineering  
San José State University  
One Washington Square  
San José, CA 95192-0180  

E-mail: fayad@sjsu.edu  
              fayad@computer.org  
              fayadm@acm.org  

Phone: (408) 924-4150  
Fax: (408) 924-4153  

URL: http://www.engr-cmpe.sjsu.edu/fayad  

Course URL: http://www.engr-cmpe.sjsu.edu/fayad /current.courses/cmpe196U  

OFFICE HOURS:  
               Tuesday & Friday 10:00 To 12:00 p.m. Engr. Rm# 155  
               Other times: stop by my office anytime.  

REQUIRED TEXTBOOKS:  


**REQUIRED ARTICLES:**


**SUPPORTING BOOKS:**


**OTHER RESOURCES:** Supporting texts and articles will be available in the library. Instructor notes will be available on the course web page.

**Course Prerequisites:** 100w (Writing Skills), CmpE 126 (Data Structures & Algorithms), CmpE 131 (Software Engineering I), CmpE 135 (Object-Oriented Analysis and Design) or PERMISSION. Good background in software analysis and design, UML, C++, and Java will be a plus.

**COURSE OVERVIEW:**

Nowadays, software engineering is moving forward on an architecture-based development conception where systems are built by composing or assembling components that are often developed independently. The key to making a large variety of software products and reducing time to market is to build pieces of software where the development effort can serve in other products as well. Thus, large-grained components are becoming a practical part of an enterprise component strategy. Such generic components usually include interactions with other components, code, design models, design patterns and specifications. In addition, they must provide ways to be adaptable and customizable according with the client's needs. In this context, enterprise and applications’ frameworks offer an appropriate base for waving the software architectures, components, and core requirements into one container that is adaptable, customizable, extensible, and reusable.
An Enterprise/Application Framework is a software architecture exposing a rich set of semantics and modeling paradigms for developing and extending enterprise applications. Enterprise and applications’ frameworks are, by design, the cornerstone of an organization's systems engineering activities. Enterprise and applications’ frameworks offer a streamlined and flexible alternative to traditional tools and applications, which feature numerous point solutions integrated into complex and often inflexible environments. Enterprise and applications’ Frameworks play an important role since they allow reuse of design knowledge and offer techniques for creating reference models and scalable architectures for enterprise integration. These models and architectures are sufficiently flexible and powerful to be used at multiple levels, e.g. from the integration of the supply chain of a multi-national corporation, to the construction of a global virtual factory, and down to the monitoring and control system for a single production cell.

These frameworks implement and enforce well-documented standards for component integration and collaboration. The architecture of an Enterprise framework provides for ready integration with new or existing components. It defines how these components must interact with the framework and how objects collaborate. In addition, it defines how developers work together to build and extend enterprise applications based on the framework. Therefore, the goal of an enterprise framework is to reduce complexity and lifecycle costs of enterprise systems, while ensuring flexibility.

The course is designed to help organizations effectively develop or adapt enterprise framework technology in the real world. This course provides treatment for:

1. Comprehensive technical and management guidelines: ranging from specifying enterprise framework structures and behaviors, to cost estimation and selecting the right enterprise framework and tools for the job.
2. Technical issues such as documenting frameworks and how to utilize enterprise frameworks.
3. Real world issues such as keeping your expensive framework up-to-date, ferreting out hidden costs, grappling with the problems of frameworks, and providing insight into successful development or adaptation of enterprise and applications’ frameworks.
4. Limitations such as maintaining frameworks and adding value to your business.

This course is intended to provide valuable, real world insight into successful development and/or adaptation of OO Enterprise Frameworks, by describing the problems with frameworks, explaining the issues related to the development and adaptation of enterprise frameworks, selecting the right methods and tools for building frameworks. The book will be derived from actual experiences, successes and failures, and is presented in a practical, easy to understand manner. This is information that readers can apply today. The key issues are:

- What are the key enterprise and application issues?
- How to develop enterprise and application frameworks and what are the framework design guidelines?
- What kind of evolution does an enterprise framework undergo and how is it correlated with the enterprise life span?
- How can the adaptation of enterprise and application framework be accomplished with minimum impact on the cost and schedule?
- Understand make vs. buy decisions, selection guidelines, and how to select and adapt the right enterprise framework for the job.
- Understand the implication of enterprise business requirements on the framework design.
- How to use your large-scale enterprise framework and how to protect your investment.
- How to deal with resource requirements, enterprise framework integration problems, framework reporting, and others.
• What are the impacts of enterprise and applications’ frameworks on the national and global economy?

This course helps organizations engineer or utilize enterprise frameworks effectively by citing examples from the real world. This book combines the actual experiences and lessons learned from developing and/or adapting enterprise framework.

COURSE FORMAT:

During the semester I will cover the basic topics in the more traditional lecture format. A design session will be taken place every 4 weeks. There will be four structured exercises (Team Exercises), a midterm test, and a take home final exam. Students will work on a project of their choice during this period and submit a paper-length report (about 15 to 20 double-spaced pages including figures and references) by the last day of classes. Project presentations will be scheduled during the last and the final’s weeks.

GRADING (TENTATIVE):

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Team Projects</td>
<td>70%</td>
</tr>
<tr>
<td>Team Problem Statement</td>
<td>5%</td>
</tr>
<tr>
<td>midterm exam</td>
<td>20%</td>
</tr>
<tr>
<td>Project presentation:</td>
<td>5%</td>
</tr>
<tr>
<td>Short Essays</td>
<td>5% (Optional)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>105%</strong></td>
</tr>
</tbody>
</table>

Professors are always asked how they grade. The below quote from Marilyn vos Savant's column (Parade Magazine, Sept 17, 1989) succinctly gives my criteria:

- If a person knows "what" happens, he has an average ability;
- If a person knows "how" it happens, he has a superior ability,
- If a person knows "why" it happens, he has an exceptional ability;

You may translate "average" to "C", "superior" to "B", and "exceptional" to "A".

Configuration of final grade (Tentative and subject to change):

**Note:** I will be using a +/-grading system.

FINAL GRADES:

Letter grades will be assigned at the end of the course. Final grades will be based on a competitive curve. At least the top 25% students will receive an 'A'. Graduate and undergraduate students are graded separately. Students will be informed of their standing at intervals throughout the course. Final grades are not negotiable. Unless there are mathematical errors, I will be unavailable to discuss final grades. Borderline cases will be considered with extreme care, and fair grades will be rendered.

ATTENDANCE POLICY:
Students are expected to attend all lectures. Absences will not relieve you of meeting course requirements. See the TA to pick up any material handed out in class. Make-up tests will only be allowed for those having a notice of illness from the Student Health Center or a family physician. Late assignments and reports will be downgraded one letter grade for each 24-hour period after the due date (all due dates are at the beginning of class period).

GROUP PROJECTS:

The class will be divided into groups of 3-4 (three preferred) for a term-long software project development. Students will be responsible for forming groups. Students will give a final presentation of their project work. Grading criteria and project ideas will be posted in a project Web page.

On occasion, students take advantage of group work, letting other members perform the bulk of the work while they reap the benefits of a good grade and can spend more time on other classes. This happens only occasionally, but it will not be tolerated in this course. Two policies will help prevent this:

1. **Twice** during the semester, group members will be asked to fill out a detailed peer assessment for group members. The aggregate score (throwing out scores deviating more than 25% of the average) will become part of the student's grading score (10% of the project score - that's 4% of total score).

   **Merely attending meetings won't be enough.** Group members must be prepared for meetings, make good suggestions, perform their share of the work, and work well with other members. The grading criteria for peer assessment is as follows:
   a. Has the group member attended meetings?
   b. Has the group member been prepared for group meetings? I.e. was he/she aware of assignment requirements, performed her/his duties, able to speak intelligently about the project, etc.? 
   c. Has the group member participated positively in meetings?
   d. Has the group member performed their share of the work, as assigned?
   e. Rate the quality of this group member's input to group discussions and design issues.
   f. Has the group member been able to work well with others?
   g. Rate the overall value of this group member to the project.
   h. Rate the level of initiative this group member has exhibited in the project.
   i. Other comments?

2. Groups experiencing problems with a student should let me know there's a problem. Do this early in the semester. My experience is that group members wait until it's too late to take action. My objective is to ensure that each group member has the opportunity to succeed. I will handle the situation and ensure there is no animosity while resolving the problem. Usually, a brief discussion will clear the matter up entirely and without further problems.

LECTURE MATERIALS:

1. During class time, we will concentrate on the difficult topics, spending less time on the easy topics.
2. Students are expected to use the reading materials to pick up topics aren't covered in detail during the class lectures.
3. Some topics from the reading materials may be on the homework, exams and/or projects, even if they were not covered in detail during the class.
4. Required text.
5. Questions may be posted on the Web/Lecture.
6. Students are expected to check the Web regularly.

TEAM PROJECTS:

1. Team projects must be handed in or before the start of the lecture on the due date.
2. Late projects and reports will be downgraded one letter grade for each 24-hour period after the due date (all due dates are at the beginning of class period).
3. Team projects must be done in groups of four to six (4-6) (no more than six per team).
4. Each team has to select a name and must handed in or e-mail the contact information of its members (name, phone, e.mail) during the last lecture of week 2.
5. Each team will be biding on the selection of their own project.
6. All the deliverables of team projects must be typed (hand written projects will not be accepted).
7. All materials will be handed in as **hard copy and electronically** (MS Word format).

PROJECT PRESENTATIONS:

Presentations start in the final weeks of the semester. Presentation time is 30 minutes total (25 for presentation and 5 for questions). You must review the presentation material with me before you present. Your presentation material will be part of the class notes on the course web. Electronic format should be submitted for web posting (PP format).

SHORT ESSAYS:
Individual efforts. Short essay (3 to 10 pages) requirements will be posted on the web.

PROBLEM STATEMENT REQUIREMENTS FOR TEAM PROJECT:
Check the course web page

DELIVERABLE DUE DATE:
Check the course web page

IMPORTANT NOTES:
Check the course web page