

# **67-307 - A Survey of Software Architectures**

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## ***Fall 2006, Mini 2 – Wednesday 6:30-8:30pm, PH 125B***

This course is a survey of and introduction to the kinds of architectures that will be found in the software industry. With projects growing ever larger, it is appropriate to discuss architecture at three levels – the Enterprise, Programs and Lines-of-Business, and the individual Project.

Course meetings will include a mix of lecture and in-class project work. Homework will include refinement of architecture projects started in class, reading, and short answer assignments.

There are no coding assignments for this class.

Upon completing this course, the student will be able to:

- Describe each kind of architecture: Enterprise, Program, Line-of-Business, and Project
- Describe the relationship between Enterprise, Program, Line-of-Business, and Project architectures
- Identify and apply changes that will have to be made to a Project architecture because of existing Enterprise and/or Program and/or Line-of-Business architectures
- Identify process errors when creating a Project architecture and describe appropriate techniques to resolve those errors.
- Review a Project architecture and identify errors and omissions
- Create a Project architecture given requirements, constraints, and any existing Enterprise, Program, or Line-of-Business architecture.
- Document a Project architecture in a Project Architecture Document

## ***Week 1 – Introduction to Software Architecture***

- Introductions and talk about the class syllabus, structure, grading, etc.
- Introduction activity
- Lecture – Introduction to software architecture
  - What is architecture – building, complex, city – project, line-of-business, enterprise
  - Where we are today in architecture - enterprise architecture, program / line-of-business architecture, project architecture
- Reading - basics of software architecture and on enterprise architecture.
- Homework - short answer questions to be turned in next class

## ***Week 2 – Enterprise Architecture***

- Short writing assignment, collect homework papers, discuss the homework.
- Enterprise architecture activity
- Lecture - Things that are defined at an enterprise level and how they affect a project's architecture. Constraints and issues.
- Reading - program and line-of-business architectures
- Homework - short answer questions to be turned in next class

## ***Week 3 – Program and Line-of-business architectures***

- Short writing assignment, collect homework papers, discuss the homework.
- Program / line-of-business architecture activity
- Lecture – What are program and line-of-business architectures? What has to be considered in these special kinds of projects? How do they affect a project's architecture? Constraints and issues.
- Reading - project architecture
- Homework - short answer questions to be turned in next class

## ***Week 4 – Project Architecture***

- Short writing assignment, collect homework papers, discuss the homework.
- Lecture on the process of doing project architecture - candidate solutions, prototyping, use case realizations, CRC card sessions.
- Project work - Create a project architecture given requirements, constraints, an Enterprise Architecture, and a Program or Line-of-Business architecture
- Reading – creating an architecture
- Homework - short answer questions to be turned in next class

## ***Week 5 – Documenting the Architecture***

- Short writing assignment, collect homework papers, discuss the homework.
- Lecture - What constitutes a completely documented architecture - and how you need to document why even more so than what. 4+1 views, Project Architecture Document.
- Project work – document your architecture
- Reading – architecture reviews

- Homework - short answer questions to be turned in next class

## ***Week 6 – Architecture Reviews***

- Short writing assignment, collect homework papers, discuss the homework.
- Lecture on how to do an architecture review. What you will see in real life (tm) and how to work around it.
- Discuss what will be the final – architecture reviews of your projects
- Project work – complete your architecture and documentation. If time allows, pair up with someone else to do a practice review of each other's architecture.

## ***Week 7 – Early Final Exams***

- This last course meeting is a time when those who want to take the final exam early may do so. Note that your whole team needs to be present, so everyone on your team will take the final at the same time.
- If your team is taking the final exam on the scheduled night (December 18), then you may attend class this evening to review other group's final projects or you may use the time to meet as a team elsewhere to finish your project.

## ***Final Examination***

- **Monday, December 18, 2006; 5:30-8:30 pm.** NOTE: the final exam starts an hour earlier than our normal class time, and is a different day of the week. This is a practical examination of your group project, and an evaluation of your skills as a reviewer of other projects. There is no effective means for me to give an individual an examination at a different time. If you cannot attend the final examination, you should consider dropping the class.
- Each architecture created during class will be reviewed. The creator (s) of the architecture will present the architecture to the class. Each other student will complete an architecture review form for that architecture. Persons performing the review should ask questions to clarify anything ambiguous in the presentation.
- When you are a presenter, be aware that the reviews will be somewhat abbreviated since we will have approximately 35 minutes per architecture for the review. A presentation is done by your whole group. Each person in your group will present some part of the architecture. Expect to do a 15-20 minute presentation (total), and allow 15 minutes for the other people to finish writing their review notes. Provide a copy of your architecture document for each person in the class. A printed copy is preferred, but you may email a link to a PDF or HTML version to the class by noon on Monday, December 18, 2006.
- When you are a reviewer, you will want to take notes during the presentation, then spend a few minutes refining your notes before the next architecture is presented.

## **Grading:**

- 15% Class Writing Assignment - at 6:35pm on class nights in weeks 2,3,4,5,6 there will be a 10 minute writing assignment based on the assigned reading. There is no makeup. You must be present to complete the assignment. Open notes (though you shouldn't need to refer to the notes).
- 30% Homework - complete, thoughtful, and submitted on-time by 6:45 pm on class nights; late homework will not be accepted
- 35% Project (quality of the architecture and documentation produced). A grading sheet with more details will be provided in week 4.
- 20% Final Examination (participation in the reviews, quality of the reviews, quality of the presentation). A grading sheet with more details will be provided in week 4.
- If warranted, I will curve final grades. (You really don't want me to curve grades if everyone has an A, now do you?!)
- You will impress me most by being prepared for class (do your homework) and participating in class.

## **Project**

- The project is intended to be a group project. The optimal group size is 3-5 people. You may select your own groups with possible adjustments by me to balance the group sizes and / or experience levels.
- The project will start in week 4.
- You should be able to complete a lot of the project during class time.
- You will submit a print copy of your project documentation to me at the final examination.

## **Course Notes**

- All course slides will be available online as PDF files. If you do not have Adobe Reader, you can get a free copy at <http://www.adobe.com> I suspect most campus computers already have it installed.

## **Reading Assignments**

- These will be papers on the internet that you can easily and freely download to read. These papers are in either HTML or PDF format.

## **Modeling Tools**

- For the modeling work, you may create diagrams with paper and pencil or pen, but be sure that the diagrams are accurate. The UML notation is quite precise.

- You may choose to use a UML modeling tool for your diagrams. Many free tools are available. A reference to a list of available tools may be found in the reference document. I will not accept electronic files for diagrams, since I do not have copies of every UML tool.

### ***Office Hours***

- PH 125B, 4:30-6:30 pm Wednesdays before class