Class Sessions:

Day: Tuesday  
Time: 3:30 pm – 6:10 pm  
Room: OHE 100C (Webcasted Course)  
Class Number: 32319D (DEN/Off-campus) and 32349D (On Campus)

Contact Information:

Instructor: Dr. Azad Madni  
Office hours: By Appointment Inly  
Office location: GER 207  
Office phone: (213)-740 3442  
E-mail: azad.madni@usc.edu

TA: Douglas Orellana  
Office hours: By Appointment Only  
Office location:  
Office phone: (617)-620-9376  
E-mail: dworella@usc.edu

Course website: http://www.uscden.net (DEN Blackboard, login required)

Course Objectives:

- To improve the students’ ability to ask the right questions and apply the right methods when architecting systems.
- To improve the students’ understanding of the role of system architects and their relationship to systems engineering.
- To introduce the students to new and advanced topics relevant to complex systems architecting and modeling.

Readings:


This text is out of print, but is available in the USC Bookstore as the “Course Reader” for SAE 549.

Second Reader for SAE 549, Fall 2010 “Selected Readings”  
These readings were culled from papers by Dr. Madni and Dr. M’Kendree.
Recommended Reading:


Notes:

Weekly class notes/charts will be provided. They will be posted on the DEN Blackboard page.

GRADE

Your grade will be primarily based on a set of weekly homework and a Research Paper. Weekly homework will account for 50% of the class grade and the Research Paper due at the end of the course, will account for the remaining, 50% of the class grade.

IF YOU WANT HELP

My office hours, phone numbers, and e-mail address are listed at the top of this syllabus.

Please include the Teaching Assistant Douglas Orrelana on distribution for any emails to me: dworella@usc.edu

I encourage you to e-mail me at any time to discuss research problems, questions, etc. The usual turnaround time for emails is 24 hours. If you don’t hear from us within that timeframe, please send us a reminder.

WEEKLY HOMEWORKS:

The homeworks will typically be assigned a week before they are due. They will be posted in the “Assignments” area on Blackboard. For example: Describe and analyze the architecture of a selected system in terms of any or all of the class concepts presented in Lecture XYZ. Your analysis should provide a quantitative and qualitative evaluation of the characteristics, benefits, and limitations of that system. Exploration of heuristics relative to that system is strongly encouraged.

The length of each weekly homework will be specified, and is generally limited to two pages, single-spaced, 12 point (in the normal profile orientation). Students may always request a waiver if they need to exceed this limit.
RESEARCH PAPER GUIDELINES

RESEARCH PAPER:

I expect the major paper to be of sufficient quality that it could be submitted to a prestigious IEEE/INCOSE/IIE/AIAA conference, with the eventual goal of submitting it to a journal. The major paper should address the following research problem:

Describe and analyze the architecture of a selected system in terms of any or all of the class concepts presented in lectures. Your analysis should discuss how the architecting process led to the architecture. The process should concern the steps taken, the questions asked, the people involved, the options generated, and the choice of/or decision techniques used. The analysis of the system should also include a quantitative and qualitative evaluation of the characteristics, benefits, and limitations of that system as a result of the aforementioned activities.

Subject to my approval, you get to choose the topic:
- It can be something that you have been personally involved in, or something that interests you.
- It should address a system where the development process is well-documented, and the measures of effectiveness, are available in the public domain.

APPROVAL: Submit a one-page proposal on the topic for approval, and is due on September 25th, 2012

FORMAT: Typed. A bibliography and contact list is essential, listing what sources you used. Be sure to provide the URLs and dates of any Internet sources used in your research. Be sure to include all necessary citations in the body of your text. Use clear style for citations and references.

The class website will provide guidelines on how to write a research paper, with suggestions for format, organization, structure, and content of good research papers. These guidelines are also applicable for weekly homework, and must be followed.

LENGTH: The Research Paper is should be about 12-15 pages, single-spaced, in 12-point type. The Research Paper is due on December 7th, 2012
ADDITIONAL INFORMATION

- Course policies and procedures for items like submitting homework (via DEN for all students) and adequate references are available on the DEN website (Current draft’s filename is 549_Policies&Procedures v081810.doc). **Students are responsible for understanding and following these policies and procedures.** Any changes will be announced.

- *Please feel free to e-mail me or the TA for help in structuring your research plan.* I will gladly work with you to identify sources, publications, Internet sites, etc.

- There have been previous attempts of students to copy someone else’s text into their papers or homework. *Never copy text in to your file without marking it with a citation. Never attempt to copy text into your file and then “.edit it into your own words.”* All the text that you turn in that comes from somewhere else must be marked as quotation. All the ideas that you turn in that come from someone else must be cited. The default punishment for plagiarism by a graduate student is failing the course, and expulsion is possible.

- If English grammar, spelling and syntax are not your strong points, *I strongly suggest that you obtain help in editing your text.* Your grade depends on the clarity of presentation.

**DELIVERY:** The homework, the research paper proposal, and the main research paper should be submitted to the DEN Blackboard system (http://den.usc.edu).

**GRADING:** Each research paper will be graded on the letter scale: A, A-, B+, B, B-, etc. Your research paper grade will require writing a paper that would be instructive or of general interest to systems architects, even ones with no interest in the particular system you analyze.

**LATENESS:** Any work submitted after the time it was due, will be docked 10% of the maximum possible score for the first 24 hours. For every additional day it is late, it will be docked a further 10% per day. You can request the instructor (copy the TA), for an extension, ahead of the deadline for an assignment. Most if not all assignments are due on Tuesday at 3:30 pm, hence an extension must be requested no later than noon on the day before, i.e. Monday, by 12 pm.

Any work submitted after 3:30pm on December 7th, 2012 will get an automatic zero.

Research papers are due on December 7th, 2012 at 3:30 pm No late papers will be accepted, and the student will be given an automatic F grade for the paper.
UNIVERSITY LEVEL ISSUES

STATEMENT FOR STUDENTS WITH DISABILITIES:

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

STATEMENT ON ACADEMIC INTEGRITY:

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one’s own academic work from misuse by others as well as to avoid using another’s work as one’s own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.
### Schedule of Class Sessions:
The exact schedule is likely to change, based on availability of guest lecturers. Dates of readings may change to align with other schedule adjustments. Changes will be announced.

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<thead>
<tr>
<th>Week</th>
<th>Session number</th>
<th>Planned topics</th>
<th>Readings</th>
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<tbody>
<tr>
<td>28 Aug</td>
<td>1</td>
<td>Introduction to the course, the instructor, and systems architeeting</td>
<td>“Preface” of Rechtin, 1991.</td>
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<tr>
<td>11 Sep</td>
<td>3</td>
<td>Guest Lecture #1</td>
<td>“Selected Readings”</td>
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| 25 Sep | 5 | Manufacturing & Production, Acceptance Testing & Operation | Ch 6, 7 and 8 from Rechtin, 1991. | “Selected Readings”:
| | | | Military Innovation in the Interwar Period by Murray and Millett |
| 2 Oct | 6 | Guest Lecture #2 | No additional readings. |
| 9 Oct | 7 | Human-System Integration: Implications for Systems Architecting and Engineering | “Selected Readings”:
<p>| 16 Oct | 8 | Guest Lecture #3 | No additional readings. |</p>
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<th>Session number: Planned topics</th>
<th>Readings</th>
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<tbody>
<tr>
<td>30 Oct 10: Guest Lecture #4</td>
<td>No additional readings.</td>
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| 6 Nov 11: Agile Systems Engineering | “Selected Readings”:
| 20 Nov 13: Guest Lecture #5 | No additional readings. |
| 4 Dec 15. Course Review | Ch 12 from (Rechtin, 1991) |
| 7 Dec | Research Paper Due |