

**SANTA CLARA UNIVERSITY**  
**Department of Computer Engineering**

COEN 120

Real-Time Embedded Computer Systems.

Fall 2001

<b>Web Page:</b>	<a href="http://cseserv.engr.scu.edu/nquinn/coen120/">http://cseserv.engr.scu.edu/nquinn/coen120/</a>	<b>Course Grading:</b>	
<b>Instructor:</b>	Dr. Neil R. Quinn Jr.	<b>Hmwrk - Participation:</b>	10%
<b>Office:</b>	CSTS	<b>Individual Project:</b>	30%
<b>Phone:</b>	554-5723	<b>Group Project:</b>	30%
<b>Office Hours:</b>	Mon, Thur 11-12am	<b>Final Exam:</b>	30%
<b>E-Mail:</b>	nquinn@scu.edu		

**Text:** Bruce Powel Douglass; *Real-Time UML, Second Edition: Developing Efficient Objects for Embedded Systems*; Addison Wesley; ISBN:0201325799

**Lecture:** MWF 01:00-02:05pm, Room ENGR-326

**Lab:** Coen Trailers Monday 2:30-5:00; Thur 2:30-5:00, 5:30-8:00 (if necessary)

**Objectives:** The objective of this course is to equip students with a working knowledge of the design and implementation of Real-Time embedded computer systems. To facilitate this understanding, the course will employ the theory of Unified Modeling Language (UML) for characterizing and describing RT systems, along with the practical application of two *industrial strength* software packages: Rhapsody® in C++ from I-Logix, and Tornado/VxWorks from WindRiver Systems. The *Theoretical* will meet the *Practical* in this course.

**Prerequisites:** Coen-020 and a working knowledge of either C++ or Java.

**Projects and Exams:** All exams are open book and open notes. Missed exams may not be taken later without a doctor's excuse or prior approval. Projects are to be demonstrated in the lab.

**Homework:** Due at the beginning of class on the date due. You are encouraged to discuss homework problem statements with others; however, all actual solutions must be that of the individual student. Violation will result in zero credit for the assignment. Homework assignments will not be accepted after the due date. Exceptions only by prior approval.

**Attendance:** **Attendance at each and every class is mandatory!!!** I reserve the right to deduct 5% of your grade for each class missed. Permission for missing a class must be granted prior to the class missed.

**TENTATIVE CLASS SCHEDULE**

<i>Week</i>	<i>Day</i>	<i>Topics</i>	<i>Reading</i>
1 Sep. 17	M	Class introduction. Syllabus. Rules! Lab description. What is a Real-Time System? What is a safety critical system?	
	W		
	F		
2 Sep. 24	M	Review of C++. ( <a href="http://devcentral.iftech.com/Learning/tutorials/c-cpp/cpp/">http://devcentral.iftech.com/Learning/tutorials/c-cpp/cpp/</a> ) Introduction to Tornado®. Introduction to VxWorks®.	Chapter 1
	W		
	F		
3 Oct. 01	M	What is UML?	Chapter 1
	W	<b>Student Planning Day (no class)</b>	
	F	UML Diagrams and Notation	
4 Oct. 08	M	Introduction to Rhapsody® Requirements Analysis of Real-Time Systems Using Use Cases	Chapter 2
	W		
	F		
5 Oct. 15	M	Statecharts and Use Cases Analysis: Defining the Object Structure	Chapter 2 Chapter 3
	W		
	F		
6 Oct 22	M	The Object Discovery Process; Object-Identification Class Diagrams Defining Object Behavior UML Statecharts	Chapter 3 Chapter 4
	W		
	F		
7 Oct 29	M	<b>Individual Project due (30%)</b>	Chapter 5
	W	Architectural Design Concurrent State Diagrams	
	F	Assigning Objects to Threads	
8 Nov 05	M	Mechanistic Design Walking through a design	Chapter 6
	W		
	F		
9 Nov 12	M	Detailed Design	Chapter 7
	W		
	F		
10 Nov 26	M	Preparation for Group Projects and Final Exam	
	W		
	F	<b>Group Project due (30%)</b> Tying it all together. Summary discussions	
Dec 03	M	<b>Final Exam in Lab (30%) 1:30-4:30 or 5:00-8:00</b>	