

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

COEN 120

Real-Time Embedded Computer Systems.

Winter 2003

<b>Web Page:</b>	<a href="http://cseeserv.engr.scu.edu/nquinn/coen120fall2002/">http://cseeserv.engr.scu.edu/nquinn/coen120fall2002/</a>	<b>Course Grading:</b>	
<b>Instructor:</b>	Dr. Neil R. Quinn Jr.	<b>Individual Project:</b>	33%
<b>Office:</b>	CSTS (House just north of A&S bldg.)	<b>Group Project:</b>	33%
<b>Phone:</b>	408-554-5723 office, 408-554-2726 room.	<b>Final Exam:</b>	34%
<b>Office Hours:</b>	By arrangement		
<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:** TR 09:55-11:40, Room ENGR-105

**Lab:** ENGR 605 Tuesday 2:30-5:00; Thursday 2:30-5:00

**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 01/07	T	Class introduction. Syllabus. Rules! Lab description.	
	R	What is a Real-Time System? What is a safety critical system?	
2 01/14	T	Review of C++. Introduction to Tornado®. Introduction to VxWorks®.	Chapter 1
	R	What is UML?	
3 01/21	T	UML Diagrams and Notation	Chapter 1
	R		
4 01/28	T	Introduction to Rhapsody® Requirements Analysis of Real-Time Systems	Chapter 2
	R	Using Use Cases	
5 02/04	T	Statecharts and Use Cases Analysis: Defining the Object Structure	Chapter 2 Chapter 3
	R	The Object Discovery Process; Object-Identification Class Diagrams	
6 02/11	T	Defining Object Behavior UML Statecharts	Chapter 3 Chapter 4
	R		
7 02/18	T	<b>Individual Project due (33%)</b>	Class notes
	R	Alternate Hardware Platforms	
8 02/25	T	Object-Identification revisited Multiplicity	Class notes
	R		
9 03/04	T	Review of sample projects.	Class notes
	R		
10 03/11	T	Preparation for Group Projects and Final Exam	
	R	<b>Group Project due (33%)</b> Tying it all together. Summary discussions	
03/15	S	<b>Final Exam in Lab (34%) 1:30 p.m.-4:30 p.m.</b>	Proposed