

EE/CpE 423

Senior Design

Fall 2004

Course Introduction

- Logistics:

- Course coordinator: Bruce McNair
 - Office: Burchard 206 // WiNSeC – Lieb 2nd floor
 - Phone: 201-216-5549
 - email: bmcnair@stevens-tech.edu
 - Web site: <http://koala.ece.stevens-tech.edu/~bmcnair>
 - Office hours: Tuesday ~9:30 - ~11 (other hours, TBD)
- TA: will be announced shortly

- Class schedule:

- Generally, 1 hour Tuesday sometime between 3 – 5:50 pm
- **LET ME KNOW ABOUT TIME CONFLICTS ON TUESDAY – I'LL SCHEDULE CLASS TIME TO MINIMIZE THEM. Class time will be 4pm for now.**
- Fall group presentations will require full class schedule time and Thursday meetings
THERE WILL OTHERWISE BE NO EE/CpE423 MEETINGS ON THURSDAY

- Class web site:

Access thru WebCT is set up. Site is also be mirrored on a site that is externally accessible:

<http://www.ece.stevens-tech.edu/sd/>

You will also be able to access via my web site

All of last year's senior design groups' sites are archived, and many before that.

A personal perspective

- My perspective on senior design
 - As a '71 student
 - As an AT&T/Bell Labs technical recruiter from 1982-1996
 - As a faculty member

Your three tasks

1. Figure out what your job (project) is
2. Tell people about it
3. Do it

Senior Design course flow

1. Project identification

- What is the problem you are trying to solve?
- Is it interesting?
- Is it doable?
- Is it meaningful?
- Can you find a sponsor?

2. Group formation/selection of Group Leader

- ~4-5 students/group
- Equal share in outcome of project ****
- Group leader keeps project on target (time and direction) and is responsible for reporting

3. Find a Faculty Advisor

- **Must** be a member of ECE, CS, or Physics Departments' faculty
- Evaluates written reports
- Determines 80% of group grade

Senior Design course flow (continued)

4. Submit Project/Advisor Form – due by 9/14/04
 - Completed after project and advisor are selected.
 - Faculty advisor signs, group submits to course coordinator (me)
 - I assign a group number that is used in all future reports
- Weekly Status Reports - first report due the Monday after group number assigned
 - From group leader to course coordinator (me): an electronic one page summary of project status, progress for the week. CC: advisor and TA
 - Due before Noon Monday via email. Send .pdf or .doc file
 - Format/template on web site – don't deviate
 - “Hours spent on project” are for CURRENT week, report person-hours
- Advisor-Group Meetings/Oral and Written Progress Reports
 - Meet with advisor **at least** once every two weeks
 - Advisor provides technical guidance, advice to group
 - All students must attend advisor-group meetings
 - Advisor signs written reports

Senior Design course flow (continued)

- Logs
 - Every student must maintain an up-to-date laboratory notebook, recording time spent on project, observations, directions, dead-ends, etc..
 - Must be made available on request to advisor, coordinator, other faculty
- Documentation required (in order)
 - Project/Advisor form – early in first semester
 - Project Proposal – middle of first semester
 - Individual project web site (I'm looking for consistency)
 - Final Design report – end of first semester
 - Project Oral Presentation – end of first semester
 - Interim Progress report – middle of second semester
 - Poster/Project demonstration – end of second semester
 - Final Report – end of second semester

Senior Design course flow (continued)

- Class Meetings
- Grades
 - 80% assigned by advisor
 - 20% assigned by course coordinator
- Awards
- Materials & Supplies
- Facilities

New or Improved this year

- **Ongoing group assessment of members/group effectiveness**
- Option for individualized grades
- Seminars on selected topics from outside speakers
- Opportunities for interdisciplinary projects with Technology Management (contact Professor Skown or Dean Laucirica)

Technical Advisors and their Research Areas

<p>Jameela Al-Jaroodi</p> <ul style="list-style-type: none"> • Distributed Systems Middleware • Parallel and Distributed Systems • Software Engineering for Distributed Systems • Wireless Ad-Hoc Networks • Wireless Security 	<p>Francis T. Boesch</p> <ul style="list-style-type: none"> • Network Design • Network Reliability • Applications of Graph Theory 	<p>Rajarthanam Chandramouli</p> <ul style="list-style-type: none"> • Networked Communications • Wireless Communications • Multimedia Computing and Security • Energy Efficient Coding for Wireless Communications
<p>Cristina Comaniciu</p> <ul style="list-style-type: none"> • QoS for wireless networks • Cross-layer design for wireless networks • Radio resource management • Admission/access control for multimedia • Spread spectrum communications • Multiuser detection & multi-access protocols 	<p>Sumit Ghosh</p> <ul style="list-style-type: none"> • Asynchronous Distributed Decision-Making Algorithms • Networking and Network Security • Computer-Aided Design of Digital Systems • Modeling and Simulation of Complex Systems • Intelligent Transportation 	<p>Chandra Kintala</p> <ul style="list-style-type: none"> • Networked Systems Dependability, QoS and management • Software Fault Tolerance and Rejuvenation
<p>Harry Heffes</p> <ul style="list-style-type: none"> • Integrated Broadband Communications Networks • Overload Controls for Distributed Switching Systems • Queuing and Teletraffic Theory and Applications • Computer Performance Modeling and Analysis • Mobile Communications and Congestion Control for High Speed Networks 	<p>Hongbin Li</p> <ul style="list-style-type: none"> • Signal Processing for Communications • Channel Identification and Equalization • Transmit/Receiver Diversity • CDMA and OFDM Systems • Stochastic Signal Processing • Sensor Array Processing • Detection and Estimation • Spectral Analysis and System Identification • Radar and Medical Imaging 	<p>Hong Man</p> <ul style="list-style-type: none"> • Image Compression • Video Compression • Error Resilient Data Compression • Wireless Data Communications
<p>Yan Meng</p> <ul style="list-style-type: none"> • Real-time Embedded Systems • Computer Vision • Robotics • Communications Networks 	<p>Bruce McNair</p> <ul style="list-style-type: none"> • Wireless Communications • Computer and Network Security • Signal Processing for Communications • Software-Defined Radios • OFDM Wireless Systems • Wireless LANs • Real-time Embedded Systems • Broadband Power Line Systems 	<p>Nader Mohamed</p> <ul style="list-style-type: none"> • Computer Systems Integration and Middleware • Cluster Interconnection • Networked and Distributed Systems • Software Systems • Autonomic Computing

Technical Advisors and their Research Areas

<p>K.P Subbalakshmi</p> <ul style="list-style-type: none">• Joint Source-Channel Coding• Image and Video Coding• Error Resilient Multimedia Communications• Multimedia Networking	<p>Stuart K. Tewksbury</p> <ul style="list-style-type: none">• VLSI and ULSI Digital Systems• System Interconnects & Packaging• Communications for Concurrent Computing• Reconfigurable Computing Systems• Computation Science & Engineering	<p>Uf Tureli</p> <ul style="list-style-type: none">• CDMA-Based Wireless Systems• Wireless Testbeds• OFDM Wireless Systems• Signal Processing for Communications
	<p>Yu-Dong Yao</p> <ul style="list-style-type: none">• Microcellular Wireless Architectures• Equalization for Co-Channel Interference• Spread Spectrum for Indoor and Mobile Wireless• Mobile Satellite Communications	

2002-2003 Projects

Chaotic Spreading Spectrum System Development and Implementation
using FPGA/VHDL for Secure Wireless Communications

Kalman Filter Library

Autonomous Advertising Robot Interface

Factory Deviation Monitor

Data Center Environmental Link

MyStevens

Voice Over IP at Stevens

Missile Course Deviation

Motion Tracking Device

Platform for Media Riche Lecture Delivery

Redesign of the Stevens Campus Network

Youth Monitoring Device

eHousing

Real-time Wireless Sensor Network – Signal Analysis for Security
Applications
Home Calling Center

Miniaturization of MP3 Player

Cell Phone – Brew Based Cellphone Application Development

Smart Appliances

“Universal” Credit Card

Digital Fingerprint Scanner

Blue Force Tracing Geolocation Services

Self Tuning Guitar

Wireless Cargo Tracking using 802.11a Technology

EZPARK

Financial Management Software

Remote Camera Control

H-26L Video Coding Standard

Autonomous Underwater Vehicle

Secure Data Transfer System

Web-based Information Tracker

Real-time Multimedia Steaming System w/ advanced
compression & steganography algorithms over wireless channels

Automobile Black Box

GPS tracking for RF transceivers

Digital Player Piano

LED Learners Guitar

Modular LED Display

Digital Video Surveillance System

Media Pad

Electronic Caddy

2003-2004 Projects

Wireless Biomedical Sensor

Environmentally Aware GPS

Wireless MP3 Player

Thumb-thing

Adaptive Communications thru
Software Defined Radio

Automatic Mailbox Notification System

Solid State Hard Drivr

GPS Mass Transit Tracker

Trans-verbal-ator

Gameboy Advance PAL

DBNS Filter

iTea – Information Transportable
Electronic Assistant

Hexaphonice Digital Mixer

Bluebird – Bluetooth Universal Remote

SmartNet

Voice Actuated Remote Control

Face Recognition Using Artificial
Neural Networks

Intelligent Cellular Docking Station

Variable Frequency Skin Impedance Monitor

AUV: Computer and Navigation System

FLASH: All in One Portable Player

Programmable Sculpture

Dynamic Spectrum Analyzer

Senior Design Tasks – Fall '04

