We are pleased to offer our second series of short courses for electrical engineers who want to keep up with today’s rapidly changing technology. This comprehensive technology series, with courses all taught by department faculty, supports the industry in meeting hands-on training requirements. We are proud of our nationally ranked engineering programs and offer this technology series as part of the ongoing university/industry partnerships that make Silicon Valley strong and successful in the global marketplace.

James Freeman
Chair, Department of Electrical Engineering
San José State University

PREPARATION FOR TOMORROW
DSP System Design and Implementations

Overview: Today’s technology provides DSP processors that can be easily used to design very sophisticated products for instrumentation, control systems, communications, and wireless systems. This course presents DSP system design and implementation using programmable signal processors. Hands-on laboratory exercises are used to present the design and implementation aspects, using hardware and software tools for system implementation. The 5 laboratory sessions follow the lectures, where participants will apply system design concepts by designing, implementing, debugging and evaluating DSP schemes.

Digital Signal Processing 4-day class with labs
Course instructor: Dr. Avtar Singh

FPGA DSP System Design
Overview: This course provides an in-depth and state-of-the-art coverage of the design and FPGA-based implementation of high-performance DSP systems. After presenting FPGA architectures and design tools by Xilinx and Altera, several hands-on design labs on DSP, digital communications and video/imaging will be covered, including FFT, FIR filters, error detection/correction circuits, modem, color space converter, and DWT (Discrete Wavelet Transform). Contents: Basic DSP/Communication theory, FPGA architecture/design tools, HDL (VHDL and Verilog), DSP-specific arithmetic circuits, hardware design of digital filters, FFT circuits, error detection and correction circuits, encryption/decryption circuits, and video/imaging circuits.

Digital System Design 4-day class with labs
Course instructor: Dr. Chang Choo

Courses provide:
- Theoretical aspects
- Hands-on experience
- Preparation for tomorrow
- Excellent value; practical; timely topics
- 5 choices, all offered in the week of March 29, 2006

Wireless Transmitters
Overview: Power amplifiers play a major role in the overall performance of transmitters. There are a number of transmitter architectures that satisfy the linearity requirements of modulation techniques employed in short- and long-range communication applications. This exceptional course introduces modulation techniques and wireless standards, presents different transmitter and power amplifier architectures and compares the RF properties and performance of CMOS, SiGe and GaAs technologies. Covered are the critical relationships among linearity, power and spectral efficiencies, output power level and frequency of operation. The lab sessions involve using MATLAB/VerilogA simulators for behavioral characterization of transmitters by generating baseband signals of constant envelope and applying transmitter nonlinearities.

Analog/RF Design 4-day class with labs
Course instructor: Dr. Sotoudeh Hamedi-Hagh

Embedded Systems and Embedded FPGAs
Overview: This short course introduces the fundamentals of embedded system and embedded FPGA design methodology. It gives an overview of the technology, covers fundamentals and advanced issues, and gives hands-on experience with embedded FPGAs. The first part addresses fundamental concepts such as microprocessor architecture, bus functionality/arbitration, memory and I/O, interrupts, instruction set, real-time operating system (ROS), and drivers in a conventional embedded system. The second focuses on advanced embedded systems design including embedded FPGA implementation and practice. The lab provides hands-on experience with configuration of processor cores, developing IP with VHDL, writing drivers, system integration, and test. Students will be exposed to a learning experience balanced between fundamental and advanced issues, theoretical concepts and hands-on experiments that will allow them to progress from novice to expert within a short time.

Digital System Design 4-day class with labs
Course instructor: Dr. Chang Choo

Sensor Networks and Mobile Ad-Hoc Technology
Overview: As the ad-hoc network technology is destined to play an increasingly important role in military, security affairs, and with the public, there is a growing interest in identifying suitable wireless interface, network architectures, and transmitting facilities for ad-hoc networks. Mobile ad-hoc networks lack any fixed infrastructure to support the mobility of the terminals in the network. In ad-hoc networks, all the network intelligence must be situated inside the mobile devices that make up the network. A sensor network can be a special case of an ad-hoc network. A sensor network is a number of sensors such as chemical, biological or solar sensors that are networked together in a certain fashion to strengthen the power of sensing. This course introduces fundamental concepts of Ad-Hoc and Sensor Networks focusing on architectures, protocols, hardware aspects, and other related issues such as scalability, fault-tolerance, and security.

Networking Engineering 4-day class with labs
Course instructor: Dr. Nader F. Mir

Faculty
Dr. Avtar Singh
Dr. Singh has developed and taught electrical engineering courses at San Jose State University since 1987. Author of 11 books, his latest is a text on Digital Signal Processing Implementations. He has worked for National Semiconductor, Anderson Jacobson, Vivix Corporation, and NASA Ames Research Center in the areas of microprocessors, data communication, biomedicinal instrumentation, and signal processing.

Dr. Sotoudeh Hamedi-Hagh
Dr. Hamedi-Hagh is a new member of the electrical engineering faculty, with areas of research in design of RF, analog and mixed-signal integrated circuits and systems for wireless, Wireline and optical communications using CMOS, SiGe and GaAs technologies. Dr. Hamedi-Hagh developed a new phase-shifted (PS) transmitter architecture in 2001, based on the outphasing linearization technique.

Dr. Nader Mir
Dr. Mir, associate professor of electrical engineering, was previously a research scientist at Stevens Institute of Technology, working on the design of advanced telecommunications networks. At Washington University he worked on the design and analysis of a gigabit switching systems project. He is a senior and highly active member of the IEEE and recipient of several teaching and research awards.

Dr. Chang Choo
Before coming to SJSU, Professor Choo consulted for National Semiconductor, RealChip Communications and Phillips Semiconductor. He was senior member of technical staff with Altera Corporation for two years. He has done research on DSP, digital design, computer architecture, and video/imaging and has over 60 publications and five patents in these areas.

Dr. Tri Caohuu
Dr. Caohuu has over 20 years of industrial experience in design and implementation of digital systems. He was employed with Bell Northern Research, Control Data...
and Leigh Systems in Canada. He was director of R&D of EMC, Ltd., Toronto, Canada, from 1981 to 1986. At San José State since 1990, he has taught courses in embedded system design, advanced computer architectures, ASIC design, digital design using VHDL and short courses in HDL-based design methodology.

More information
Complete course descriptions, prerequisites and faculty profiles are available at our Web site: www.engr.sjsu.edu/eshortcourse

Class dates and times
Wed., March 29, through Sat., April 1
8:30 am – 4:30 pm daily

Cost: $995 per course; $945 for IEEE Members (includes student notebook, lunches and refreshments; CDs with class notes and problem solutions for certain classes)

For additional information, or assistance with registration, contact Irma Alarcón at 408-924-3938.

Come to SJSU
Easy access: Classes start before most students arrive on campus, so parking in the Seventh Street Garage is a snap!

Electrical Engineering
SJSU’s Department of Electrical Engineering is a leading provider of engineering talents to Silicon Valley’s high-tech industry. Through extensive hands-on laboratory work, industry internship programs and rigorous coursework, our accredited program provides students with a balanced engineering education.

Our curriculum offers specialization in the areas of:
- digital logic and system design
- networking and telecommunication systems
- fiber communication networks
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- integrated circuit design and fabrication
- analog electronics
- RF and microwave
- control and power electronics
- VLSI systems

The College of Engineering
According to U.S. News & World Report’s survey of “America’s Best Colleges 2006,” SJSU’s College of Engineering ranks among the top schools nationally offering bachelor’s and master’s programs. The departments of Computer Engineering, Civil Engineering, Electrical Engineering and Mechanical Engineering consistently place among the nation’s top 20 in their respective disciplines.

SJSU is the No.1 provider of engineers in Silicon Valley. Close ties with Silicon Valley industry provide students with access to internships, research opportunities and employment. Thousands of accomplished alumni are employed in key staff and management positions in many of Silicon Valley’s most recognized companies.

Learn more about SJSU’s College of Engineering—
Visit our web site at www.engr.sjsu.edu.

Call the Office of the Dean at 408-924-3800.

Registration Form
Register online: www.engr.sjsu.edu/eshortcourse

Class Choice (check one or more)
- DSP System Design and Implementation (Mar. 29 – Apr. 1, 2006)
- Wireless Transmitters (Mar. 29 – Apr. 1, 2006)
- FPGA DSP System and Embedded FPGA (Mar. 29 – Apr. 1, 2006)
- Sensor Networks and Mobile Ad-Hoc Technology (Mar. 29 – Apr. 1, 2006)

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Cost for each class is $995.
(For IEEE members, a $50 discount per course)
Add course costs together and make check for the total payable to SJSU.
Or pay by credit card (see below).

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San José State University
San José, CA 95192-0084

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