Teaching Laboratories

- Analog Laboratory
- Communications and Signal Processing Simulation Facility
- Digital Systems Design Laboratory
- Electrical & Computer Engineering Computer Aided Design Laboratory
- Digital Signal Processing Laboratory
- Unix Laboratory
- Semiconductor Device Characterization Laboratory
- IEEE Student Laboratory

Analog Laboratory

Contact Person: Anthony Olivo
Location: Rooms 283,Light Engineering
Usage: ESE 123, ESE 211, ESE 275, ESE 314, and ESE 324

This laboratory contains eighteen work stations consisting of equipment for testing simple to complex analog circuits, from DC to 11 MHz. Each work station consists of the following test equipment:

1) Hewlett-Packard Model 54603B 60 MHz Dual Trace Digital Storage Oscilloscope.
2) Tektronix Model PS280 Triple Output Power Supply with fixed +5VDC and two 0 to 30 VDC variable outputs.
3) Fluke Model 45 High Resolution Digital Multimeter with Frequency Counter and Dual Display for simultaneous measurements.
4) Two Tektronix Model CFG280 Function Generators that produce Sine waves, Triangle waves, Square waves, and Pulse signals from 0.1 Hz to 11 MHz along with a 100 MHz Frequency Counter.
5) General Radio Capacitance and Resistance decades .
6) Simpson Analog Volt-Ohm-Current meter, and Fluke Series 73 handheld Digital Multimeter.
7) Three section Solderless Breadboard for the construction and testing of circuits designed in the laboratory.

A Tektronix Model 571 Transistor Curve Tracer and a Philips Model 6303A Automatic RLC meter are available for general use. The CAD laboratory is used in conjunction with this laboratory for the design, modeling, and simulation of all Analog and Digital circuits built and tested for laboratory experiments

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Communications and Signal Processing Simulation Facility

Contact Person: Prof. Petar Djuric, Prof. Stephen Rappaport
Location: Room 256, Light Engineering
Usage: ESE 337,340,341,342,346,347,358,440,441,499

This laboratory was established to service communications and signal processing course offerings, individual projects and research activities at the undergraduate level. The facility is equipped with networked workstations and X-terminals. Specialized software packages include SIMSCRIPT, COMNET and MATLAB.

The laboratory is available on a walk-in basis to undergraduate students enrolled in communications and signal processing courses and/or projects. .

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Digital Systems Design Laboratory

Contact Person: Anthony Olivo
Location: Room 283A, Light Engineering
Usage: ESE 318

This laboratory contains twelve work stations consisting of a Tektronix Model 2213 Dual Trace Oscilloscope, a state-of-the-art Hewlett Packard Model 54620A Digital Logic Analyzer and an E.L. Cadet Digital Designer.

The HP Digital Logic Analyzer can capture and display up to 16 channels of digital data via a flexible dual 8-channel

cable. Data acquisition is accomplished by normal, time base, channel activity, or glitch triggering.

The E.L. Cadet Digital Designer is a multi-function breadboard system which consists of the following:

1) A three section Solderless Breadboard for the construction and testing of circuits
2) A function generator, that outputs sine waves, triangle waves, square waves, and TTL square waves from 0.1 Hz to 100 kHz.
2) Three internal power supplies with a fixed +5VDC, a +1.3 to +15 VDC variable output, and a -1.3 to -15 VDC variable output
3) 16 LED logic indicators (8 logic HIGH and 8 Logic LOW)
4) 8 Logic switches, two debounced switches, and a 8 ohm speaker

The CAD laboratory is used in conjunction with this laboratory for the design, modeling, and simulation of all Digital circuits built and tested for laboratory experiments

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Electrical & Computer Engineering Computer Aided Design Laboratory

Contact Person: Scott Campbell, Prof. John Murray
Location: Room 281, Light Engineering
Usage:
ESE 120, ESE 123, ESE 124, ESE 211, ESE 271, ESE 275,
ESE 300, ESE 305, ESE 306, ESE 314, ESE 315, ESE 316,
ESE 318, ESE 324, ESE 337, ESE 345, ESE 346, ESE 347,
ESE 349, ESE 357, ESE 358, ESE 372, ESE 380, ESE 381,
ESE 382, ESE 440, ESE 441, ESE 475

The Electrical & Computer Engineering Computer Aided Design Laboratory is the primary computing resource for all undergraduate courses taught in the department. The ECE CAD Lab offers undergraduate students access to CAD software tools used to analyze, model, simulate, and better understand engineering concepts. The importance of computer aided design has grown through the years, it has become a necessary part of electrical engineering design and as a consequence a fundamental tool for teaching engineering concepts. This is reflected in the ECE CAD Lab's close ties with both the Analog & Digital Systems Design Laboratories (Rooms 283 & 283A respectively). Students design, model, and simulate all analog and digital circuits prior to building and testing them for laboratory experiments.

The ECE CAD Lab currently has 6 Dell Dimension Pentium II 400MHz PC's, 22 Dell Dimension Pentium II 333MHz PC's, 4 Dell Dimension Pentium II 266 MHz PC's, and 9 Dell Dimension Pentium 133 PC's. All of the computers are networked via switched ethernet 10 Base-T to a Dell PowerEdge file server running Novell 4.1 as the network operating system. All the Pentium PC's run MS Windows NT Workstation 4.0 as the client operating system. Two network laser printers, a HP Laserjet 8000DN and a HP Laserjet 4000TN are available for students to print their results.

The lab is in a transition period, a major effort is being undertaken to upgrade the hardware and software packages in the lab to support both the existing Electrical Engineering major and the newly created Computer Engineering major. This involves the purchase of new PC's and updating or acquiring new CAD software packages to provide a complete set of software tools to our undergraduates.

The following software packages are available to the users on the network:

Visio Technical 5.0 - made possible by a donation from the Visio Corporation.
- Workview Office - Viewlogic Systems Inc.
- Matlab - The Mathworks Inc.
- Comnet III - CACI
- Maple V - Waterloo Maple Inc.
- Electronics Workbench - Interactive Image Technologies Inc.
- Borland C++, Turbo Assembler - Borland
- Pspice - Microsim Inc.
- Texas Instruments TMS329 family development tools
- More packages are being added each year

The ECE CAD Lab is an undergraduate computing facility, as such all undergraduate Electrical & Computer Engineering students have access to this facility.

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Digital Signal Processing Laboratory

Contact Person: Prof. John Murray

Location: Room 179, Light Engineering

Usage: ESE 347

The Digital Signal Processing Laboratory has twelve stations, each of which contains a 386sx-class personal computer with 1 Mbyte of RAM, a 30 Mbyte hard disk, and monochrome graphics. Ten of the stations have 50 MHz oscilloscopes, function generators, and Texas Instruments TMS32010 Evaluation Modules and Analog Interface Boards, which are interfaced to the PC by an RS-232 connection. These evaluation modules can also function as in-circuit emulators. Two of the stations have second-generation Texas Instruments (TMS320C25) Software Development Systems, again with emulation capabilities. Six of the stations have third-generation Texas Instruments (TMS320C30) floating-point Evaluation Modules with full analog in to analog out capability.

All of the stations have a full set of development tools (assembler, linker, and simulator) for all three generations, and C compilers for the second and third generations; this software is also available in the CAD lab, providing students with access outside laboratory hours.

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Unix Laboratory

Contact Person:

Location: Room 246, Light Engineering

Usage: General Shared Facility

This facility is not under the control of the Electrical Engineering Department, but rather a computing facility available to all students.

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Embedded Systems Design Laboratories

Contact Person: Prof. Ken Short or Scott Tierno
Location: Rooms 228 and 230, Light Engineering
Usage:
ESE 380, ESE 381, ESE 382, ESE 440, ESE 441, ESE 475, ESE 499

The Embedded Systems Design Laboratories are devoted to teaching, research, and system design projects involving embedded microprocessor based systems and or VHDL based digital systems. The laboratories are located in two adjoining rooms in the Light Engineering building: Y228 and Y230

Room 230 is used primarily to support the laboratory portions of two undergraduate courses: ESE 380 and ESE 381, Embedded Microprocessor Systems Design I and II. This laboratorycontains 10 student stations, each of which supports a group of 2 students. Each student station is equipped with a personal computer (PC), a full function solderless breadboarding system, an EVB188EB/+ Single Board Microcomputer, a Fluke model 45 dual display DMM, a Phillips PM3055 50 MHz oscilloscope, and a variety of other test equipment.

The lab station PCs are networked (via a 10Base-2 Ethernet LAN) to a high performance

Pentium network server. The server, which has four high capacity high speed SCSI hard drives, is currently running the Novell Version 4.1 network operating system in a duplexed SFT configuration. The LAN is bridged to the campus Ethernet backbone. This provides high speed access to a variety of on and off campus computer systems, either through direct logons or via the Internet.

Room 228 is an advanced laboratory which supports undergraduate and graduate embedded system design and research projects, as well as the laboratory portion of an undergraduate upper level VHDL digital design course,

ESE-382. This room is configured with design stations that are equipped with Pentium II based workstations that are also networked to the laboratory's Novell server. Each workstation provides access to several sophisticated software design packages, including Synario from Minc Corporation and Model Technologies VHDL Simulator.

The design stations may be configured with a variety of test and debugging equipment. Available are microsystem testers, in-circuit emulators, logic analyzers, oscilloscopes, counter/timers, and a variety of other standard lab test equipment. Also provided in this room are two device programming stations that support a large number of programmable logic devices including EPROMs, microcontrollers, standard and complex PLDs, and FPGAs. Currently this lab supports embedded system designs based on the 80C88, 80C188EB and several single chip microcontrollers, such as the 80C51 family. Digital system designs using VHDL with CPLDs and FPGAs from Vantis and Altera are currently supported.

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Semiconductor Device Characterization Laboratory

Contact Person: Prof. Gregory Belenky
Location Room 281A
Usage: ESE 332

This new laboratory contains 3 workstations. Each station consists of a 586 based computer containing a Digital to Analog converter card, a Dual D.C. power supply and voltage to current converter circuit.

Specially developed software allows students to carry out measurements of output characteristics of microelectronic semiconductor devices such as BJT, FET, different types of diodes. The obtained data are used to determine the correlation between the device output characteristics and the device design.

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IEEE Student Laboratory

Contact Person: President IEEE Student Branch
Location: Room 175, Light Engineering

This laboratory is run, independently, by the student chapter of the Institute of Electrical and Electronic Engineers. Seniors find the laboratory particularly useful in testing their senior design projects..

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