Course Schedule - Spring 2005

Electrical and Computer Engineering

101 ***Exploring Digital Info Tech*** Credit: 3 hours.

Principles and processes for the development of information technologies: digital music, digital images, digital logic, data compression, error correction, information security, and communication networks. Laboratory for design of hardware and software, and experiments in audio and image processing. Intended for students outside the College of Engineering. Credit is not given to students enrolled in Electrical or Computer Engineering

This course satisfies the General Education Criteria for a Physical Sciences course.

CRN	Type	Section	Time	Days	Location	Instructor
39883	laboratory	ABA	08:00 AM - 09:50 AM	M	room 251 Everitt Elec and Comp Engr Lab	Jones, D; Narayanan, S
39883: Physical Sciences course.						
39895	laboratory	ABB	10:00 AM - 11:50 AM	M	room 251 Everitt Elec and Comp Engr Lab	Jones, D; Narayanan, S
39895: Physical Sciences course.						
39896	laboratory	ABC	01:00 PM - 02:50 PM	M	room 251 Everitt Elec and Comp Engr Lab	Jones, D; Hesford, A
39896: Physical Sciences course.						
39897	laboratory	ABD	03:00 PM - 04:50 PM	M	room 251 Everitt Elec and Comp Engr Lab	Jones, D; Hesford, A
39897: Physical Sciences course.						
39374	lecture	AL	11:00 AM - 11:50 AM	TR	room 260 Mechanical Engineering Bldg	Jones, D
39374: Physical Sciences course.						

110 ***Intro Elec & Comp Engrg*** Credit: 4 hours.

(ECE 110) Integrated introduction to selected fundamental concepts and principles in electrical and computer engineering: circuits, electromagnetics, communications, electronics, controls, and computing. Laboratory experiments and lectures focus on a design and construction project, such as an autonomous moving vehicle. Prerequisite: Credit or registration in either MATH 220 or MATH 235.

Students must register for one lab and one lecture section.

CRN	Type	Section	Time	Days	Location	Instructor
32456	laboratory	ABA	09:00 AM - 11:50 AM	M	room 146 Everitt Elec and Comp Engr Lab	Nakka, N; Franke, P; Elayat, A

32459	laboratory	ABB	08:00 AM - 10:50 AM	T	room 146 Everitt Elec and Comp Engr Lab	Ramachandran, A; Franke, P; Sylvester, L
32460	laboratory	ABC	11:30 AM - 02:20 PM	T	room 146 Everitt Elec and Comp Engr Lab	Franke, P; Longino, J; Kuo, S
32461	laboratory	ABD	09:00 AM - 11:50 AM	W	room 146 Everitt Elec and Comp Engr Lab	Franke, P; Adekunle, O; Elayat, A
32462	laboratory	ABE	11:30 AM - 02:20 PM	R	room 146 Everitt Elec and Comp Engr Lab	Franke, P; Kollia, V; Young, M
32463	laboratory	ABF	09:00 AM - 11:50 AM	F	room 146 Everitt Elec and Comp Engr Lab	Franke, P; Tseng, R; Watson, C
32464	lecture	AL1	01:00 PM - 01:50 PM	MWF	room 151 Everitt Elec and Comp Engr Lab	Trick, T
32465	laboratory	BBA	02:00 PM - 04:50 PM	M	room 146 Everitt Elec and Comp Engr Lab	Franke, P; Young, M; Longino, J
32466	laboratory	BBB	03:00 PM - 05:50 PM	T	room 146 Everitt Elec and Comp Engr Lab	Franke, P; Usmani, S; Srinivasa, S
32467	laboratory	BBC	01:00 PM - 03:50 PM	W	room 146 Everitt Elec and Comp Engr Lab	Franke, P; Maggio, D; Pfeiffenberger, J
32468	laboratory	BBD	08:00 AM - 10:50 AM	R	room 146 Everitt Elec and Comp Engr Lab	Ramachandran, A; Franke, P; Koprulu, F
32469	laboratory	BBE	03:00 PM - 05:50 PM	R	room 146 Everitt Elec and Comp Engr Lab	Franke, P; Sylvester, L; Kuo, S
32470	laboratory	BBF	01:00 PM - 03:50 PM	F	room 146 Everitt Elec and Comp Engr Lab	Franke, P; Mekonnen, Y; Lo, L
32471	lecture	BL1	12:00 PM - 12:50 PM	MWF	room 151 Everitt Elec and Comp Engr Lab	Brunet, M

190 ***Intro to Computing Systems*** Credit: 4 hours.

Bits, binary representations, digital logic structures, the von Neumann computing model, an example instruction set, machine and assembly language programming, machine-level input/output, subroutines, the C programming language, variables and operators, control constructs, functions in C, pointers and arrays, input/output in C, recursion, simple data. Credit is not given for both ECE 190 and CS 125.

CRN	Type	Section	Time	Days	Location	Instructor

39001	discussion-recitation	A	03:00 PM - 03:50 PM	M	room 241 Everitt Elec and Comp Engr Lab	Patel, S
	lecture-discussion	A	02:00 PM - 02:50 PM	MWF	room 165 Everitt Elec and Comp Engr Lab	Patel, S
: 4 hours						
39002	discussion-recitation	B	03:00 PM - 03:50 PM	W	room 241 Everitt Elec and Comp Engr Lab	Patel, S
	lecture-discussion	B	02:00 PM - 02:50 PM	MWF	room 165 Everitt Elec and Comp Engr Lab	Patel, S
: 4 hours						
38999	discussion-recitation	C	03:00 PM - 03:50 PM	F	room 241 Everitt Elec and Comp Engr Lab	Patel, S
	lecture-discussion	C	02:00 PM - 02:50 PM	MWF	room 165 Everitt Elec and Comp Engr Lab	Patel, S
: 4 hours						
39000	discussion-recitation	D	09:00 AM - 09:50 AM	T	room 169 Everitt Elec and Comp Engr Lab	Nichols, M
	lecture-discussion	D	02:00 PM - 02:50 PM	MWF	room 165 Everitt Elec and Comp Engr Lab	Patel, S
: 4 hours						
39003	discussion-recitation	E	12:00 PM - 12:50 PM	R	room 241 Everitt Elec and Comp Engr Lab	Patel, S
	lecture-discussion	E	02:00 PM - 02:50 PM	MWF	room 165 Everitt Elec and Comp Engr Lab	Patel, S
: 4 hours						

200 ***Seminar*** Credit: 0 hours.
(ECE 200) Discussions of educational programs, career opportunities, and other topics in electrical and computer engineering For ECE students. Approved for S/U grading only.

CRN	Type	Section	Time	Days	Location	Instructor
32482	lecture	SH	05:00 PM - 06:50 PM	W	room 151 Everitt Elec and Comp Engr Lab	Hutchinson, S; Horner, B

32482: This course does not meet the first two weeks of the semester.

205 ***Intro Elec & Electr Circuits*** Credit: 3 hours.
(ECE 205) Basic principles of circuit analysis, transient analysis, AC steady-state analysis, introduction to semiconductor devices and fabrication, digital logic circuits, op-amps, and A/D and D/A conversion. ECE students may not receive credit for this course. Prerequisite: PHYS 212.

CRN	Type	Section	Time	Days	Location	Instructor
32483	lecture	A	08:00 AM - 08:50 AM	MWF	room 151 Everitt Elec and Comp Engr Lab	Zhang, J
32483: 3 hours						
32484	lecture	F	02:00 PM - 02:50 PM	MWF	room 151 Everitt Elec and Comp Engr Lab	Choi, H
32484: 3 hours						

206 ***Intro Elec & Electr Ckts Lab*** Credit: 1 hours.
(ECE 206) Laboratory instruments and basic measurement techniques, electric circuits, CMOS logic circuits, DTL and TTL circuits, and op-amps. ECE students may not receive credit for this course. Prerequisite: PHYS 212; concurrent registration in ECE 205.

CRN	Type	Section	Time	Days	Location	Instructor
32485	laboratory	F1	10:00 AM - 11:50 AM	M	room 268 Everitt Elec and Comp Engr Lab	Zhang, J; Jones, K
32485: 1 hours						
32501	laboratory	F10	06:00 PM - 07:50 PM	R	room 268 Everitt Elec and Comp Engr Lab	Zhang, J; Pandya, S
32501: 1 hours						
32486	laboratory	F11	08:00 AM - 09:50 AM	T	room 268 Everitt Elec and Comp Engr Lab	Zhang, J; Disarro, J
32486: 1 hours						
32487	laboratory	F2	12:00 PM - 01:50 PM	M	room 268 Everitt Elec and Comp Engr Lab	Zhang, J; Disarro, J
32487: 1 hours						
32489	laboratory	F3	08:00 AM - 09:50 AM	M	room 268 Everitt Elec and Comp	Deng, Z; Zhang, J

					Engr Lab	
32489: 1 hours						
32491	laboratory	F4	02:00 PM - 03:50 PM	M	room 268 Everitt Elec and Comp Engr Lab	Zhang, J; Lovitt, A
32491: 1 hours						
32493	laboratory	F5	10:00 AM - 11:50 AM	W	room 268 Everitt Elec and Comp Engr Lab	Liu, Y; Zhang, J
32493: 1 hours						
32495	laboratory	F6	01:00 PM - 02:50 PM	W	room 268 Everitt Elec and Comp Engr Lab	Liu, J; Zhang, J
32495: 1 hours						
32497	laboratory	F7	06:00 PM - 07:50 PM	M	room 268 Everitt Elec and Comp Engr Lab	Zhang, J; Shi, J
32497: 1 hours						
32499	laboratory	F8	06:00 PM - 07:50 PM	T	room 268 Everitt Elec and Comp Engr Lab	Zhang, J; Akkineni, H
32499: 1 hours						
32502	laboratory	F9	06:00 PM - 07:50 PM	W	room 268 Everitt Elec and Comp Engr Lab	Zhang, J; Zhong, Y
32502: 1 hours						

210 ***Analog Signal Processing*** Credit: 4 hours.
(ECE 210) Introduction to analog signal processing, with an emphasis on underlying concepts from circuit and system analysis: linear systems, review of elementary circuit analysis, differential equation models of linear circuits and systems, Laplace transform, convolution, stability, phasors, frequency response, Fourier series, Fourier transform, active filters and AM radio. Prerequisite: ECE 110 and PHYS 212; credit or concurrent registration in MATH 385, MATH 386, or MATH 441.

Students must register for one lab and one lecture section. You will receive a TIME CONFLICT ERROR when registering for this course. Please contact the M&IE Undergraduate Programs Office, 154 MEB, 217-333-0366, ahouser@uiuc.edu to receive the necessary override to register for the course.

CRN	Type	Section	Time	Days	Location	Instructor
32534	laboratory	ABA	10:00 AM - 11:50 AM	M	room 234 Everitt Elec and Comp Engr Lab	Chen, J; Jalan, A; Benavi, A
32535	laboratory	ABB	10:00 AM - 11:50 AM	M	room 234 Everitt Elec and Comp Engr Lab	Chen, J; Jalan, A; Benavi, A

32536	laboratory	ABC	12:00 PM - 01:50 PM	M	room 234 Everitt Elec and Comp Engr Lab	Wu, H; Jalan, A
32537	laboratory	ABD	12:00 PM - 01:50 PM	M	room 234 Everitt Elec and Comp Engr Lab	Wu, H
32538	laboratory	ABE	02:00 PM - 03:50 PM	M	room 234 Everitt Elec and Comp Engr Lab	Chen, J; Widikdo, E
32539	laboratory	ABF	02:00 PM - 03:50 PM	M	room 234 Everitt Elec and Comp Engr Lab	Chen, J; Widikdo, E
32541	laboratory	ABG	04:00 PM - 05:50 PM	M	room 234 Everitt Elec and Comp Engr Lab	Chen, J; Widikdo, E
32561	laboratory	ABH	04:00 PM - 05:50 PM	M	room 234 Everitt Elec and Comp Engr Lab	Chen, J; Widikdo, E
32564	laboratory	ABI	06:00 PM - 07:50 PM	T	room 234 Everitt Elec and Comp Engr Lab	Wu, H; Benavi, A
32566	laboratory	ABJ	06:00 PM - 07:50 PM	T	room 234 Everitt Elec and Comp Engr Lab	Wu, H; Benavi, A
32571	laboratory	ABK	06:00 PM - 07:50 PM	W	room 234 Everitt Elec and Comp Engr Lab	Wu, H; Chen, J
32575	laboratory	ABL	06:00 PM - 07:50 PM	W	room 234 Everitt Elec and Comp Engr Lab	Wu, H; Chen, J
32505	lecture	AL1	09:00 AM - 09:50 AM	MTWF	room 269 Everitt Elec and Comp Engr Lab	Basar, T
32532	lecture	AL2	01:00 PM - 01:50 PM	MTWF	room 269 Everitt Elec and Comp Engr Lab	Bigelow, T
32533	lecture	AL3	02:00 PM - 02:50 PM	MTWF	room 269 Everitt Elec and Comp Engr Lab	Mitofsky, A

211 ***Topics Analog Ckts & Systems*** Credit: 2 hours.
(ECE 211) Introduction to concepts from circuit and system analysis: linear systems, review of elementary circuit analysis, op amps, transient analysis, differential equation models of linear circuits and systems, Laplace transform. Students may not receive credit for both ECE 211 and ECE 210. Prerequisite: ECE 110 and PHYS 212; credit or concurrent registration in MATH 385, MATH 386, or MATH 441

CRN	Type	Section	Time	Days	Location	Instructor

32581	lecture	B	09:00 AM - 09:50 AM	MTWF	room 269 Everitt Elec and Comp Engr Lab	Basar, T
32581: Meets 18-Jan-05 - 11-Mar-05.						
32581: 2 hours						
32620	lecture	E	01:00 PM - 01:50 PM	MTWF	room 269 Everitt Elec and Comp Engr Lab	Bigelow, T
32620: Meets 18-Jan-05 - 11-Mar-05.						
32620: 2 hours						
32660	lecture	F	02:00 PM - 02:50 PM	MTWF	room 269 Everitt Elec and Comp Engr Lab	Mitofsky, A
32660: Meets 18-Jan-05 - 11-Mar-05.						
32660: 2 hours						

280 ***Biomedical Imaging*** Credit: 3 hours.
(ECE 280) Introduction to the physics and engineering principles associated with magnetic resonance, ultrasound, computed tomography and nuclear imaging. Same as BIOE 280. Prerequisite: MATH 385, MATH 386, or MATH 441; PHYS 212; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
39320	lecture	G	03:00 PM - 03:50 PM	MWF	room 217 Noyes Laboratory	Webb, A
39320: 3 hours						

290 ***Computer Engineering, I*** Credit: 3 hours.
Introduction to digital logic and computer systems. Representation of information, combinational network analysis and design, sequential network analysis and design, computer organization and control. Laboratory for design and simulation of digital systems. Credit is not given for both ECE 290 and CS 231. Prerequisite: One of CS 101, CS 125, ECE 110, ECE 190.

Students must register for one discussion and one lecture section.

CRN	Type	Section	Time	Days	Location	Instructor
32786	discussion-recitation	ADB	09:00 AM - 09:50 AM	R	room 269 Everitt Elec and Comp Engr Lab	Brown, D; Knox, A
32787	discussion-recitation	ADC	10:00 AM - 10:50 AM	R	room 269 Everitt Elec and Comp Engr Lab	Brown, D; Knox, A
32788	discussion-	ADD	11:00 AM - 11:50	R	room 269 Everitt	Brown, D; Gupta, A

	recitation		AM		Elec and Comp Engr Lab	
32789	discussion-recitation	ADE	12:00 PM - 12:50 PM	R	room 269 Everitt Elec and Comp Engr Lab	Brown, D; Gupta, A
32790	discussion-recitation	ADF	01:00 PM - 01:50 PM	R	room 269 Everitt Elec and Comp Engr Lab	Brown, D; McClain, M
32791	discussion-recitation	ADG	02:00 PM - 02:50 PM	R	room 269 Everitt Elec and Comp Engr Lab	Brown, D; Matthews, D
32792	discussion-recitation	ADH	03:00 PM - 03:50 PM	R	room 269 Everitt Elec and Comp Engr Lab	Brown, D; Matthews, D
32793	lecture	AL1	12:00 PM - 12:50 PM	MW	room 314 Altgeld Hall	Brown, D; Frank, M

307 ***Techniques for Engin Decisions*** Credit: 3 hours.
The course is concerned with the modeling of decisions in engineering work and the analysis of models to develop a systematic approach to making decisions. The course aims to teach students to think structurally about decision-making problems. Fundamental concepts in linear and dynamic programming, probability theory and statistics serve as the mathematical basis for the development of techniques for solving typical problems faced in making engineering decisions in industry and government. Topics include resource allocation, logistics, scheduling, sequential decision making, sitting of facilities, investment decisions, application of financial derivatives and other problems for decision making under uncertainty. Extensive use of case studies from actual industrial applications gets students involved in real-world decisions. Prerequisite: ECE 210; credit or concurrent registration in ECE 413 or equivalent.

CRN	Type	Section	Time	Days	Location	Instructor
39322	lecture	G	10:00 AM - 11:20 AM	TR	room 245 Everitt Elec and Comp Engr Lab	Gross, G
39322: 3 hours						

316 ***Engineering Ethics*** Credit: 3 hours.
(ECE 216) Ethical issues in the practice of engineering: safety and liability, professional responsibility to clients and employers, whistle-blowing, codes of ethics, career choice, legal obligations; case studies. Same as PHIL 316. Prerequisite: Junior standing; RHET 105.

This course satisfies the General Education Criteria for a Advanced Composition, and Hist&Philosoph Perspect course.

CRN	Type	Section	Time	Days	Location	Instructor
32661	lecture	E3	09:00 AM - 10:20 AM	TR	room 170 Everitt Elec and Comp Engr Lab	Hillmer, P

32661: Advanced Composition, and Hist&Philosoph Perspect course.						
32661: 3 hours						
32662	lecture	E4	01:00 PM - 02:20 PM	TR	room 329 Gregory Hall	Hillmer, P
32662: Advanced Composition, and Hist&Philosoph Perspect course.						
32662: 3 hours						

328 ***Comp Soln EM Probs, I*** Credit: 1 hours.
(ECE 230) Solution of selected electromagnetics problems at the ECE 329 level using personal computers.
Prerequisite: Credit or concurrent registration in ECE 329.

CRN	Type	Section	Time	Days	Location	Instructor
32669	lecture-discussion	B	09:00 AM - 09:50 AM	F	room 241 Everitt Elec and Comp Engr Lab	Franke, P
32669: 1 hours						

329 ***Intro Electromagnetic Fields*** Credit: 3 hours.
(ECE 229) Elementary electromagnetic field theory as summarized in Maxwell's equations for time-varying fields in integral and differential forms; energy storage; static and quasistatic fields; and time-domain analysis of waves.
Prerequisite: ECE 205 or ECE 210

CRN	Type	Section	Time	Days	Location	Instructor
32665	discussion-recitation	B	09:00 AM - 09:50 AM	MWF	room 106B8 Engineering Hall	Dunn, E; Cunningham, B
32665: 3 hours						
32666	discussion-recitation	E	01:00 PM - 01:50 PM	MWF	room 106B1 Engineering Hall	Dunn, E; Oelze, M
32666: 3 hours						
32667	discussion-recitation	F	02:00 PM - 02:50 PM	MWF	room 245 Everitt Elec and Comp Engr Lab	Dunn, E; Cheng, K
32667: 3 hours						
32668	discussion-recitation	X	12:00 PM - 12:50 PM	MWF	room 106B1 Engineering Hall	Dunn, E
32668: 3 hours						

385 ***Digital Systems Laboratory*** Credit: 2 hours.

(ECE 249) Introduction to the experimental analysis and synthesis of digital networks, including the use of a microcomputer as a controller. Prerequisite: ECE 110 and ECE 290.

Students must register for one lab and one lecture section.

CRN	Type	Section	Time	Days	Location	Instructor
32767	laboratory	ABA	08:00 AM - 10:50 AM	T	room 234 Everitt Elec and Comp Engr Lab	Kempf, S
32768	laboratory	ABB	08:00 AM - 10:50 AM	T	room 234 Everitt Elec and Comp Engr Lab	Tsai, X
32769	laboratory	ABC	11:30 AM - 02:20 PM	T	room 234 Everitt Elec and Comp Engr Lab	Bray, N
32770	laboratory	ABD	11:30 AM - 02:20 PM	T	room 234 Everitt Elec and Comp Engr Lab	Cheng, J
32771	laboratory	ABE	03:00 PM - 05:50 PM	T	room 234 Everitt Elec and Comp Engr Lab	Fettinger, A
32772	laboratory	ABF	03:00 PM - 05:50 PM	T	room 234 Everitt Elec and Comp Engr Lab	Mehta, V
32773	laboratory	ABG	12:00 PM - 02:50 PM	W	room 234 Everitt Elec and Comp Engr Lab	Shah, N
32774	laboratory	ABH	12:00 PM - 02:50 PM	W	room 234 Everitt Elec and Comp Engr Lab	Tang, X
32775	laboratory	ABI	03:00 PM - 05:50 PM	W	room 234 Everitt Elec and Comp Engr Lab	Shah, N
32776	laboratory	ABJ	03:00 PM - 05:50 PM	W	room 234 Everitt Elec and Comp Engr Lab	Komma, N
32777	laboratory	ABK	08:00 AM - 10:50 AM	R	room 234 Everitt Elec and Comp Engr Lab	Kempf, S
32778	laboratory	ABL	08:00 AM - 10:50 AM	R	room 234 Everitt Elec and Comp Engr Lab	Sanghavi, S
32779	laboratory	ABM	11:30 AM - 02:20 PM	R	room 234 Everitt Elec and Comp Engr Lab	Bray, N
32780	laboratory	ABN	11:30 AM - 02:20 PM	R	room 234 Everitt Elec and Comp Engr Lab	Budhlakoti, S

32781	laboratory	ABO	03:00 PM - 05:50 PM	R	room 234 Everitt Elec and Comp Engr Lab	Fettinger, A
32782	lecture	AL1	03:00 PM - 03:50 PM	M	room 151 Everitt Elec and Comp Engr Lab	Patel, J

390 ***Computer Engineering, II*** Credit: 3 hours.
(ECE 291) Design and development of assembly language programs; input-output, interrupts, multitasking; introduction to data structures and graphics; ethical and social issues in computing; laboratory assignments on real-time data acquisition and device control. Credit is not given for both ECE 390 and CS 232. Prerequisite: ECE 290 or CS 231.

Students must register for one lab and one lecture section.

CRN	Type	Section	Time	Days	Location	Instructor
32794	laboratory	AB1	ARRANGED			
32795	lecture	AL1	10:30 AM - 11:50 AM	TR	room 151 Everitt Elec and Comp Engr Lab	Kalbarczyk, Z

395 ***Adv Digital Projects Lab*** Credit: 2 to 3 hours.
(ECE 246) Planning, designing, executing, and documenting a microcomputer based project. Hardware is emphasized but the special projects required of student may also require an equal emphasis on software. Prerequisite: ECE 385 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
32766	laboratory	A	ARRANGED			Bernsee, S
	lecture	A	11:00 AM - 11:50 AM	F	room 261 Everitt Elec and Comp Engr Lab	Patel, J

396 ***Honors Project*** Credit: 1 to 4 hours.
(ECE 296) Special project or reading course for James Scholars in engineering. Prerequisite: James Scholar in engineering; consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
10013	independent study		ARRANGED			
10013: Instructor Approval Required						

397 ***Individual Study in ECE*** Credit: 0 to 4 hours.

(ECE 272) Prerequisite: Approved written application to department as specified by department or instructor

CRN	Type	Section	Time	Days	Location	Instructor
10010	independent study		ARRANGED			
10010: Instructor Approval Required						

398 ***Special Topics in ECE*** Credit: 0 to 4 hours.
(ECE 271) Prerequisite: As specified for each topic offering; see Schedule or departmental course information.

CRN	Type	Section	Time	Days	Location	Instructor
40557	lecture	MM	02:00 PM - 02:50 PM	MWF	room 106B6 Engineering Hall	Levinson, S
40557: 3 hoursTopic: Mathematical Methods in ECE. Prerequisite: Math 242. Corequisities: Math 385.						
39321	lecture	SSL	10:30 AM - 11:45 AM	TR	room 252 Mechanical Engineering Bldg	Lumetta, S
39321: 3 hoursTopic: Computer Systems Engineering. ECE 290 or CS 331; ECE 190 encouraged.						

403 ***Audio Engineering*** Credit: 3 hours.
(ECE 303) Review of resonance and wave phenomena; acoustics of rooms and auditoriums; artificial reverberation and sound localization/spatialization; loudspeakers, enclosures, and microphones; and topics in digital audio. Prerequisite: ECE 290, ECE 410, and ECE 473; or consent of instructor

CRN	Type	Section	Time	Days	Location	Instructor
32796	discussion-recitation	E	01:00 PM - 01:50 PM	MWF	room 245 Everitt Elec and Comp Engr Lab	Hasegawa-Johnson, M
32796: 3 hours						

410 ***Digital Signal Processing, I*** Credit: 4 hours.
(ECE 310) Introduction to discrete-time systems and digital signal processing: discrete-time linear systems, difference equations, z-transform, discrete convolution, stability, discrete-time Fourier transform, analog-to-digital and digital-to-analog conversion, interpolation and decimation, digital filter design, discrete Fourier transform, fast Fourier transform, spectral analysis, applications of digital signal processing. Prerequisite: ECE 210 or consent of instructor

CRN	Type	Section	Time	Days	Location	Instructor
32797	lecture-	D	11:00 AM - 12:20	MW	room 1320 Digital	Singer, A

	discussion		PM		Computer Laboratory	
	lecture-discussion	D	11:00 AM - 11:50 AM	F	room 165 Everitt Elec and Comp Engr Lab	Singer, A
: 4 hours						
32799	lecture-discussion	G	03:00 PM - 04:20 PM	MW	room 269 Everitt Elec and Comp Engr Lab	Do, M
	lecture-discussion	G	03:00 PM - 03:50 PM	F	room 165 Everitt Elec and Comp Engr Lab	Do, M
: 4 hours						

411 ***Comp Organization & Design*** Credit: 4 hours.

(ECE 312) Basic computer organization and design, computer arithmetic, control design and microprogramming, memory organization, I/D design, reliability/performance evaluation; laboratory for computer design implementation, simulation, and layout. Credit is not given toward graduate degrees in Electrical Engineering. Prerequisite: ECE 390 or CS 232.

Students must register for one lab and one discussion section.

CRN	Type	Section	Time	Days	Location	Instructor
32816	lecture	G	03:00 PM - 04:20 PM	MW	room 165 Everitt Elec and Comp Engr Lab	Polychronopoulos, C
32815	laboratory-discussion	G1	ARRANGED			Patel, A; Ye, S; Sommers, P; Nefcy, B

412 ***Microcomputer Laboratory*** Credit: 3 hours.

(ECE 311) Design, construction, and use of a small general purpose computer with a micro-processor CPU; MSI and LSI circuits used extensively; control panel, peripheral controllers, control logic, central processor, and programming experiments; and open lab format. Prerequisite: ECE 385; ECE 390 or CS 232. Recommended: credit or concurrent registration in ECE 411.

CRN	Type	Section	Time	Days	Location	Instructor
32802	lecture	T	03:00 PM - 03:50 PM	TR	room 260 Everitt Elec and Comp Engr Lab	Burke, D
32801	laboratory	T1	ARRANGED			

413 ***Probability with Engrg Applic*** Credit: 3 hours.

(ECE 313) Introduction to probability theory with applications to engineering problems such as the reliability of

circuits and systems and to statistical methods for hypothesis testing, decision making under uncertainty, and parameter estimation. Credit is not given toward graduate degrees in Electrical Engineering. Prerequisite: ECE 210.

CRN	Type	Section	Time	Days	Location	Instructor
32817	discussion-recitation	C	10:00 AM - 10:50 AM	MWF	room 260 Everitt Elec and Comp Engr Lab	Sarwate, D
32817: 3 hours						
32818	discussion-recitation	D	11:00 AM - 11:50 AM	MWF	room 245 Everitt Elec and Comp Engr Lab	Sarwate, D
32818: 3 hours						

414 ***Biomedical Instrumentation*** Credit: 3 hours.
(ECE 314) Introduction to engineering aspects of the detection, acquisition, processing, and display of signals from living systems; biomedical transducers for measurements of biopotentials, ions and gases in aqueous solution, force, displacement, blood pressure, blood flow, heart sounds, respiration, and temperature; and therapeutic and prosthetic devices. Same as BIOE 414. Prerequisite: ECE 205 or ECE 210 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
33724	discussion-recitation	B	09:00 AM - 09:50 AM	MWF	room 165 Everitt Elec and Comp Engr Lab	Fish, R
33724: 3 hours						

415 ***Biomedical Instrumentation Lab*** Credit: 2 hours.
(ECE 315) Laboratory to accompany ECE 414. Studies medical instrumentation and transducers for static and dynamic nonbiological inputs and measures actual biomedical signals; requires some animal experiments. Same as BIOE 415. Prerequisite: Credit or concurrent registration in ECE 414.

CRN	Type	Section	Time	Days	Location	Instructor
33726	laboratory	AB1	01:00 PM - 03:50 PM	T	room 236 Everitt Elec and Comp Engr Lab	Fish, R
33727	laboratory	AB2	09:00 AM - 11:50 AM	R	room 236 Everitt Elec and Comp Engr Lab	Fish, R
33728	laboratory	AB3	01:00 PM - 03:50 PM	R	room 236 Everitt Elec and Comp Engr Lab	Fish, R
33729	laboratory	AB4	01:00 PM - 03:50 PM	W	room 236 Everitt Elec and Comp	Fish, R

					Engr Lab	
33730	lecture	AL1	09:00 AM - 09:50 AM	T	room 106B1 Engineering Hall	Fish, R

418 ***Image & Video Processing*** Credit: 4 hours.
(ECE 318) Basic concepts and applications in image and video processing; introduction to multidimensional signal processing: sampling, Fourier transform, filtering, interpolation and decimation; human visual perception; scanning and display of images and video; image enhancement, restoration and segmentation; digital image and video compression; and image analysis. Laboratory exercises allow students to gain hands-on experience with these topics and develop C and Matlab programs. Prerequisite: ECE 410; credit or concurrent registration in one of ECE 413, STAT 400, IE 300, MATH 415, MATH 461; experience with C programming language.

CRN	Type	Section	Time	Days	Location	Instructor
33737	laboratory	NB1	ARRANGED			
33738	lecture	NL1	10:00 AM - 11:20 AM	TR	room 163 Everitt Elec and Comp Engr Lab	Shinagawa, Y

420 ***Digital Signal Processing Lab*** Credit: 2 hours.
(ECE 320) Development of real-time digital signal processing (DSP) systems using a DSP microprocessor; several structured laboratory exercises, such as sampling and digital filtering, followed by an extensive DSP project of the student's choice. Prerequisite: ECE 410.

CRN	Type	Section	Time	Days	Location	Instructor
33739	laboratory	ABA	02:00 PM - 03:50 PM	T	room 251 Everitt Elec and Comp Engr Lab	Yin, Z; Frutiger, M; Allen, J; Ko, G
33740	laboratory	ABB	02:00 PM - 03:50 PM	R	room 251 Everitt Elec and Comp Engr Lab	Yin, Z; Frutiger, M; Allen, J; Ko, G
33741	laboratory	ABC	02:00 PM - 03:50 PM	W	room 251 Everitt Elec and Comp Engr Lab	Yin, Z; Frutiger, M; Allen, J; Ko, G
33742	laboratory	ABD	03:00 PM - 04:50 PM	F	room 251 Everitt Elec and Comp Engr Lab	Frutiger, M; Allen, J; Ko, G
33744	lecture	AL1	02:00 PM - 02:50 PM	M	room 106B8 Engineering Hall	Allen, J

421 ***Plasma and Fusion Science*** Credit: 3 hours.
(ECE 321) Same as NPRE 421 and PHYS 479. See NPRE 421.

CRN	Type	Section	Time	Days	Location	Instructor
34719	lecture-discussion	L	08:30 AM - 09:50 AM	TR	room 203 Nuclear Engineering Lab	Miley, G

425 ***Intro VLSI System Design*** Credit: 3 hours.
(ECE 325) Complementary Metal-Oxide Semiconductor (CMOS) technology and theory; CMOS circuit and logic design; layout rules and techniques; circuit characterization and performance estimation; CMOS subsystem design; Very-Large-Scale Integrated (VLSI) systems design methods; VLSI Computer Aided Design (CAD) tools; laboratory experience in custom VLSI chip design on workstations using concepts of cell hierarchy; final project involving specification, design and evaluation of a VLSI chip or VLSI CAD program; and written report and oral presentation on the final project. Same as CS 435 and CSE 433. Prerequisite: ECE 385 and ECE 411; or CS 232.

CRN	Type	Section	Time	Days	Location	Instructor
33850	laboratory	AB1	ARRANGED			
33853	lecture	AL1	11:00 AM - 12:20 PM	MW	room 269 Everitt Elec and Comp Engr Lab	Carter, N

428 ***Distributed Systems*** Credit: 3 hours.
(ECE 328) Same as CS 425 and CSE 424. See CS 425.

CRN	Type	Section	Time	Days	Location	Instructor
31388	lecture-discussion	T	03:30 PM - 04:45 PM	TR	room 1310 Digital Computer Laboratory	Gupta, I

430 ***Power Ckts & Electromechanics*** Credit: 3 hours.
(ECE 330) Network equivalents, power and energy fundamentals, resonance, mutual inductance, three-phase power concepts, forces and torques of electric origin in electromagnetic and electrostatic systems, energy conversion cycles, principles of electric machines, transducers, relays, laboratory demonstration. Credit is not given toward graduate degrees in Electrical Engineering. Prerequisite: ECE 210.

CRN	Type	Section	Time	Days	Location	Instructor
33871	discussion-recitation	C	10:00 AM - 10:50 AM	MWF	room 165 Everitt Elec and Comp Engr Lab	Sauer, P; Liu, C
33871: 3 hours						
33873	discussion-recitation	F	12:30 PM - 01:50 PM	TR	room 163 Everitt Elec and Comp Engr Lab	Liu, C
33873: 3 hours						

431 ***Electric Machinery*** Credit: 4 hours.
(ECE 333) Theory and laboratory experimentation with three-phase power, power factor correction, single- and three- phase transformers, induction machines, DC machines, and synchronous machines; includes project work on energy control systems; digital simulation of machine dynamics. Prerequisite: ECE 430.

CRN	Type	Section	Time	Days	Location	Instructor
33876	laboratory	ABA	10:00 AM - 12:50 PM	R	room 50 Everitt Elec and Comp Engr Lab	Zhang, G
33878	laboratory	ABB	12:00 PM - 02:50 PM	W	room 50 Everitt Elec and Comp Engr Lab	Amrhein, M
33879	laboratory	ABC	02:00 PM - 04:50 PM	R	room 50 Everitt Elec and Comp Engr Lab	Kwasinski, A
33880	lecture	AL1	11:00 AM - 11:50 AM	MWF	room 260 Everitt Elec and Comp Engr Lab	Krein, P

435 ***Computer Networking Laboratory*** Credit: 3 to 4 hours.
(ECE 335) Design, apply, analyze and evaluate communication network protocols under both Linux and Window NT operating systems. Emphasis on identifying problems, proposing alternative solutions, implementing prototypes using available network protocols and evaluating results. Students work in pairs on multiple programming projects per term. 3 undergraduate hours; or 3 to 4 graduate hours. Graduate students may receive 4 graduate hours by performing independent design projects. Prerequisite: CS 438.

CRN	Type	Section	Time	Days	Location	Instructor
33882	laboratory	C	ARRANGED			Yu, H; Wah, B
	lecture	C	10:00 AM - 10:50 AM	MWF	room 269 Everitt Elec and Comp Engr Lab	Yu, H; Wah, B
: 3 hours						
33881	laboratory	C1	ARRANGED			Yu, H; Wah, B
	lecture	C1	10:00 AM - 10:50 AM	MWF	room 269 Everitt Elec and Comp Engr Lab	Yu, H; Wah, B
: 4 hours						

437 ***Sensors and Instrumentation*** Credit: 3 hours.
This course gives senior and graduate students in ECE a hands-on introduction to the fundamental technology and practical application of sensors. Capacitive, inductive, optical, electromagnetic, and other sensing methods are examined. Instrumentation techniques incorporating computer control, sampling, and data collection and analysis

are reviewed in the context of real-world scenarios. Prerequisite: ECE 329.

CRN	Type	Section	Time	Days	Location	Instructor
39328	laboratory	AB1	02:00 PM - 05:00 PM	R	room 235 Everitt Elec and Comp Engr Lab	Bernhard, J; Alvey, G
39329	laboratory	AB2	09:00 AM - 12:00 PM	F	room 235 Everitt Elec and Comp Engr Lab	Bernhard, J; Alvey, G
39362	laboratory	AB3	02:00 PM - 05:00 PM	F	room 235 Everitt Elec and Comp Engr Lab	Bernhard, J; Alvey, G
39326	lecture	AL1	03:00 PM - 04:30 PM	T	room 165 Everitt Elec and Comp Engr Lab	Bernhard, J

438 ***Communication Networks*** Credit: 3 hours.
(ECE 338) Same as CS 438 and CSE 425. See CS 438.

CRN	Type	Section	Time	Days	Location	Instructor
31412	lecture-discussion	R	02:00 PM - 03:15 PM	TR	room 1404 Siebel Center for Comp Sci	Kravets, R; Patel, M; Luo, H
31412: 3 hours						

440 ***Solid State Electronic Devices*** Credit: 3 hours.
(ECE 340) Semiconductor materials and their electronic properties and applications to electronic devices; p-n junctions; transistors; junction field effect transistors and MOS devices; and introduction to integrated circuits. Credit is not given toward graduate degrees in Electrical Engineering. Prerequisite: PHYS 214; credit or concurrent registration in ECE 329.

CRN	Type	Section	Time	Days	Location	Instructor
33883	discussion-recitation	A	08:00 AM - 08:50 AM	MWF	room 165 Everitt Elec and Comp Engr Lab	Timp, G
33883: 3 hours						
33884	discussion-recitation	C	10:00 AM - 10:50 AM	MWF	room 169 Everitt Elec and Comp Engr Lab	Bishop, S
33884: 3 hours						
33886	discussion-	E	01:00 PM - 01:50	MWF	room 165 Everitt	Kim, K

	recitation		PM		Elec and Comp Engr Lab	
33886: 3 hours						
33887	discussion-recitation	G	03:00 PM - 03:50 PM	MWF	room 260 Everitt Elec and Comp Engr Lab	Tucker, J
33887: 3 hours						
33885	discussion-recitation	X	12:00 PM - 12:50 PM	MWF	room 245 Everitt Elec and Comp Engr Lab	Kim, K
33885: 3 hours						

441 ***Physcs & Modeling Semicond Dev*** Credit: 3 hours.
(ECE 341) Detailed presentation of advanced concepts such as generation-recombination, hot electron effects, and breakdown mechanisms; essential features of small ac characteristics, switching and transient behavior of p-n junctions, bipolar and MOS transistors; addresses fundamental issues for device modeling and discusses the perspective and limitations of Si-devices. Prerequisite: ECE 440.

CRN	Type	Section	Time	Days	Location	Instructor
33888	lecture-discussion	D	11:00 AM - 11:50 AM	MWF	room 241 Everitt Elec and Comp Engr Lab	Leburton, J
33888: 3 hours						

442 ***Electronic Circuits*** Credit: 3 hours.
(ECE 342) Analysis and design of analog and digital electronic circuits using MOS field effect transistors and bipolar junction transistors, with an emphasis on the study of amplifiers in integrated circuits. Credit is not given toward graduate degrees in Electrical Engineering. Credit is not given for both ECE 442 and PHYS 404. Prerequisite: ECE 210 and ECE 440.

CRN	Type	Section	Time	Days	Location	Instructor
33889	discussion-recitation	B	09:00 AM - 09:50 AM	MWF	room 151 Everitt Elec and Comp Engr Lab	Rosenbaum, E
33889: 3 hours						

443 ***Electronic Circuits Laboratory*** Credit: 1 hours.
(ECE 343) Laboratory to accompany ECE 442. Credit is not given toward graduate degrees in Electrical Engineering. Credit is not given for both ECE 443 and PHYS 404. Prerequisite: Concurrent registration in ECE 442.

CRN	Type	Section	Time	Days	Location	Instructor

33890	laboratory	M	12:00 PM - 02:50 PM	T	room 268 Everitt Elec and Comp Engr Lab	Liu, D; Zhang, J
33890: 1 hours						
33892	laboratory	N	03:00 PM - 05:50 PM	R	room 268 Everitt Elec and Comp Engr Lab	Zhang, J; Byrd, E
33892: 1 hours						
33894	laboratory	O	09:00 AM - 11:50 AM	R	room 268 Everitt Elec and Comp Engr Lab	Zhang, J; Chelliyil, R
33894: 1 hours						
33896	laboratory	R	03:00 PM - 05:50 PM	T	room 268 Everitt Elec and Comp Engr Lab	Zhang, J; Byrd, E
33896: 1 hours						
33898	laboratory	S	12:00 PM - 02:50 PM	R	room 268 Everitt Elec and Comp Engr Lab	Liu, D; Zhang, J
33898: 1 hours						

444 ***IC Device Theory & Fabrication*** Credit: 4 hours.
(ECE 344) Laboratory and lecture course on the physical theory, design, and fabrication of devices suitable for integrated circuitry; includes the electrical properties of semiconductors and techniques (epitaxial growth, oxidation, photolithography diffusion, ion implantation, metallization, characterization) for fabricating integrated circuit devices such as p-n junction diodes, bipolar transistors, and field effect transistors. Prerequisite: ECE 440.

CRN	Type	Section	Time	Days	Location	Instructor
33902	laboratory	ABA	09:00 AM - 11:50 AM	T	room 50M Everitt Elec and Comp Engr Lab	Chen, G; Sievers, D; Pawlowski, D; Verma, V
33903	laboratory	ABB	02:00 PM - 04:50 PM	T	room 50M Everitt Elec and Comp Engr Lab	Sievers, D; Chu, H; Pawlowski, D
33904	laboratory	ABC	09:00 AM - 11:50 AM	R	room 50M Everitt Elec and Comp Engr Lab	Sievers, D; Chu, H; Pawlowski, D; Verma, V
33905	laboratory	ABD	02:00 PM - 04:50 PM	R	room 50M Everitt Elec and Comp Engr Lab	Chen, G; Sievers, D; Chu, H
33906	laboratory	ABE	02:00 PM - 04:50 PM	M	room 50M Everitt Elec and Comp Engr Lab	Sievers, D; Chu, H; Pawlowski, D
33907	laboratory	ABF	02:00 PM - 04:50	W	room 50M Everitt	Chen, G; Sievers, D;

			PM		Elec and Comp Engr Lab	Chu, H; Verma, V
33908	laboratory	ABG	02:00 PM - 04:50 PM	F	room 50M Everitt Elec and Comp Engr Lab	Sievers, D; Chu, H; Pawlowski, D
33900	discussion-recitation	AD1	09:00 AM - 09:50 AM	MWF	room 245 Everitt Elec and Comp Engr Lab	Coleman, J
33901	discussion-recitation	AD2	10:00 AM - 10:50 AM	MWF	room 245 Everitt Elec and Comp Engr Lab	Choquette, K

445 ***Senior Design Project Lab*** Credit: 2 hours.
(ECE 345) Individual design projects in various areas of electrical and computer engineering; projects are chosen by students with approval of the instructor; a written report, prepared to journal publication standards, and an oral presentation are required. Credit is not given toward graduate degrees in Electrical Engineering. Prerequisite: Senior standing in ECE.

Additional Laboratory time to be arranged in 246 Everitt Laboratory.

CRN	Type	Section	Time	Days	Location	Instructor
33909	laboratory	H	04:00 PM - 04:50 PM	W	room 151 Everitt Elec and Comp Engr Lab	Carney, P
33909: 2 hours						

447 ***Active Microwave Ckt Design*** Credit: 3 hours.
(ECE 347) Laboratory and lecture course on microwave circuit design of amplifiers, oscillators, and mixers. Prerequisite: ECE 450 and ECE 453.

CRN	Type	Section	Time	Days	Location	Instructor
33910	laboratory	ABA	01:00 PM - 03:50 PM	W	room 251 Everitt Elec and Comp Engr Lab	Elkow, J
33911	laboratory	ABB	06:00 PM - 08:50 PM	W	room 251 Everitt Elec and Comp Engr Lab	Elkow, J
33912	laboratory	ABC	06:00 PM - 08:50 PM	R	room 251 Everitt Elec and Comp Engr Lab	Elkow, J
33913	lecture	AL1	04:00 PM - 05:15 PM	M	room 245 Everitt Elec and Comp Engr Lab	Feng, M

448 ***Intro Artificial Intelligence*** Credit: 3 or 4 hours.
(ECE 348) Same as CS 440. See CS 440.

CRN	Type	Section	Time	Days	Location	Instructor
31425	lecture-discussion	Q3	12:30 PM - 01:45 PM	TR	room 1320 Digital Computer Laboratory	Ponce, J; Bergstrom, A; Mobahi, H
31425: 3 hours						
31426	lecture-discussion	Q4	12:30 PM - 01:45 PM	TR	room 1320 Digital Computer Laboratory	Ponce, J; Bergstrom, A; Mobahi, H
31426: 4 hours						

450 ***Lines, Fields, and Waves*** Credit: 3 hours.
(ECE 350) General plane wave solution of Maxwell's equations; reflection and transmission of plane waves; transmission lines; impedance matching; waveguides and cavities; and radiation. Credit is not given toward graduate degrees in Electrical Engineering. Prerequisite: ECE 329.

CRN	Type	Section	Time	Days	Location	Instructor
33914	discussion-recitation	E	01:00 PM - 01:50 PM	MWF	room 260 Everitt Elec and Comp Engr Lab	Makela, J
33914: 3 hours						
33915	discussion-recitation	X	12:00 PM - 12:50 PM	MWF	room 260 Everitt Elec and Comp Engr Lab	Schutt-Aine, J
33915: 3 hours						

453 ***Radio Communication Circuits*** Credit: 4 hours.
(ECE 353) Design of a radio system for transmission of information; types of receivers, matching techniques, receiver and antenna noise, types of modulation, high-frequency circuitry, and point-to-point and satellite communications. Prerequisite: ECE 442; credit or concurrent registration in ECE 450

CRN	Type	Section	Time	Days	Location	Instructor
33916	laboratory	ABA	09:00 AM - 11:50 AM	T	room 251 Everitt Elec and Comp Engr Lab	Hagen, C
33917	laboratory	ABB	12:00 PM - 02:50 PM	T	room 251 Everitt Elec and Comp Engr Lab	Hagen, C
33919	laboratory	ABC	03:00 PM - 05:50	T	room 251 Everitt	Schlachter, S

			PM		Elec and Comp Engr Lab	
33918	discussion-recitation	AD1	11:00 AM - 11:50 AM	MWF	room 163 Everitt Elec and Comp Engr Lab	Franke, S

454 ***Antennas*** Credit: 3 hours.
(ECE 354) Antenna parameters; polarization of electromagnetic waves; basic antenna types; antenna arrays; broadband antenna design; and antenna measurements. Prerequisite: ECE 450 or consent of instructor

CRN	Type	Section	Time	Days	Location	Instructor
33920	discussion-recitation	B	09:00 AM - 09:50 AM	MWF	room 260 Everitt Elec and Comp Engr Lab	Michielssen, E
33920: 3 hours						
41670	online	XM	ARRANGED			Michielssen, E
41670: Academic Outreach restrictions and assessments apply, see http://www.outreach.uiuc.edu.OnlineAO Tuition 608, AO Tuition 608, AO Fees 36, and AO Fees 36.00 dollars.						

457 ***Microwave Devices & Circuits*** Credit: 3 hours.
(ECE 357) Electromagnetic wave propagation, microwave transmission systems, passive components, microwave tubes, solid state microwave devices, microwave integrated circuits, S-parameter analysis, microstrip transmission lines. Prerequisite: ECE 440 or equivalent; ECE 450 or equivalent.

CRN	Type	Section	Time	Days	Location	Instructor
33921	lecture	G	03:00 PM - 03:50 PM	MWF	room 1105 Siebel Center for Comp Sci	Bernhard, J
33921: 3 hours						

458 ***Applic of Rad Wave Propagation*** Credit: 3 hours.
(ECE 358) Terrestrial atmosphere, radio wave propagation, and applications to radio sensing and radio communication. Prerequisite: ECE 450 or consent of instructor

CRN	Type	Section	Time	Days	Location	Instructor
33922	discussion-recitation	G	03:00 PM - 03:50 PM	MWF	room 57 Everitt Elec and Comp Engr Lab	Kudeki, E
33922: 3 hours						

459 ***Communications, I*** Credit: 3 hours.
(ECE 359) Introduction to analog and digital modulation techniques, random processes, and power spectral density. Effects of noise on, and bandwidth requirements of, different modulation schemes. Prerequisite: ECE 413 or equivalent

CRN	Type	Section	Time	Days	Location	Instructor
41750	online	ONL	ARRANGED			Basar, T
41750: Academic Outreach restrictions and assessments apply, see http://www.outreach.uiuc.edu; For additional information on this course, please visit http://online.engr.uiuc.edu/descriptions/spring2005.htm.OnlineAO Tuition 608, AO Tuition 608, AO Fees 36, and AO Fees 36.00 dollars.						
33923	discussion-recitation	R	01:30 PM - 02:50 PM	TR	room 165 Everitt Elec and Comp Engr Lab	Viswanath, P
33923: 3 hours						

461 ***Communications, II*** Credit: 3 hours.
(ECE 361) Digital communication systems, modulation, demodulation, channel models, bit error rate, spectral occupancy, synchronization, equalization, and trellis-coded modulation. Prerequisite: ECE 459

CRN	Type	Section	Time	Days	Location	Instructor
33924	discussion-recitation	L	08:30 AM - 09:50 AM	TR	room 163 Everitt Elec and Comp Engr Lab	Hajek, B
33924: 3 hours						

462 ***Logic Design*** Credit: 3 hours.
(ECE 362) Design of combinational networks, hazards, finite state testing machines, design of sequential networks in fundamental mode and pulse mode, state reduction, state assignment and races, and fault detection and testing. Same as CS 462 and MATH 491. Prerequisite: ECE 290 or CS 231

CRN	Type	Section	Time	Days	Location	Instructor
33957	discussion-recitation	C	10:00 AM - 10:50 AM	MWF	room 132 Bevier Hall	Vaidya, N
33957: 3 hours						

468 ***Optical Remote Sensing*** Credit: 3 hours.
Introduction to Optical Remote Sensing. Optical sensors including single element and area arrays (CCDs). Systems including imager, spectrometer, interferometer and lidar optical principles and light gathering power. Electromagnetics of atomic and molecular emission and scattering with applications to the atmosphere as an example. Applications include ground and spacecraft platforms. Four laboratory sessions (4.5 hours each) will be arranged during the semester in lieu of four lectures. Same as AE 468 and ATMS 468. Prerequisite: PHYS 214, ECE 210, ECE 329, and a course in probability or statistics; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
40643	lecture	A	11:30 AM - 01:00 PM	TR	room 169 Everitt Elec and Comp Engr Lab	Swenson, G
40643: 3 hoursThis course has 4 lab times that will be arranged.						

473 ***Fund of Engrg Acoustics*** Credit: 3 or 4 hours.
(ECE 373) Development of the basic theoretical concepts of acoustical systems; mechanical vibration, plane and spherical wave phenomena in fluid media, lumped and distributed resonant systems, and absorption phenomena and hearing. Same as TAM 413. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: MATH 385 or equivalent.

CRN	Type	Section	Time	Days	Location	Instructor
33967	discussion-recitation	F3	02:00 PM - 02:50 PM	MWF	room 163 Everitt Elec and Comp Engr Lab	Frizzell, L

474 ***Ultrasonic Techniques*** Credit: 3 or 4 hours.
(ECE 374) Ultrasonic wave propagation, generation, detection, and measurement in liquid and solid media, acoustic impedance concepts, ultrasonic absorption and velocity measurement techniques, piezoelectricity, and discussion of industrial, experimental, bioengineering, and medical applications. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: ECE 473 or equivalent or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
39330	lecture	L	08:30 AM - 09:50 AM	TR	room 245 Everitt Elec and Comp Engr Lab	Frizzell, L
39330: 3 hours						

478 ***Formal Software Dev Methods*** Credit: 3 or 4 hours.
Same as CS 477. See CS 477.

CRN	Type	Section	Time	Days	Location	Instructor
39766	lecture-discussion	B3	09:30 AM - 10:45 AM	TR	room 1131 Siebel Center for Comp Sci	Viswanathan, M
39766: 3 hours						
39767	lecture-discussion	B4	09:30 AM - 10:45 AM	TR	room 1131 Siebel Center for Comp Sci	Viswanathan, M
39767: 4 hours						

483 ***Analog IC Design*** Credit: 3 hours.
(ECE 383) Basic linear integrated circuit design techniques using bi-polar, JFET, and MOS technologies; operational amplifiers; wide-band feedback amplifiers; sinusoidal and relaxation oscillators; electric circuit noise; application of linear integrated circuits. Prerequisite: ECE 442.

CRN	Type	Section	Time	Days	Location	Instructor
33973	discussion-recitation	L	02:00 PM - 02:50 PM	MWF	room 114 Transportation Bldg	Chiu, Y
33973: 3 hours						

484 ***Prin Adv Microelec Processing*** Credit: 3 hours.
(ECE 384) Teaches seniors and first year graduate students in Electrical Engineering advanced topics in semiconductor device processing. Covers the principles of advanced methods of pattern delineation, pattern transfer, modern material growth and how these are applied to produce novel and high performance devices and circuits in various semiconductor materials with special emphasis on compound semiconductors. Issues in computer simulation of processes and the manufacturing of devices and circuits are also covered. Prerequisite: ECE 444.

CRN	Type	Section	Time	Days	Location	Instructor
33974	lecture-discussion	N	10:00 AM - 11:20 AM	TR	room 260 Everitt Elec and Comp Engr Lab	Adesida, I
33974: 3 hours						

486 ***Control Systems*** Credit: 4 hours.
(ECE 386) Analysis and design of control systems with emphasis on modeling, state variable representation, computer solutions, modern design principles, and laboratory techniques. Prerequisite: ECE 210 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
33976	laboratory	ABA	03:00 PM - 05:50 PM	T	room 235 Everitt Elec and Comp Engr Lab	Holm, J
33977	laboratory	ABB	11:00 AM - 01:50 PM	T	room 235 Everitt Elec and Comp Engr Lab	Imer, O
33978	laboratory	ABC	02:00 PM - 04:50 PM	W	room 235 Everitt Elec and Comp Engr Lab	Holm, J
33975	discussion-recitation	ADC	10:00 AM - 10:50 AM	MWF	room 163 Everitt Elec and Comp	Meyn, S

					Engr Lab	

488 ***Compound Semicond & Devices*** Credit: 3 hours.
(ECE 388) Advanced semiconductor materials and devices course covering elementary band theory, heterostructures, transport issues, three-terminal devices, two-terminal devices, including lasers and light modulators. Prerequisite: ECE 440; ECE 450 or consent of instructor

CRN	Type	Section	Time	Days	Location	Instructor
39332	lecture	C	10:00 AM - 10:50 AM	MWF	room 170 Everitt Elec and Comp Engr Lab	Cheng, K
39332: 3 hours						

489 ***Robot Dynamics and Control*** Credit: 4 hours.
(ECE 389) Same as GE 422 and ME 446. See GE 422.

CRN	Type	Section	Time	Days	Location	Instructor
40492	laboratory	AB1	ARRANGED			
40674	lecture	AL1	10:30 AM - 11:50 AM	TR	room 1105 Siebel Center for Comp Sci	Spong, M

490 ***Introduction to Optimization*** Credit: 3 or 4 hours.
(ECE 390) Basic theory and methods for the solution of optimization problems; iterative techniques for unconstrained minimization; and introductory presentation of linear and nonlinear programming with engineering applications. Same as CSE 441. 3 undergraduate hours. 4 graduate hours. Prerequisite: CS 101 or CS 125; MATH 380; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
33979	discussion-recitation	P	11:30 AM - 12:50 PM	TR	room 165 Everitt Elec and Comp Engr Lab	Kumar, P

491 ***Intro to Numerical Analysis*** Credit: 3 or 4 hours.
(ECE 391) Same as CS 450, CSE 401, and MATH 450. See CS 450.

CRN	Type	Section	Time	Days	Location	Instructor
31436	lecture-discussion	B3	09:00 AM - 09:50 AM	MWF		Bond, S

31436: 3 hours						
31438	lecture-discussion	B4	09:00 AM - 09:50 AM	MWF	room 1310 Digital Computer Laboratory	Bond, S
31438: 4 hours						

492 ***Intro to Parallel Programming*** Credit: 3 or 4 hours.
(ECE 392) Same as CS 420 and CSE 402. See CS 420.

CRN	Type	Section	Time	Days	Location	Instructor
31374	lecture-discussion	D3	11:00 AM - 11:50 AM	MWF	room 1310 Digital Computer Laboratory	Padua, D
31374: 3 hours						
39739	lecture-discussion	D4	11:00 AM - 11:50 AM	MWF	room 1310 Digital Computer Laboratory	Padua, D
39739: 4 hours						

497 ***Senior Research Project*** Credit: 2 hours.
(ECE 298) Individual research project under the guidance of a faculty member: for example, mathematical analysis, laboratory experiments, computer simulations, software development, circuit design, or device fabrication. Preparation of a written research proposal, which includes preliminary results. 2 undergraduate hours. No graduate credit. Prerequisite: Senior standing; RHET 105; consent of instructor.

This course satisfies the General Education Criteria for a Advanced Composition course.

This course is intended for Honors students and Chancellor Scholars.

CRN	Type	Section	Time	Days	Location	Instructor
10016	independent study		ARRANGED			
10016: Instructor Approval Required						

498 ***Special Topics in ECE*** Credit: 0 to 4 hours.
(ECE 371) Lectures and discussions relating to new areas of interest. May be repeated. Prerequisite: As specified for each topic offering; see Schedule or departmental course information.

CRN	Type	Section	Time	Days	Location	Instructor
40109	lecture	DN	01:00 PM - 02:20 PM	MW	room 260 Mechanical Engineering Bldg	Nicol, D

40109: 3 hoursTopic: Discrete-Event Simulation of Computer and Communicaiton Systems. Prerequisites: one of Math 461, Math 463, ECE 413, or permission of instructor. Eligible students should demonstrate familiarity with one or more of the following: basic network analysis, programming methodoligies, graphic design, human perception and cognition, statistics, computer vision, computer speech analysis, computer graphics, and human computer interaction.						
40108	lecture	NA	05:00 PM - 07:50 PM	T	room 2269 Beckman Institute	Ahuja, N
40108: Instructor Approval RequiredTopic: Visualizing and Navigation Knowledge Networks. Prerequisites: Admission to the course is by permission of the instructor. Eligible students should demonstrate familiarity with one or more of the following: basic network analysis, programming methodoligies, graphic design, human perception and cognition, statistics, computer vision, computer speech analysis, computer graphics, and human computer interaction. Can be taken for 3 hours for undergrads and 4 hours for graduates.						
39963	lecture	TH	09:00 AM - 10:20 AM	MW	room 106B6 Engineering Hall	Huang, T
39963: 3 hoursTopic: multimedia Signal Processing. Prerequisites: ECE 410, ECE 413.						

499 ***Senior Thesis*** Credit: 2 hours.
(ECE 299) Completion of the research project begun under ECE 497. Preparation and oral presentation of a written thesis that reports the results of the project. 2 undergraduate hours. No graduate credit. Prerequisite: ECE 497 and consent of instructor.

This course satisfies the General Education Criteria for a Advanced Composition course.

CRN	Type	Section	Time	Days	Location	Instructor
10018	independent study		ARRANGED			
10018: Instructor Approval Required						
43004	independent study	RIM	ARRANGED			Masel, R
43004: 2 hoursAdvanced Composition course.						

500 ***Graduate Seminar*** Credit: 0 hours.
(ECE 400) Required of all graduate students. Approved for S/U grading only.

CRN	Type	Section	Time	Days	Location	Instructor
33981	lecture	U	04:00 PM - 04:50 PM	R	room 151 Everitt Elec and Comp Engr Lab	
40290	lecture	U1	04:00 PM - 04:50 PM	R	room 151 Everitt Elec and Comp Engr Lab	Fisher, L
33982	lecture	U2	04:00 PM - 04:50 PM	R	room 151 Everitt Elec and Comp	Fisher, L

					Engr Lab	

512 ***Computer Microarchitecture*** Credit: 4 hours.
(ECE 411) Design of high performance computer systems; instruction level concurrency; memory system implementation; pipelining, superscalar, and vector processing; compiler back-end code optimization; profile assisted code transformations; code generation and machine dependent code optimization; cache memory design for multiprocessors; synchronization implementation in multiprocessors; compatibility issues; technology factors; state-of-the-art commercial systems. Same as CSE 528. Prerequisite: ECE 511; CS 426 or equivalent.

CRN	Type	Section	Time	Days	Location	Instructor
39333	lecture-discussion	G	03:00 PM - 04:20 PM	MW	room 252 Mechanical Engineering Bldg	Hwu, W
39333: 4 hours						

515 ***Control Syst Theory & Design*** Credit: 4 hours.
(ECE 415) Synthesis of feedback control systems to meet design specifications, including sensitivity; multivariable systems; introduction to systems with random inputs; state variable techniques; and nonlinear systems. Prerequisite: ECE 486 or equivalent; or consent of instructor

CRN	Type	Section	Time	Days	Location	Instructor
33983	discussion-recitation	N	10:00 AM - 11:20 AM	TR	room 165 Everitt Elec and Comp Engr Lab	Perkins, W
33983: 4 hours						
40663	online	ONL	ARRANGED			Perkins, W
40663: 4 hoursAcademic Outreach restrictions and assessments apply, see http://www.outreach.uiuc.edu; Please see http://online.engr.uiuc.edu/descriptions/spring2005.htm for more details on this course.OnlineAO Tuition 608, AO Tuition 608, AO Fees 36, and AO Fees 36.00 dollars.						

520 ***EM Waves & Radiating Systems*** Credit: 4 hours.
(ECE 420) Fundamental electromagnetic theory with applications to transmission lines, waveguides, and antennas; introduction to the solution of advanced problems in static electric and magnetic fields. Prerequisite: ECE 452.

CRN	Type	Section	Time	Days	Location	Instructor
33984	discussion-recitation	E	01:00 PM - 01:50 PM	MWF	room 106B8 Engineering Hall	Schutt-Aine, J
33984: 4 hours						

528 ***Analysis of Nonlinear Systems*** Credit: 4 hours.

(ECE 428) First-level graduate course on the analysis on nonlinear dynamical systems, covering topics such as nonlinear dynamics, vector fields and flows, Lyapunov stability theory, regular and singular perturbations, averaging, integral manifolds, input-output and input-to-state stability, and various design applications in control systems and robotics. Same as GE 520, and ME 546. Prerequisite: ECE 515 or equivalent; one of MATH 385, MATH 386, MATH 441; or consent of instructor

CRN	Type	Section	Time	Days	Location	Instructor
33986	discussion-recitation	R	01:30 PM - 02:50 PM	TR	room 169 Everitt Elec and Comp Engr Lab	Ma, Y
33986: 4 hours						

531 ***Theory of Guided Waves*** Credit: 4 hours.
(ECE 431) Propagation of electromagnetic waves in general cylindrical waveguides; stationary principles; non-uniform inhomogeneously filled waveguides; mode and power orthogonality; losses in waveguides; analytical and numerical techniques; microwave integrated circuits waveguides; and optical waveguides. Prerequisite: ECE 520; MATH 556 recommended

CRN	Type	Section	Time	Days	Location	Instructor
39338	discussion-recitation	C	10:30 AM - 11:50 AM	MW	room 450D Everitt Elec and Comp Engr Lab	Chew, W
39338: 4 hours						

533 ***Parallel Computer Architecture*** Credit: 4 hours.
(ECE 433) Same as CS 533 and CSE 522. See CS 533.

CRN	Type	Section	Time	Days	Location	Instructor
31613	lecture-discussion	S	09:30 AM - 10:45 AM	TR	room 1109 Siebel Center for Comp Sci	Torrellas, J
31613: 4 hours						

534 ***Random Processes*** Credit: 4 hours.
(ECE 434) Basic concepts of random processes; linear systems with random inputs; Markov processes; spectral analysis; Wiener and Kalman filtering; applications to systems engineering. Prerequisite: One of ECE 413, MATH 461, STAT 400; or consent of instructor

CRN	Type	Section	Time	Days	Location	Instructor
33989	discussion-recitation	F	02:30 PM - 03:50 PM	MW	room 1214 Siebel Center for Comp	Hadjicostis, C

					Sci	
33989: 4 hours						

536 ***Integ Optics & Optoelectronics*** Credit: 4 hours.
(ECE 436) Integrated optical and optoelectronic devices; theory of optical devices including laser sources, waveguides, photodetectors, and modulations of these devices. Prerequisite: One of ECE 455, ECE 487, PHYS 486; ECE 488 recommended

CRN	Type	Section	Time	Days	Location	Instructor
33990	discussion-recitation	N	10:30 AM - 11:50 AM	TR	room 170 Everitt Elec and Comp Engr Lab	Chuang, S
33990: 4 hours						

539 ***Adv Theory Semicond & Devices*** Credit: 4 hours.
(ECE 439) Selected advanced topics of current interest in the physics of semiconductors and solid-state devices. Same as CSE 534. Prerequisite: ECE 535.

CRN	Type	Section	Time	Days	Location	Instructor
39334	discussion-recitation	X	12:00 PM - 12:50 PM	MWF	room 170 Everitt Elec and Comp Engr Lab	Ravaioli, U
39334: 4 hours						

543 ***Dig Testing & Design for Test*** Credit: 4 hours.
(ECE 443) Fundamental techniques of detecting failures in complex digital systems, algorithms for automatic test generation, schemes for designing systems to be easily testable and with self test capability; hands-on experience with state-of-the-art computer-aided test tools in the laboratory. Prerequisite: ECE 411; ECE 462 or equivalent

CRN	Type	Section	Time	Days	Location	Instructor
33993	discussion-recitation	C	10:00 AM - 11:20 AM	MW	room 336 Mechanical Engineering Bldg	Patel, J
33993: 4 hours						

548 ***Comp Models of Cognitive Proc*** Credit: 4 hours.
(ECE 448) Same as CS 548. See CS 548.

CRN	Type	Section	Time	Days	Location	Instructor

31617	lecture-discussion	R	12:30 PM - 01:45 PM	TR	room 1131 Siebel Center for Comp Sci	Dejong, G
31617: 4 hours						

550 ***Advanced Robotic Planning*** Credit: 4 hours.
(ECE 450) Computational approaches to robot motion planning, configuration space, algebraic decompositions, artificial potential fields, retraction, approximate decompositions, planning under uncertainty, grasp planning and task- level planning. Prerequisite: CS 473 or equivalent; graduate standing

CRN	Type	Section	Time	Days	Location	Instructor
39335	lecture-discussion	R	11:30 AM - 12:50 PM	TR	room 260 Everitt Elec and Comp Engr Lab	Hutchinson, S
39335: 4 hours						

551 ***Digital Signal Processing II*** Credit: 4 hours.
(ECE 451) Reviews basic concepts of digital signals and systems; examines computer-aided digital filter design, quantization effects, decimation and interpolation, fast algorithms for convolution and the DFT; and introduces adaptive signal processing. Same as CSE 542. Prerequisite: ECE 410 and ECE 413; or equivalent

CRN	Type	Section	Time	Days	Location	Instructor
33996	discussion-recitation	R	01:30 PM - 02:50 PM	TR	room 260 Everitt Elec and Comp Engr Lab	Liang, Z
33996: 4 hours						
41669	online	XM	ARRANGED			Singer, A
41669: Academic Outreach restrictions and assessments apply, see http://www.outreach.uiuc.edu.OnlineAO Tuition 608, AO Tuition 608, AO Fees 36, and AO Fees 36.00 dollars.						

553 ***Optimum Control Systems*** Credit: 4 hours.
(ECE 453) Formulation of the optimization problem; controlability; observability; stability; Lyapunov's second method; application of variational calculus, maximum principle, and principle of optimality to control problems; stochastic control; and adaptive control. Prerequisite: ECE 515

CRN	Type	Section	Time	Days	Location	Instructor
33998	discussion-recitation	N	12:30 PM - 01:50 PM	MW	room 106B3 Engineering Hall	Liberzon, D
33998: 4 hours						

558 ***Digital Imaging*** Credit: 4 hours.
(ECE 458) Multidimensional signals, convolution, transforms, sampling, and interpolation; design of two-dimensional digital filters; sensor array processing and range-doppler imaging; applications to synthetic aperture radar, optics, tomography, radio astronomy, and beam-forming sonar; image estimation from partial data. Prerequisite: ECE 410 and ECE 413; or equivalent

CRN	Type	Section	Time	Days	Location	Instructor
34000	discussion-recitation	D	11:00 AM - 11:50 AM	MWF	room 169 Everitt Elec and Comp Engr Lab	Kamalabadi, F
34000: 4 hours						

560 ***VLSI in DSP & Communication*** Credit: 4 hours.
(ECE 460) Basic concepts in digital signal processing, VLSI design methodologies, VLSI DSP building blocks; algorithm transformation and mapping techniques, high-speed, low-power transforms, applications to digital filtering; basics of finite-field arithmetic, forward-error correction algorithms, and architectures; DSP implementation platforms, programmable DSPs, media processors, FPGAs, ASICs, case studies of multimedia communications systems, video codecs, xDSL and cable modems. Homework and a term project allow students to apply these concepts in the design of VLSI architectures for digital signal processing and communication systems. Prerequisite: ECE 410

CRN	Type	Section	Time	Days	Location	Instructor
41686	online	ONL	ARRANGED			Shanbhag, N
41686: Academic Outreach restrictions and assessments apply, see http://www.outreach.uiuc.edu; For course details, please visit http://online.engr.uiuc.edu/descriptions/spring2005.htm.OnlineAO Tuition 608, AO Tuition 608, AO Fees 36, and AO Fees 36.00 dollars.						
39336	lecture	R	11:00 AM - 12:20 PM	TR	room 57 Everitt Elec and Comp Engr Lab	Shanbhag, N
39336: 4 hours						

561 ***Detection & Estimation Theory*** Credit: 4 hours.
(ECE 461) Introduction to detection and estimation theory, with applications to communication, control, and radar systems; decision-theory concepts and optimum-receiver principles; detection of random signals in noise, coherent and noncoherent detection; and parameter estimation, linear and nonlinear estimation, and filtering. Prerequisite: ECE 534 or equivalent or consent of instructor

CRN	Type	Section	Time	Days	Location	Instructor
34003	discussion-recitation	E	01:00 PM - 02:20 PM	MW	room 1105 Siebel Center for Comp Sci	Moulin, P
34003: 4 hours						

567 ***Communication Network Analysis*** Credit: 4 hours.
(ECE 467) First high-level course in performance analysis and design of multiple-user communication systems; emphasizes rigorous formulation and analytical and computational methods; includes queuing networks, decentralized minimum delay routing and dynamic network flow control. Prerequisite: CS 438; ECE 534 or MATH 466; or consent of instructor

CRN	Type	Section	Time	Days	Location	Instructor
39337	discussion-recitation	C	02:00 PM - 03:30 PM	TR	room 163 Everitt Elec and Comp Engr Lab	Srikant, R
39337: 4 hours						

572 ***Quantum Electronics*** Credit: 4 hours.
(ECE 472) Brief theoretical introduction to quantum mechanics and atomic physics, with many applications in spin resonance and modern maser theory. Prerequisite: PHYS 485 recommended

CRN	Type	Section	Time	Days	Location	Instructor
34007	discussion-recitation	B	09:00 AM - 09:50 AM	MWF	room 163 Everitt Elec and Comp Engr Lab	Choquette, K
34007: 4 hours						

576 ***Power System Dyn & Stability*** Credit: 4 hours.
(ECE 476) Detailed modeling of the synchronous machine and its controls, such as excitation system and turbine-governor dynamics; time-scales and reduced order models; non-linear and linear multi-machine models; stability analysis using energy functions; power system stabilizers. Same as CSE 544. Prerequisite: ECE 476 or consent of instructor. Concurrent registration in ECE 515 recommended

CRN	Type	Section	Time	Days	Location	Instructor
39339	discussion-recitation	G	03:00 PM - 03:50 PM	MWF	room 245 Everitt Elec and Comp Engr Lab	Sauer, P
39339: 4 hours						
41741	online	ONL	ARRANGED			Sauer, P
41741: Academic Outreach restrictions and assessments apply, see http://www.outreach.uiuc.edu; For more information please visit http://online.engr.uiuc.edu/descriptions/spring2005.htm.OnlineAO Tuition 608, AO Tuition 608, AO Fees 36, and AO Fees 36.00 dollars.						

579 ***Computational Complexity*** Credit: 4 hours.
(ECE 479) Turing machines; determinism and non-determinism; time and space hierarchy theorems; speed-up and tape compression; Blum axioms; structure of complexity classes NP, P, NL, L, PSPACE; complete problems; randomness and complexity classes RP, RL, BPP; alternation, polynomial-time hierarchy; circuit complexity,

parallel complexity, NC, RNC; relativized computational complexity; time-space trade-offs. Same as CS 579 and MATH 578. Prerequisite: CS 473 or CS 475 or consent of instructor

CRN	Type	Section	Time	Days	Location	Instructor
41445	lecture-discussion	F	01:00 PM - 01:50 PM	MWF	room 169 Everitt Elec and Comp Engr Lab	Roman, M
41445: 4 hours						

580 ***Optimization by Vector Methods*** Credit: 4 hours.
(ECE 480) Same as MATH 587. See MATH 587.

CRN	Type	Section	Time	Days	Location	Instructor
40722	lecture-discussion	D1	11:00 AM - 12:30 PM	MW	room 252 Mechanical Engineering Bldg	Basar, M

582 ***Physical VLSI Design*** Credit: 4 hours.
(ECE 482) Basic physical design requirements for VLSI; performance-oriented formulation and optimization of chip partitioning, module placement and interconnection; optimized design and layout of on-chip modules; circuit extraction; high-speed VLSI circuits; yield and reliability analysis; advanced VLSI packaging and parametric testing. Prerequisite: ECE 425 or ECE 482

CRN	Type	Section	Time	Days	Location	Instructor
34008	lecture-discussion	N	10:00 AM - 11:20 AM	TR	room 169 Everitt Elec and Comp Engr Lab	Wong, M
34008: 4 hours						

590 ***Grad Sem in Special Topics*** Credit: 0 to 2 hours.
(ECE 490) Lectures and discussions on current research and literature on advanced topics in electrical engineering. May be repeated. Approved for S/U grading only. Prerequisite: Advanced standing; consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
34012	lecture	B	04:00 PM - 04:50 PM	T	room 269 Everitt Elec and Comp Engr Lab	Chew, W
34010	lecture	D	04:00 PM - 04:50 PM	T	room 245 Everitt Elec and Comp Engr Lab	O'Brien, W

34013	lecture	G	04:00 PM - 04:50 PM	W	room B2 Coordinated Science Lab	Liu, C
34014	lecture	I	04:00 PM - 04:50 PM	M	room 50 Everitt Elec and Comp Engr Lab	Gross, G
34011	lecture	P	04:00 PM - 04:50 PM	W	room 2269 Beckman Institute	Do, M
34015	lecture	X	04:00 PM - 04:50 PM	T	room B2 Coordinated Science Lab	Nicol, D
34015: 1 hours						

594 ***Math Models of Language*** Credit: 3 or 4 hours.
(ECE 494) Mathematical models of linguistic structure and their implementation in computational algorithms used in automatic speech understanding and speech synthesis. Statistical and automata theoretic techniques are studied allowing a quantitative description of acoustic-phonetics, phonology, phonotactics, lexicons, syntax and semantics. Students will use the methods to build components of a speech understanding system. Same as LING 594. For 4 hours credit, an extended project is required. Prerequisite: ECE 537 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
34016	lecture	B	09:00 AM - 09:50 AM	MWF	room 170 Everitt Elec and Comp Engr Lab	Levinson, S

596 ***Master's Project*** Credit: 1 to 8 hours.
(ECE 496) Graduate-level individual or team projects in electrical and computer engineering emphasizing advanced engineering analysis and design. May be repeated to a maximum of 16 hours. Only one unit of ECE 496 can be included in the 8 units required for the M. S. degree in Electrical Engineering. Credit in ECE 496 cannot be included in the 16 post-M. S. units required for the Ph.D. degree in Electrical Engineering. Prerequisite: Graduate standing in ECE. Students with deferred credit for ECE 599 may not register in ECE 596 without consent of the ECE department.

CRN	Type	Section	Time	Days	Location	Instructor
10020	independent study		ARRANGED			
10020: Instructor Approval Required						

597 ***Individual Study in ECE*** Credit: 1 to 8 hours.
(ECE 498) Individual projects. Prerequisite: Consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor

10023	independent study		ARRANGED			
10023: Instructor Approval Required						

598 ***Special Topics in ECE*** Credit: 0 to 4 hours.
(ECE 497) Lectures and discussions relating to new areas of interest. May be repeated. Prerequisite: As specified for each topic offering; see Schedule or departmental course information.

CRN	Type	Section	Time	Days	Location	Instructor
39363	lecture	AC	03:00 PM - 04:30 PM	MW	room 170 Everitt Elec and Comp Engr Lab	Cangellaris, A
39363: 4 hoursTopic: Advanced Topics in EM Theory. Prerequisites: ECE 520 or equivalent.						
39928	lecture	JL	10:00 AM - 11:20 AM	TR	room 106B6 Engineering Hall	Lyding, J
39928: 4 hoursTopic: Advanced Nanotechnology. Prerequisite: Graduate standing or permission of instructor.						
34024	lecture	KH	02:00 PM - 02:50 PM	MWF	room 57 Everitt Elec and Comp Engr Lab	Hess, K
34024: 4 hoursTopic: Quantum Mechanics for Nano-technology. Prerequisites: ECE 535.						
39341	lecture	PLC	04:00 PM - 05:15 PM	TF	room 163 Everitt Elec and Comp Engr Lab	Chapman, P
39341: 4 hoursTopic: Advanced Topics in Power Electronics. Prerequisites: ECE 464 Power Electronics, ECE 515 Control Systems.						
40220	lecture	TB	08:30 AM - 09:50 AM	TR	room 57 Everitt Elec and Comp Engr Lab	Basar, M
40220: 4 hoursTopic: Static and Dynamic Game Theory. Prerequisites: ECE 413 and ECE 515 and ECE 490, or equivlanets, or consent of the instructor.						

599 ***Thesis Research*** Credit: 0 to 16 hours.
(ECE 499) May be repeated. Approved for S/U grading only.

CRN	Type	Section	Time	Days	Location	Instructor
10025	independent study		ARRANGED			
10025: Instructor Approval Required						
41712	independent study	JA	ARRANGED			Allen, J