

Auburn University
Department of Electrical and Computer Engineering
WIRE Program Option - Wireless Electives*

Approval may be requested from the Wireless Curriculum Committee to use a 4000/5000-level ELEC/COMP course not on this list as the Wireless Elective. *NOTE – Any course required in your wireless specialization is excluded as an elective.

ELEC 4970 Special Topics in Electrical Engineering (Credit To Be Arranged, 1 to 5). Pr., departmental approval. May be taken more than one semester. Permission required.

ELEC 4980 Special Projects in Electrical Engineering (Credit To Be Arranged, 1 to 3). Pr., departmental approval. May be taken more than one semester. Permission required.

ELEC 4997 Honors Thesis (Credit To Be Arranged 1 to 6). Pr., department head approval. Individual student endeavor consisting of directed research and writing of honors thesis. (ELEC Honors College students only. May be repeated once for a maximum of six total credit hours.) Permission required.

***ELEC 5120 Telecommunication Networks** (3). Lec. 3. Pr., ELEC 3400. Introduction to public and private telecommunication systems, including switched telephone networks, circuit and packet switching, voice and data networks, transmission technologies and protocols, switching protocols and architectures, and network management.

***ELEC 5130 RF Devices and Circuits** (3). Lec. 3. Pr., ELEC 3700. Introduction to RF semiconductor devices and circuits targeted for wireless applications.

ELEC 5150 Information Security (3). Pr., Senior standing and departmental approval. Emerging protocols, standards and technologies of information security; design of information network security, firewall, virtual private networks and secured applications.

ELEC 5190 Introduction to Digital and Analog IC Design (3). Pr., ELEC 2210, ELEC 3700. Introduction to digital and analog integrated circuit (IC) design with emphasis on front-end IC design skills. Digital IC designs using Verilog hardware description language. Analog IC designs using Cadence analog IC design tools. Gain hands-on experience through digital and analog IC design projects.

***ELEC 5220 Information Networks and Technology** (3) Lec. 3. Pr., ELEC 2220 or COMP 3350. Architectures, protocols, standards and technologies of information networks; design and implementation of information networks based on requirements; applications of information networks for data, audio and video communications.

ELEC 5260 Embedded Computing Systems (3). Pr. ELEC 2220 or COMP 3350. The design of systems containing embedded computers. Microcontroller technology, assembly language and C programming, input/output interfacing, data acquisition hardware, interrupts, and timing. Real-time operating systems and application programming. Embedded system application examples.

ELEC 5270 Low-Power Design of Electronic Circuits (3). Lec. 3. Pr. ELEC 2210 or Departmental approval. Design of digital circuits and systems for reduced power consumption, power analysis algorithms, low-power MOS technologies, low-power design architectures for FPGA, memory and microprocessor, reduction of power in testing of circuits.

ELEC 5310 Design of Antennas and Antenna Systems (3) Lec. 3. Coreq., ELEC 3320. Application of Electromagnetic and Circuit concepts to the design of practical antennas and antenna systems.

ELEC 5320 Electromagnetic Compatibility (3) Lec. 3. Pr., ELEC 3320, ELEC 3700. Electromagnetic noise coupling, designing for electromagnetic compatibility (EMC), EMC regulation, noise sources, standard techniques for eliminating noise, circuit layout for reduced electromagnetic interference (EMI).

ELEC 5340 Microwave and RF Engineering (3) LEC. 3. Pr., ELEC 3320, ELEC 3700. Application of Electromagnetic and Electronic concepts to the design of practical microwave devices and circuits typically used in wireless communications.

ELEC 5350 RADAR and SONAR Principles (3) LEC. 3. Pr., ELEC 3320, ELEC 3800. Study of the fundamentals of RADAR systems including detection of nondeterministic signals in noise, and introduction to the principles of wave acoustics with emphasis on SONAR systems.

ELEC 5410 Digital Signal Processing (3) Lec. 3. Pr., ELEC 3800. Digital processing of signals, sampling, difference equations, discrete-time Fourier transforms, discrete and fast Fourier transforms, digital filter design.

ELEC 5730 Microelectronic Fabrication (3) Lec. 2, Lab. 3. Pr., ELEC 2210 or departmental approval. Introduction to monolithic integrated circuit technology, bipolar and MOS processes and structures, elements of layout, design, fabrication, and applications, experiments in microelectronic technologies.

ELEC 5760 Solid-State Sensors (3) Lec. 3. Pr., ELEC 3700 or departmental approval. Theory, technology and design of micro-mechanical sensors, electrochemical microsensors, photodetectors, and integrated smart sensors.

ELEC 5770 VLSI Design (3) Lec. 3. Pr., ELEC 2210, ELEC 2220. Review of MOS transistor fundamentals, CMOS logic circuits; VLSI fabrication and design rules; clocking strategies and sequential design; performance estimation; memories and programmable arrays; standard cell design methodologies; computer aided design (CAD) tools.

ELEC 5780 Analog Circuit Design (3) Lec. 3. Pr., ELEC 3700 or departmental approval. Circuit design techniques used for implementing analog integrated circuits in both CMOS and bipolar technologies.

ELEC 5810 Computed Imaging Systems (3) Lec. 3. Pr. ELEC 2120 or departmental approval. Introduction to computed imaging systems such as magnetic resonance imaging (MRI), computed tomography (CT), and synthetic aperture radar (SAR).

ELEC 5820 MEMS Technology (3) Lec. 3. Pr. Senior standing or departmental approval. Introduction to Micro-Electro-Mechanical Systems (MEMS), the study of the materials and microfabrication processes used to fabricate MEMS devices, the principles of operation of MEMS devices, and an introduction to the different application areas of MEMS devices.

COMP 5320 Design and Analysis of Computer Networks (3) Pr., COMP 4320 or departmental approval. Computer network design, including multiplexing, switching, routing, internetworking, transport protocols, congestion control, and performance evaluation.

COMP 5360 Wireless and Mobile Networks (3) Pr., COMP 4320 or departmental approval. Mobile IP, wireless routing, location management, ad-hoc wireless networks, wireless, wireless TCP personal communication systems, and GSM.

COMP 5380 Personal Area Networks (3) Pr., COMP 4320 or ELEC 5220. Fundamentals of very low power, short-range high-bandwidth personal network technologies such as Bluetooth and direct diffusion.

COMP 5390 3G and 4G Wireless (3) Pr., COMP 5360 or ELEC 5110. Exploration of technology types, design issues for handset and network systems, economics. Exploration of standards such as CT2, CT3, IS91A. Future challenges for 4G.

COMP 5510 Networked Multimedia Systems (3) Pr., COMP 4320 or departmental approval. Basic concepts, architecture, and design of networked multimedia systems.