

**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 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). Lec. 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 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) Lec. 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 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 5410. Digital Signal Processing](#) (3) Lec. 3. Pr., ELEC 3400. 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. This course explores the circuit design techniques used for implementing analog integrated circuits in both CMOS and bipolar technologies. Differential amplifiers, operational amplifiers, current sources, data converters, circuit layout and device modeling are topics central to this course.

[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.