

ELECTRICAL ENGINEERING UNDERGRADUATE PROGRAM
Department of Electrical and Computer Engineering (E&CE)
The University of Alabama at Birmingham
Advising Brochure for Fall 2007

The Electrical Engineering (EE) program at UAB has 128 semester credit hours and is accredited by the Accreditation Board for Engineering and Technology programs (ABET). In addition to courses in composition, literature, the fine arts, humanities, history, social or behavioral science, mathematics, calculus-based physics, and chemistry, students take courses in fundamental engineering outside of Electrical Engineering; courses in the breadth of Electrical Engineering; and advanced elective courses in Electrical Engineering. The culmination of a student's program of study is a capstone design experience. A Bachelor of Science in Electrical Engineering (BSEE) degree can provide the foundation that a student will need in many areas of Electrical Engineering including analog and digital electronics, embedded computer applications, digital computer systems, internet/intranet applications, computer networks, software systems, wireless communication, biomedical instrumentation, electric utility power systems, digital and industrial control, and digital signal processing.

E&CE DEPARTMENT VISION

Our Vision is to be a nationally recognized Department of Electrical and Computer Engineering: a first choice for undergraduate and graduate education.

E&CE DEPARTMENT MISSION

Our Mission is to prepare graduates to be immediately productive and able to adapt to a rapidly changing environment while also creating and applying knowledge for the benefit of Birmingham, the state and beyond.

EE PROGRAM OBJECTIVES

The Electrical Engineering undergraduate program prepares graduates to

- A. succeed in a **career** in electrical engineering or in further education,
- B. approach problem-solving with an **engineering** mind set, and
- C. grow **professionally**.

EE PROGRAM DESIRED OUTCOMES

The Electrical Engineering undergraduate program strives to instill the following skills, knowledge and behaviors in its students by the time of graduation:

- 1) an ability to **apply knowledge** of mathematics,

science, and engineering to the analysis of electrical and computer engineering problems [Engineering Criterion 3(a); Electrical Engineering Program Criteria],

- 2) an ability to design and conduct scientific and engineering **experiments**, as well as to analyze and interpret data [Engineering Criterion 3(b)],
- 3) an ability to **design** a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability [Engineering Criterion 3(c); Electrical Engineering Program Criteria],
- 4) an ability to function on multidisciplinary **teams** [Engineering Criterion 3(d)],
- 5) an ability to identify, formulate, and solve engineering **problems** [Engineering Criterion 3(e); Electrical Engineering Program Criteria],
- 6) an understanding of professional and ethical **responsibility** [Engineering Criterion 3(f)],
- 7) an ability to convey technical material through **written** work products which satisfy accepted standards for writing style [Engineering Criterion 3(g)],
- 8) an ability to convey technical material through **verbal** presentation and interaction with an audience [Engineering Criterion 3(g)],
- 9) a broad education and knowledge of contemporary **issues** necessary to understand the impact of electrical engineering solutions in a global, economic, environmental, and societal context [Engineering Criterion 3(h, j)],
- 10) a recognition of the need for, and ability to engage in life-long **learning** [Engineering Criterion 3(i)],
- 11) an ability to use modern engineering techniques, skills, and **tools**, including computer-based tools for analysis and design [Engineering Criterion 3(k)],
- 12) a knowledge of **mathematics** through differential and integral calculus and advanced topics in differential equations, linear algebra, complex variables, and discrete mathematics [Electrical Engineering Program Criteria],
- 13) a knowledge of probability and **statistics**, including electrical engineering applications [Electrical Engineering Program Criteria], and

14) an ability to design systems that include **hardware** and **software** components [Electrical Engineering Program Criteria].

FULL-TIME FACULTY

Dr. Dale W. Callahan, P.E., Assistant Professor and Program Director of Information Engineering and Management (Information Engineering and Management, Wireless, Internet Robotics, Telecommunications)

Dr. Greg A. Franklin, P.E., Assistant Professor (Electrical Power Systems, Power Electronics)

Mr. David G. Green, Instructional Associate Professor (Digital Systems, Computer Networks, Software Engineering, Computer Applications)

Dr. Gary J. Grimes, Professor and Wallace R. Bunn Chair in Telecommunications (Telecommunications, Optics)

Dr. Thomas C. Jannett, Professor and Graduate Program Director (Digital Control Systems, Electronics, Biomedical Instrumentation, Industrial Controls)

Mr. Jon R. Marstrander, P.E., Instructor (Electronics, Digital Systems, Digital Signal Processing, Image Processing)

Mr. Dalton S. Nelson, P.E., Instructor (Biomedical Instrumentation, Electronics, Controls, Machinery, Networks)

Dr. Murat M. Tanik, Professor (Software Systems, Integrated Systems Design and Process Engineering, Electromagnetics)

Dr. Gregg L. Vaughn, P.E., Associate Professor and Chair (Communications, Electronics, Microprocessor Applications)

PART-TIME FACULTY

Dr. David A. Conner, P.E., Professor Emeritus and Chair Emeritus (Electromagnetics, Electrical Networks, Telecommunications)

Mr. James R. Jones, P.E., Associate Professor, Emeritus (Commercial Power Systems, Controls, Energy, Lighting, Machinery)

FACULTY FROM LOCAL INDUSTRY:

Dr. Kenneth N. Burst, P.E. (BellSouth) – Adjunct Assistant Professor (Telecommunications, Data Communications and Networking, Computer Systems, Software)

Dr. Mark D. Conner (Hoover High School) – Adjunct Associate Professor (Electrical Circuits)

Mr. Kenneth A. Kuhn, P.E. (CMS Research Corp.) – Adjunct Assistant Professor (Design of Active Circuits, Electronics, Instrumentation)

Mr. Larry H. Lokey (BellSouth Telecommunications, Inc.) – Adjunct Assistant Professor (Communications, Networks, Instrumentation)

Dr. Shih-Min Hsu (Southern Company Services) – Adjunct Assistant Professor (Electrical Power Systems)

ADMISSION INTO UNDERGRADUATE PROGRAMS

Applications for admission to undergraduate programs in the School of Engineering are handled by the Office of Admissions, Suite 260, Hill University Center, 1400 University Boulevard, Birmingham, AL 35294, telephone (205) 934-8221. This office is responsible for receiving and processing applications. All students admitted to the School of Engineering will initially be advised by the School of Engineering Office of Academic Programs, Suite 101, Hoehn Engineering Building, 1075 13th Street South, telephone (205) 934-8410.

Beginning Freshmen

Recent high school graduates with no previous college credit should take the American College Testing Program Examination (ACT) and have the results sent directly to UAB Admissions. The Scholastic Aptitude Test (SAT) is acceptable in lieu of the ACT.

High school graduates are admissible to the UAB School of Engineering if they have a composite ACT score of at least 22 and a minimum high school GPA of 2.25/4.0 in academic subjects.

Students who do not meet the above requirements may be admitted to the School of Engineering as pre-engineering students if they have a composite ACT score between 20 and 21 and a minimum GPA of 2.25/4.0. Students with a high school GPA below 2.25/4.0 or who have not met the above requirements may be admitted to general studies.

Students with more than 24 hours of college-level credit Transferring From Other Schools or Divisions within UAB

UAB students may transfer to the School of Engineering if the following performance requirements have been met: (a) A GPA of at least 2.0 (4.0 scale) in all college-level coursework attempted (b) A UAB GPA of at least a 2.0 (4.0 scale) and (c) A GPA of at least 2.25 (4.0 scale) in a minimum of 12 hours of mathematics, natural sciences, and engineering courses

applicable to the degree. A “Change of School/Major Request” application can be completed at the School of Engineering Office of Academic Programs, Suite 101, 1075 13th Street South, Birmingham, AL 35294, telephone (205) 934-8410.

Students with more than 24 hours of college-level credit Transferring from Other Institutions (Universities, Colleges, Junior Colleges, Community Colleges)

Transfer applicants will be admitted to the School of Engineering if both of the following performance requirements have been met: (a) An overall GPA in college-level work of at least 2.0 (4.0 scale) and (b) A grade-point average of at least 2.25 (4.0 scale) in a minimum of 12 hours of mathematics, natural sciences, and engineering courses applicable to the degree.

COURSE REPEAT POLICY

If a course is repeated once, the second grade awarded may be used to replace the first in computing the student’s grade point average. If a course is repeated more than once, all grades for the course – excluding the first grade – will be employed in computation of the student’s grade point average. Recognition of a replaced grade is not automatic. It is the student’s responsibility to notify the Office of Registration and Academic Records of courses repeated for grade replacement. A student may use this policy to replace the grade for a maximum of four courses since the start of Fall 2006.

GRADUATION REQUIREMENTS

In addition to satisfaction of the general UAB graduation requirements, the School of Engineering requires that all students make reasonable progress toward the completion of their academic program. Reasonable progress includes maintaining a GPA of at least 2.0 in all UAB courses attempted and in all UAB engineering courses applicable to their degree attempted.

Excessive withdrawals may be interpreted as lack of progress. Students who are not making reasonable progress toward graduation will be placed on academic probation. Students who are on probation cannot graduate from the School of Engineering.

APPLICATION FOR DEGREE

Students are advised to file an official application for degree at least two terms prior to completing work for a baccalaureate degree. This will allow time for the application to be processed and completion of degree requirements to be verified. The absolute deadline to submit an application for degree to the department

granting the degree is the last day of class for the semester prior to that in which the student plans to graduate. Application forms are available in the Office of Registration and Academic Records (HUC 207) or the departmental office.

DEPARTMENTAL INFORMATION

See the Department intranet site for more helpful information: <http://www-ece.eng.uab.edu>.

Students are advised of the following policies:

- 1) A student must attain a grade of “C” or better in each of the following courses before progressing to a successor course: EE 210, EE 314, and EE 316.
- 2) An instructor may ban the use of any or all calculation devices on quizzes.
- 3) Students must maintain a grade point average of at least 2.0 on all UAB courses and a grade point average of at least 2.0 on all engineering courses applicable to the student’s program of study in order to avoid academic probation.
- 4) The senior design courses are intended to be capstone design experiences. As such, they must be taken during the last semester possible.
- 5) Prerequisites of any Electrical Engineering course include all prior prerequisites.

MINOR IN ELECTRICAL ENGINEERING

Required Courses (take all)

EE 134	3	Engineering Computer Methods
EE 210	3	Digital Logic
EE 233	3	Engineering Programming Methods
EE 300	3	Engineering Problem Solving
EE 314	3	Electrical Circuits
EE 316	4	Electrical Networks
EE 351	4	Electronics

23 semester hours total

MINOR IN SOFTWARE ENGINEERING

Required Courses (take all)

EE 134	3	Engineering Computer Methods
EE 210	3	Digital Logic
EE 233	3	Engineering Programming Methods
EE 333	3	Engr. Programming Using Objects
EE 337	4	Introduction to Microprocessors
EE 432	3	Computer Networking

Elective Courses (take one)

EE 433	3	Engineering Software Solutions
EE 447	3	Internet/Intranet Design
EE 452	3	VHDL Digital System Design

22 semester hours total

RELATIONSHIPS BETWEEN OBJECTIVES AND OUTCOMES

OUTCOME \ OBJECTIVE	OBJECTIVE													
	1 Apply Knowledge	2 Experiment	3 Design	4 Team	5 Problems	6 Responsibility	7 Written	8 Verbal	9 Issues	10 Learning	11 Tools	12 Mathematics	13 Statistics	14 HW & SW
A. Career	•	•	•	•	•	•	•	•	•	•	•	•	•	•
B. Engineering	•	•	•		•		•	•			•	•	•	•
C. Profession			•	•		•	•	•	•	•				

OUTCOMES THAT ARE ADDRESSED IN EACH COURSE

COURSE \ OUTCOME	OUTCOME														
	Required or Elective	1 Apply Knowledge	2 Experiment	3 Design	4 Team	5 Problems	6 Responsibility	7 Written	8 Verbal	9 Issues	10 Learning	11 Tools	12 Mathematics	13 Statistics	14 HW & SW
EGR 100	R			•	•		•	•	•						
ME 102	R							•				•			
CE 210	R	•					•		•						
ME 251	R	•					•								
EE 134	R			•			•	•				•			
EE 210	R			•			•					•			
EE 233	R			•			•				•	•			
EE 300	R		•						•			•		•	
EE 314	R	•			•		•				•	•		•	
EE 316	R	•	•		•		•		•		•	•		•	
EE 318	R										•	•			
EE 333	R			•	•		•	•			•	•			
EE 337	R	•	•	•			•	•			•	•			•
EE 341	R	•					•			•		•			
EE 351	R	•	•	•	•		•				•	•			
EE 361	R	•			•		•				•	•			
EE 421	R	•					•				•	•		•	
EE 426	R	•		•			•				•	•			
EE 431	R	•		•			•				•	•		•	•
EE 485	R			•	•		•	•	•		•				
EE 497 or 499	R	•	•	•	•		•	•	•		•				•
EE 418	E	•	•	•			•			•		•		•	
EE 423	E	•	•	•			•				•	•			•
EE 427	E	•	•	•	•		•				•	•			•
EE 432	E	•		•			•				•	•			
EE 433	E	•	•	•			•				•	•			
EE 438	E	•		•			•				•	•			•
EE 442	E	•	•	•	•		•				•	•			
EE 447	E			•			•			•					•
EE 448	E			•	•		•		•		•	•			
EE 452	E	•		•			•				•	•			
EE 461	E	•		•			•				•				
EE 471	E	•		•			•						•		
EE 473	E	•		•			•					•			
EE 498	E	•	•	•	•		•	•	•		•				•

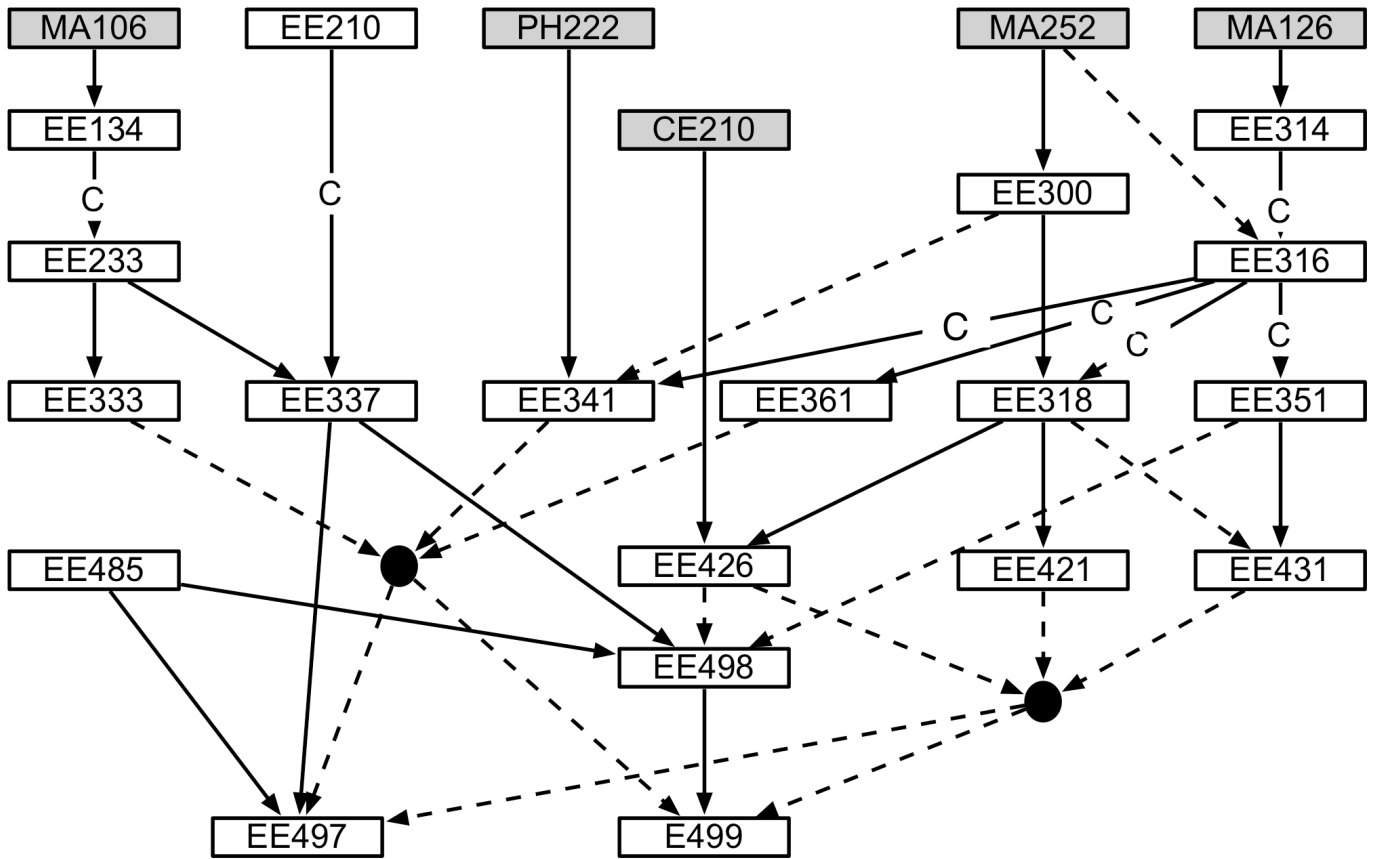
ELECTRICAL ENGINEERING PROGRAM OF STUDY

128 Semester-Hour Program					
Course	Title	Core	Hours	Day Track	Night Track
EH 101	English Composition I	I	3	1 Fall	1 Spring
EH 102	English Composition II	I	3	1 Spring	1 Summer
Literature	Literature Course from approved list	II	3	2 Fall	4 Fall
Fine Arts	Fine Arts Course from approved list	II	3	2 Spring	4 Fall
Humanities	Humanities Course from approved list	II	3	3 Fall	6 Summer
History	History Course from approved list	IV	3	3 Spring	5 Fall
SBS	Social or Behavioral Science Course	IV	3	4 Fall	7 Summer
SBS	Social or Behavioral Science Course	IV	3	4 Spring	8 Summer
MA 125	Calculus I	III	4	1 Fall	1 Fall
MA 126	Calculus II	V	4	1 Spring	1 Spring
MA 227	Calculus III	V	4	2 Fall	3 Fall
MA 252	Differential Equations	V	3	2 Spring	3 Spring
PH 221/221L	General Physics I (calculus based)	III	4	1 Spring	2 Spring
PH 222/222L	General Physics II (calculus based)	III	4	2 Fall	3 Spring
CH 115/116	General Chemistry I	V	4	1 Fall	2 Fall
EGR 100	Introduction to Engineering	Eng	2	1 Spring	2 Fall
ME 102	Engineering Graphics	Eng	2	1 Fall	2 Spring
CE 210	Statics	Eng	3	2 Fall	4 Spring
ME 251	Thermodynamics	Eng	2	2 Spring	3 Summer
EE 134	Engineering Computer Methods	V	3	1 Fall	1 Fall
EE 210	Digital Logic	Major	3	1 Spring	2 Summer
EE 233	Engineering Programming Methods	Major	3	2 Spring	3 Fall
EE 300	Engineering Problem Solving	V	3	3 Fall	5 Spring
EE 314	Electrical Circuits	Major	3	2 Fall	4 Spring
EE 316	Electrical Networks	Major	4	2 Spring	4 Summer
EE 318	Methods of System Analysis	Major	3	3 Spring	5 Summer
EE 333	Engineering Programming w/ Objects	Major	3	3 Fall	5 Spring
EE 337	Microprocessors	Major	4	3 Spring	5 Fall
EE 341	Electromagnetics	V	3	3 Fall	6 Spring
EE 351	Electronics	Major	4	3 Fall	6 Fall
EE 361	Machinery I	Major	4	3 Spring	6 Spring
EE 421	Communication Systems	Major	3	4 Spring	7 Spring
EE 426	Control Systems	Major	3	4 Fall	7 Fall
EE 431	Analog Integrated Electronics	Major	4	3 Spring	7 Spring
EE 485	Engineering Operations	Major	3	3 Fall	6 Fall
EE 497 or 499	Senior Design Team Project (II)	Major	3	4 Spring	8 Spring
EE Major	EE Depth Course from approved list	Major	3	4 Fall	7 Fall
EE Major	EE Depth Course from approved list	Major	3	4 Fall	8 Fall
EE Major	EE Depth Course from approved list	Major	3	4 Fall	8 Fall
EE Major	EE Depth Course from approved list	Major	3	4 Spring	8 Spring
Total Hours			128		

Students must demonstrate in-depth study in a particular discipline of the humanities and fine arts or history, social, and behavioral sciences through completion of 6 semester hours in a particular discipline.

CHART OF PREREQUISITES FOR REQUIRED UNDERGRADUATE COURSES

Prerequisites that may be taken concurrently are shown as dashed lines.



EE MAJOR COURSES MUST COME FROM THE FOLLOWING LIST OF ELECTIVES.

(The chair may approve substitutes).

Course	Title	Prerequisite(s)
EE 418	Wireless Communications	EE 318
EE 423	Digital Signal Processing	EE 318
EE 427	Industrial Controls	EE 233, EE 318, EE 351
EE 432	Introduction to Computer Networking	EE 210, EE 233
EE 433	Engineering Software Solutions	EE 333
EE 438	Intermediate Microprocessors	EE 337
EE 442	Computer Networking Protocols	EE 432
EE 447	Internet/Intranet Application Development	EE 233
EE 448	Software Engineering Projects	EE 333
EE 452	VHDL Digital Systems Design	EE 337
EE 458	Medical Instrumentation	EE 351
EE 461	Machinery II	EE 361
EE 471	Power Systems I	EE 361
EE 473	Protective Relaying of Power Systems	EE 361
EE 498	Senior Design Team Project I, only with EE 499	See above.

Each student must complete a senior design project of either EE 497 or EE 499. EE 498 is allowed as an elective only if EE 499 is used to fulfill the senior design project requirement.

Revised: 7/31/07 16:00