California State University, Los Angeles
Department of Electrical and Computer Engineering

Electrical Engineering Undergraduate Student Handbook

Twelfth Edition

Effective Fall Quarter 2012

Revised on April 17, 2012
by Dr. Jane Dong and Fred Daneshgaran

EE Student Handbook
Twelfth Edition

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Although every attempt has been made to keep this handbook up to date and accurate, it is an advising tool and not an official University policy statement. Therefore, in cases where there are contradictions, the official university rules take precedence over statements in this handbook.

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I. INTRODUCTION

Welcome to the Department of Electrical and Computer Engineering at California State University, Los Angeles. The faculty members of the department are pleased to provide you with this information manual. You are expected to read this entire manual. Failure to become aware of the information presented may well delay your graduation! If you have any questions, make sure to ask an advisor.

If you have not already done so, you should review the latest University Catalog and Schedule of Classes for the current quarter that are both available on-line. The schedule contains much more than the listing of classes being offered during the quarter. It also contains important rules and regulations and critical dates and deadlines. The University Catalog can be found on the Cal State L.A. website at http://ecatalog.calstatela.edu/, while the schedule of classes is available at http://www.calstatela.edu/classschedule/.

Note: the schedule goes to production long before the quarter begins, and changes occur while it is being processed. The most up-to-date version of the Electrical Engineering class schedule is posted on a bulletin board next to the department office and also available through GET at https://get.calstatela.edu (follow the links at this website)

Instruction in Electrical Engineering is offered Fall, Winter and Spring on a quarter system with the possibility of Summer sessions. Each of the four quarters that comprise the academic year (Fall, Winter, Spring and Summer) is typically 11 weeks in duration - 10 weeks for instruction and one week for final exams. You may accelerate your program by attending the Summer quarter when available, although to maintain continuing student's status, you only need to attend two quarters within any 12 month period.

The BS degree program in Electrical Engineering is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET). You will need a minimum of 198 quarter units to obtain the degree. The 198 units are divided into General Education (GE) and the major as follows:

- 44 units of General Education
- 4 additional units of Written Communication (ENGL 102) if not taken in Community College
- 63 units of Lower Division Required courses in the major
- 48 units of Upper Division Required courses in the major
- 39 units of Electives in the major

The General Education (GE) courses comprise 44 of the 198 units. GE requirements are modified for engineers. Do not use the GE requirements in the Schedule of Classes. Instead, refer to the modified GE form at the end of this handbook. A faculty advisor will help you decide which courses you should select.

The Lower Division Required courses comprise 63 of the 198 units. These courses are in the areas of Physics, Chemistry, Calculus, and Basic Engineering. They are numbered 1xx and 2xx. If you need to take certain remedial math courses, these won't be counted toward the 63 units.

The Upper Division Required courses comprise 48 of the 198 units. These are your basic junior- and senior-level Electrical Engineering courses; they are required of all EE majors. They are numbered 3xx and 4xx, although most of the required core is at the 300 level.

The remaining 39 units are your Electives including 35 units in Electrical Engineering and a 4 unit upper division elective Math class. These courses are mostly at the 400-level. These courses give you the chance to select a specialization area within Electrical and Computer Engineering. You should consult

with a faculty advisor to select your area(s) of specialization and receive advisement on which courses to take. He or she can discuss your career goals with you and give helpful suggestions.

While it is a good idea to continue to see the same advisor, you can approach any faculty member who is free at the time to discuss any problem you may have. You will find that the faculty have your best interests at heart. The more you become involved with the department, the more you will benefit. Section III describes how and when to see an advisor.

The Department of Electrical and Computer Engineering is here for you! Use it to your advantage.

II. MISSION AND EDUCATIONAL OBJECTIVES

This section describes the mission, educational objectives, and outcomes of our Electrical Engineering program.

Mission:

To be a pre-eminent Electrical Engineering program that accepts students from diverse backgrounds and through academic excellence prepares them for successful electrical engineering careers.

Educational Objectives and Program Outcomes:

The Educational Objectives describe the characteristics that the California State University, L.A.'s Electrical Engineering Program is seeking to produce in its graduates in the three areas:

- The *knowledge* they will have
- The *skills* they will possess
- The *attitudes* they will hold

The educational objectives and student outcomes statements are periodically evaluated and updated to meet the up-to-date requirement of Electrical Engineering profession. The most recent objective and outcome statements (updated in year 2011) are listed below.

Knowledge:

Educational Objectives: Graduates of the Electrical and Computer Engineering program will have the knowledge in math, science, and engineering principles that enables them to competently solve practical electrical and computer engineering problems with a systems perspective. In addition to this fundamental knowledge, they will have an understanding of the current and evolving societal needs which will allow them to consider the broader impact of their profession on society.

These educational objectives will be demonstrated by the following outcomes:

1. Knowledge of the fundamentals of mathematics. (*ABET a*)
2. Knowledge of the fundamentals of science. (*ABET a*)
3. Knowledge of the engineering principles. (*ABET a*)
4. Awareness of the effect of economics, humanities, and social sciences on engineering. (*ABET h*)
5. A more focused knowledge in a field of specialization in electrical engineering in addition to a comprehensive knowledge in major fields within electrical engineering.
6. Knowledge of current events and contemporary societal issues (non-engineering related). (*ABET j*)

Skills:

Educational Objectives: Our graduates will possess the practical skills necessary to apply theory to the design, implementation, and analysis of electrical engineering systems. They will be able to identify, formulate and solve engineering problems both as individuals and as members of multidisciplinary teams. The graduates will have the skills to utilize technical tools and the rapidly expanding base of technical information necessary in an engineering profession. The graduates will also be able to effectively communicate to a broad audience.

These educational objectives will be demonstrated by the following outcomes:

1. Ability to apply theory to engineering practice by designing and conducting laboratory experiments and class projects. *(ABET b)*
2. Ability to design and implement engineering system or component to meet desired needs within realistic constraints such as economical, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. *(ABET c)*
3. Ability to identify, formulate, and solve Electrical and Computer Engineering problems *(ABET e)*
4. Capability to analyze and interpret experimental results. *(ABET b)*
5. Capability to use the computer and other modern engineering tools necessary for engineering practice *(ABET k)*
6. Ability to work individually and in teams on projects including those of a multidisciplinary nature. *(ABET d)*
7. Skills to find and use available technical information *(ABET k)*
8. Ability to communicate effectively orally and in written reports *(ABET g)*
9. Ability to conduct abstract logical thinking and critical analysis, as well as to integrate and synthesize knowledge acquired through various engineering courses.

Attitudes:

Educational Objectives: Graduates of the Electrical Engineering program will view their education as a lifelong process and value the benefits of learning in their professional and personal development. They will have the flexibility to adapt to the changing demands of the engineering profession. They will value the perspective of their peers and mentors, carefully consider their input, and recognize the importance of working with team members. They will also recognize the importance of sharing their knowledge as well as developing their management and leadership skills at their place of employment.

These educational objectives will be demonstrated by the following outcomes:

1. Recognition of the need for, and an ability to engage in life long learning. (*ABET i*)
2. Understanding of their ethical and professional responsibilities. (*ABET f*)
3. An understanding of responsibility and accountability.
4. A desire to be a flexible and adaptable team player.

III. HOW AND WHEN TO SEE AN ADVISOR

All full time faculty in the Department of Electrical and Computer Engineering serve as advisors. Advising hours are posted outside the department and faculty offices. You may select your own advisor based on your area of specialization or schedule constraints. While you are encouraged to select a permanent advisor, you can meet with any faculty advisor.

When to see an advisor:

1. Prior to your first quarter of attendance, there will be an orientation session you can attend where an advisor makes sure that you understand the rules.
2. You must then meet with an advisor during your first quarter of attendance. During this session you should put together a tentative year-by-year plan.
3. If you are a transfer student, you should meet with an advisor to do a complete transfer credit evaluation once the university has evaluated your transcripts
4. You should check with your advisor to periodically revise your academic plan.
5. You must also see an advisor before choosing your upper-division specialization.
6. You must see the Department Chair or designated advisor to do your graduation check as part of your application for graduation. Refer to Section XIII for more details on applying for graduation.

During your first meeting with your advisor at the beginning of your program (a mandatory meeting), the faculty advisor fills out a "Major Department Evaluation" (MDE) form (at the end of this document), which lists all the major requirements, and a "General Education Advisement" (GEA) form (attached to MDE at the end of this document), which lists all GE requirements. Upon completion, the faculty advisor and the Department chair both approve the MDE and GEA forms, which are filed in the ECE Department office. During this meeting, you can also work with the faculty advisor to develop a tentative year-by-year plan.

If you have transferred to the University from another institution, your transfer courses will be first evaluated by the admission office. After the initial evaluation, your transfer credits will be available on GET. You can review your transfer credit information on GET to see which courses are transferred and what are the CSULA equivalent courses. If you meet with an advisor before the admission office completes the initial evaluation of your transfer courses, the transfer credit information may not be available online. In these cases, the advising can be based on a tentative evaluation by the advisor on the basis of an unofficial transcript, which will be formalized later once the University has completed its evaluation. If the courses you took from another institution are not articulated (credits accepted but no equivalent CSULA course is assigned), you should see an advisor to evaluate your transcript to decide whether the transfer units can be used to fulfill any of the EE major requirements and if so, what the proper equivalent courses are.

After meeting with your faculty advisor during your first quarter of attendance, you are urged to see your advisor each quarter prior to registration. The purpose of these pre-registration meetings is to review your progress, to double check that you are meeting the prerequisites, and to provide an opportunity for you to discuss any questions you may have.

You are required to see the advisor when you are ready to take upper-division technical electives. During this advisement session, you will discuss with the advisor how to select an area of specialization and how to determine a suitable set of eight lecture courses and three laboratory courses.

In addition to advising students on class schedules and electrical and computer engineering careers, each full-time faculty or group of faculty is responsible for coordinating one of the department's advisement services as shown in Table 3-1. The outreach coordinator oversees the department's outreach efforts to high schools and community colleges. The transfer evaluation coordinator oversees EE transfer credit evaluations and works with the Department Chair to develop and maintain articulation agreements with local community colleges. The internship coordinator coordinates internship opportunities and student placements. The graduation evaluators and Department Chair are responsible for conducting graduation evaluations in GET two quarters prior to a student's anticipated graduation. The career counseling coordinator coordinates resume and interview skills workshops and works closely with the University Career Center. The graduate coordinator provides general advising related to the graduate program.

Table 3-1. Advisement service coordinators

Advisement Service	Coordinator
Outreach	Dr. Daneshgaran
Major Transfer Credit Evaluation	Drs. Dong, Liu and Won
Internships	Dr. Tabrizi
Graduation Evaluation	Drs. Dong, Liu and Won
Career Counseling	Drs. Karimlou and Ryaciotaki-Boussalis
Graduate Program Advising	Drs. Warter-Perez and Daneshgaran

IV. HOW TO REGISTER

If this is your first registration, you must first see an advisor. Following advising, you obtain department approval to register. If you are a new student born after December 31, 1956 you must visit the Health Center where you will be asked to present proof of measles and rubella immunizations and verification of negative tuberculin test or chest x-ray within the past year. If you are 18 years of age or younger, you must provide proof of being immunized against the hepatitis B virus. Information can be obtained at the Health Center. Provided you are not trying to take any restricted courses (see description below), you are ready to pay your fees and register. Follow the schedule sent to you with the registration material.

New students must attend the University orientation session for new students. At that session, you will receive valuable information about the University and about registration. The information you receive at the University orientation session supplements that given by our faculty advisors.

Newly admitted students and continuing students can register using GET on the Internet. Instructions for using GET can be found in the Schedule of Classes. Your Personal Identification Number (PIN) should be sent to you. The PIN is the password to access GET and should be kept separately from your Campus Identification Number (CIN). You will not be allowed to register for classes if you have not completed the prerequisites. If you took the prerequisite at another university (other than a California Community College), the computer may not know that this is equivalent. In such cases, see an adviser or come to the department office. We can put an authorization into the computer so you will be able to register.

Adding classes is done using GET. To add during the first week, the class instructor would give the names of students adding the course to the Department Staff to issue permit in GET to allow students to register. If there is room in the class and it is not restricted, you can add without any constraints during this first week period (CAUTION: you must attend the first class meeting or the instructor can drop you from the class if already registered). If the class is full, or if you are adding during the second week of classes, you must obtain the instructor's permission to ADD. Once this permission is granted, the department clerical staff enters a code in the computer, which then permits you to add using GET. These permissions expire in several days, so do not delay adding. The Department Coordinator will e-mail you when the add permit is available for you to enroll using GET; it is important for you to provide the department with a current e-mail address which you check regularly in order for you to receive any important information from the department.

Study Load: Undergraduate students must carry a study load of 12 units for full-time enrollment certification by the University. The recommended full-time study load for undergraduates is 16 units. The maximum study load is 18 units. This can only be exceeded with written department permission.

V. POLICY ON DROPPING CLASSES

Students withdraw from courses by filing a completed program change form at Administration 146. Early in the quarter (usually the first week), students may simply drop classes on GET with no indication on their permanent academic record. After the "no-record drop" deadline, students may withdraw from any course but only for serious and compelling reasons, but the drop will be recorded as a "W" grade for the course on the official transcript. These requests are granted only with the approval of the instructor and the department chair on program-change forms available at Administration 146. Beginning in Fall 2009, undergraduate students will be limited to no more than 28 quarter-units of "W" grades. Complete information about withdrawals, as well as withdrawal deadlines for each academic quarter, appear in the Schedule of Classes.

VI. GENERAL EDUCATION PROGRAM

To be a University graduate implies a liberal education above and beyond technical skills. This need is universally recognized by such diverse bodies as the State of California, Tau Beta Pi (the Engineering honor society), and IEEE (the EE professional organization). This requirement for liberal education is also mandated by our University system and by the accrediting agency, ABET.

Our General Education (GE) Requirements are categorized into specific areas. These are delineated on the "GENERAL EDUCATION LOWER DIVISION COURSES FOR ENGINEERING MAJORS FORM" (see Section XV). The required courses in your Engineering major cover some of the required General Education areas, and some variances have been permitted. Therefore, it is critical to realize that your General Education requirement is not the same as that of other majors on this campus. If you follow the University requirement without realizing this, **you may not be taking the correct courses**. GE courses for engineers total 44 units: 32 at the lower-division level and 12 in an upper-division "theme". These 44 units must include 2 "diversity" courses, marked (d) in the Schedule of Classes section on GE. In addition to the 44 units, you need to take ENGL 102 before taking WPE as a university requirement.

The 32-unit lower-division GE requirement is divided as follows:

A - BASIC SUBJECTS (8 UNITS) - You must take ENGLISH 101 and COMM 150. NOTE: you must also take the second course in Written Communications, ENGL102, which is a University requirement and not considered part of the 44 units for GE.

AMERICAN INSTITUTIONS (8 UNITS) - You must take either HISTORY 202A or HISTORY 202B. In addition, you must take POLITICAL SCIENCE 150. (Exception: if you took a U.S. Government course at an institution outside the Southern California area, you only need State and Local Government. In that case, POLITICAL SCIENCE 200 is an acceptable alternative to 150.)

B - NATURAL SCIENCES (0 UNITS) - No additional courses required.

C - HUMANITIES (12 UNITS) - Five categories are included in this area; they are C1-Literature, C2-Arts, C3-Philosophy, C4-Languages other than English, and C5-Integrated Humanities. You must select 3 courses from among these 5 categories, with no more than one course in any category. If you choose Languages other than English as one of your categories, you *may not* take a 100-level course in your native language.

D - SOCIAL SCIENCES (0 UNITS) - Electrical Engineering majors satisfy this requirement with ENGR 300 (Economics for Engineers), so you need take no additional courses in this category.

E - LIFELONG UNDERSTANDING (4 UNITS) - You must select one course from the list, Category E of the University General Education Requirements.

Beyond the Lower Division General Education courses is an Upper Division Theme consisting of three courses (12 units) in a defined area. The Upper Division Themes are listed and described in the current Schedule of Classes. You should seek the advice of a faculty advisor when selecting a theme. IMPORTANT: unless you have taken an acceptable lower-division biology course, you must select an Upper Division Theme which offers a course taught by the Biology Department, and you must take that course as part of your theme. Also, pay particular attention to the frequency of offerings of the courses in the theme so that you can coordinate the theme with your major program.

Do not consider your GE courses as distasteful chores; they are necessary and vital parts of your education and should provide a rewarding learning experience. Social forces and humanistic considerations have a considerable impact on the work and the lives of engineers (and vice versa). GE courses are designed to help you understand these phenomena and prepare you to deal with the many non-technical realities you will face in the "real world".

VII. LOWER DIVISION REQUIREMENTS

This is a first of three sections describing the requirements in the major.

The Lower Division requirements consist of the following 63 units:

CHEM101	General Chemistry I	5
EE204	Circuit Analysis	4
EE210	Electrical Measurements Laboratory	1
EE211	Electric Circuits Laboratory	1
CS242	“C” Programming	4
EE244	Digital Engineering	4
EE246	Digital Logic Laboratory	1
EE290	EE Computing	3
ENGR150	Introduction to Higher Ed for Engineers	1
CE/ME208	Statics & Strength of Materials	4
MATH206-9	Calculus I – IV	16
MATH215	Differential Equations	4
PHYS211	Mechanics	5
PHYS212	Waves, Optics, and Thermodynamics	5
PHYS213	Electricity and Magnetism	5

The prerequisites for each of these courses are listed in the University catalog. You MUST have the prerequisite before taking any class. The only exception is if the course instructor completes and signs a prerequisite waiver form which is also signed by Chairperson of the department. This form must be submitted to the EE department to become a permanent part of your file.

It is extremely important that you complete the 5 required MATH courses (Calculus and Differential Equations) and the 3 required PHYSICS courses as soon as possible. The reason for this becomes obvious when you check prerequisites in the catalog. For example, EE 204-Circuits Analysis is a prerequisite for most Electrical Engineering courses and cannot be taken until you have completed the first three Calculus and Physics courses.

Most of the prerequisite listings are self-explanatory with the following exception:

Prior to taking your first Math course on this campus, you must take one or more PLACEMENT EXAMS in addition to taking the Entry Level Math Exam (see Section XI for more details on placement exams). Even if you think you have a sound background in Algebra and Trigonometry, you may not be ready for immediate entry in the first Calculus course, MATH 206. In order to register for MATH 206, you must pass two placement exams given in the Testing office on the second floor of the Library South. If the placement exams indicate you are not ready to take Calculus, then you must take certain remedial math courses including Algebra and/or Trigonometry. Each of these courses, in turn, has its own prerequisites, so check the University catalog before registering. We again emphasize that it is critical that you get into the Calculus courses as soon as possible. Otherwise, your progress toward a degree will be delayed.

Prior to taking any Placement Exam, you should review the material being covered in the placement exam. This is *most important*; it could save you having to repeat one or more introductory courses.

VIII. UPPER DIVISION REQUIREMENTS

The 48 units of upper division required courses are listed below:

ENGR300	Economics for Engineers	4
ENGR301	Ethics and Professionalism in Engineering	1
EE304	Electric Machines	4
EE317	Electronics Laboratory I	1
EE320	Analog Communication Systems	4
EE330	Writing for Electrical Engineers	1
EE332	Systems Analysis	4
EE334	Probability and Random Processes	4
EE336	Electronics	4
EE345	Microcomputer Programming	4
EE360	Control Systems Theory I	4
EE437	Electric and Magnetic Fields	4
EE496A,B,C	Senior Design I, II, III	3,3,3

Notes on Senior Design:

- EE496A, B, and C are offered as a 3-quarter sequence starting from Fall quarter. The College of ECST has been working hard to provide practical design experience for our students. Currently, most of the senior design projects are real-world projects that are sponsored by various corporates. During the first senior design course, EE 496A, you will be asked to rank your preferred projects and you will be assigned to work on one based on your interest, your skill sets as well as the inputs from the faculty and industry liaisons. During the senior design sequence, you will learn the project design and project management skills while working on the assigned project in a team environment and you will meet with your faculty advisor and industry liaison periodically. Each project team needs to make a presentation at the Senior Design Workshop by the end of Spring quarter (EE496C).
- To make sure that you are eligible to take EE496ABC at your senior year, plan well to take all pre-requisite courses and preferably co-requisites ahead of time. The co-requisites include EE330 (the writing course) and an upper division elective laboratory. The prerequisites are at least two 300-level required major courses and selection of your specialization area(s).
- Also, in your study plan, make sure to take courses that will prepare you for the technical aspects of your specific project before taking EE 496ABC. These courses will likely be in your area of specialization but can also be courses which tend to be more generally applicable to most senior design projects, such as EE 445, Microprocessor Interface Design.

Effective Spring 2012, PHYS333 has been eliminated from the upper division requirement, and each of the three courses in the senior design sequence (EE496A, B, and C) will have 3 units. There is an exception to this. If you are already registered in the senior design sequence starting with Fall 2011, then you MUST take Phys333 to complete the unit requirement of the degree.

IX. ELECTIVES

As an Electrical Engineering major, you choose 39 units of elective courses. These courses should be selected with the help of an advisor, and based upon interests that you develop while taking the required courses.

Electives fall within 3 categories as follows:

Math Elective	4 units	
Technical Electives	22 units	(5 lectures, 2 laboratories)
Upper Division Specialization	13 units	(3 lectures, 1 laboratory)

We now expand upon each of these 3 categories.

MATH ELECTIVE

Choose one course from the following list. Before making this choice, carefully check the other electives you plan to take. Some of them may require one of these Math courses as a prerequisite.

MATH325	Mathematical Notation and Proof
MATH402A	Advanced Mathematics I for Engineers and Physicists
MATH403	Partial Differential Equations
MATH474	Theory of Probability

TECHNICAL ELECTIVES and UPPER DIVISION SPECIALIZATION

Choose 8 lectures from the following list. Of these, 3 must be in your area of specialization (see below).

CS342 Object Oriented Programming Using C++
EE347 Computer Logic Design
EE371 Analog Electronics
EE372 Digital Electronics
EE412 Antennas
EE413 Systems Engineering
EE420 Digital Communication Systems
EE421 Coding for Communications
EE422 Digital Signal Processing
EE424 Fiber Optics
EE426 Digital Image Processing
EE427 Speech Signal Processing
EE431 Electric Power Distribution
EE432 Power Transmission Lines
EE433 Electric Power System Analysis

EE434 Electromagnetic Energy Conversion
EE436 Analog Integrated Circuits
EE439 Digital Integrated Circuits
EE440 Data Communications and Networking
EE442 Multimedia Networking
EE445 Microprocessor Interface Design
EE446 Embedded Architectures
EE447 Backend Compiler Technology
EE449 Computer Organization
EE460 Control Systems Theory II
EE461 Discrete-Time Control Systems
EE462 State Space Control Systems
EE472 Optoelectronics
EE483 Power Electronics
EE485 Biomedical Instrumentation
EE486 Biomedical Signal Processing
EE454 Special Topic Course

Choose 3 laboratory courses from the following list. Of these, one must be in your area of specialization (see below).

EE314 Electromagnetic Energy Conversion Laboratory
EE321 Communications Laboratory
EE340 Electronics Laboratory II
EE428 Digital Signal Processing Laboratory
EE443 Programmable Logic Laboratory
EE448 HDL Design and Simulation Laboratory
EE468 Control Systems Laboratory
EE498 Cooperative Education
EE499 Undergraduate Directed Study (1)

UPPER DIVISION SPECIALIZATION

You must select one of the following seven areas of specialization. You should meet with your advisor to discuss this selection.

Communications	Control Systems
Computers	Electronics
Power	Biomedical Engineering
Systems Engineering	

Courses in each of these areas come from the list of technical electives presented above. Once you choose an area of specialization, you will be required to take three classes and one laboratory from that area. You are free to choose any specialization you wish, and you do not need approval to change specialization. However, you will NOT GRADUATE unless you meet the requirements of at least one area of specialization. Therefore, even though you do not need approval to change, it would be wise to discuss this with an advisor if you have any questions. If you are interested in more than one area, do not be concerned since you still have additional elective units that permit you to select courses in areas beyond your selected specialization.

Communications	Controls
You must take EE 420 and choose two courses from the list below. In addition, select one of the two labs listed.	You must take all the courses listed below:
EE 412 Antennas	EE 460 Control Systems Theory II
EE 421 Coding for Communications	EE 461 Discrete-Time Control Systems
EE 422 Digital Signal Processing	EE 462 State Space Control Systems
EE 424 Fiber Optics	EE 468 Control Systems Lab
EE 426 Digital Image Processing	
EE 427 Speech Signal Processing	
EE 440 Data Communications & Networking	**Systems**
select either:	You must take all the courses listed below:
EE 321 Communications Lab	EE 413 Systems Engineering
or	EE 460 Control Systems Theory II
EE 428 Digital Signal Processing Lab	EE 461 Discrete-Time Control Systems
	EE 468 Control Systems Lab
Computers	**Biomedical**
You must take EE 347 and choose two courses from the list below. In addition, select one of the two labs listed.	You must take EE 485 and EE 486, and choose one more 4 unit course from the list below. In addition, select one of the three labs listed below:
CS 342 Object Orient Prog Using C++	EE 420 Digital Communication Systems
EE 440 Data Communications & Networking	EE 422 Digital Signal Processing
EE 442 Multimedia Networking	EE 426 Digital Image Processing
EE 445 Microprocessor Interface Design	EE 427 Speech Signal Processing
EE 446 Embedded Architecture	EE 436 Analog Integrated Circuits
EE 447 Backend Compiler Technology	EE 439 Digital Integrated Circuits
EE 449 Computer Organization	EE 460 Control Systems Theory II
select either:	Select one of the three labs below:
EE 443 Programmable Logic Lab	EE 340 Electronics Laboratory II
or	EE 428 Digital Signal Processing Lab
EE 448 HDL Design & Simulation Lab	EE 499 Undergraduate Directed Study in Biomedical Engineering
Power	**Electronics**
You must take EE 432, EE 433, and EE 314 (lab). In addition, select one course from the list below:	You must take EE 371, EE 372, and EE 340 (lab). In addition, select one course from the list below:
EE 431 Electric Power Distribution	EE 436 Analog Integrated Circuits
EE 434 Electromagnetic Energy Conversion	EE 439 Digital Integrated Circuits
EE 483 Power Electronics	EE 472 Optoelectronics
	EE 483 Power Electronics

X. PREREQUISITES

The previous sections have listed the required and elective courses in the major. All of the prerequisites to these courses can be found by referring to the current University Catalog, or to updated supplements issued by the Department. As courses evolve, prerequisites can sometimes change. You are responsible for having the prerequisites currently in effect for the courses you are taking.

Changing the prerequisites may not seem fair since it may require altering your projected program from time to time. However, the alternatives are for us to never change course content, or for you to enter a class without the proper preparation. Neither alternative is acceptable. We endeavor to make prerequisite changes only when absolutely necessary.

Some courses shown under "Prerequisites" in the following list are followed by the phrase “May be taken concurrently”. These courses are also known as “co requisites”. For example, EE321 lists prerequisites as: "EE317, EE320 (May be taken concurrently)". This means that to enroll in EE321, you must have already completed EE317, but you need not have already completed EE320. However, if EE320 was not previously taken, it must be taken at the same time as EE321. In such cases, if you register for both EE321 and EE320 but subsequently drop E320, you must also drop EE321.

Current course prerequisites are listed below. Note: EE290, COMM 150, and ENGL 102 are prerequisite to ***all*** 300- and 400-level EE courses.

COURSE	PREREQUISITE
LOWER DIVISION REQUIREMENTS	
ENGR 150	**Introduction to Higher Ed for Engineers (1)** *Prerequisite*: NONE
CHEM 101	**General Chemistry I (5)** *Prerequisite*: As described in the Catalog
EE 204	**Circuit Analysis (4)** *Corequisites*: Math 208, PHYS 213 (ABC/NC)
CE/ME 208	**Statics and Strength of Materials (4)** *Prerequisites*: Math 207, PHYS 211
EE 210	**Electrical Measurements Laboratory (1)** *Prerequisite*: PHYS 213
EE 211	**Electric Circuits Laboratory (1)** *Prerequisite*: EE 204
CS 242	**“C” Programming (4)** *Prerequisite*: Math 104B or Consent of Instructor
EE 244	**Digital Engineering (4)** *Prerequisite*: NONE
EE 246	**Digital Logic Laboratory (1)** *Prerequisites*: EE 244 (ABC/NC)
EE 290	**Electrical Engineering Computing (3)** *Prerequisites*: MATH 209, PHYS213
MATH 206	**Calculus I: Differentiation (4)** *Prerequisites*: MATH 104A and 104B with “C” or Placement Test
MATH 207	**Calculus II: Integration (4)** *Prerequisite*: MATH 206 with a minimum of “C” grade
MATH 208	**Calculus III: Sequences, Series, and Coordinate Systems (4)** *Prerequisite*: MATH 207 with “C”
MATH 209	**Calculus IV: Several Variables (4)** *Prerequisite*: MATH 208 with a minimum of “C” grade
MATH 215	**Differential Equations (4)** *Prerequisite*: MATH 209
PHYS 211	**Mechanics (5)** *Prerequisites*: High School PHYS; MATH 206 (concurrently)
PHYS 212	**Waves, Optics, and Thermodynamics (5)** *Prerequisites*: MATH 207 (concurrently), PHYS 211
PHYS 213	**Electricity and Magnetism (5)** *Prerequisites*: MATH 208 (concurrently), PHYS 212
UPPER DIVISION REQUIREMENTS	
EE 304	**Electric Machines (4)** *Prerequisite*: EE 204 with “C” or higher grade
EE 317	**Electronics Laboratory I (1)** *Prerequisites*: EE 210, EE 211, EE 336
EE 320	**Analog Communication Systems (4)** *Prerequisite*: EE 332
EE 330	**Writing for Electrical Engineers (1)** *Corequisites*: GWAR; *Prerequisites*: completion of any two 300-level EE lectures
EE 332	**Systems Analysis (4)** *Prerequisites*: EE 204, *Corequisites*: MATH 215
EE 334	**Probability and Random Processes (4)** *Corequisites*: MATH 209
EE 336	**Electronics (4)** *Prerequisite*: EE 204

UPPER DIVISION REQUIREMENTS (continued)

EE 345	**Microcomputer Programming (4)** *Prerequisite*: EE 244
EE 360	**Control Systems Theory I (4)** *Prerequisite*: EE 332
EE 437	**Electric and Magnetic Fields (4)** *Prerequisite*: EE 332
EE 496A	**Senior Design I (3)** *Prerequisites*: Selection of UD specialization; completion of at least two 300 level required courses; *Corequisites*: EE 330; completion of at least one UD technical elective lab.
EE 496B	**Senior Design II (3)** *Prerequisite*: EE 496A with grade of 'C' or higher
EE 496C	**Senior Design III (3)** *Prerequisite*: EE 496B with grade of 'C' or higher
ENGR 300	**Economics for Engineers (4)** *Prerequisite*: Must be Junior or Senior Standing in Engineering
ENGR 301	**Ethics and Professionalism in Eng (1)** *Prerequisite*: Must be Junior or Senior Standing in Engineering

UPPER DIVISION ELECTIVES

EE 314	**Electromagnetic Energy Conv Laboratory (1)** *Prerequisites*: EE 304, EE 211
EE 321	**Communications Laboratory (1)** *Prerequisites*: EE 317; EE 320 (concurrently)
EE 340	**Electronics Laboratory II (1)** *Prerequisite*: EE 317
CS 342	**Object Oriented Programming Using C++ (4)** *Prerequisite*: CS 242
EE 347	**Computer Logic Design (4)** *Prerequisite*: EE 244
EE 371	**Analog Electronics (4)** *Prerequisite*: EE 336
EE 372	**Digital Electronics (4)** *Prerequisites*: EE 244, EE 336
EE 412	**Antennas (4)** Co*requisite*: EE 437
EE 413	**Systems Engineering (4)** *Prerequisite*: EE 360
EE 420	**Digital Communication Systems (4)** *Prerequisite*: EE 320
EE 421	**Coding for Communications (4)** *Prerequisite*: EE 320
EE 422	**Digital Signal Processing (4)** *Prerequisite*: EE 320
EE 424	**Fiber Optics (4)** *Prerequisite*: EE 320
EE 426	**Digital Image Processing (4)** *Prerequisite*: EE 320
EE 427	**Speech Signal Processing (4)** *Prerequisites*: CS 242, EE 334, and EE 422
EE 428	**Digital Signal Processing Laboratory (1)** *Prerequisites*: EE 290, EE 332
EE 431	**Electric Power Distribution (4)** *Prerequisite*: EE 304
EE 432	**Power Transmission Lines (4)** *Prerequisite*: EE 304
EE 433	**Electric Power System Analysis (4)** *Prerequisite*: EE 432
EE 434	**Electromagnetic Energy Conversion (4)** *Prerequisite*: EE 304
EE 436	**Analog Integrated Circuits (4)** *Prerequisite*: EE 336
EE 439	**Digital Integrated Circuits (4)** *Prerequisites*: EE 336
EE 440	**Data Communications and Networking (4)** *Prerequisites*: EE 320, CS 242
EE 442	**Multimedia Networking (4)** *Prerequisites*: EE 290, EE 440
EE 443	**Programmable Logic Laboratory (1)** *Prerequisite*: EE 448 or previous experience with Verilog VHDL
EE 445	**Microprocessor Interface Design (4)** *Prerequisite*: EE 345
EE 446	**Embedded Architectures (4)** *Prerequisites:* CS 242, EE 244
EE 447	**Backend Compiler Technology (4)** *Prerequisites*: CS 342, EE 347 or permission of instructor
EE 448	**HDL Design and Simulation Laboratory (1)** *Prerequisite*: EE 246
EE 449	**Computer Organization (4)** *Prerequisite*: EE 347 (concurrently)
EE 460	**Control Systems Theory II (4)** *Prerequisite*: EE 360
EE 461	**Discrete-Time Control Systems (4)** *Prerequisite*: EE 360
EE 462	**State Space Control Systems (4)** *Prerequisite*: EE 360
EE 468	**Control Systems Laboratory (1)** *Prerequisite*: EE 360 (concurrently)
EE 472	**Optoelectronics (4)** *Prerequisite*: EE 336
EE 483	**Power Electronics (4)** *Prerequisite*: EE 336
EE 485	**Biomedical Instrumentation (4)** *Prerequisite:* EE204, EE332, EE336
EE 486	**Biomedical Signal Processing (4)** *Prerequisite:* EE332
EE 498	**Cooperative Education (1)** *Prerequisites*: Department's Permission
E 499	**Undergraduate Directed Study (1)** *Prerequisites*: Department's Permission

COURSE	PREREQUISITE
UPPER DIVISION MATH ELECTIVE	
MATH 325	**Math Notation and Proof (4)** *Prerequisite*: MATH 208
MATH 402A	**Advanced Math I for Engineers & Physicists (4)** *Prerequisite*: MATH 215 or MATH 401
MATH 403	**Partial Differential Equations (4)** *Prerequisite*: MATH 215 or MATH 401
MATH 474	**Theory of Probability (4)** *Prerequisite*: MATH 209

XI. PLACEMENT AND WRITING EXAMS

In addition to placement tests that are required to enter the first course in Math, there are THREE EXAMS that almost all EE students will have to take. Failure to take these exams as described below is extremely serious, and can result in denial of permission to register. READ THIS CAREFULLY.

ENTRY-LEVEL MATHEMATICS (ELM): You must take the Entry-Level Math (ELM) examination very early in your stay at Cal State L.A. You will not be able to register for any Math classes until you satisfy this requirement. The exam tests your knowledge of Algebra and Geometry. Details and exam schedules appear in the Schedule of Classes. Review the material before taking this exam.

You are exempted from this requirement if either of the following applies to you:

1. You enter Cal State L.A. with certified transfer credit for a course that satisfies the General Education-Breadth or Intersegmental General Education Transfer. Such transfer credit must be listed on your credit summary issued by the University upon admission.
2. You have obtained these minimum scores or higher on one of the following:
   a) 3 or higher on the AP Mathematics (Calculus AB or BC) or Statistics test or...
   b) 550 or higher on the Mathematics section of the SAT I Reasoning Test or on the College Board SAT II Mathematics Tests Level I, IC (Calculator), II, or IIC (Calculator) or…
   c) 23 or higher on the Math section of the ACT or…
   d) 550 or higher on Level I, IC, II, or IIC of the College Board Math Achievement test or SAT II: Mathematics Test or …
   e) A score of "Exempt" on the augmented mathematics CST, i.e., the CSU Early Assessment Program (EAP), taken in grade 11.

ENGLISH PLACEMENT TEST (EPT): You must take this examination in order to see if you are ready to register for any English course. Depending upon your performance on the English Placement Test, it may be necessary for you to take one or more English classes prior to registering for ENGL101. See the Schedule of Classes for details and rules regarding this exam and when it must be taken. It should normally be taken immediately after you are admitted to Cal State L.A. You are exempted from this requirement if you satisfy one of the following requirements.

1. You have completed and transferred a course that satisfies the General Education-Breadth or Inter-segmental General Education Transfer Curriculum (IGETC) written communication requirement, provided such course was completed with a grade of C or better, or

2. You have obtained these minimum scores or higher on one of the following:
   a) 3, 4, or 5 on either the Language and Composition or the Literature and Composition exam of the College Board Scholastic Advanced Placement Program or….

b) A score of "Exempt" on the augmented English CST, i.e. the CSU Early Assessment Program (EAP) taken in grade 11 or …

c) 550 or higher on the verbal part of the SAT I: Reasoning Test (taken April 1995 or after) or...

d) 24 or higher on the enhanced ACT English (October 1989 or after) or...

e) 680 or higher on the re-centered and adjusted College Board SAT II: Writing Test (taken May 1998 or after)

UPPER DIVISION WRITING REQUIREMENT: Prior to completion of 135 quarter units, you must take the upper division writing proficiency exam (WPE). This is extremely important since the university will block you from registering beyond 135 units until you pass this exam!! If you transferred in with more than 135 transfer units, you are required to take the exam during your very first quarter here. Details are given in the Schedule of Classes. Don't be caught by surprise! You will not receive any special notice as you near the 135 unit level. It is your responsibility to take the exam at the proper time. You register for the exams as UNIV400, which is listed in the schedule of classes along with the other "UNIV." courses.

Pass rate statistics for the WPE indicate that students are more likely to pass the exam soon after they complete ENGL101 and ENGL102. Don't delay out of fear of the exam. If you fail the first time, you must meet with a consultant in the university Writing Center. Based on recommendations from the consultant, you may retake the exam or enroll in UNIV401, the upper-division writing proficiency course. Check the schedule of classes for details. Help is also available to correct deficiencies in your writing. You must be able to write effectively in order to succeed in the profession.

XII. PROFESSIONAL ACTIVITIES

The Department offers opportunities to supplement classroom instruction for the purposes of preparing you to enter into the profession upon graduation. The campus chapter of the Institute of Electrical and Electronics Engineers (IEEE) is one such opportunity. The Institute of Electrical and Electronics Engineers is a professional society for Electrical and Computer Engineers. The IEEE was founded in 1884 and is the world's largest professional engineering society. Its purposes are summarized as follows:

A. IEEE is a SCIENTIFIC AND EDUCATIONAL organization directed toward the advancement of the theory and practice of electrical engineering, electronics, computer engineering, and the allied branches of engineering and the related arts and sciences. The IEEE publishes journals in the various disciplines and holds meetings and conferences for the reading and discussion of professional papers.

B. IEEE is a PROFESSIONAL organization directed toward the advancement of the standing of the members of the professions it serves. The IEEE conducts and publishes surveys and reports on matters of professional concern to the members, collaborates with public bodies and with other societies for the benefit of the Engineering profession as a whole, and establishes standards of qualification and ethical conduct.

C. IEEE strives to enhance the quality of life for all people throughout the world through the constructive application of technology. It endeavors to promote understanding of the influence of such technology on the public welfare.

Everyone preparing to enter the electrical and electronics field is invited to join the thousands of engineers and students who are members of IEEE (http://ieee.org/). The campus chapter of IEEE at Cal State LA is a very active chapter. The Department Faculty is fully committed to supporting the chapter and encourages every student to participate in its activities. As a student member of this chapter, your dues are only a fraction of the regular member dues, and they entitle you to all of the privileges of membership. The chapter schedules periodically meetings, where engineering leaders from the many

companies located in our area present technical talks. Participation in the campus chapter activities enhances your future career by offering leadership experience, and activities such as field trips, employment seminars, and design projects. It also allows you to meet socially with your professional peers and faculty members.

The campus chapter of IEEE at Cal State LA sponsors a Micro Mouse project. Students design and race robotic "mice" in competition with mice from other schools.

As a student member, you receive a membership pin and membership card, as well as POTENTIALS, the IEEE student magazine. This publication focuses upon the student members' needs and concerns while in school and as they prepare to become working members of the profession. Also included with student membership is the world acclaimed technical magazine, SPECTRUM.

A student member is eligible to compete in design paper contests sponsored by IEEE. A student can win recognition and cash awards through competition that emphasizes communication and technical skills. Students in the department are encouraged to submit entries in the Southern California TECHNICAL PAPER CONTEST. Most electrical engineering schools in Southern California participate in this contest. Cal State LA winners have gone on to compete with finalists from other areas and have won recognition at the Western Regional Level (including Hawaii and Alaska).

If you are not currently a member, the Faculty of this Department strongly recommend that you join and take advantage of all the benefits that membership confers. To join, go to http://www.ieee.org, on the membership page, click on "Join IEEE as a student member".

XIII. APPLYING FOR GRADUATION

Well, you look like you are going to make it. You have followed the instructions in this handbook, and can now see the light at the end of the tunnel. You appear to be close to graduation. But graduation does not happen automatically--YOU MUST APPLY for it. Application forms are available in Administration 146. You fill out the application form, take it to the cashier and pay the fees, and then return to the department to meet with the faculty advisors or Department Chair to initiate GradCheck. The deadlines are given in the instructions accompanying the application form and in the Schedule of Classes. Generally, you must apply two quarters ahead of your expected graduation date. In your meeting with the Department Chair or designated advisor, you discuss your program and projected schedule. The faculty advisor or department chair will evaluate your academic record in GET system to see your progress towards graduation. Do not wait until the last minute to apply for graduation! After the initial evaluation conducted by the department, your graduation application is sent to the University Graduation Office for review and approval. After reviewing your graduation application, the Graduation Office updates the website with the latest information about your status. If there are no remaining requirements, you are ready to graduate.

Before approving your application, the Graduation Office checks to see if you have completed all requirements and have earned a C average (2.0) or better in the following categories:

a) All university- and college-level work (including transferred courses).
b) All work taken at Cal State LA.
c) All courses taken to satisfy requirements *in the major*.

It is important that you be aware of the last category. Students who have an overall GPA at Cal State LA of even slightly above 2.0 are considered (by the University) to be doing acceptable work in their courses. So, even if their work *in the major* is below 2.0, they will not be placed on probation or disqualified. Therefore, unless you keep track of your performance in the major, you may be in for a shock when you

are told at grad-check time that a grade-point deficiency exists and graduation will be delayed. So, if you think you might be in trouble in the major, see your advisor right away for a preliminary "check-up"--don't set yourself up for an unwanted surprise.

Students are encouraged to track their own progress towards graduation on GET. GET allows you to add/drop classes, check your grades and do a quick degree audit. If you need help with GET system, you can go to the ITS help desk located at Library South. If you see any discrepancy in your GET record, you should go to an advisor for help.

XIV. ACADEMIC STANDARDS

You are now joining an academic community. Along with the privileges of membership go certain obligations. Failure to meet established standards may result in various penalties. In extreme cases this could result in expulsion from the University.

We hope that behavior standards never become an issue, but it is important that you prove worthy of the trust we place you in. Honesty is extremely important both for the operation of the University and for your personal development. More details about “Student Conduct” can be found in Schedule of Classes.

XV. FORMS

(Effective Fall 2012)

CALIFORNIA STATE UNIVERSITY, LOS ANGELES

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Major Department Evaluation (MDE)

Mailed to Student
Date _____

Name_____ **Phone H ( )**_____ **CIN#** _____
Last First Middle **W( )** _____
E-mail _____

Address_____
Street City Zip Code

Quarter admitted _____ **Readmitted** _____
Qtr/Yr Qtr/Yr

Date MDE Submitted to Graduation Section _____ **Expected Graduation Date** _____
Qtr/Yr

Advisor _____ **Transfer Institution** _____

COURSE	TRANSFERRED FROM		QTR UNITS	GRADE	G*
	INSTITUTION	DEPT & COURSE			
LOWER DIVISION REQUIRED COURSES (63 units)					
ENGR 150 Introduction to Higher Ed for Engineers (1)					
EE 204 Circuit Analysis (4)					
CE/ME 208 Statics and Strength of Materials (4)					
CHEM 101 General Chemistry I (5)					
EE 210 Electrical Measurements Laboratory (1)					
EE 211 Electric Circuits Laboratory (1)					
CS 242 "C" Programming (4)					
EE 244 Digital Engineering (4)					
EE 246 Digital Logic Laboratory (1)					
EE 290 Electrical Engineering Computing (3)					
MATH 206 Calculus I: Differentiation (4)					
MATH 207 Calculus II: Integration (4)					
MATH 208 Calculus III: Sequences, Series, & Coordinate Systems (4)					
MATH 209 Calculus IV: Several Variables (4)					
MATH 215 Differential Equations (4)					
PHYS 211 Mechanics (5)					
PHYS 212 Waves, Optics and Thermodynamics (5)					
PHYS 213 Electricity and Magnetism (5)					

* Required for Graduation

WPE PASSED _____ (must be taken prior to the completion of 135 units)

GRADUATION CHECKLIST OF DEGREE REQUIREMENTS

Refer to _____ (**Fall 1998 or later)** catalog for GE requirements; refer to _____ (**Summer 1998 or later)** catalog for major requirements.

Bachelor of Science major ..... 198 units.
Lower General Education ..... 32 units, must select two *diversity* courses from among all GE courses taken
University Requirement ..... 4 units
Upper General Education ..... 12 units, a biology course must be included as part of Upper GE Theme
Grade Point Average ..... minimum C average (2.0) is required in:
* all college work
* all courses attempted at CSULA
* all GE courses
* all courses required in major
* all Upper Division courses in major

Major ..... 150 units
Residence ..... 45 units in residence at CSULA, including 36 Upper Division units; 18 units in major; and 12 units in Upper GE
Upper Division Units ..... 60 units minimum
Writing Skills Requirement ..... minimum C grade in ENGL 101, ENGL 102 and passing score on Writing Proficiency Examination (WPE)

CAUTION: These requirements remain in effect only if you remain in continuous attendance. If for any reason you find it necessary to drop out of school for more than two consecutive quarters, you must apply for and be granted an official leave of absence, or you will be held for requirements in effect at the time when you return. Consult your advisor for additional details.

COURSE	TRANSFERRED FROM		QTR UNITS	GRADE	G*
	INSTITUTION	DEPT & COURSE			
UPPER DIVISION REQUIRED COURSES (48 units)					
EE 304 Electric Machines (4)					
EE 317 Electronics Laboratory I (1)					
EE 320 Analog Communication Systems (4)					
EE 330 Writing for Electrical Engineers (1)					
EE 332 Systems Analysis (4)					
EE 334 Probability and Random Processes (4)					
EE 336 Electronics (4)					
EE 345 Microcomputer Programming (4)					
EE 360 Control Systems Theory I (4)					
EE 437 Electric and Magnetic Fields (4)					
EE 496A Senior Design I (3)					
EE 496B Senior Design II (3)					
EE 496C Senior Design III (3)					
ENGR 300 Economics for Engineers (4)					
ENGR 301 Ethics and Professionalism in Engineering (1)					
UPPER DIVISION MATH ELECTIVE (4 units)					
Select one from the following:					
MATH 325 Math Notation and Proof (4)					
MATH 402A Advanced Math I for Engineers and Physicists (4)					
MATH 403 Partial Differential Equations (4)					
MATH 474 Theory of Probability (4)					
UPPER DIVISION TECHNICAL ELECTIVES AND SPECIALIZATION (35 units)					
Select 3 lecture courses and 1 laboratory course in one specialty with advisor's approval. Select 5 additional lectures and 2 laboratories as upper division technical electives.					
ELECTIVE LECTURES:					
CS 342 Object Oriented Programming Using C++ (4)					
EE 347 Computer Logic Design (4)					
EE 371 Analog Electronics (4)					
EE 372 Digital Electronics (4)					
EE 412 Antennas (4)					
EE 413 Systems Engineering (4)					
EE 420 Digital Communication Systems (4)					
EE 421 Coding for Communications (4)					
EE 422 Digital Signal Processing (4)					
EE 424 Fiber Optics (4)					
EE 426 Digital Image Processing (4)					
EE 427 Speech Signal Processing (4)					
EE 431 Electric Power Distribution (4)					
EE 432 Power Transmission Lines (4)					
EE 433 Electric Power System Analysis (4)					
EE 434 Electromagnetic Energy Conversion (4)					
EE 436 Analog Integrated Circuits (4)					
EE 439 Digital Integrated Circuits (4)					
EE 440 Data Communications & Networking (4)					
EE 442 Multimedia Networking (4)					
EE 445 Microprocessor Interface Design (4)					
EE 446 Embedded Architectures (4)					
EE 447 Backend Compiler Technology (4)					
EE 449 Computer Organization (4)					
EE 460 Control Systems Theory II (4)					
EE 461 Discrete-Time Control Systems (4)					
EE 462 State Space Control Systems (4)					
EE 472 Optoelectronics (4)					

COURSE	TRANSFERRED FROM		QTR UNITS	GRADE	G*
	INSTITUTION	DEPT & COURSE			
ELECTIVE LECTURES (Cont.):					
EE 483 Power Electronics (4)					
EE 485 Biomedical Instrumentation (4)					
EE 486 Biomedical Signal Processing (4)					
EE 454 Special Topic Course (4)					
ELECTIVE LABORATORIES:					
EE 314 Electromagnetic Energy Conversion Laboratory (1)					
EE 321 Communications Laboratory (1)					
EE 340 Electronics Laboratory II (1)					
EE 428 Digital Signal Processing Laboratory (1)					
EE 443 Programmable Logic Laboratory (1)					
EE 448 HDL Design and Simulation Laboratory (1)					
EE 468 Control Systems Laboratory (1)					
EE 498 Cooperative Education (1)					
EE 499 Undergraduate Directed Study (1)					

EVALUATION APPROVAL

Advisor: _____ Date: _____

Department Chair: _____ Date: _____

GENERAL EDUCATION ADVISEMENT FORM

CATEGORY/COURSE	TRANSFERRED FROM		QTR UNITS	GRADE	REMARKS
	INSTITUTION	COURSE			
I. LOWER DIVISION GENERAL EDUCATION AND UNIVERSITY REQUIREMENT (32 or 36 units) **(please skip to Part II if the Lower Division GE is entirely completed and certified at a community college.)**					
BLOCK A: BASIC SUBJECTS (8 units)					
A1: ENGL 101 (4)					
A2: COMM 150 (4)					
AMERICAN INSTITUTIONS (8 units)					
HIST 202A *or* 202B					
POLS 150 or 200					
BLOCK B: NATURAL SCIENCES (4 units)*					
BIOL 155 or 156 or MICR 151					
BLOCK C: HUMANITIES (12 units) ***Select three courses from three different areas***					
C1: LITERATURE AND DRAMA **(d)** CHS 201 ENGL 207, 250, 258, **(d)** 260, **(d)** 270, 280 SPAN 242 TA 152					
C2: ARTS ART 101ABC, 150, 152, 155, 156, 157, 159, **(d)** 209 CHS 112 **(d)** CHS/PAS 260 DANC 157 DANC/TA/TVF 210 ENGL/TVF 225 **(d)** LBS 234 MUS 150, 151, 152, 156, 157, 160					
C3: PHILOSOPHY AND RELIGIOUS STUDIES PHIL 151, 152 **(d)** PHIL/RELS 200 **(d)** PHIL 220					
C4: LANGUAGES OTHER THAN ENGLISH COMD 150 CHIN 100ABC, 200ABC FREN 100ABC, 200AB JAPN 100ABC, 200ABC KOR 100ABC PAS 120 SPAN 100ABC, 105, 200ABC, 205AB					
C5: INTEGRATED HUMANITIES ENGL/TA/TVF 240 ENGL/PHIL 210					
BLOCK E: LIFELONG UNDERSTANDING AND SELF-DEVELOPMENT (4 units)					
ANTH 265 **(d)** ART 240 BUS 200 **(d)** CHDV/SOC 120 COMM 230 PH 150 KIN 150 **(d)** PHIL 230 POLS 120 PSY 160 **(d)** SOC 202 TECH 250					
* Natural Sciences course is not required for all students who are admitted Fall 1998 and later. **(d) preceding the course number indicates that it is an Approved Diversity Course.**					
II. LOWER DIVISION GENERAL EDUCATION CERTIFICATION					
☐ GE Certification					

CATEGORY/COURSE	TRANSFERRED FROM		QTR UNITS	GRADE	REMARKS
	INSTITUTION	COURSE			
III. UNIVERSITY REQUIREMENT (4 units)					
ENGL 102					
WPE	* must be taken at CSU				
IV. GENERAL EDUCATION UPPER DIVISION THEME (12 units)					**Theme Designation _____**
	* must be taken at CSU				
	* must be taken at CSU				
	* must be taken at CSU				

GENERAL EDUCATION NOTES

* A minimum *C grade average* in GE is required of all students following the 1987-1989 or any later catalog.
* Students, who fall under the Fall 1998 or any later GE catalog, must complete ***two diversity courses*** which may be selected from BLOCK C, BLOCK E or from the GE Upper Division Themes.
* ENGL 102 is required for all students who entered Cal State L.A. Summer 1993 or later, and who are subject to the requirements of the 1993-95 or later GE catalog. A minimum C grade is required. *A 'C-' grade is not acceptable*.
* Engineering majors, who fall under the Fall 1998 or any later GE catalog, must complete a BIOLOGY course as part of their Upper Division Theme.

Advisor: _____ Date: _____

Department Chair: _____ Date: _____

GE FOR ENGINEERING MAJORS

Effective: Fall Quarter, 1998

A Basic Subjects	American Institutions	B Natural Sciences	C Humanities	D Social Sciences	E Lifelong Understanding & Self-Development
8 units	8 units	0 units	12 units	0 units	4 units
<u>A1: WRITTEN COMM</u> ENGL 101 ENGL 102* <u>A2: ORAL COMM</u> COMM 150 <u>A3: CRITICAL THINKING</u> exempt <u>A4: MATH</u> fulfilled in major "C" grade or better in these courses is required.	<u>US HISTORY</u> HIST 202A or 202B <u>US CONSTITUTION</u> POLS 150† <u>STATE-LOCAL GOV'T</u> POLS 150† or 200	<u>B1: BIOLOGICAL**</u> (with lab) exempt <u>B2: PHYSICAL</u> (with lab) fulfilled in major <u>B3: APPLIED NATURAL</u> exempt	<u>C1: LITERATURE & DRAMA</u> (d) CHS 201 ENGL 207, 250, 258, (d) 260, (d) 270, 280 SPAN 242 TA 152 <u>C2: ARTS</u> ART 101ABC, 150, 152, 155, 156, 157, 159, (d) 209 CHS 112 (d) CHS/PAS 260 DANC 157 DANC/TA/TVF 210 ENGL/TVF 225 (d) LBS 234 MUS 150, 151, 152, 156, 157, 160 <u>C3: PHILOSOPHY & RELIGIOUS STUDIES</u> PHIL 151, 152 (d) PHIL/RELS 200 (d) PHIL 220	ENGR 300 fulfilled in major <u>C4: LANGUAGES OTHER THAN ENGLISH</u> COMD 150 CHIN 100ABC, 200ABC FREN 100ABC, 200AB JAPN 100ABC, 200ABC KOR 100ABC PAS 120 SPAN 100ABC, 105, 200ABC, 205AB <u>C5: INTEGRATED HUMANITIES</u> ENGL/TA/TVF 240 ENGL/PHIL 210	ANTH 265 (d) ART 240 BUS 200 (d) CHDV/SOC 120 COMM 230 PH 150 KIN 150 (d) PHIL 230 POLS 120 PSY 160 (d) SOC 202 TECH 250 *(d) Approved diversity courses.*

NOTES:

* ENGL 102 is required for all students who entered Cal State LA Summer 1993 or later and who are subject to the 1993-95 or later GE catalog requirements.

† POLS 150 meets the requirements for both areas.

** Natural Sciences: Biological course is not required for all students who are admitted Fall 1998 and later.

- A minimum "C" grade average in general education is required for all students following the 1987-89 or any later catalog.
- Students must complete two diversity courses which may be selected from blocks C, E, or from GE upper division themes.
- To satisfy the upper division requirement, all engineering majors must successfully complete a biology course as part of their upper division theme.
- Engineering majors may not include successful completion of a course in Engineering or Technology to meet any part of their upper division theme requirement.

CAL STATE L.A.

Revised 03/6/12

Sample 4 year plan for Freshman Students for the Bachelor of Science Degree in Electrical Engineering (Total: 198 Units)

	Fall ____	Winter____	Spring____	Summer__	Total
Year 1	CHEM 101 (5) ENGL 101 (4) MATH 206 (4) TOTAL: (13)	ENGL 102 (4) ENGR 150 (1) MATH 207 (4) PHYS 211 (5) TOTAL: (14)	CE/ME 208 (4) MATH 208 (4) PHYS 212 (5) TOTAL: (13)	COMM 150 (4) MATH 209 (4) PHYS 213 (5) TOTAL: (13)	53
Year 2	EE 204 (4) EE 210 (1) EE 290 (3) MATH 215 (4) TOTAL: (12)	EE 211 (1) EE 244 (4) EE 336 (4) HIST 202A/B (4) UNIV 400 (0) TOTAL: (13)	EE 246 (1) EE 332 (4) POLS 150 (4) TOTAL: (9)	CS 242 (4) EE317 (1) ENGR 300 (4) TOTAL: (9)	43
Year 3	EE 304 (4) EE 330 (1) EE 334 (4) GE: HUMANITIES (4) TOTAL: (13)	EE 320 (4) EE 345 (4) EE 360 (4) ENGR 301 (1) GE: HUMANITIES (4) TOTAL: (17)	EE 437 (4) EE LAB ELECTIVE (1) UPPER DIV MATH (4) GE: HUMANITIES (4) TOTAL: (13)	EE LAB ELECTIVE (1) EE TECH ELECTIVE (4) GE UPPER DIVISON THEME (4) TOTAL: (9)	52
Year 4	EE 496A (3) EE ELECTIVE (4) EE ELECTIVE (4) GE BLOCK E (4) TOTAL: (15)	EE 496B (3) EE ELECTIVE (4) EE ELECTIVE (4) GE UPPER DIVISION THEME, BIOLOGY (4) TOTAL: (15)	EE 496C (3) EE ELECTIVE (4) EE ELECTIVE (4) TOTAL: (11)	EE LAB ELECTIVE (1) EE TECH ELECTIVE (4) GE UPPER DIVISON THEME (4) TOTAL: (9)	50

Sample 2 year plan for Transfer Students for the Bachelor of Science Degree in Electrical Engineering (Total: 198 Units including Transfer Units)

	Fall ____	Winter____	Spring____	Summer__	Total
Year 3	EE 332 (4) EE 334 (4) ENGL 102 (4) GE THEME (4) TOTAL: (16)	EE 320 (4) EE 360 (4) EE 336 (4) ENGR 301 (1) UNIV 400 (0) TOTAL: (13)	EE 330 (1) EE 304 (4) EE 345 (4) GE THEME (4) TOTAL: (13)	EE 317 (1) ENGR 150 (1) ENGR 300 (4) GE THEME (4) TOTAL: (10)	52
Year 4	EE 496A (3) EE ELECTIVE (4) EE ELECTIVE (4) EE ELECTIVE (4) EE LAB ELECTIVE (1) TOTAL: (16)	EE 496B (3) EE ELECTIVE (4) EE ELECTIVE (4) EE LAB ELECTIVE (1) TOTAL: (12)	EE 496C (3) EE 437 (4) EE ELECTIVE (4) EE ELECTIVE (4) TOTAL: (15)	EE ELECTIVE (4) EE LAB ELECTIVE (1) UPPER DIVISION MATH (4) TOTAL: (9)	52

Assumes transfer credit received for the following courses (Equivalent of 94 Units):

ENGL 101 (4)	CHEM 101 (5)	CE/ME 208 (4)
COMM 150 (4)	MATH 206 (4)	EE 204 (4)
HIST 202A/B (4)	MATH 207 (4)	EE 210 (1)
POLS 150 (4)	MATH 208 (4)	EE 211 (1)
GE HUMANITIES (4)	MATH 209 (4)	EE 244 (4)
		EE 290 (3)
GE HUMANITIES (4)	MATH 215 (4)	EE 246 (1)
GE HUMANITIES (4)	PHYS 211 (5)	CS 242 (4)
GE BLOCK E (4)	PHYS 212 (5)	
	PHYS 213 (5)	
Total: 32 Units	Total: 40 Units	Total: 22 Units