

# **UNDERGRADUATE NOTES**

**2010 - 2011**



**Department of Electrical Engineering and  
Computer Sciences**

**University of California, Berkeley**

# **Undergraduate Notes 2010-2011**

*For Students Entering Fall 2010 – Spring 2011*

Department of Electrical Engineering and Computer Sciences  
University of California at Berkeley

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## Preface

Ask any two electrical engineers or computer scientists what they do, and you will likely get very different answers. Not surprisingly, the range of skills needed for engineering jobs is also very diverse. The EECS degree reflects this by giving you broad exposure to all aspects of the field and the flexibility to deepen your understanding in directions you choose. This flexibility requires some planning on your part, and these notes are designed to help you with this planning.

Although degree plans and goals tend to evolve as you proceed in your studies, it is very important that you start the process already in your first semester at Berkeley. For your degree you have a choice of hundreds of courses offered by the department, the college, and the university. You need to start looking at your options now to ensure that you follow the program that best fits you and your goals. Some of your choices may have profound impact on your career opportunities for years to come.

Learning happens not only in the classroom. The department offers a wide range of options to learn about the field, including undergraduate research opportunities and internships. Many of these are in high demand and often require appropriate preparation (e.g. taking specific courses ahead of time). Becoming an undergraduate teaching assistant is an excellent opportunity to deepen your understanding in core areas of engineering. The EECS Honors degree program gives additional flexibility in your program and the opportunity to select an academic concentration outside EECS. You may find more information about these and other opportunities in these notes.

Not all possible study plans make sense and guarantee that you will become a successful engineer. A number of rules have been designed to ensure that your degree program gives you a good grasp of engineering concepts and comprehensive in-depth exposure in one or more areas. This guide summarizes these rules and helps you find your way through the system efficiently. The first chapter is a "quick guide" to the Bachelor of Science degree and guides you through the most important decisions for this program. Later chapters describe other degree programs and policies. You may find the sample programs in Chapter 4 useful as a starting point for your own studies.

In addition to this guide you have sources of information available to plan your degree. Take the opportunity to discuss your degree plan with your academic adviser and ask him about options you should consider. More information is also available on departmental and university websites, and in the UC Berkeley General Catalog and the College of Engineering Announcement.

Learning is not a passive activity. I invite you to challenge your creativity to put together a degree program that engages your talents and starts a fruitful career.

*David Wagner  
Vice Chair for Undergraduate Matters  
October 2010*

## Undergraduate Student Learning Initiative

The [Undergraduate Student Learning Initiative](#) (USLI) is a campus-wide initiative that supports departments in establishing program level learning goals and evaluation procedures for all of our undergraduate major programs. As a result of this process, faculty and students will have a shared understanding of the purpose of the major and what graduating seniors are expected to know or be able to do at the end of their program of study. Faculty and students will also have evidence of how well their program goals are being met. In short, at a program level this process is about identifying what it is we want our students to learn and then making sure they learn it.

The goal of this on-going process of developing learning goals and assessing them is to improve undergraduate education at UC Berkeley. The goals of the USLI are consistent with those of ABET, the [Accreditation Board for Engineering and Technology](#).

- [EECS USLI Report](#) [[Word](#) / [pdf](#)]
- [EECS USLI Website](#)



# Chapter 1: Guide to the Bachelor of Science

## 1.1 Introduction

Electrical Engineering and Computer Sciences (EECS)<sup>1</sup> encompasses a very wide range of topics. Successful engineers balance a broad understanding of fundamentals with in-depth expertise in one or several topics.

The requirements for the EECS degree give you a lot of flexibility in choosing courses. This guide helps you to assemble a personal curriculum taking into account your interests, prior experience, and goals. While objectives may change over the course of your studies, it is important to plan ahead and start with an initial draft curriculum during your freshman year. Many interesting upper division courses have prerequisites that must be taken early. Advising sessions and experience gained as you go along will help you refine this draft in the following semesters. Additional information is available from the following sources:

Detailed course descriptions and prerequisite listings:

<http://www.eecs.berkeley.edu/Courses/>

General Catalog: <http://catalog.berkeley.edu/>

## 1.2 Lower Division EECS Core Courses

Although engineers are becoming increasingly specialized, a broad understanding of general concepts is critical for the successful completion of engineering projects. The following set of lower division courses covers the field broadly and must be taken by all EECS students:

- a) EE 40 focuses on the physical aspects of EECS, including the devices and electronic circuits used in computers, phones, cars, etc.
- b) EE 20N an introduction to mathematical modeling techniques used in the design electronic systems.
- c) CS 61A, 61B or 61BL, 61C or 61CL concentrate on computing, including programming.

You don't need to satisfy other course requirements before taking EECS lower-division core courses. If you have satisfied all of the prerequisites (or placed out of the prerequisites through Advanced Placement credit), we encourage you to start taking the EECS lower-division core courses as early as you can! Try to complete all five courses by the end of your sophomore year.

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<sup>1</sup> <http://www.eecs.berkeley.edu/>

### 1.3 Upper Division Curriculum

Upper division courses give you in-depth exposure to one or more areas of EECS. For most courses, the only condition for enrolling is having completed prerequisite courses (listed in the course catalog). Strive to balance breadth with specialization by choosing two or three areas and taking multiple related courses in each. The EECS degree requires a minimum of 20 units of upper division courses in the department and 45 units total (including upper division EECS units) in the College of Engineering, as well as an ethics requirement. Most students find that they need to take more units than the required minimum for a complete education and to maximize their opportunities for jobs or graduate school. We strongly recommend that you use the resources available to you to optimize your education.

To help you choose from the large number of available upper division courses, the table below lists related courses for several areas. Please refer to the course catalog at <http://catalog.berkeley.edu> for detailed course descriptions. This is only meant to be a guide; many other combinations are also possible. Discuss your choices with your faculty adviser, fellow students, and, if you have a chance, practicing engineers: your plan may have a profound impact on your future. Plan early and revise readily when you see new opportunities or your interests change.

<b>AREA</b>	<b>COURSES</b>
Devices	EE 105, EE 119, EE 130, EE 143
Analog Circuits	EE 105, EE 140, EE 142, EE 113
Digital Circuits	EE 105, EE 141, CS 150
Computer Architecture	CS 150, CS 152
Signals	EE 120, EE 123, EE 126, EE C145B
Communication & Networking	EE 120, EE 121, EE 122
Robotics & Control	EE C125, EE C128
Laboratory & Projects	EE C145L, EE 145M, or C145M, EE 192
Algorithms	CS 170, CS 172, CS 174
Artificial Intelligence	CS 188
Databases	CS 186
Software & Languages	CS 169, CS 162, CS 164
Security	CS 161
Interface & Graphics	CS 160, CS 184
Quantum Computing	CS C191

### 1.4 Math and Science

Engineers use math and science as tools in their designs. The following requirements ensure that you have the necessary background:

- Math 1A, 1B, 53, 54

- Physics 7A and 7B
- CS 70
- Additional math and science courses for at least 30 units total. See Section 2.2 for a complete listing of the requirements.

Many of these courses are prerequisites for engineering courses but you do not need to complete all 30 units before starting to take courses in EECS. You also do not need to retake courses for which you received advanced placement credit (see pages 7-10 in the College of Engineering Undergraduate Handbook, [http://coe.berkeley.edu/students/current-undergraduates/advising/Undergraduate Handbook 10-11](http://coe.berkeley.edu/students/current-undergraduates/advising/Undergraduate%20Handbook%2010-11)). Check your transcript for a listing.

## 1.5 Additional Opportunities

Berkeley's EECS department offers many opportunities for maximizing your engineering education beyond curriculum requirements. The department is internationally acclaimed for its research and consistently ranks among the top universities in the world. Participating in research is an excellent opportunity to gain practical experience and learn about the cutting edge of a field.

Undergraduate research projects are in high demand, and finding one requires some planning. You can find out about ongoing projects by talking to professors during their office hours (their purpose is not only to inquire about exam grades or lost homework), attending research seminars, or checking out department web pages. Many (but not all) undergraduate research opportunities are listed at <http://research.berkeley.edu/>. Oftentimes you will need to have successfully completed one or more upper division courses in the area of the project, so plan ahead.

Summer internships at companies are another excellent opportunity to gain practical experience. More information is available at <http://www.eecs.berkeley.edu/IPRO/internship.shtml>.

If you are interested in a more extensive research experience and taking additional courses, you should consider the honors program. This program requires a well thought out plan and good grades, and is available only to our top students. See <http://www.eecs.berkeley.edu/Programs/honors.html> for more information. It is strongly recommended that you apply in your junior year or earlier. Attend an overview session before applying.

## 1.6 Humanities and Special Interests

Courses outside the [College of Engineering \(COE\)](http://www.coe.berkeley.edu)<sup>2</sup> help to round out your education. You have a choice of courses in humanities, social sciences, foreign languages, physical education, and many other disciplines. You can also earn a minor from a different department in or outside the COE, or you can enroll in one of our double-major programs (currently EECS/MSE and EECS/NE). However, you are not completely free with your choices. Complete requirements are listed at <http://www.coe.berkeley.edu/students/current-undergraduates/>.

## 1.7 Study Plan

Please keep in mind the following when preparing your Study Plan:

- You need to complete at least 12 units in each semester and an average of 30 units in each year.
- Try to distribute technical and non-technical courses evenly over the semesters.
- Carefully plan your schedule to complete your degree in eight semesters, attending summer sessions if necessary.
- Make sure to take courses with prerequisite chains in the right order.
- Not all courses are given in each semester and some courses overlap. Because of this you sometimes need to modify your program when the Schedule of Classes is updated.
- Not all degree requirements are listed here. See your Engineering Student Services Adviser (ESS) in 230 Bechtel Hall periodically for a degree check to make sure you're on track.

A Study Plan Worksheet appears on the following page.

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<sup>2</sup> <http://coe.berkeley.edu/>

	FALL			SPRING			SUMMER		
	#	Description	Units	#	Description	Units	#	Description	Units
<b>FRESHMAN</b>									
<b>SOPHOMORE</b>									
<b>JUNIOR</b>									
<b>SENIOR</b>									

Study Plan For: \_\_\_\_\_ Date: \_\_\_\_\_

## Chapter 2: The Bachelor of Science Degree

### 2.1 Undergraduate Program

The Department offers two programs: Electrical and Computer Engineering (ECE), and Computer Science and Engineering, (CSE), both of which are accredited by ABET. We have designed a set of courses of study for these programs, called options, described further in later chapters. Students working towards the B.S. degree select an option within their program and are then assigned an appropriate faculty adviser on the basis of their selection.

The ECE options include Option I (Electronics), Option II (Communication, Networks, and Systems), Option III (Computer Systems), and Option V (General). There are also lists of sample courses of study that can be used as guidelines for planning balanced programs in the various areas contained in this handbook. The transcripts of students in these options indicate that their degree is from the Electrical and Computer Engineering program.

The CSE program includes Option IV (Computer Science). The Computer Science option is for students with interests in all aspects of computer science, including design and analysis of algorithms, complexity theory, artificial intelligence, computer graphics, and database systems. The transcripts of students in Option IV indicate that their degree is from the Computer Science and Engineering Program.

All EECS diplomas will state that the student received a Bachelor of Science Degree from the University of California, Berkeley College of Engineering. Diplomas do not indicate the EECS major or program.

The ECE and CSE programs have the following broad objectives:

- Preparing graduates to pursue post-graduate education in engineering or other professional fields.
- Preparing graduates for success in technical careers related to electrical and computer engineering

To achieve these objectives, both programs attempt to provide students with the following:

1. An ability to configure, apply test conditions, and evaluate outcomes of experimental systems.
2. An ability to design systems, components, or processes that conform to given specifications and cost constraints.

3. An ability to work cooperatively, respectfully, creatively, and responsibly as a member of a team.
4. An ability to identify, formulate, and solve engineering problems.
5. An understanding of the norms of expected behavior in engineering practice and their underlying ethical foundations.
6. An ability to communicate effectively by oral, written, and graphical means.
7. An awareness of global & societal concerns and their importance in developing engineering solutions.
8. An ability to independently acquire and apply required information, and an appreciation of the associated process of life-long learning.
9. A knowledge of contemporary issues.
10. An in-depth ability to use a combination of software, instrumentation, and experimental techniques practiced in circuits, physical electronics, communication, networks and systems, hardware, programming, and computer science theory.

## 2.2 Overall Requirements for the Degree

Generally, you must take a course of study that meets the unit or topic requirements in this section. If you have any questions after reading these descriptions, please contact your Engineering Student Services Adviser in 230 Bechtel Hall. The requirements can be found at: <http://www.coe.berkeley.edu/students/current-undergraduates>.

We require a minimum of 120 semester units.

- At least 30 units of natural science, mathematics, and statistics comprising of
  - At least 11 units of natural science, including Physics 7A and B or H7A and B, and one course chosen from among
    - Physics 7C or H7C (recommended)
    - Engineering 5, Chemistry 1A (recommended), Chemistry 1A lab required, (lab counts toward natural science), Chemistry 1B, 3A or B, 4A or B or 5
    - Biology 1A (recommended) or Biology 1B
    - Astronomy 7A or B
    - Molecular and Cell Biology 32 (MCB 32 may be taken with or without 32L; if taken with 32L, 32L units count towards the natural science requirement) or any upper-division course in Astronomy, Biology, Chemistry, Earth and Planetary Science, Integrative Biology, Molecular and Cell Biology, Physics or Plant and Microbial Biology
  - Mathematics
    - Math 1A-B, 53 and 54
    - CS 70. Note: CS 70 is a new requirement, effective for all incoming students Fall 2010 or later.

- A total of 45 units of technical engineering courses comprised of at least 20 units of upper-division EECS courses. A student may count most letter-graded courses (lower or upper division) in the COE towards the 45 unit requirement. We encourage students to take courses outside the department.<sup>3</sup> Whatever choices you make regarding your courses, check with an adviser in advance to make sure that the course will fulfill your requirements.
- EECS lower-division core courses (which also count as technical engineering courses):
  - EE 20N
  - EE 40
  - CS 61A<sup>4</sup>, B/BL and C/CL
- Ethics Requirements:  
Students must complete one course about engineering ethics or the social implications of technology. This may be fulfilled by completing one of the following courses: CS 195, CS H195, ERG 100 or ERG C100, ISF 60 ISF 100D. CS H195, ERG 100 or C100, ISF 60 and ISF 100D fulfill both a Humanities/Social Science requirement and the EECS ethics/social implications of technology requirement.

Note:

Students who transfer into EECS from other departments can substitute E 7 for CS 61A, if they have taken E7 before entering the major. **E7 will not serve to fill the prerequisite of upper division courses that call for 61A.**

Junior transfers who have received partial credit for CS 61A, CS61B and CS 61C taken at a community college may petition to complete the courses through supplementary work in CS47A, 47B, or 47C. For further information please check with your Engineering Student Services Adviser in 230 Bechtel.

Transfer students must complete lower-division requirements within the first two semesters after admission.

A student with junior-level status must take any remaining lower and upper-division technical courses required for the EECS major at UC Berkeley.

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<sup>3</sup> The 45 Units of engineering cannot include the following courses: BioE 100; Engineering 100, 110, C111, 124, 130AC, 140, 191, 193, 195, 196; IEOR 172, 190 series, 191. In the past, we've found the following courses to be of interest:

- CEE 130
- E 36, 45, 115, 177, and 120
- MSE 102 and 111
- ME 102A, 104, 134, and 135
- NE 101 and 107

This list is suggested and not exclusive.



As a grandfathering provision, junior transfer students entering the major on or before Spring 2012 may satisfy the CS 70 requirement if they have taken a course equivalent to Statistics 20, Statistics 25, Math 55 at a community college before entering UC Berkeley. Note that this exception applies only to courses taken at a community college before entering Berkeley, and only for junior transfer students until Spring 2012. Junior transfers who have not already taken one of these courses at community college should take CS 70 at Berkeley.

**As of summer 2010, E190 is no longer required for EECS students.**

In the past, the department has required students to take a course in technical communications. This requirement has been eliminated for students graduating in Summer 2010 or later, pending introduction of a suitable course on technical communications. The department expects to re-introduce a technical communications requirement at some point in the future.

You must still take a total of 45 units of engineering courses, including at least 20 units of upper division EECS courses. CS or EE 194 courses must be approved as a technical course. The 45 units of engineering courses cannot include: any course taken on a P/N basis; courses numbered 24, 39, 84; BioE 100; 195, C195; E 100, C111, 140, 191, 193, 196; IEOR 172, 190 series.

- An upper-division engineering course providing a major design experience based on the knowledge and skills acquired in earlier coursework and incorporating engineering standards and realistic constraints (counts as engineering units for requirement 2). The current EECS design courses are:
  - EE C125, C128, 130, 140, 141, 143, C149, 192
  - CS C149, 150, 160, 162, 164, 169, 184, 186.

Effective Fall 2011 the following courses no longer satisfy the design course requirement:

CS 152, EE 145L and EE 145M

In other words, these courses are temporarily grandfathered and will satisfy the design requirement if taken in Fall 2010 and Spring 2011; but if they are taken in Fall 2011 or later, they do not satisfy the design requirement.

A course in other engineering departments having substantial engineering design content can be substituted by petition.

- To promote a better understanding of the humanities and social sciences, the University and the College of Engineering have established degree requirements for the humanities and social studies. Students must satisfy the terms of the Entry level writing, Humanities and Social Studies requirements that are in effect at the time of their admission. The list of courses for this requirement is revised regularly.

Students will be expected to satisfy this requirement by taking courses that are on the list when the course is taken. For more information on Humanities and other requirements please see <http://www.coe.berkeley.edu/students/current-undergraduates>.

- **Computing Service Courses.** You may earn a maximum total of at most 5 units of credit toward graduation for courses labeled as “computing service” courses, which include CS 3S, CS 10, the CS 9 courses, and Engineering 110. You will receive no more than 1 unit of credit for each computing service course taken after the first or after any of the CS 61 courses. Any units beyond these limits will not count toward graduation, although they will count for the sole purpose of determining whether your study list falls within the minimum and maximum unit loads.
- **English as a Second Language (ESL).** You may apply no more than 3 units of ESL coursework toward the degree.
- **Physical Education.** You may apply no more than 4 units of physical education toward the degree.
- **Independent Study: EE or CS 199.** You may apply no more than 10 units of course 199 (Independent Study and Research) toward the degree.

### 2.3 University Requirements

You are expected to make what is called "normal progress" toward your degree each year. Normal progress requires 30 units of completed required course work for EECS each year. Coursework outside the major requirements do not apply to normal progress. In any case, students must make minimal progress. Officially, minimal progress means that:

- **Unit Requirement:** At the end of each semester, you have completed at least  $15(N-1)$  units, where  $N$  is the number of Fall and Spring semesters you have been enrolled. We recommend, however, that you not let your total accumulated units drop much below  $15N$ .
- **Semester Unit Requirement:** Your final program each semester must contain at least 12 and at most 20.5 units. It must include at least two letter graded technical courses required for your major. All technical courses and courses required for the engineering major must be taken for a letter grade. Programs of less than 12 or more than 20.5 units require prior approval of the Associate Dean.

For reasons of health or disability (as certified by a University physician or the Disabled Students Program), family obligations (e.g., single parent without alternative childcare arrangements), or employment of 15 hours or more per week with documented financial need, students may petition to enroll in less than the normal program. For the complete process, students

should contact their Engineering Student Services (ESS) Adviser in 230 Bechtel. Reduced study lists still must contain two letter graded technical courses. Minimum units of study based on hours of employment per week are as follows:

Hours of Employment	0	10	15	20	30	40
Minimum Units	12	12	11	9	6	3

You must submit any requests for a reduced study list and documentation substantiating it to your Engineering Student Services (ESS) Adviser in 230 Bechtel no later than the eighth week of classes each semester. You should not plan to carry a substantially reduced load for multiple semesters. With the exception of cases covered in the table above, the EECS degree is a full-time program.

- **Normative Time:** Entering freshman are allowed eight semesters to graduate and transfers are allowed four semesters to graduate. If a student has been making normal progress each year and needs an extra semester to graduate, they must petition in advance for permission to do so. Students meet with their Engineering Student Services Adviser in 230 Bechtel to initiate an appeal for an extra semester. Note that two extra semesters are almost never approved.

Enforcement of the minimum 12 unit and 2 technical courses per term requirement will continue until the last semester of completing the degree, during which the student may take less than the minimum units. (Students receiving Federal Financial Aid should consult with the financial aid office to determine if enrolling in fewer than 12 units will impact their aid package.) If a student completes his/her major requirements earlier than their final semester then they may petition to take few than 2 technical courses in a term but must continue to meet the minimum 12 unit per term requirement until their final semester.

- **Residence Requirement:** You must complete your final 30 units, constituting two consecutive semesters, in residence in the College of Engineering on the Berkeley campus. For full College Policy refer to the current official College Undergraduate Handbook: <http://www.coe.berkeley.edu/students/current-undergraduates>.
- **Humanities and Other Requirements:** The set of requirements applicable to you depends on when you entered. A list of the current approved humanities courses may be obtained from the Engineering Student Services (ESS) Office in 230 Bechtel or on the web at <http://www.coe.berkeley.edu/students/current-undergraduates>.

## 2.4 Laboratory Courses

Laboratory experience is an important part of your education at Berkeley. The table below gives the current list of upper-division courses that have associated physical, hardware, or software laboratories. We recommend that you take at least three of these courses. Since this table is subject to change, you should consult the most recent version of these Notes to make sure you are using up-to-date information.

Refer to EECS General Catalog for complete list at:  
[http://sis.berkeley.edu/catalog/gcc\\_view\\_req?p\\_dept\\_cd=EECS](http://sis.berkeley.edu/catalog/gcc_view_req?p_dept_cd=EECS).

### *Upper-Division Laboratory Courses*

EE105: Microelectronic Devices & Circuits	CS150: Components & Design Techniques for Digital Systems
EE 117 Electromagnetic Fields and Waves	CS152: Computer Architecture & Engineering
EE 123: Digital Signal Processing	
EE 127A Optimization Models in Engineering	CS 160: User Interfaces
EE 128: Feedback Control	CS 162: Operating Systems & System Programming
EE 140: Linear Integrated Circuits	CS 164: Programming Languages & Compilers
EE 141: Digital Integrated	CS 169: Software Engineering
EE 142: Integrated Circuits for Communication	CS 184: Foundations of Computer Graphics
EE/CS C149: Intro to Embedded Systems	CS 186: Introduction to Database Systems
EE 143: Microfabrication Technology	
EE 145L: Introductory Electronic Transducers	
EE C145O Lab in Mechanics of Organisms	
EE 192: Mechatronic Design Laboratory	
EE 125: Introduction to Robotics	
EE 145M: Introductory Microcomputer Interfacing	

## 2.5 Upper-Division Core Courses

As the engineering profession has expanded, courses of study selected by undergraduates have tended to become unduly specialized. After graduation, engineers are usually required to participate in projects that are not limited to their area of specialization. This fact necessitates a basic understanding of the fundamentals in many subfields of EECS. Moreover, changes in technology and the economy frequently require engineers to shift their area of specialization to avoid losing their jobs, so it is important to acquire the fundamentals of more than one area of EECS. The table below lists upper-division courses in the EECS curriculum which are intended to provide a basic familiarity with the various subject areas in the department. They are designed both for the specialist and for the non-specialist and contain a balance of theory and practice.

### *Upper-Division Core Courses*

<b>AREA</b>	<b>CORE COURSE</b>
Microelectronic Devices & Circuits	EE 105
Electromagnetic Fields & Waves	EE 117
Signals & Systems	EE 120
Feedback Control	EE 128
Integrated-Circuit Devices	EE 130
Linear Integrated Circuits	EE 140
Integrated Circuits for Communications	EE 142
Components & Design Techniques For Digital Systems	CS 150
Random Processes in Communications Systems	EE 126
Computer Architecture & Engineering	CS 152
Operating Systems & System Programming	CS 162
Programming Languages & Compilers	CS 164
Software Engineering	CS 169
Efficient Algorithms & Intractable Problems	CS 170

## 2.6 Grading, Course Unit, and Advanced Placement Policies

**Grading Scale:** Your courses are either graded using the usual letter-grade scale (A-F, modified by a + or -), or Passed/Not Passed (P/NP). In a letter-graded course, a D- or better is considered a passing grade. In a P/NP course, a P grade corresponds to a C- or better. For any given semester, you may also receive a grade of I (Incomplete) or IP (In Progress), which is not counted toward satisfying your requirements. It is not used in computing your grade-point average until you complete the work. Technical courses are those in engineering, mathematics, chemistry, physics, statistics, biological sciences and computer science.

**Graduate Courses:** Graduate courses can be valuable for students who intend to pursue advanced degrees or who find a subject so intriguing that they want to find out about current research in the area. You must have completed at least 60 units of undergraduate course work and have an upper-division GPA of at least 3.0. Enrolling in graduate courses requires the instructor's permission. We will treat most EECS graduate courses as upper-division courses for the purposes of determining whether you have fulfilled your degree requirements. However, you must inform your Engineering Student Services (ESS) Adviser in 230 Bechtel if you intend to enroll in a graduate course.

**Incompletes:** Your instructor may assign a grade of Incomplete if your work in a course has been of passing quality, but is incomplete for reasons beyond your control. You must make arrangements with your instructor to receive this grade before the end of the course. After you complete the work, submit a Petition to Remove an Incomplete Grade to the Registrar, who will "remove" the incomplete (a record of it actually remains on your transcript) and replace it with the grade assigned by the instructor.

- You must remove an Incomplete grade received in the Fall semester by the first day of instruction in the following Fall semester.

- You must remove an Incomplete grade received in the Spring or Summer by the first day of instruction of the following Spring semester.
- If you are a bachelor's degree candidate, you must remove Incomplete grades in required courses by the last day of the last semester in which you are registered to avoid being dropped from the degree list.

You should make arrangements with the instructor to complete the required coursework at least 30 days prior to these deadlines; faculty are not obliged to accept work submitted after that time. Petition forms are available from the Registrar and from the Engineering Student Services (ESS) Office (230 Bechtel); you will need to pay a processing fee to submit the completed form. If you fail to remove an Incomplete grade by the deadline, it reverts to an F (or an NP if you took the course P/NP).

You may petition to relax these rules, but acceptance of such petitions is not automatic. In particular, you may petition to "freeze" up to two Incomplete grades so that they remain on the record, but never become F or NP; file such a petition in the Engineering Student Services (ESS) Office by the deadlines described above. A course in which you hold a frozen Incomplete grade may never be completed or repeated. Do not accumulate 12 or more semester units of unrevised Incomplete grades (frozen or otherwise), or you will require the Dean's permission to register.

**Repeating Courses:** You may only repeat courses in which you receive a grade NP or less than C-. You may not repeat courses for a P/NP grade if you first took them for a letter grade. For the first 12 units' worth of repeated courses, the grade you receive the second time replaces the original grade in the course (although a record of the original remains on your transcript). Beyond 12 units of repeated courses, all grades assigned and units attempted count toward your grade-point average. *A course repeated more than once will count as F in computing your grade-point average. If you do pass the course on one of these tries, however, it will still count toward satisfying your course requirements* (subject credit only).

**Unit Credit:** The maximum number of units that a student may transfer to the University from a community college is 70 semester units.

**Transferring Credit:** The Office of Undergraduate Admissions determines the units of advanced-standing credit to be allowed for work successfully completed at another institution. The Engineering Student Services (ESS) Office will evaluate the work in terms of subject credit. Where there is a question regarding the equivalence of prior coursework, the student will be directed to the departmental faculty representative of the course in question for the determination of course satisfaction. Students attending California community colleges should refer to the Assist website to determine transferability and equivalency of courses.

**Subject Credit:** A student who claims credit for coursework completed at a junior college or at a four-year university must see their Engineering Student Services (ESS)

Adviser in 230 Bechtel who will assist the student in completing a course evaluation form for submission to the instructor in charge of the equivalent course at Berkeley.

**Advanced-Placement Credit:** AP tests that satisfy some of the requirements can be found at <http://www.coe.berkeley.edu/students/current-undergraduates/advising/advising07-08.pdf/view>. If you take a course for which you have already received AP credit, the College of Engineering or the Office of Undergraduate Admission may deduct the duplicated units. Refer to the Undergraduate Handbook for complete details on exams 1B and A -Level exams at <http://coe.berkeley.edu/students/current-undergraduates/advising/Undergraduate%20Handbook%2010-11>

## **2.7 The Five-Year Bachelor/Master Program**

The Five Year Bachelor/Master's Program, called the 5th Year M.S. Program for short, offers qualified EECS and L&S CS undergraduate students a unique opportunity to begin graduate study during their undergraduate years, thereby accelerating the Master's degree by requiring only one additional year beyond the Bachelor's degree. This is not a concurrent degree program. Students earn their Bachelor degree first and then the Masters. However, careful planning during the undergraduate program allows motivated students to begin a research project and complete some Master's course requirements while still in undergraduate standing. Depending on how quickly a student progresses through the undergraduate program, the additional graduate year may come sooner than the 5th year at Berkeley. The Five Year Program is not intended for those who wish to pursue a Ph.D.

For details, see the website at <http://www.eecs.berkeley.edu/FiveYearMS/>.

## Chapter 3: The Bachelor of Arts Degree

### 3.1 Introduction

The Computer Science Division administers a major in [Computer Science](#)<sup>5</sup> for students in the College of Letters and Science. Graduates receive a Bachelor of Arts (B.A.) degree. The EECS Honors Degree Program and the Five-Year Bachelor/Masters Program are also open to L&S CS students. For more information, visit the [CS Letters and Science Website](#). There is also an L&S CS Adviser to answer your questions and provide assistance (office: 377 Soda Hall, telephone: 510-642-7214). You may declare your major at the end of the term in which you expect to complete all of your technical prerequisites.

### 3.2 Lower-Division Requirements

The following lower-division technical courses are required for entry into the Letters and Sciences major in Computer Science. You must take all of these courses for a grade, with the exception of EE 43.

- One year of college-level calculus and one course in linear algebra and differential equations: Math 1A, 1B, 54 or 54M.
- One course in discrete mathematics and probability theory: CS 70.
- One course in electronics: EE 42.
- We strongly recommend that you take EE 43 (a one-unit lab course) with EE 42. Alternatively, you can use EE 40 in place of EE 42.

*Note: EE 42 is not intended for EECS students; they should take EE 40 instead. For those students who might switch to EECS, take EE 40 instead of EE 42.*

- Completion of the lower-division sequence in computer science: CS 61A-B-C.
- L&S CS majors must earn 27 units in upper division technical courses. Any technical upper division CS or EE letter graded course taken for a letter grade is automatically approved. See the list of other approved non-CS technical electives [http://www.eecs.berkeley.edu/csugrad/tech\\_electives.shtml](http://www.eecs.berkeley.edu/csugrad/tech_electives.shtml).
  - Required courses: Theory (CS 170), Operating Systems (CS 162)
  - Required breadth courses: You must take two software project courses from the following set:

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<sup>5</sup> <http://ls-major.berkeley.edu/compsci.html>



CS 160	CS161	CS164	CS184
CS150	CS152	CS169	CS186

- Additional CS courses
- Technical Electives: Technical electives may be any upper-division CS or EE course or any course from the approved list located at [http://www.eecs.berkeley.edu/csugrad/tech\\_electives.shtml](http://www.eecs.berkeley.edu/csugrad/tech_electives.shtml). It is also available at the L&S CS Advisers' office (377 Soda Hall). The list includes courses from the fields of engineering, mathematics, statistics, linguistics, art, information management, psychology, economics, geophysics, business administration, cognitive science, and physics. All CS and EE courses offered for a letter grade are automatically approved as technical electives. You must submit requests for exceptions to these requirements in writing to the CS Advising Office. Such requests are subject to the approval of a Faculty Adviser.

### 3.3 Minor in Computer Science

A minor in computer science is available to all undergraduate students at Berkeley with a declared major, except CS and EECS majors, through the College of Engineering. The lower-division technical requirements are

- CS 70 or Math 55
- CS 61A
- CS 61B or CS 61BL
- CS 61C or CS 61CL

Students approved for the minor are given the opportunity to take three upper-division CS courses subject to available space, but with higher priority than other non-CS majors. Applications and more information on the CS minor are available at the Computer Science Advising Office, 377 Soda Hall, 510-642-7214. Online applications are located at <http://www.eecs.berkeley.edu/csugrad/minor.shtml>.

## Chapter 4: Sample Curricula

The EECS degree rules are very flexible to accommodate different directions including device physics, communications systems, and computer science—to list a few examples. The choice of direction is up to you, and many students choose to get in-depth exposure in several areas.

The sample programs listed in this chapter are intended to serve as examples for possible curricula. You may consider using one of these programs as a starting point for assembling the list of courses you want to follow. **However, we encourage you to devise your own program—please do not feel bound to follow the sample curriculum. You are encouraged to make substantial changes to meet your specific interests and needs, or to invent your own program.** One of the core philosophies of the EECS major is “flexibility”. Every student is different, and no one-size-fits-all curriculum would be right for everyone. Therefore, we encourage you to devise your own curriculum, according to your own interests, goals, and background. Sometimes students think that they need to follow one of the sample curricula closely, but we emphasize that this is not how we intend you to use them. We provide the sample curricula as a few examples of possible paths through the EECS program, not as a template to slavishly emulate. We make no claim that the sample curricula are the only or best way through the EECS program.

Most sample curricula below assume that you have no advanced placement (AP) credit. However, if you are entering Berkeley with AP credit, we encourage you to make modifications to fit your interests or situation—and we especially encourage you to start your EECS courses earlier than the sample programs would otherwise indicate. This will free up time in later semesters, for example to get exposure to more aspects of EECS with additional upper division course, to enroll in undergraduate research, or to pursue a minor in a different field.

The sample programs are organized into five thematic options. These have no formal significance: you are not required to follow any one option and in fact most students combine courses from several options in their programs. It is your responsibility however to ensure that your program meets all university and degree requirements. You must also complete all prerequisites listed in the General Catalog before enrolling in a course. Your Engineering Student Services (ESS) Adviser in 230 Bechtel can advise you if your study plan meets degree requirements.

Every semester you are required to fill out a list of courses you are planning to take. This list also has an entry for the “option” you have chosen. This information is used only for assigning you a faculty adviser who specializes in the area where you have the most interest. For example, if your primary area of interest is electronics you would mark option I on the form, while for a computer science emphasis you indicate option IV. In all cases you may take and in fact are encouraged to take courses from other options.

Changing your faculty adviser is straightforward: simply email the form to [change-adviser@eecs.berkeley.edu](mailto:change-adviser@eecs.berkeley.edu) with your request to inform advisors in 205 Cory that you want to change your “option” and/or faculty adviser.

**Electronics (Option I):** For students interested in integrated circuits, including fabrication technology, solid state devices, analog and digital circuit analysis and design, VLSI design, and computer-aided design and manufacturing; and for students interested in microelectromechanical systems, electromagnetics, acoustics, optoelectronics, plasmas, cryoelectronics, and antennas and propagation.

**Communications, Networks, and Systems (Option II):** For students with interests in networks, control, robotics, digital and analog communications, computer networks, signal processing, systems design and optimization, or power systems planning and operation; or for students with an interest in biology or medicine as well as electrical engineering, including biological sensors and signals, signal and image processing, and analysis and modeling of biological systems.

**Computer Systems (Option III):** For students interested in machine architecture and logic design, operating systems, database systems, programming systems and languages, or digital devices and circuits.

**Computer Science (Option IV):** For students interested in design and analysis of algorithms, complexity theory and other theoretical topics, artificial intelligence, or computer graphics.

**General Option (Option V):** For students whose interests are broad or are not yet focused on a specific field, this very flexible option enables students to explore several of the areas of electrical engineering and computer sciences.

**Joint Majors:** The Department offers Joint Major Programs designed to qualify students for employment in either of two major fields of engineering, or for positions where competence in both fields is required. Both majors are listed on the student's transcript. Currently, we have established two such majors, described below.

- **EECS/Materials Science and Engineering:** For students interested in materials and devices, a joint major in EECS/MSE can be valuable. The program combines the study of materials from a broad perspective, as taught in MSE, with the study of their applications in electronic devices and circuits, as taught in EECS. Students selecting this joint major program have two Faculty Advisers, one from MSE and one from EECS.
- **EECS/Nuclear Engineering:** The EECS/NE joint major combines the traditional EE program with one in the nuclear sciences. Nuclear Engineering shares with EE a concern for electrical power generation, automatic control, computer sciences and plasmas. Students selecting this joint major program have two Faculty Advisers, one from NE and one from EECS. There is no sample

curriculum currently available for the EECS/NE joint major. Please consult the EECS/NE Faculty Advisers for more information.

**Dual Major:** A Dual Major is the pursuit of two distinct majors within the College of Engineering. You may petition to set up other double majors in engineering, as long as you do so before your junior year and have a GPA of at least 3.0. For consideration of a proposed dual major, meet with your ESS adviser to obtain specific information about applying for a dual major. Dual majors will not be granted additional semesters to graduate.

**Simultaneous Degrees:** It is also possible to get simultaneous degrees in EECS and in a college or school outside of the College of Engineering. This requires a Simultaneous Degree petition, submitted by the end of your sophomore year, and at least a 3.0 GPA for consideration, along with approval of the department chairs and Faculty Adviser in EECS and the other department. If you want to consider a double major or simultaneous degree, see your Engineering Student Service (ESS) Adviser.

*Sample Curriculum for Entering Students with AP Credit for Math 1A (All Options)*

Year	Fall	Spring
<b>FRESHMAN</b>	Math 1B (4 units)	Math 53 (4 units)
	Physics 7A (4 units)	Physics 7B (4 units)
	CS 61A (4 units)	CS 61B or 61 BL (4 units)
	Humanities (4 units)	Humanities (4 units)
<b>SOPHOMORE</b>	Math 54 (4 units)	EE 20N (4 units)
	Physics 7C, Chem 1A or Bio 1A (4 units)	CS 61C or 61CL (4 units)
	EE 40 (4 units)	Elective*
	Humanities (3 units)	Humanities (3 units)

\*Refer to your sample curriculum in the following pages for recommendations on electives.

*Sample Curricula for Option I: Electronics*

YEAR	IA: Electronics		IB: Integrated Circuits		IC: Physical Electronics	
	Fall	Spring	Fall	Spring	Fall	Spring
FRESHMAN	Math 1A (4 units)	Math 1B (4 units)	Math 1A (4 units)	Math 1B (4 units)	Math 1A (4 units)	Math 1B (4 units)
	Chem 1A (4 units)	Physics 7A (4 units)	Chem 1A (4 units)	Physics 7A (4 units)	Chem 1A (4 units)	Physics 7A (4 units)
	CS 61A (4 units)	CS 61B or 61BL(4 units)	CS 61A (4 units)	CS 61B or 61BL (4 units)	CS 61A (4 units)	CS 61B or 61BL (4 units)
	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)
SOPHOMORE	Math 53 (4 units)	Math 54 (4 units)	Math 53 (4 units)	Math 54 (4 units)	Math 53 (4 units)	Math 54 (4 units)
	Physics 7B (4 units)	Physics 7C (4 units)	Physics 7B (4 units)	Physics 7C (4 units)	Physics 7B (4 units)	Physics 7C (4 units)
	EE 20N (4 units)	EE 40 (4 units)	EE 20N (4 units)	EE 40 (4 units)	EE 20N (4 units)	EE 40 (4 units)
	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)
JUNIOR	EE 105 (4 units)	EE 130 (4 units)	EE 105 (4 units)	EE 130 (4 units)	EE 105 (4 units)	EE 130 (4 units)
	EE 117 (4 units)	EE 140 or 141 (4 units)	EE 117 (4 units)	EE 140 /141 (4 units)	EE 117 (4 units)	CS 150 (5 units)
	CS 61C or 61CL (4 units)	CS 150 (5 units)	CS 61C or 61CL (4 units)	CS 150 (5 units)	CS 61C or 61 CL (4 units)	Technical Elective (3-4 units)
	Technical Elective (3-4 units)	Humanities (3 units)	Technical Elective (3-4 units)	Humanities (3 units)	Humanities (3 units)	
SENIOR	EE 143 (4 units)	Stat 134/EE 126 (3 units)	EE 143 (4 units)	Stat 134/EE 126 (3 units)	Physics 137A (4 units)	Stat 134/EE 126 (3 units)
	EE 120 (4 units)	Electives (4 units)	EE 120 (4 units)	EE 142 (4 units)	EE 140 or 141 (4 units)	
	Humanities (4 units)	Engin. Electives (4 units)	Humanities (3 units)	CS 152 (5 units)	EE 120 (4 units)	EE 143 (4 units)
		Electives (3 units)		Electives (3 units)	Humanities (3 units)	Humanities (4 units)

*Sample Curricula for Option I, continued*

YEAR	ID: Microelectromechanical		IE: Semiconductor Manufacturing		IF: Power Electronics	
	Fall	Spring	Fall	Spring	Fall	Spring
	FRESHMAN	Math 1A (4 units)	Math 1B (4 units)	Math 1A (4 units)	Math 1B (4 units)	Math 1A (4 units)
Chem 1A (4 units)		Physics 7A (4 units)	Chem 1A (4 units)	Physics 7A (4 units)	Chem 1A (4 units)	Physics 7A (4 units)
CS 61A (4 units)		CS 61B or 61BL (4 units)	CS 61A (4 units)	CS 61B or 61BL (4 units)	CS 61A (4 units)	CS 61B or 61BL (4 units)
Humanities (4 units)		Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)
SOPHOMORE	Math 53 (4 units)	Math 54 (4 units)	Math 53 (4 units)	Math 54 (4 units)	Math 53 (4 units)	Math 54 (4 units)
	Physics 7B (4 units)	EE 20N (4 units)	Physics 7B (4 units)	Physics 7C (4 units)	Physics 7B (4 units)	Physics 7C (4 units)
	E 45 (4 units)	EE 40 (4 units)	EE 40 (4 units)	EE 20N (4 units)	EE 20N (4 units)	EE 40 (4 units)
	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)
JUNIOR	Physics 7C (4 units)	EE 130 (4 units)	EE 105 (4 units)	EE 130 (4 units)	EE 105 (4 units)	EE 120 (4 units)
	EE 105 (4 units)	EE 140/141 (4 units)	EE 117 (4 units)	EE 140/141 (4 units)	EE 117 (4 units)	EE 130 (4 units)
	CS 61C or 61CL (4 units)	E 36 (2 units)	CS 61C or 61CL (3 units)	CS 150 (5 units)	CS 61C or 61CL (4 units)	CS 150 (5 units)
	Technical Elective (3-4 units)	Humanities (4 units)	Technical Elective (3-4 units)		Technical Elective (3-4 units)	Humanities (3 units)
SENIOR	EE 120 (4 units)	EE 126 (4 units)	EE 120 (4 units)	Stat 134 (3 units)	EE 113 (4 units)	Stat 134/EE 126 (3 units)
	EE 143 (4 units)	Technical Elective (3-4 units)	EE 143 (4 units)	Electives (9 units)	EE 143 (4 units)	
	Humanities (3 units)	CE 130 (3 units)	Humanities (3 units)	Humanities (3 units)	Humanities (4 units)	EE 140/141 (4 units)
	Electives (3 units)	Electives (3 units)	Chem E 179 (3 units)		Humanities (4 units)	ME 229 (3 units)

**Sample Curricula for Option II Communications, Networks, Systems**

YEAR	IIA: Communications		IIB: Bioelectronics		IIC: Circuits and Systems	
	Fall	Spring	Fall	Spring	Fall	Spring
FRESHMAN	Math 1A (4 units)	Math 1B (4 units)	Math 1A (4 units)	Math 1B (4 units)	Math 1A (4 units)	Math 1B (4 units)
	Chem 1A (4 units)	Physics 7A (4 units)	Chem 1A (4 units)	Chem 3A & 1B (4 units)	Chem 1A (4 units)	Physics 7A (4 units)
	CS 61A (4 units)	CS 61B or 61 BL(4 units)	CS 61A (4 units)	Physics 7A (4 units)	CS 61A (4 units)	CS 61B or 61 BL (4 units)
	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)
SOPHOMORE	Math 53 (4 units)	Math 54 (4 units)	Math 53 (4 units)	Math 54 (4 units)	Math 53 (4 units)	Math 54 (4 units)
	Physics 7B (4 units)	Physics 7C (4 units)	Bio 1A (4 units)	Bio 1B (4 units)	Physics 7B (4 units)	Physics 7C (4 units)
	EE 20N (4units)	EE 126 (4 units)	Physics 7B (4 units)	EE 20N (4units)	EE 20N (4units)	EE 40 (4 units)
	Humanities (3 units)	Humanities (3 units)	CS 61B or 61 BL (4 units)	EE 40 (4 units)	Humanities (3 units)	Humanities (3 units)
JUNIOR	EE 40 (4 units)	EE 118/122 (3 or 4 units)	EE 12x117 (3 or 4 units)	EE 105 (4 units)	EE 126 (4 units)	EE 122 (4 units)
	EE 120 (4 units)	EE 121 (4 units)	EE 120 (4 units)	E 153 (3 units)	EE 120 (4 units)	EE 105 (4 units)
	CS 61C or 61CL (4 units)	EE 117 (4 units)	CS 61C or 61CL(4 units)	Technical Elective (3-4 units)	CS 61C or 61CL (4 units)	EE 121 (4 units)
	Technical Elective (3-4 units)	Humanities (3 units)	Humanities (4 units)	Humanities (4 units)	Technical Elective (3-4 units)	Humanities (3 units)
SENIOR	CS 150 (5 units)	EE 12x (4 units)	Stat 134 or EE 126 (4 units)	EE 129 (3 units)	CS 150 (5 units)	EE 142 (4 units)
	EE 12x (3 units)	Humanities (3 units)	EE 145L (3 units), EE 145B (4 units)		EE 140 or 141 (4 units)	EE 140 or 141 (4 units)
	CS 170 (4 units)	Elective	Elective	EE 145M (3 units)	EE 12x (3 or 4 units)	EE 12x (3 or 4 units)
	Humanities (3 units)	Elective	Humanities (4 units)	Humanities (3 units)	Humanities (3 units)	Humanities (3 units)



*Sample Curricula for Option II, continued*

YEAR	IIB: Communications, accelerated		IIE: Robotics & Mechatronics	
	Fall	Spring	Fall	Spring
	FRESHMAN	Math 53 (4 units)	Math 54 (4 units)	Math 1A (4 units)
Physics H7A (4 units)		Physics H7B (4 units)	Chem 1A (4 units)	Physics 7B (4 units)
CS 61A (4 units)		CS 61 B or 61 BL (4 units)	Physics 7A (4 units)	CS 61A (4 units)
Humanities (4 units)		Humanities (4 units)	Humanities (4 units)	Humanities (4 units)
SOPHOMORE	Physics H7C (4 units)	EE 122 (3 units)	Math 53 (4 units)	Math 54 (4 units)
	EE 20N (4 units)	EE 120 (4 units)	Physics 7C (4 units)	EE 20N (4 units)
	EE 40 (4 units)	EE 126 (4 units)	CS 61B or 61 BL	EE 40 (4 units)
	Humanities (3 units)	Humanities (4 units)	Humanities (4 units)	Humanities (4 units)
JUNIOR	EE 105 (4 units)	CS 150 (5 units)	EE 117 (4 units)	EE 105 (4 units)
	CS 61C or 61CL (4 units)	EE 117 (4 units)	EE 120 (4 units)	EE145M (3 units)
	EE 121 (4 units)	Technical Elective (3-4 units)	CS 61C or 61CL (4 units)	CS150 (5 units)
	Technical Elective (3-4 units)	Humanities (4 units)	Technical Elective (3-4 units)	Humanities (4 units)
SENIOR	EE 140 (4 units)	EE 142 (4 units)	EE 125 (4 units)	EE 126 (4 units)
	EE 12x (4 units)	EE 12x (4 units)	EE 128 (4 units)	CS 188 (4 units)
	CS 170 (4 units)	Math 104/110 (4 units)	EE145L (3 units)	EE 192 (4 units)
	Humanities (3 units)		Humanities (4 units)	Humanities (4 units)

*Sample Curriculum for Option III: Computer Systems*

YEAR	III: Computer Systems	
	Fall	Spring
FRESHMAN	Math 1A (4 units)	Math 1B (4 units)
	Science (4 units)	Physics 7A (4 units)
	CS 61A (4 units)	CS 61B or 61 BL (4 units)
	Humanities (4 units)	Humanities (4 units)
SOPHOMORE	Math 53 (4 units)	Math 54 (4 units)
	Physics 7B (4 units)	EE 20N (4 units)
	CS 61C or 61CL (4 units)	EE 40 (4 units)
	Humanities (3 units)	Humanities (4 units)
JUNIOR	CS 70 (4 units)	EE 120 (4 units)
	EE 141 (4 units)	CS 162 (4 units)
	CS 150 (5 units)	Technical Elective (3-4 units)
	Humanities (3 units)	Elective (4 units)
SENIOR	CS 152 (5 units)	Electives (11 units)
	CS 164 (4 units)	
	Electives (3 units)	
	Humanities (3 units)	

*Sample Curriculum for Option IV: Computer Science*

Year	IV: Computer Science	
	Fall	Spring
FRESHMAN	Math 1A (4 units)	Math 1B (4 units)
	Science (4 units)	Physics 7A (4 units)
	CS 61A (4 units)	CS 61B or 61 BL (4 units)
	Humanities (4 units)	Humanities (3 units)
SOPHOMORE	Math 53 (4 units)	Math 54 (4 units)
	Physics 7B (4 units)	CS 70 (4 units)
	CS 61C or 61CL (4 units)	EE 20N (4 units)
	Humanities (3 units)	Humanities (3 units)
JUNIOR	Physics 7C (4 units)	CS 164 (4 units)
	EE 40 (4 units)	CS 170 (4 units)
	CS 162 (4 units)	Engineering (4 units)
	Technical Elective (3-4 units)	Humanities (3 units)
SENIOR	CS 169 (4 units)	CS 150 (5 units)
	Engineering (4 units)	Engineering (4 units)
	Humanities (3 units)	Humanities (3 units)
	Elective (4 units)	Elective (3 units)

*Sample Curriculum for Option V: General*

<b>Year</b>	<b>V: General</b>	
	<b>Fall</b>	<b>Spring</b>
<b>FRESHMAN</b>	Math 1A (4 units)	Math 1B (4 units)
	Science (4 units)	Physics 7A (4 units)
	CS 61A (4 units)	CS 61B or 61 BL (4 units)
	Humanities (4 units)	Humanities (4 units)
<b>SOPHOMORE</b>	Math 53 (4 units)	Math 54 (4 units)
	Physics 7B (4 units)	Physics 7C (4 units)
	EE 20N (4 units)	EE 40 (4 units)
	Humanities (4 units)	Humanities (4 units)
<b>JUNIOR</b>	EE 105 (4 units)	EE 126 (4 units)
	EE 120 (4 units)	EE 140 or 141 (4 units)
	CS 61C or CS 61CL (4 units)	CS 150 (5 units)
	Technical Elective (3-4 units)	
<b>SENIOR</b>	EE 117 (4 units)	EE 143 (4 units)
	EE 130 (4 units)	CS 152 (5 units)
	CS 162 (4 units)	Humanities (4 units)
	Humanities (4 units)	

*Sample Curricula for Junior Transfers*

Year	I: Electronics		II: Communications, Networks, and Systems		III: Computer Systems		IV: Computer Science	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
JUNIOR	CS 61A (4 units)	CS 61C or 61CL (4 units)	CS 61A (4 units)	CS 61C or 61CL (4 units)	CS 61A (4 units)	CS 61C or 61CL (4 units)	CS 61A (4 units)	CS 61C or 61CL (4 units)
	EE 40 (4 units)	EE 20N (4 units)	EE 20N (4 units)	EE 126 (3 units)	EE 40 (4 units)	EE 20N (4 units)	EE 20N (4 units)	EE 40 (4 units)
	Stat 25 (3 units)	EE 105 (4 units)	EE 40 (4 units)	EE 120 (4 units)	CS 70 (4 units)	EE 141 (4 units)	CS 70 (4 units)	CS 170 (4 units)
	Humanities (3 units)	Humanities (3 units)	Humanities (3 units)	Math, e.g. 104 (4 units)	Humanities (3 units)	Humanities (3 units)	Humanities (4 units)	Humanities (4 units)
SENIOR	EE 130 (4 units)	EE 117 (4 units)	EE 12x (4 units)	EE 121 (4 units)	CS 150 (5 units)	EE 120 (4 units)	CS 162 (4 units)	CS 150 (5 units)
	EE 120 (4 units)	EE 140/141 (4 units)	EE 117 (4 units)	CS 172/16x (4 units)	CS164 (4 units)	CS 152 (5 units)	CS164 (4 units)	CS169 (4 units)
	CS 150 (5 units)	EE 143 (4 units)	CS 16x (4 units)	Technical Elective (3-4 units)	Technical Elective (3-4 units)	CS 162 (4 units)	Technical Elective (3-4 units)	CS 174 (3 units)
	Technical Elective (3-4 units)	Humanities (4 units)	CS 170 (4 units)	Humanities (3 units)		Humanities (2 units)		Humanities (3 units)

This curriculum assumes that entering junior transfer students have: CS 61B or 61 BL equiv (4), Phys/Life Sci (16), Math (16) (not including Math 55 or Stat 20, English composition (4), humanities (12), engineering electives (4) and other electives (4), for a total of 60 transfer units.

*Sample Curriculum for EECS/MSE Joint Major*

Year	EECS and Material Science Engineering	
	Fall	Spring
FRESHMAN	Math 1A (4 units)	Math 1B (4 units)
	Chemistry 1A or 4A (4 units)	Physics 7A (4 units)
	Engineering 10 (3 units)	Engineering 7 (4 units)
	Electives (3 units)	Electives (4 units)
SOPHOMORE	Math 53 (4 units)	Math 54 (4 units)
	Physics 7B (4 units)	Physics 7C (4 units)
	E 45 (3 units)	EE 40 (4 units)
	CS 61A (4 units)	CS 61B or 61 BL (4 units)
	Humanities Electives (3 units)	
JUNIOR	Physics 137A (4 units)	EE 105 (4 units)
	Engineering 115 or Physics 112 (4 units)	Stat 25, Stat 134, or EE 126 (3-4 units)
	MSE 102 (3 units)	MSE 111 or EE 130 (4 units)
	CS 61C/CL or EE 20N (4 units)	Electives (4 units)
	Humanities Electives (3 units)	
SENIOR	EE 117 (4 units)	Technical Elective (3-4 units)
	Physics 141A (3 units)	MSE 103 (3 units)
	EE 140 or 141 (4 units)	MSE 104 (4 units)
	MSE 130A (3 units)	Electives (6 units)
	Electives (3 units)	

*Sample Curriculum for EECS/NE Joint Major*

Year	EECS and Nuclear Engineering	
	Fall	Spring
<b>FRESHMAN</b>	Math 1A (4 units)	Math 1B (4 units)
	Chemistry 1A (4 units)	CS 61B or 61 BL (4 units)
	Engineering 10 (3 units)	Physics 7A (4 units)
	CS 61A (4 units)	Electives (3 units)
<b>SOPHOMORE</b>	Math 53 (4 units)	Math 54 (4 units)
	Physics 7B (4 units)	Physics 7C (4 units)
	E 45 (3 units)	EE 40 (4 units)
	EE 20N or CS 61Cor 61CL (4 units)	Electives (3 units)
<b>JUNIOR</b>	NE 101 (4 units)	Stat 25/Stat134/EE 126 (3-4 units)
	Engineering 115 (4 units)	NE 150 (3 units)
	Humanities Electives (6 units)	NE 104 (3 units)
	EE 105 (4 units)	Technical Elective (3-4 units)
		Humanities Electives (3 units)
<b>SENIOR</b>	EE 120 (4 units)	NE 170A (3 units)
	EE 117 (4 units)	EE 140 (4 units)
	EE 130 (4 units)	NE Electives (6 units)
	NE Electives (4 units)	Humanities Electives (3 units)

Technical electives must include at least 9 units of upper division nuclear engineering technical courses. See the College of Engineering Announcement for more details.

## Chapter 5: Course and Scheduling Information

### 5.1 Scheduling

Refer to the EE and CS scheduling websites for course descriptions and class scheduling:

Electrical Engineering: <http://www.eecs.berkeley.edu/Scheduling/EE/>.

Computer Sciences: <http://www.eecs.berkeley.edu/Scheduling/CS/>.

### 5.2 Lower-Division Computer Science Courses

Computer science is an important part of the EECS major. For official course descriptions for EE or CS, see General Catalog at <http://catalog.berkeley.edu/>.

CS 47A, 47B, and 47C are self-paced, abbreviated versions of CS 61A, 61B /61 BL, and 61C /61CL respectively. The CS 47 courses are intended for and available only to students who, through courses or work experience, have learned substantially all of the material in a CS 61-series course. Under these circumstances only, students may petition to instead take the corresponding CS 47 series course. Any student seeking this alternative must submit a completed petition for review by the dean no later than the second week of instruction of the semester in which they are taking CS 47A-B-C.

In addition, students in CSE who choose to pursue this option must replace any missing units from the corresponding CS 61 series with an additional upper-division Computer Science course that cannot also count towards the required 20 units of upper-division EECS (ABET requirement). Students in all other Options may satisfy the required 45 units of Engineering with additional letter-graded EE, CS or Engineering technical units. See your Engineering Services (ESS) Adviser in 230 Bechtel Hall to obtain the petition form and additional information to begin the evaluation process.

### 5.3 Lower-Division EECS Courses

**CS 70:** Discrete Mathematics. This course covers discrete mathematics and probability from an EECS perspective. It provides background in various areas of mathematics that are important in the major, including formal logic, proofs, number theory, recurrence relations, combinatorics, probability, and statistics. Each major topic is paired with an application from electrical engineering or computer science, to help solidify your understanding of the mathematical concepts and illustrate how they are used in EECS. CS 70 is required for both EECS majors and L&S CS majors. The prerequisites for CS 70 are Math 1A, Math 1B, and CS 61A, though often instructors will allow you to take CS 61A and CS 70 concurrently. While CS 70 is currently officially listed under a CS course number for historical reasons, it focuses on all of EECS and contains background that will be relevant throughout your upper-division coursework.



## 5.4 Other Courses of Interest to New Students

**EE 24:** Freshman Seminar. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments, and topics may vary from semester to semester.

**EE 43:** Introductory Electronics Lab. Do you want to become familiar with the operation of electronic test equipment such as oscilloscopes, power supplies, and spectrum analyzers? For those students who do not complete EE 40 at Berkeley, the department offers an introductory lower-division electronics laboratory course, EE 43. You will find the course useful if you have not had much laboratory experience; it allows you to become more adept in the use of the equipment before taking your upper-division laboratories. The course is worth one unit of credit and is graded on a P/NP basis. You cannot use it to satisfy the B.S. graduation requirement of 45 units in the College of Engineering.

## 5.5 Advice for Junior Transfer Students

If you are a junior transfer and have not completed the EE 40 requirement, we strongly recommend that you do so during your first semester. It is also a good idea to enroll in a most one junior-level core course (EE 105, EE 120, CS 150) during your first semester. An introductory electronics course covering only passive circuits does not fulfill the EE 40 requirement.

You must complete any outstanding lower division technical courses (i.e., EE 20N, EE 40, CS 61A, CS 61B or 61 BL, CS 61C or 61CL and CS 70 before the start of your 3rd semester at Berkeley.

Junior level courses are challenging and make heavy use of concepts from lower-division mathematics (Math 1A, 1B, 53, 54), physics (primarily 7B), and introductory electrical engineering prerequisites (EE 40). Plan on spending extra time early in the semester to review the prerequisites and fill in any gaps in your lower-division background.

If you do not follow this advice, and especially if you need to take one or more of the CS 61 series of lower-division computer science courses, you may delay your progress toward completion of your degree. The College of Engineering recognizes the curricular challenges faced by junior transfer students. If you have been making normal progress each year (defined as 30 units in courses required for the major) and need an extra semester to graduate, you must petition in advance to do so. The extra semester is not guaranteed.

The EECS Course List at <http://www.eecs.berkeley.edu/Courses/> lists prerequisites. Notwithstanding these official course prerequisites, you may always take a course with the explicit permission of the instructor in a given term. We generally suggest that you do not skip prerequisites, since they are there for a reason.

## Chapter 6: Advising and Support

### 6.1 Orientation

CalSO (Cal Student Orientation) programs, administered by the [Office of New Student Services](#) helps incoming freshmen (and their parents) and transfer students make a smooth transition to campus life. The CalSO counselors are a diverse group of 40 undergraduates who have spent over five months in training, learning about university academic and support services. During the summer, CalSO puts together an orientation program for students and parents. New students receive academic counseling and are able to register for classes through Tele-BEARS, an interactive computer system that allows you to enroll in courses through the [Tele-BEARS website](#)<sup>6</sup>. Students who miss CalSO will receive lowest priority for enrolling in courses. We strongly recommend that you attend (financial assistance for doing so is available). For more comprehensive information, visit CalSO on the web. A brochure on CalSO is available from their office, 2610 Channing Way, Berkeley, CA, 94720-2272; 510-642-4970.

### 6.2 Academic Advising

Your EECS Faculty Adviser, assigned by the EECS Center for Student Affairs in 205 Cory Hall **will meet with you to discuss your schedule and academic progress twice a year (April and October), prior to course registration. You will need to meet with your Adviser in order to receive your Advising Code, which you will use to enroll in classes via Tele-BEARS.** Faculty Advisers keep regular weekly office hours throughout the school year for the purpose of giving advice on academic problems, career objectives, long-term program planning, etc. Faculty Advisers are assigned by Option. You will be reminded of your Faculty Adviser's contact information by email in April and in October. If you do not know who your Faculty Adviser is or if you have any other questions, you may check the Faculty Adviser binder in 230 Bechtel or come to the EECS Center for Student Affairs in 205 Cory Hall. For additional information visit the EECS Undergraduate Advising webpage at <http://www.eecs.berkeley.edu/Programs/facadvising.html>.

Your Engineering Student Services (ESS) Adviser in the College of Engineering (230 Bechtel Hall) provides administrative assistance and advice on college policy, and monitors your progress from admission through graduation. They will assist you in planning your lower-division program, explain graduation requirements, interpret college policy and regulations, explain petitions, and make referrals to other units on campus. Return all petitions turned into The Center for Student Affairs Office in 205 Cory for approval to 230 Bechtel

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<sup>6</sup> <https://telebears.berkeley.edu/telebears/home>

Engineering Student Services (ESS) Advisers and staff are available for drop-in counseling. Refer to the online advising schedule at:  
<http://coe.berkeley.edu/students/current-undergraduates/advising>.

The Center for Student Affairs<sup>7</sup> is located in 205 Cory Hall. The EECS Center for Student Affairs (CSA) was established in 1998 and consolidates, in a single office, both academic and referral services for all EECS undergraduates. All of the programs sponsored by CSA are designed to foster academic success and retention of undergraduates. Coordination of faculty advising, academic support workshops, freshman and transfer student recruitment, and advising for graduate school illustrate key themes in our services. The Center develops and provides information and orientations for prospective and current Berkeley EECS freshman and transfer students. To increase retention and academic success, the Center sponsors workshops and mentoring programs for students in EECS. Promoting undergraduate research is a strong focus of such programs. In collaboration with alumni and our industrial partners, the Center presents programs to educate students about the transition to industry and to expose undergraduates to a wide variety of professionals working in academia as well as industry. Finally, CSA staff engages in a spectrum of activities to promote community among undergraduate students, and to foster an orientation to community service. More information is available on the [Center's homepage](#). If you are not sure who to contact or where to go please drop by The Center for Student Affairs office in 205 Cory Hall.

Undergraduate peer advisers who are members of [Eta Kappa Nu \(HKN\)](#)<sup>8</sup> and the Institute of Electrical and Electronics Engineers (IEEE) Student Branch organize group advising meetings during the Tele-BEARS advising period each semester (October & April). Peer advisers provide information from a student's perspective on specific courses, faculty, and the department. More information can be found at <http://www.eecs.berkeley.edu/Programs/facadvising.html>.

Among the many informal sources of information and advice, the [EECS Student Course Survey](#)<sup>9</sup> prepared by Eta Kappa Nu is particularly helpful. It provides student evaluations of every instructor, teaching assistant, and course each semester. You can read the evaluations online by consulting their website.

The College of Letters and Science (L&S)<sup>10</sup> also provides Advisers for L&S undergraduates. There are two types of L&S Advisers. First, L&S College Advisers (113 Campbell Hall, 510-642-1483) will advise you on satisfaction of breadth requirements and will help you to find a major. Second, the Computer Science Adviser will advise on declaring the major and can help with technical program planning. The Adviser can be found in 377 Soda Hall, 510-642-7214. In addition to these L&S Advisers, the Computer Science Division also provides Faculty Advisers for L&S

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<sup>7</sup> <http://www.eecs.berkeley.edu/Students/csa.shtml>

<sup>8</sup> <http://hkn.berkeley.edu/>

<sup>9</sup> <http://hkn.eecs.berkeley.edu/student/CourseSurvey/>

<sup>10</sup> <http://ls.berkeley.edu/>

majors. Contact the Computer Science Advising Office for details or refer to their website.

### 6.3 Incompletes

The grade "I" (Incomplete) may be assigned if your work in a course has been of passing quality but is incomplete for reasons beyond your control. Prior arrangements must be made with the instructor, because in assigning the "I" grade the instructor is required to specify the reasons to the department chair. For undergraduate students, an Incomplete grade received in the Fall semester must be replaced by the first day of instruction in the following Fall semester. An Incomplete grade received in the Spring semester or Summer Session must be replaced by the first day of instruction in the following Spring semester. When you complete the required work or deferred examination, grade points will be assigned if you receive a grade of A, B, C, or D. If you repeat the course, grade points will then be assigned to the earned grade if the dean has given prior written approval to repeat it. If you repeat the course without the approval of the dean, the "I" grade will be converted to an F.

### 6.4 Changing Your Option or Adviser

When you are admitted, CSA will assign you a Faculty Adviser who specializes in an area related to one of the sample programs within EECS. Indicate your program on your Academic Plan form at [CalSO](#)<sup>11</sup>. If you decide later to change your program, contact the Student Affairs Adviser in 205 Cory or email [change-adviser@eecs.berkeley.edu](mailto:change-adviser@eecs.berkeley.edu) for more details. The College processes changes of option bi-annually, in December and May. If you change options, please inform the CSA advisers in 205 Cory about such a change in order to be assigned a new Faculty Adviser that specializes in your chosen area.

### 6.5 Tutoring

Tutoring is available free of charge from a number of sources. It is important to seek academic assistance early if you feel that you need it. You should start by consulting the professor and the Graduate Student Instructor (Teaching Assistant) in your course during office hours. Some other resources include:

- **[Eta Kappa Nu \(HKN\)](#)**<sup>12</sup> student members of the EECS undergraduate honor society have organized a voluntary tutoring service for both lower and upper division EECS courses. The schedule for this service is posted outside of the HKN offices (290 Cory Hall and 345 Soda Hall) and is available on their webpage. An HKN officer is designated each semester to coordinate a schedule

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<sup>11</sup> <http://services.housing.berkeley.edu/NSS/>

<sup>12</sup> <http://hkn.eecs.berkeley.edu/student/tutoring.shtml>

and to respond to individual requests. If you have any questions you may send email to: [tutors@hkn.berkeley.edu](mailto:tutors@hkn.berkeley.edu).

- **The Student Learning Center**<sup>13</sup> (198 Cesar E. Chavez Student Center, 510-642-7332) offers individual and group tutorial sessions and workshops for a number of lower-division courses, including languages, pre-calculus, statistics, chemistry, biology, physics, social sciences, and writing. Check in at the SLC for their schedule or refer to their webpage.
- **Upsilon Pi Epsilon (UPE)**<sup>14</sup>, an honor society for Computer Science majors in the College of Letters and Science, provides tutoring for computer science courses. Their office is in 346 Soda, and you may reach them by telephone (510-642-9997), electronic mail ([officers@upe.cs.berkeley.edu](mailto:officers@upe.cs.berkeley.edu)), or visit their webpage.
- **Residence Halls Academic Centers**.<sup>15</sup> Experienced graduate and undergraduate tutors hold drop-in hours and offer general study tips and assistance on assignments, essays, and problem sets in your unit. Please check for the office hours in your unit's academic center.
- **MEP Academic Center** located in 225B Bechetal is used for workshops, tutoring, advising and meetings. MEP and campus partners offer workshops in calculus, chemistry, physics, and other engineering courses. The MEP Director works closely with industry sponsors to develop and implement meaningful internship experiences. MEP informs students about and assists them with pursuing scholarships and aid opportunities, including private, foundation, industry-sponsored, state and federally-funded financial aid.

## 6.6 Personal Advising and Counseling

**Counseling and Psychological Services**<sup>16</sup> (Tang Center, 2222 Bancroft Way, Room 3300) provides career, academic, and personal counseling through individual and group sessions, couples counseling, testing services, and occupational information. Counselors are a multicultural group of social workers, psychologists, and psychiatrists. Any Berkeley student can come in to talk about deciding on a major, pinpointing interests and abilities, clarifying career goals, coping with personal crisis, dealing with concerns about family or other relationships, feelings of anxiety or loneliness, stress, or any of the many issues we all encounter. Talking with a counselor in a confidential, nonjudgmental atmosphere can aid in self-understanding and in solution of personal issues. If you know of students who need help, please refer them to the professional advisers at campus counseling services. Please refer to the website for additional information: <http://www.uhs.berkeley.edu/>.

Student Life Advising Services (140 Cesar E. Chavez Student Center, 510-642-7224) is a counseling and advising program that provides academic, personal, financial, and career

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<sup>13</sup> <http://slc.berkeley.edu/general/index.htm>

<sup>14</sup> <http://upe.berkeley.edu/>

<sup>15</sup> <http://www.reshall.berkeley.edu/academics/>

<sup>16</sup> <http://uhs.berkeley.edu/students/appointments/Counseling.shtml>

guidance to all undergraduate students, with an emphasis on underrepresented ethnic minority students. Please refer to their website for more information:  
<http://slas.berkeley.edu/>.

## 6.7 Career Advising

The UC Berkeley Career Center (2111 Bancroft Way, 510-642-1716) provides a wide range of advice and assistance in the areas of careers, internships, student jobs, and professional/graduate schools. A Career Counselor for EECS students is available for individual and drop-in appointments. Refer to website for hours of operation at <http://career.berkeley.edu/>. A few of the services include:

- [CalJobs](#)<sup>17</sup>: Online job listings (full-time, part-time, summer, and internships on and off campus) exclusively for UC Berkeley students and alumni.
- On-Campus Recruiting: Employers visit campus to interview students for summer internships and full-time opportunities.
- [CareerMail](#)<sup>18</sup>: Email notices about activities according to your areas of interest.
- [Special Events](#)<sup>19</sup>: Includes Career and Graduate School Fairs
- [Cal Profiles](#)<sup>20</sup>: Statistics and other information on the careers chosen by graduates in each major
- [Callisto](#)<sup>21</sup>. Your gateway to Career Center online resources and important updates! Callisto includes access to job, internship & OCR listings, sign-ups for Career Center programs, workshops and employer information sessions, career fairs, and additional career development and employment resources.

Moreover, as an expert in your field, your Faculty Adviser is in an excellent position to provide you with career advice. You do not need to wait until your Tele-BEARS enrollment period to contact your Faculty Adviser, but you may meet with them at any time during the course of the year. Typically the best way to contact your Faculty Adviser is by attending their scheduled office hours. Office hours for faculty are posted on the [EECS website](#)<sup>22</sup>.

## 6.8 Other Advising Services

There are many other sources of formal and informal academic and personal advice for students, including the following:

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<sup>17</sup> <http://career.berkeley.edu/Callisto/CalJobs.stm>

<sup>18</sup> <http://career.berkeley.edu/MailList/MailList.asp>

<sup>19</sup> <http://career.berkeley.edu/Calendar/Events.stm>

<sup>20</sup> <https://secure.vcbf.berkeley.edu/calprofiles/login.aspx>

<sup>21</sup> <http://career.berkeley.edu/Callisto/Callisto.stm>

<sup>22</sup> <http://www.eecs.berkeley.edu/Faculty/Lists/list.shtml>

- [Berkeley International Office](#)<sup>23</sup> (International House, 2299 Piedmont Ave., 510-642-2818) offers a variety of services on immigration, financial aid, work permission, advising, and special programs for Berkeley international students and scholars.
- [Disabled Students' Program](#)<sup>24</sup> (DSP) (260 César E. Chávez Student Center, 510-642-6376) is committed to ensuring that all students with disabilities have equal access to educational opportunities at UC Berkeley. We offer a wide range of services for students with disabilities. These services are individually designed, and based on the specific needs of each student as identified by our Disability Specialists.
- [Gender and Equity Resource Center](#)<sup>25</sup> (GenEq) (202 Cesar E. Chavez Student Center, 510-643-5730) is committed to providing programs, services and resource information about gender, sexual orientation, sex and gender identity, sexual & relationship violence and bias-related incidents. GenEq is a space for those interested in forming a community that welcomes difference, and for those interested in exploring issues of social justice.
- [Student Legal Clinic](#)<sup>26</sup> (300A Eshleman Hall, 510-642-9986), drop in hours Monday through Thursday 10:00-4:00pm, Friday 10:00-2:00pm. Undergraduate or graduate students work as interns by listening to clients' problems, researching their legal issues, informing clients of their options, and, if necessary, making agency or attorney referrals. They provide guidance in all areas of law, but the most popular cases involve small claims court, traffic/parking violations, and divorce and bankruptcy issues. During the Spring semester they also provide free income tax assistance.
- [Transfer Re-entry & Student Parent Center](#)<sup>27</sup> (100 Cesar Chavez Student Center, 510-642-4257, [trsp@berkeley.edu](mailto:trsp@berkeley.edu)) serves students who have had a break in their higher education and return to college to complete personal, academic, and career goals. The Re-entry Center provides orientations, special courses, tutoring, workshops and publications for current students. The center is also the hub of services for veterans, former foster youth, and otherwise independent students and provides orientations, academic courses, workshops, and mentoring programs for current and prospective students.

Student Parents have several resources available here on campus:

- [Childcare Services](#)<sup>28</sup> (510-642-1827).
- [The UCB-Parents Network](#)<sup>29</sup> has a parent-run website that contains information for parents who work, teach, or go to school on the UCB campus. You can also

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<sup>23</sup> <http://internationaloffice.berkeley.edu/>

<sup>24</sup> <http://dsp.berkeley.edu/>

<sup>25</sup> <http://students.berkeley.edu/osl/geneq.asp>

<sup>26</sup> <http://students.berkeley.edu/osl/studentgroups/public/index.asp?todo=getgroupinfo&SGID=12076>

<sup>27</sup> <http://trsp.berkeley.edu/>

<sup>28</sup> <http://berkeley.edu/work/child.shtml>



- request to be added to their electronic mailing list, either by visiting their website, or sending email to [ucb-parents@berkeley.edu](mailto:ucb-parents@berkeley.edu).
- The [Student Parent Project](#)<sup>30</sup>, initiated by the Women's Resource Center, provides a drop-in resource room (252 Cesar E. Chavez Student Center, 510-643-5729) for nursing, napping, and diaper changing. You may get assistance in setting up childcare swaps and parent support groups, and there is a parent locator service that enables your child's care provider or school to reach you on campus in an emergency. Those who do not have a beeper can borrow one from the center.
  - [Cal Parents](#)<sup>31</sup> (510-642-7147, [calparents@berkeley.edu](mailto:calparents@berkeley.edu)) is an array of services, information, events, and person-to-person help for parents of UC Berkeley students. With a parent advisory board and a dedicated campus staff, Cal Parents is your gateway to navigating the Berkeley campus.
  - If your parenting duties are causing difficulties and you would like to request a reduced course load, contact your Adviser in 230 Bechtel.

## 6.9 Financial Support Advising and Emergency Loans

The [Financial Aid Office](#)<sup>32</sup> located at 120 Sproul Hall offers various types of financial awards for undergraduates. The offered financial aid is either need based or non-need based. Non-need-based financial aid is made up of unsubsidized loans. Need-based financial aid includes subsidized loans, grants, scholarships, and federal work-study.

Interest-free Emergency Loans are available to all registered students. The maximum loan amount is \$775 per semester, due and payable within 60 days. For more details please see <http://students.berkeley.edu/finaid/undergraduates/eloans.htm>.

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<sup>29</sup> <http://parents.berkeley.edu/>

<sup>30</sup> <http://grad.berkeley.edu/publications/thegraduate/Spring97/S97PAREN.htm>

<sup>31</sup> <http://calparents.berkeley.edu/index.html>

<sup>32</sup> <http://students.berkeley.edu/finaid/>

## Chapter 7: Administrative Matters

### 7.1 Registration and Enrollment

The [Tele-BEARS](#)<sup>33</sup> system handles course enrollment. Twice a year (in April for Fall semester and October for Spring semester), you will receive an email from the department reminding you of your Faculty Adviser's contact information, when your Faculty Adviser will hold his/her advising sessions, and how to obtain your advising code. After you plan out your schedule, you are required to meet with your Faculty Adviser prior to registration for approval of your course schedule. Your Faculty Adviser will give you your advising code and you may complete the registration. You must obtain an Adviser Code each semester to register for classes. For detailed Faculty Advising information visit the website at: <http://www.eecs.berkeley.edu/Programs/facadinstr.htm>

Refer to the [Schedule of Classes](#)<sup>34</sup> for further information on Tele-BEARS enrollment periods.

*Note: To receive registration information from your department, it is important that your email address is current on [BearFacts](#).*

### 7.2 Computer Accounts

If you are an undergraduate EECS major or an L&S CS major, you can obtain a long-term "named" computer account on the EECS Instructional computers. This account will remain active as long as you are in the department. It will not expire or be turned off at the end of each semester.

These accounts have been access to Instructional computers running Unix and Windows, workstations in Soda and Cory Hall labs and multi-user servers such as `cory.eecs` and `icomp1.eecs`. To obtain or renew a named account, go to 199 Cory or 273 Soda and look for the signs that tell you how to login as "newacct", or following the instructions at <http://inst.eecs.berkeley.edu/~inst/newusers.html>

Some classes will also receive separate "class" accounts, which are created at the request of faculty and distributed via account forms to students in class (you will not have to request them). Class accounts expire at the end of the semester.

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<sup>33</sup> <https://telebears.berkeley.edu/telebears/home>

<sup>34</sup> <http://schedule.berkeley.edu/>

Current information about EECS Instructional facilities is posted on the blue bulletin boards near 105 Cory and 271 Soda. Information is also available online at <http://inst.eecs.berkeley.edu>.

CalMail email accounts are available free of charge to all UCB students and are accessed via a WEB browser. To set up a CalMail account, login using your CalNet ID password at <http://calmail.berkeley.edu>.

**Regardless of the email account you prefer to use, you should keep your email address up to date on [BearFacts](#)<sup>35</sup>. The department will use your BearFacts email to communicate important information (such as your Tele-BEARS schedule) to you.**

### 7.3 Schedule Adjustments

To adjust your schedule after enrolling, consult the [Schedule of Classes](#)<sup>36</sup> and see your Adviser in 230 Bechtel. Detailed instructions on all aspects of the [Tele-BEARS](#) system as well as course control numbers can be found on this website.

If you wish to add or drop a class that will not conflict with the 12-unit, 2 technical courses (math/science/engineering) policy, you only need your Adviser's signature on the [Add/Drop Form](#)<sup>37</sup> (not your Faculty Adviser's) through the 5th week of instruction, except that courses on the early drop list must be dropped by the end of the second week of classes. There is a fee for adding a course after the 3rd week of classes and for dropping a course after the second week of classes. In addition, the Dean must approve requests to add courses or to drop courses beyond the deadlines. The Associate Dean will approve drops after the deadline only if you meet one of the following criteria and provide documentation.

- Serious illness, accident or legal problem affecting the student.
- Illness of a close family member (parent, sibling, child, spouse, partner, but only when this requires a student to be absent for a long time to care for the sick relative).
- An involuntary increase in working hours: in this case, you must provide work verification forms and document of financial need for employment.
- A decision to leave the College of Engineering.

Your Adviser will review the petition before it goes to the Associate Dean for approval.

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<sup>35</sup> <http://bearfacts.berkeley.edu/>

<sup>36</sup> <http://schedule.berkeley.edu/>

<sup>37</sup> <http://www.coe.berkeley.edu/students/current-undergraduates/forms-petitions/add-drop.pdf>

<http://coe.berkeley.edu/students/current-undergraduates/forms-petitions/add.drop%20form%204.10%20pdf.pdf>

## 7.4 Transferring to EECS

There are three ways to transfer into EECS: from within the College of Engineering; from another college within UC Berkeley; or from another university. Admission to EECS is competitive, including admission from other colleges within Berkeley. An outstanding GPA and full lower-division preparation are decidedly helpful.

**From Within the College of Engineering:** To transfer into EECS from within the College of Engineering you will need to file a [Change of Major Petition](#)<sup>38</sup> and supplementary forms with the Engineering Student Services (230 Bechtel). The petition will be reviewed by a representative from the EECS department. If you are not currently enrolled, in which case you will also need to file an [Application for Readmission](#)<sup>39</sup>. Usually, you submit this application at the end of your sophomore year. The ESS Office advisers (230 Bechtel) will advise you of the outcome of your petition in mid-April, but for final acceptance, you must also satisfactorily complete the term in progress. Contact your Adviser in 230 Bechtel Hall for more information.

**Students in the Engineering-Undeclared Program:** If you have completed their Engineering-Undeclared curriculum with a minimum of a 2.0 overall GPA you may submit a [Change of Major Petition](#)<sup>40</sup> to the ESS Office (230 Bechtel) for admission to EECS.

**From Another College on the Berkeley Campus:** To transfer into EECS from another college (such as Letters and Science), you will need to file a [Change of College Petition](#)<sup>41</sup> and a supplementary application with the Engineering Student Services Office (230 Bechtel) by February 15 of the preceding academic year. The same deadline applies if you are not currently enrolled, in which case you will also need to file an [Application for Readmission](#)<sup>42</sup> by the same date.

The petition and application will be reviewed by a representative from the EECS department. Usually, you submit this application at the end of your sophomore year. The Engineering Student Services Office (230 Bechtel) will communicate the outcome of your petition in mid-April, but for final acceptance, you must also satisfactorily complete the term. Check the College of Engineering Prospective Student website at <http://coe.berkeley.edu/students/prospective-students> for more information. Junior transfers and those students admitted as change of college students are not permitted to change their majors.

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<sup>38</sup> <http://www.coe.berkeley.edu/students/current-undergraduates/forms-petitions>

<sup>39</sup> <http://students.berkeley.edu/admissions/index.asp?id=72&navid=N>

<sup>40</sup> <http://registrar.berkeley.edu/elecforms/col.maj.ug.pdf>

<sup>41</sup> <http://registrar.berkeley.edu/elecforms/col.maj.ug.pdf>

<sup>42</sup> <http://students.berkeley.edu/admissions/index.asp?id=72&navid=N>

**From Another University or Community College.** The University considers you a transfer applicant if you graduated from high school and enrolled in a regular session at another college or university. Students may not disregard their college record and apply as a freshman. Prospective students will find further information on the EECS Prospective Transfer website.

In admitting transfer applicants, the department considers college grades, the extent to which the departmental lower-division prerequisites have been completed, and the personal statement. Students must have earned 60 semester units by the end of the Spring term prior to Fall enrollment. All applicants should have completed 100% of the required lower-division admission requirements for the major prior to the semester in which they wish to enter UC Berkeley.

These requirements are available by visiting the [ASSIST](#)<sup>43</sup> website, selecting your community college, the University of California, Berkeley, and Electrical Engineering and Computer Sciences from the 'By Major' menu. Every California community college has an agreement with UC Berkeley, called a transferable course agreement (TCA), that specifies which of its courses receive UC transfer credit. Not all transferrable courses may be deemed equivalent to satisfy requirements. TCAs are available from your community college counseling office or transfer center. Comprehensive articulation information, including TCAs for all California community colleges, is available. Preference is given to California community college transfers over applicants from state universities and other four-year schools.

**Transfer Applicants** must complete the University of California admission application by November 30th for admission for the following Fall semester. Berkeley does not accept new transfer applications for the Spring semester. To transfer into EECS from another university, visit the [Office of Undergraduate Admission](#)<sup>44</sup> website. Additional information can be found on the [College of Engineering Prospective Students](#)<sup>45</sup> and the [EECS Prospective Transfer](#)<sup>46</sup> pages.

## 7.5 Petitions

A petition submitted to the College of Engineering is the standard device for doing anything out of the ordinary. The most common sorts of petitions are to add or drop courses or to change the grading option for a course (from letter grade to Passed/No Passed or vice versa). You may also petition to substitute requirements in the EECS major. Some petitions require the approval of the Undergraduate Dean, and the Vice Chairman for Undergraduate Affairs. You can obtain petition forms and an explanation of the petition process in 230 Bechtel. If you have a problem regarding a petition, or in

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<sup>43</sup> <http://www.assist.org/web-assist/welcome.html>

<sup>44</sup> <http://students.berkeley.edu/admissions/index.asp?id=72&navid=N>

<sup>45</sup> <http://www.coe.berkeley.edu/students/prospective-students>

<sup>46</sup> <http://students.berkeley.edu/admissions/transfer.asp>

deciding if a petition is necessary, see your Adviser in 230 Bechtel first. Two common places to find forms are

- <http://coe.berkeley.edu/students/current-undergraduates/forms-petitions>
- <http://registrar.berkeley.edu/GeneralInfo/elecforms.html>

## 7.6 Incompletes

If circumstances arise that do not allow you to complete your work for the semester, incompletes can be given if work is of passing quality up to that point. Please refer back to earlier sections for more information.

## 7.7 Withdrawal

If circumstances arise that require you to withdraw for the semester, you must submit a formal [Petition for Withdrawal](#).<sup>47</sup> To withdraw for reasons of health, you will need to contact your Adviser in 230 Bechtel and receive an endorsement by the Director of Health Services, following review by the medical staff or your private physician. You must also meet with the Engineering Associate Dean regarding readmission conditions, should you choose to be readmitted at a future date.

## 7.8 Courses Taken Outside of UC Berkeley

A student may not enroll at another school simultaneously while at the University. In extenuating circumstances, an exception may be granted by the Dean and the Director of Undergraduate Admissions. A regularly enrolled student who wishes to take work to another school in the summer or in a given semester when not enrolled in the College should consult their Adviser and with the Office of Admissions before registering for courses at another school.

**Correspondence and Extension Courses:** A limited number of engineering courses are available through correspondence study and extension classes. In general, the policy of the College of Engineering is that required courses must be taken in residence. In extenuating cases, the Dean will give consideration to requests of students to complete a required course through correspondence or extension. Correspondence and extension courses may not be taken concurrently with regular class work. Units earned in [UC Extension](#)<sup>48</sup> (XB courses) will be counted toward a student's UC Berkeley Engineering degree only in the following circumstances:

- Spring-deferred students who need to meet admission conditions.

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<sup>47</sup> <http://www.coe.berkeley.edu/students/current-undergraduates/forms-petitions/WithdrawalForm2.07.pdf>

<sup>48</sup> <http://www.unex.berkeley.edu/>

- Dismissed students who have developed a written and approved academic plan with the Associate Dean as a condition for being re-admitted. Upon approval for readmission, units and grade points for courses taken will be added to UC Berkeley transcript.
- Students who, after 120 units and with approval of the Associate Dean, need to complete academic requirements for graduation. Units and grade points will be added to UC Berkeley transcript.

## **7.9 Commencement**

The College of Engineering Commencement<sup>49</sup> honors the class of undergraduate and graduate degree recipients with the ceremonial awarding of degrees at the Greek Theater, followed by a department reception. Graduates from Summer, Fall and Spring semesters are invited to participate in the ceremony, which takes place at the end of each academic year. Fall term graduates are also honored at a December reception sponsored by the Engineering Alumni Association. Students are not permitted to "walk" in commencement ceremonies prior to the calendar year in which they are graduated.

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<sup>49</sup> <http://www.coe.berkeley.edu/events/college-of-engineering-commencement-ceremony.ics>

## Chapter 8: Student Programs and Academic Opportunities

### 8.1 Becoming a Reader

The Department appoints readers each semester to check and correct students' course work, other than examinations. To become a Reader, you must have received at least a B in the course for which you are to read and have an overall GPA of 3.0 or better. The salary for undergraduate and graduates Readers for the 2010-2011 academic year will be \$12.18 per hour. You may read for more than one course or section, up to a maximum total of 20 hours per week during the academic year and up to 40 hours per week during summer session. The number of Reader hours per week for a given course depends on the number of students enrolled in the course.

**To become a Reader:** Complete the online [Reader Application](#)<sup>50</sup> and submit it electronically. These forms, along with further information, are available from the department's [GSI webpage](#)<sup>51</sup>. If you are selected for a Reader job, you will be notified via email. Once you are selected as a reader, go to the HR/Payroll Office, 339 Soda Hall, to sign employment forms and obtain time sheet information. The HR/Payroll office will calculate the Reader allocation for each course, based on the 5th week enrollment figures. You will not be paid for any hours beyond the total allocation without prior approval. Address course hours and employment questions to the [HR/Payroll Office](#)<sup>52</sup>.

### 8.2 Graduate Student Instructor (GSI) Positions

Occasionally, outstanding undergraduates are selected to serve as Graduate Student Instructors (GSI's). If you are interested in applying for a GSI position, you may submit an application during the GSI application period (April for Fall semester, November for Spring semester). Applicants for undergraduate GSI positions must have previously taken the course or its equivalent and received a grade of A- or better, and have an overall GPA of 3.1 or higher.

GSI positions are scarce, and undergraduates are rarely appointed to these positions. Exceptions have been made for students who have performed extremely well in a class, and have been recommended by the professor in charge of the class. Applications for EE and CS courses may only be submitted electronically at <https://buffy.eecs.berkeley.edu/PHP/gsiapp/menu.php>. For the 2009-2010 academic year, the typical monthly GSI salary was \$1639.10 for a 50% position, and \$819.55 for a 25% position.

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<sup>50</sup> <https://buffy.eecs.berkeley.edu/PHP/readerapp/menu.php>

<sup>51</sup> [http://www.eecs.berkeley.edu/Scheduling/EE/ta\\_applications.shtml](http://www.eecs.berkeley.edu/Scheduling/EE/ta_applications.shtml)

<sup>52</sup> <http://www.eecs.berkeley.edu/Benefits/>



### 8.3 Student Organizations

Involvement in student organizations is one of the best ways to gain leadership experience, to participate in volunteer and social service opportunities, and just to have fun. These organizations can have a very positive impact on your Cal experience. Below is a list of student organizations you might want to consider joining. You can also visit the [EECS Student Organizations Website](#).<sup>53</sup>

[Association of Women in CS and EE \(AWE\)](#)<sup>54</sup> (292 Cory Hall, 510- 642-6735) is dedicated to recruiting women undergraduates in CS and EE, facilitating academic and social support, and fostering the academic and professional careers of women in EECS. AWE gives a "voice" to women in CS and EE, as well as a friendly atmosphere in which they can learn leadership skills and build community. Weekly "Breaktimes" with distinguished speakers, such as Professor Barbara Grosz, and industry alumni workshops, are among their regular activities. All undergraduate EE and CS women are included.

Black Engineering and Science Students Association (BESSA) (101 Naval Architecture Building, 510-642-1326, [bessa\\_ucb@hotmail.com](mailto:bessa_ucb@hotmail.com)) is the UC Berkeley Chapter of the National Society of Black Engineers (NSBE), and represents African American students in the College of Engineering. If you are interested in joining this group, call the BESSA office or stop by their office.

[Computer Science Undergraduate Association \(CSUA\)](#)<sup>55</sup> (337 Soda Hall, 510-642-7453, [politburo@csua.berkeley.edu](mailto:politburo@csua.berkeley.edu)) represents students in the Computer Science Division of the EECS Department. The CSUA nominates student members to Department committees and provides a common voice for undergraduates in Department affairs. The CSUA also provides a consulting service for students, a library with current textbooks and magazines, and computer accounts on undergraduate machines. The Association is an opportunity for students to become involved in managing machines, running the organization, and taking part in efforts to improve the undergraduates' education in the CS Division. If you are interested in joining, send email or stop by their office. There are general meetings each semester and everyone is invited to attend.

Eta Kappa Nu (HKN) is the EECS honor society. The Berkeley chapter is among the most active engineering societies at Cal, providing many academic services to fellow undergraduates. HKN offers free drop-in tutoring for EE and CS courses on weekdays between 11am and 5pm in 290 Cory Hall and 345 Soda Hall. In addition, past EE and CS exams as well as course and professor ratings are available on the HKN website: <http://hkn.eecs.berkeley.edu><sup>56</sup>. HKN also hosts career fairs, info sessions, review sessions, and other events for the EECS community.

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<sup>53</sup> <http://www.eecs.berkeley.edu/Students/organizations.shtml#csua>

<sup>54</sup> <http://www-inst.eecs.berkeley.edu/~auwicsee/>

<sup>55</sup> <http://www.eecs.berkeley.edu/Students/organizations.shtml#csua>

<sup>56</sup> <http://hkn.eecs.berkeley.edu/>

Membership in Eta Kappa Nu is extended to the top fourth of the junior class and the top third of the senior class in EECS. Interested undergraduates should watch for the list of eligible names, which is posted around Cory Hall at the beginning of each semester. For more information please visit the HKN website and please email any questions to [hkn@hkn.eecs.berkeley.edu](mailto:hkn@hkn.eecs.berkeley.edu).

**Hispanic Engineering Society (HES)**<sup>57</sup> (104 Naval Architecture Building [hes@eecs.berkeley.edu](mailto:hes@eecs.berkeley.edu)) is a UC Berkeley student group composed of Latino engineering and science majors. The organization's goals are to provide support and networks for students as well as to build relationships between corporations and students. HES also has a high emphasis on reaching out to the community to encourage children of all ages to attend a university. HES is open to all students. If you are interested in finding out more about HES, send us an email.

**Society of Women Engineers (SWE)**<sup>58</sup> (131 Hesse Hall, [swe.berkeley@gmail.com](mailto:swe.berkeley@gmail.com)) is the campus chapter of the national organization. Recognized for the overall quality of their innovative programs, UCB's chapter has earned awards on both the regional and national levels.

Each Fall, SWE hosts the popular Evening with Industry event, during which students and representatives from over 30 companies interact in a relaxed and personal atmosphere. Company tours in the Fall and the "Shadow an Engineer" program during spring break allow students to experience the daily routine of a "real" engineer outside the pressure-filled environment of an interview. SWE also hosts workshops such as Resume Review and Business Etiquette and has an extensive outreach program designed to spark an interest in engineering and science-related careers among students from elementary school to junior college. Members also enjoy a variety of social activities with other engineering societies. If you would like to find out more about SWE, attend the first general meeting during the second week of school, or stop by the SWE office. You can reach SWE by phone or email. SWE encourages all engineering students, both men and women, to join.

**Tau Beta Pi (TBP)** (220 Bechtel Engineering Center, (510) 642-4014, [tbp@tbp.berkeley.edu](mailto:tbp@tbp.berkeley.edu))<sup>59</sup> is the national engineering honor society. As an extremely active student group on campus, TBP works to serve both its members and the engineering community in general. They offer a wide range of student services including course advising, professional development workshops, company info sessions, and a student-led course for new students called E98: Surviving Berkeley Engineering. TBP also values service to the surrounding community and helps plan and run events such as Engineering for Kids Day and P.I.E. (Pioneers in Engineering). To check out some of TBP's valuable resources and learn more, visit their webpage at [tbp.berkeley.edu](http://tbp.berkeley.edu).

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<sup>57</sup> <http://www.berkeleyhes.org/>

<sup>58</sup> <http://www.ocf.berkeley.edu/~swe/>

<sup>59</sup> <http://tbp.berkeley.edu/>

[Institute of Electrical and Electronics Engineers](#)<sup>60</sup> (IEEE Student Branch, formerly UCSEE) (246 Cory Hall, (510) 642-3791, [officers@ieee.eecs.berkeley.edu](mailto:officers@ieee.eecs.berkeley.edu)) is one of the largest chapters in the nation. The IEEE Student Branch lab (open for all students to use) is in 204 Cory Hall. You can reach IEEE officers by email. There is also an IEEE Student Branch newsgroup ([ucb.org.ucsee](mailto:ucb.org.ucsee)). Flyers are available on the second floor of Cory Hall. The group provides social and professional services, and service opportunities. There are several general meetings with guest speakers and pizza, broomball games, peer advising (with HKN), and other social activities. It also sponsors an introductory electronics decal known as HOPE (Hands on Practical Electronics) as well as a Startup Fair and Graduate School Series. It compiles a resume book each year, which it distributes to several companies. It sponsors several presentations each semester by companies for EECS and other Engineering students, followed by pizza and recruiting for both internships and permanent jobs.

[Upsilon Pi Epsilon \(UPE\)](#)<sup>61</sup> (345 Soda Hall, (510) 642-9952, [officers@upe.berkeley.edu](mailto:officers@upe.berkeley.edu), <http://upe.berkeley.edu>) is an honor society for computer science students in the College of Letters and Science. They provide tutoring, advising, company info session hosting, social activities and campus and community service.

## 8.4 Undergraduate Research

Individual initiative is important in seeking out independent study in our large department. The Center for Undergraduate Matters provides advising on finding undergraduate research opportunities. The following may help in finding a research position:

1. Check the [EECS Undergraduate Research Website](#)<sup>62</sup>, which lists academic and summer research programs as well as undergraduate research resources, such as workshop announcements as well as guides and hints to obtaining research positions.
2. Review the [EECS Faculty Website](#)<sup>63</sup> or the [EECS Research Projects Website](#)<sup>64</sup> and select a list of faculty whose research interests match with yours. Visit faculty during their office hours or make appointments with faculty to learn more about ongoing projects that could benefit from the assistance of an undergraduate researcher.
3. Learn what research is happening in the EECS Department by reading the [EECS Research Summary](#)<sup>65</sup>. Copies are available in the Center for undergraduate Matters, in the HKN and IEEE offices, and on the ERL Research Summary Website.

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<sup>60</sup> <http://www-ieee.eecs.berkeley.edu/>

<sup>61</sup> <http://upe.berkeley.edu/>

<sup>62</sup> <http://www.eecs.berkeley.edu/Programs/ugrad/UgradResearch/>

<sup>63</sup> <http://www.eecs.berkeley.edu/Faculty/Lists/>

<sup>64</sup> <http://www.eecs.berkeley.edu/Research/Projects/>

<sup>65</sup> <http://www.eecs.berkeley.edu/IPRO/Summary/>

4. Investigate related opportunities in other engineering departments, such as Mechanical Engineering, Bioengineering or Materials Science, by navigating their departmental websites. Many students find interesting research with faculty in other departments or at the [Lawrence Berkeley National Laboratory](#)<sup>66</sup>.
5. Attend the weekly EECS colloquia, which are research presentations organized during the academic year on Wednesday afternoons. These informal seminars discuss current research projects in the Electrical Engineering and Computer Science fields. Featured speakers include EECS faculty, faculty from peer institutions, and highly ranked industry representatives. For the latest information and schedule, check the EECS [Joint Colloquium Website](#)<sup>67</sup>.
6. Attend EECS meetings and seminars scheduled throughout the semester. Look for sessions featuring research topics and presentations that most appeal to you so you can gain greater exposure to the department's research community. For a complete listing of events, pick up the most recent issue of Engineering News, publications put out by the College of Engineering, check the daily seminar bulletin board in the main hallway on the second floor of Cory, or visit the [schedule online](#)<sup>68</sup>.
7. Talk to current EECS graduate students about their work; consult the [EECS Resume Book](#)<sup>69</sup> published each Fall that lists graduate students by their area of research. By networking with graduate students, you might be able to obtain a research position with them directly, or they could help you negotiate a position with their Faculty Advisers.
8. Attend the bi-annual Undergraduate Science and Engineering Research Poster Sessions to see firsthand the research projects your peers are doing.
9. Consult your Faculty Adviser or the staff in the Center for Student Affairs, 205 Cory Hall, for further advice, to borrow any of the above publications, and to get an idea of research other EECS undergraduates have undertaken.
10. Visit the campus-wide [Office of Undergraduate Research](#)<sup>70</sup> in 301 Campbell Hall. The office provides information, resources, and when available, funding to enable undergraduate research.
11. Join the Research@Berkeley electronic mailing list. To subscribe, send email to [majordomo@listlink.berkeley.edu](mailto:majordomo@listlink.berkeley.edu) with the following message in the body of the email: subscribe researcher.

When you have identified projects that look interesting, investigate the research environment. For example:

- What kinds of work are undergraduates doing? What type of project will you be working on? Some projects are very simplistic and closely defined (e.g., "Write an interface to this tool"), while others are more open-ended

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<sup>66</sup> <http://www.lbl.gov/>

<sup>67</sup> <http://www.eecs.berkeley.edu/Colloquium/>

<sup>68</sup> <http://www.eecs.berkeley.edu/cal/>

<sup>69</sup> <http://www.eecs.berkeley.edu/IPRO/resume.info.shtml>

<sup>70</sup> <http://research.berkeley.edu/>

(e.g., "Doing this seems like a good idea, but we don't know how to do it, so let's figure it out").

- How much independence or responsibility would you have on the project?
- Are there senior graduate students who will mentor you?
- How often will you interface with the faculty research Adviser?
- Could you obtain a co-authored publication from your research experience?
- Will this position possibly lead to a paid research position as an Assistant III (Senior Engineering Aide)?
- Does the group meet regularly? When?

### ***Additional Resources***

**EECS 199: Independent Study.** You may undertake independent study and research through EE 199 or CS 199 course units. Over 75 students per year take advantage of this opportunity. After you have located your faculty sponsor, you may pick up forms to enroll in EE 199 from the Center for Student Affairs in 205 Cory Hall, and CS 199 from 379 Soda Hall.

**Undergraduate Research Opportunities (URO) Program<sup>71</sup>:** The College of Engineering's Undergraduate Research Opportunities (URO) Program provides an opportunity for UC Berkeley undergraduate students to participate in research with engineering faculty members. It allows students to survey the wide array of research opportunities available at the College and faculty the occasion to find qualified undergraduates to work in their labs. Students participating in undergraduate research have found the program to be a great enhancement of their educational experience and future employment opportunities.

All regularly enrolled undergraduates in good standing are eligible to apply to a URO project, regardless of financial need. You will find a list of projects and the application on the URO website, <http://coe.berkeley.edu/uro>. Applications and announcements of projects are posted mid-Spring semester for the following Fall and mid-Fall semester for the following Spring.

A stipend of \$250 per semester is awarded upon the completion of a semester of research. All regularly enrolled undergraduates at UC Berkeley in good academic standing (minimum GPA of 3.0) are eligible to apply. Selection is based upon academic record and preparation, as well as a demonstrated interest in the research topic.

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<sup>71</sup> <http://www.coe.berkeley.edu/students/current-undergraduates/student-research/uro>

**Center for Information Technology Research in the Interests of Society (CITRIS)<sup>72</sup>:** CITRIS creates information technology solutions for many of our most pressing social, environmental and healthcare problems.

The first public-private partnership created to use IT in this way, CITRIS partners more than 300 faculty and thousands of students from myriad departments at four UC campuses (Berkeley, Davis, Merced and Santa Cruz) with industrial researchers from over 60 corporations. Together they are thinking about IT in ways that have not been thought of before. They see solutions to many of the concerns that face all of us today, from the environment and finding viable sustainable energy alternatives to healthcare delivery and developing secure electronic medical records and remote diagnosis, ultimately boosting economic productivity. CITRIS represents a bold and exciting vision that is leveraging one of the top university systems in the world with highly successful corporate partners and government resources.

**National Science Foundation (NSF) Research Experience for Undergraduates (REU) Program<sup>73</sup>:** The NSF sponsors summer research programs for students in engineering disciplines at universities nationwide. Eligibility is limited to US citizens and permanent residents. For more information see the NSF REU webpage .

**Intel Undergraduate Research (IUR) Program<sup>74</sup>:** This program targets traditionally underrepresented students in specific fields of interest to Intel (BioE, CS, EE, ME, IEO, MSE, etc.). To qualify, you must be a U.S. Citizen or Permanent Resident with a GPA of 3.0 or higher. IUR students must present research progress and results in some forum, such as a research group or poster session. If you are selected by a participating faculty mentor, you will receive a stipend of up to \$1500 when you complete the research. To apply, submit an application, resume, BearFacts transcript, and statement to Sheila Humphreys, 203 Cory Hall, ([humphrys@eecs.berkeley.edu](mailto:humphrys@eecs.berkeley.edu)).

**Summer Undergraduate Program in Engineering Research at Berkeley-Computer Science in the Interest of Society (CSIS)<sup>75</sup>:** This program, offered by the EECS Department, has the objective of providing research opportunities in engineering to students who have been historically underrepresented in the field for reasons of social, cultural, educational or economic barriers. You must have junior status, be a U.S Citizen or permanent resident, have completed some upper-division course work in EECS, and have a minimum overall GPA of 3.0. You need not have prior research experience. You will be required to attend orientation and complete the entire eight-week program, and to give an oral presentation and submit a written report describing the results of your research. For further details about the program and how to apply, see the webpage.

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<sup>72</sup> <http://www.citris-uc.org/>

<sup>73</sup> [http://www.nsf.gov/crssprgm/reu/reu\\_search.cfm](http://www.nsf.gov/crssprgm/reu/reu_search.cfm)

<sup>74</sup> <http://www.eecs.berkeley.edu/~humphrys/intel.html>

<sup>75</sup> <http://www.eecs.berkeley.edu/Programs/ugrad/superb/superb.html>

## 8.5 EECS Honors Degree Program

The EECS Honors Degree Program<sup>76</sup> is designed to provide very talented undergraduate students, both in the College of Engineering<sup>77</sup> and in the College of Letters and Science<sup>78</sup>, with more flexibility at the undergraduate level. Honors students have a concentration outside of EECS, called a "breadth" area. In addition, students receive a special faculty Adviser, engage in research, receive official notation of the honors degree on their Berkeley transcript, and are invited to special events with faculty and EECS Honors alumni. Honors students may optionally elect to complete a Senior Honors Thesis (EE H196 A/B or CS H196 A/B).

Applications to the Honors Degree Programs are accepted at the end of the Fall and Spring semester. Typically students apply during their junior year. Visit the EECS student affairs office for more information about applying.

### *Eligibility*

- At least 45 units completed at UC Berkeley. (May also include up to 10 AP units.)
- Junior transfer students must complete at least 12 units at UCB and typically apply at the end of their second semester.
- Completion of lower-division technical requirements for the degree.
- Minimum overall and technical GPA of 3.7 or above.
- Applicants with only one semester remaining are not typically admitted.

### *Course of Study*

- Fulfill all degree requirements in EECS or L&S CS.
- A breadth requirement, consisting of at least 3 upper-division courses (totaling at least 10 units) taken for a letter grade, outside the College of Engineering.
- The breadth requirement courses may be taken in a single department, or in related departments if they address a unifying theme. The breadth courses are part of the honors application and may be changed (later) by petition only.
- At least 4 units of supervised Independent Study, EECS 199, H196, or other approved research (usually taken on a P/NP graded basis). You are responsible for arranging to complete these units. Independent-study forms are available in 205 Cory Hall or 387 Soda Hall.

### *To Apply*

You can download a form from the [EECS Honors Program website](http://www.eecs.berkeley.edu/Programs/honors.html)<sup>79</sup>, or obtain one directly from the Center for Student Affairs, 205 Cory Hall. Center for Student Services staff are available to advise you on your eligibility to the program.

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<sup>76</sup> <http://www.eecs.berkeley.edu/Programs/honors.html>

<sup>77</sup> <http://www.coe.berkeley.edu/>

<sup>78</sup> <http://www.ls.berkeley.edu/>

<sup>79</sup> <http://www.eecs.berkeley.edu/Programs/honors.html>

We hold Honors Degree Program information sessions twice yearly. The information sessions will provide you with the opportunity to find out more about the Program and to ask questions. You may also inquire about the program at the Center for Student Services, 205 Cory Hall.

The Vice Chair for Undergraduate Matters reviews applications and looks for various signs of aptitude for the program, such as a well-written essay, above-average course loads, sincere commitment to a breadth area outside EECS, and grades. We look favorably on breadth areas that are more than just extensions of a sequence already used to fulfill the humanities and social science requirements.

The deadline to turn in applications is the last day of classes of every Fall and Spring semester.

## **8.6 Academics and Industry**

The field of engineering benefits greatly from cooperation with industry. Gaining engineering work experience before graduation can help you understand the relevance of your classroom experience and provide you with a better idea of how to chart your academic program. The following sections describe two programs to seriously consider.

International students engaging in internships during the academic year or during the summer will need to consult with the [Berkeley International Office \(BIO\)](#)<sup>80</sup> in order to obtain work permits.

## **8.7 EECS Internship Program**

EECS undergraduates have the opportunity to combine industrial experience with their academic studies through the EECS Internship Program. We recommend this program for students with high academic qualifications who are interested in gaining valuable experience in industry before graduation.

### ***Admission***

Selection takes place during the Spring semester so we encourage all eligible students to apply. For more information, visit the [EECS Internship website](#)<sup>81</sup> for the most current timeline and application information, or see the EECS Internship Staff in 205 Cory Hall. We will also post notices regarding Internship Program events in Cory Hall on the Internship Bulletin Board (located across the hall from 205 Cory).

### ***Timeline Summary for 2010-2011***

#### **The EECS Internship Program Open House: January**

Come hear company representatives speak about specifics of the program, talk with representatives and pick up information. Students seeking interviews should attend the Open House.

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<sup>80</sup> <http://internationaloffice.berkeley.edu/>

<sup>81</sup> <http://www.eecs.berkeley.edu/IPRO/internship.shtml>



### **Interviews: Late February**

Interviews are held on campus or at the discretion of the company. Companies select and inform students directly about their decisions. Here are recently participating companies: Adobe, The Aerospace Corporation, Agilent Technologies, Amazon, Analog Devices, Cisco Systems, Citadel, CNET Networks, Dow, eBay, Facebook, FotoFlexer Goldman Sachs, Google, HP, IBM IGT, Intel, Intuit, KLA Tencor, Lockheed Martin, Marvell, Meebo Microsoft, NVIDIA, Oracle, Pixar, Qualcomm, Riverbed, Charles Schwab SHRC, Sun Microsystems, and VMWare.

## **8.8 Education Abroad Program**

Each year, several EECS students study and travel abroad through the [Education Abroad Program \(EAP\)](#)<sup>82</sup> program. Over the last five years students have traveled to France, Germany, Hong Kong, Israel, Japan, Korea, Spain, Sweden, Vietnam, the United Kingdom and New Zealand. Students participating in EAP are considered registered Berkeley students, and should note that the semester participation in EAP will not grant them an additional semester at Berkeley. Courses taken at the foreign site might not transfer for full credit to Berkeley. EAP participants will need to receive prior approval from the Dean of Engineering. Students wishing to participate in the program should contact their Adviser early in their UCB career, as well as EAP.

## **8.9 College of Engineering Minors**

Minor programs are intended as optional programs that encourage coherence in the work that students undertake outside their major field(s) of study. Minors are currently offered in EECS, Bioengineering, Civil and Environmental Engineering (environmental engineering, structural engineering), Computer Science, Industrial Engineering and Operations Research, Materials Science Engineering, Mechanical Engineering and Nuclear Engineering.

Requirements:

- A minimum overall grade-point average of 3.0 and a 3.0 grade-point average in prerequisite courses for the minor.
- To successfully complete the minor, you must have a minimum grade point average of 2.0 in the minor courses at graduation.
- Only one upper-division course used for the minor can overlap with courses used for the major.
- Completing a minor may not delay graduation.

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<sup>82</sup> <http://eap.ucop.edu/>

For specific requirements on these minors, contact the sponsoring department.

## 8.10 The EECS Minor

The EECS minor, offered through the College of Engineering, is open to any undergraduate who has declared a major on the Berkeley campus with the exception of EECS majors. It is intended for students who have an interest in electrical engineering and computer science. Students interested only in computer science courses should consider the Computer Science minor. Applications are accepted throughout the year and are available from the Center for Student Affairs, 205 Cory Hall, or the [EECS Minor website](#)<sup>83</sup>.

### *Course Requirements*

- EECS 20N
- EE 40, Physics 7B and EE 42 (both courses need to be taken to fulfill the requirement), or EE 100
- CS 61A or E 7
- CS 61B/BL or CS 61C/CL
- Any three upper-division courses in EECS, total of 9 units minimum

### *Restrictions*

- You must take each of these courses for a letter grade; none may be taken Passed/Not Passed. You may substitute EE 42 or EE 100 for the EE 40 requirement, but if you use EE 42 to fulfill the EE 40 requirement you must also take Physics 7B as well.
- You may substitute E 7 for CS 61A, but E 7 will not serve to fill the prerequisite requirements of upper-division courses that call for CS 61A.
- You may not use EE 100 as one of the upper-division courses.
- You may have no more than one overlapping upper-division course between your declared major and the EECS minor. College of Letters and Science Computer Science majors may not count upper-division computer science courses toward the minor.

Admission to the minor requires a 3.0 GPA in the required lower-division courses listed above. To be given credit for the minor, you must maintain at least a 2.0 GPA in the upper-division courses taken to fulfill the requirements.

Students in the minor program have priority over the non-CS and non-EECS majors for entrance to courses. For upper-division computer science courses, however, their priority is just below that of CS minors. This priority is not recognized in the Tele-BEARS system. It becomes relevant when appealing denial of admission to the desired course.

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<sup>83</sup> <http://www.eecs.berkeley.edu/Programs/eecsminor.html>

## **Chapter 9: Applying to Graduate School**

### **9.1 Why Go to Graduate School?**

Perhaps the best reason to go to graduate school is a passion for EE or CS and the desire to conduct research. Working with a faculty member in a research lab as an undergraduate is not only a good way to get involved in cutting-edge research, but is a great way to get a feel for graduate life - which can help you to determine whether or not graduate school is for you. Possessing undergraduate research experience can be a great asset to your resume and graduate school application, and can help you to develop a stronger relationship with your sponsoring professor, which will come in handy when you begin to collect letters of recommendation. The best preparation for graduate school is to engage in research as an undergraduate. Research experience is now virtually a requirement for graduate admission to many EECS Ph.D. programs. If you are interested in graduate school, but have not yet been involved in undergraduate research, it would be in your best interest to search out research opportunities. Be willing to volunteer on a research project that interests you.

In many EECS fields, an M.S. degree is effectively the entry-level requirement, simply because these areas are too complex to master in two years of upper-division course work. In general, people with master's degrees and doctorates are given more freedom, more responsibility, and more interesting work to do. A Ph.D. is a requirement for university teaching and is nearly a requirement for work in industrial research labs.

An advanced degree can make a difference in your starting salary. In 2004, Berkeley EECS graduates were offered median starting salaries of \$62,000 at the B.S. level, \$75,000 at the M.S. level, and \$105,000 at the Ph.D. level. While at first glance it may seem more financially rewarding to pursue a graduate degree, you will also want to factor in the costs associated with attending a graduate school, and the number of years you will spend in graduate school (one to three years for a Master's degree, and at least five years for a Ph.D.) during which you will not be earning a significant salary or building industry experience. Typically, if your primary goal is to maximize your life-long financial compensation, a Ph.D. degree is unlikely to be the best way to attain that goal, due to the lost earnings potential and experience that cannot be accrued as you study for your Ph.D.

### **9.2 Where to Apply**

Before you prepare your applications you should first research which schools to apply to. Remember that you are choosing a department, not a university. Some highly ranked universities have weak EE or CS departments, or may be weak in the specific area in which you would like to specialize. Ask around, visit departmental websites, read

university catalogs, or if possible, the schools which you are interested in, and talk to your Faculty Adviser for advice! The Peterson's Guides are a good source of rankings.

Several rankings of EE and CS programs have been published over the past several years. These are useful in giving an overall picture of the top 15-20 schools, although other factors should be weighed in making your decision. For example, several of the premier schools (Berkeley, Stanford, USC, UCLA, UC San Diego, Cal Tech, UC Davis, and UC Santa Barbara - all of which have strong programs) are all located in California. For 2008, *US News & World Reports* ranked our engineering program third nationally. However, you should also consider programs at other schools in the nation. As you might expect, the prestige of your Berkeley undergraduate degree increases with distance from the Campanile. Many schools in the rest of the country would be very happy to have more Berkeley EECS students in their graduate EE or CS programs, which may give you an edge over "local" students for fellowships or research assistantships.

You should apply to more schools than you think you need to, and not just the top-ranked schools. Admission is very competitive and you should include "safe" schools on your list. As a final word of advice, you should start early and plan carefully to ensure that you have the best chance of furthering your technical knowledge in an EE or CS graduate program.

To apply to the Graduate Program in EECS at UC Berkeley you should contact the EECS Student Affairs Office, 205 Cory Hall, [gradadm@eecs.berkeley.edu](mailto:gradadm@eecs.berkeley.edu) and refer to our website at <http://www.eecs.berkeley.edu/Gradadm/>. Applications are generally available in early September. We recommend that you begin the application process at the beginning of your senior year, so that you have time to obtain faculty recommendations, schedule your Graduate Record Examination, and obtain transcripts. The deadline for receipt of completed applications, test scores, recommendations, etc., is stated in the application. The deadline for Fall 2010 is mid-December. New graduate students are admitted for the Fall semester only, but deferrals can be requested for the Spring semester if you are admitted for Fall

### **9.3 Academic Preparation**

When applying to Ph.D. programs, the most important factor tends to be evidence of research ability, either through successful research experiences or in other ways. When applying to M.S. programs, research experience is less important.

Either way, your academic preparation and performance in undergraduate courses is also an factor in admissions to graduate programs. Most admissions committees are primarily interested in your technical courses and your technical GPA. Most successful applicants have a GPA of 3.7 or higher, though some are admitted with a lower GPA usually based on specific talents and research experience. Having done well in EECS classes will improve your chances for admission. Recommendation letters from EECS faculty have high credibility with their colleagues who serve on the admissions committee. Most admissions committees care that you have a core background that supports your plans in

graduate school. While most successful applicants have an EE or CS degree we also admit applicants from other science and engineering disciplines. However, essentially all admits have strong technical backgrounds.

## 9.4 The Graduate Record Exam

The [GRE](#) is a more advanced version of the SAT. If you are a good student, and if you did well on the SAT, the GRE shouldn't worry you. This means that it is worthwhile to review the format of the test and take some practice exams. Most admissions committees will be primarily interested in your quantitative score, but your verbal score is also important. (For Berkeley, your quantitative percentile should be in the 90's.) If you elect to take any of the GRE Subject Tests, high scores on these can also help your application in some cases.

You may take the exams several times, but ETS reports all scores to the universities you list. It is a good idea to prepare well in advance of the GRE by taking a GRE prep course or reading preparation books. Taking practice tests will improve your score. The goal should be a good score on your first real exam. Be sure to take the exam early. If you wait until November or December of your senior year to take the GRE, your scores may not be reported to admissions committees in time for the January-February admission decision deadlines.

For information about registration or for sample questions, visit the [GRE website](#)<sup>84</sup> or call (800) 473-2255. A number of preparation books for the general exam are also available from commercial publishers; check at any college textbook store. In addition, HKN provides review sessions for the [CS Subject Test](#).

## 9.5 Letters of Recommendation

Most graduate departments ask for three letters of recommendation. Ideally, at least one of these letters is from a faculty member with whom you have done research. Most undergraduate research projects are supervised by graduate students, and typically these graduate student 'mentors' work closely with the faculty research sponsor in drafting letters of recommendation. The faculty Adviser, not the graduate student, should sign these letters. One strong letter of support by a respected member of the Berkeley faculty can do you a tremendous amount of good, possibly helping you to gain a fellowship at a premier department. With such a letter, you increase your chances of getting into a good graduate program, even if you do not have a perfect GPA.

Letters of recommendation may also be from professors who have had you in class, for whom you have done project work, or from your Faculty Adviser. The best letters are from professors who know you personally and can speak about you as an individual.

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<sup>84</sup> <http://www.ets.org/gre>

University professors travel a lot and are tied into an international network of experts in their field. They know many of the faculty at other institutions, at least by reputation.

If you have participated in an internship or co-op with an industrial research lab, a letter from your supervisor or mentor can also be worthwhile. In this case, it would be helpful if your supervisor could describe his/her academic background in the letter. Admissions committees want to hear from people who have known you in an academic setting, or whose academic standards are well calibrated. Letters from other internships or employers are generally less prestigious.

Unfortunately, undergraduate classes at Berkeley tend to be large, and professors may not get to know all of their students. So what should you do? First of all, plan ahead. Start thinking about getting letters as soon as you begin taking upper-division courses. If you know you are doing particularly well in a course, be sure the professor knows you. Go to his/her office hours, even if you do not need help. You can tell the professor that you are considering graduate school and ask them if they would be willing to write you a letter in the future. That way, if for some reason they are not able to write a good letter for you, at least you have given them an "out" and you will still have plenty of time to seek another recommendation. Most faculty will be willing to write a letter for you as long as you give them ample time to prepare.

Once you have identified your recommenders, be sure to let them know several months ahead of time that you will be needing a letter, so they won't be surprised when you show up at their door with a recommendation form. Start preparing a packet of information about yourself for each of your recommenders. This packet should contain: a rough draft of your statement of purpose, a list of the courses you took with that professor, the grades you received in their class, and your academic resume. Your resume should list the schools you have attended, courses you have taken, any research work or related employment you have held, a list of honors you have received, plus anything else that can help the professor to get to know you as a person. A rough draft of your statement of purpose is especially helpful to your recommender. Providing this serves a two-fold purpose: in addition to serving as another reviewer for your essay, after reading it your recommender will be more familiar with your particular interests, which will be helpful to them in writing you a more specific and stronger letter of recommendation. You should also feel free to inform your recommender about any achievements or accomplishments of yours that you are particular proud of—this is not the time to be modest and self-effacing.

Letters of recommendation are now submitted online at UC Berkeley and many other campuses. This means that submitting your online application earlier than the deadline gives your recommenders more time to write your letter. Otherwise, as soon as you receive your recommendation form, you should hand-deliver it to each recommender along with the packet you have compiled. Make sure you have clearly communicated to your recommender the deadline for the submission of your letter. In order to ensure that your letter arrives on time, you may want to arrange to pick up your letters directly from your recommenders. Most schools will accept a letter of recommendation from you as

long as the letter is placed in a sealed envelope that is signed by the recommender across the seal. You can then mail the letters along with your other application materials. Some students choose to keep their letters of recommendation on file with the [Berkeley Career Center's Letter Service](#)<sup>85</sup> (2111 Bancroft Way, Room 249, (510) 642-1716). The Letter Service will keep your letters of recommendation on file and will mail copies of these letters to each school you specify or submit them online, as requested. The Letter Service charges a fee for maintaining your files and for mailing each letter.

## 9.6 Statement of Purpose

The Statement of Purpose is your opportunity to explain who you are and what your career goals are. If you already know the area you wish to specialize in (e.g., wireless communication, theory, graphics, MEMS, databases), indicate that in your statement. Most admitted applicants have focused Statement of Purpose essays and clear research goals. Many even mention in the application the faculty they want to work with if they are admitted.

If there is a reasonable chance that you may wish to pursue the Ph.D., you should state that as your ultimate goal. The Ph.D. is more prestigious, and faculty are generally more interested in selecting students who make a commitment to a Ph.D. than to students who will leave after two years with a Master's. At Berkeley, we treat MS and Ph.D. students the same once they are here, but do not favor Master's applicants during the admission process.

If you worked on a research project or entered a competition, describe this. If you have co-op or industrial experience, explain your role and the knowledge that you gained from the experience. If you believe your grades don't reflect your true ability, you may discuss this in your statement, using your best judgment.

Your statement should give the impression that you are mature and highly motivated, and that your academic goals are reasonable. Your statement does not have to be a literary masterpiece: a simple, unpretentious expository style is best. It should go without saying that your statement should be neat, grammatical, and concise, without misspellings. The statement should be approximately one page single-spaced. Remember that the admissions committee members are reading many applications: an excessively long statement may work against you. Be concise and to the point. Avoid frivolity, boasting and self-deprecation. Finally, have at least one peer proof your statement. The more people who review your essay and provide feedback, the more polished your application will be.

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<sup>85</sup> <http://career.berkeley.edu/Letter/Letter.stm>

## 9.7 Funding for Graduate School

Most Berkeley undergraduates (or their families) pay the university a substantial sum of money for the privilege of attending college. By contrast, nearly all EECS graduate students are fully funded to go to school. Sources of support for graduate students include:

- External fellowships, awarded to individual students by foundations or government agencies external to the university, e.g., the National Science Foundation, NDSEG, etc. These fellowships typically cover fees, tuition, and provide a living stipend. They may be good for multiple years and often may be used at any university you choose to attend. Some of these fellowship deadlines fall a month or two prior to the graduate admissions applications, so you will want to start preparing your application materials early. A good source for engineering fellowships is the website at the Graduate Admissions homepage, <http://www.eecs.berkeley.edu/Gradadm/fellowships.html>
- University fellowships, funded by the university itself. Students are usually notified of these awards at the time of admission.
- Departmental fellowships, funded by grants or donations made to the university, awarded by the department. Students are usually notified of these awards at the time of admission.
- Research Assistantships (RAs), funded by research grants made to the university, usually by federal agencies such as the National Science Foundation, Advanced Research Projects Agency (ARPA), or Department of Energy. Most of the time, RAs are hired by, and work for, an individual professor.
- Graduate Student Instructor (GSI) positions, funded by the university. The department hires GSIs to lead discussion and laboratory sections.

Not all graduate schools are able to support their students as well as Berkeley. Fellowships are usually awarded to only the top students. But the fact remains that there is more money available to support graduate students than undergraduates. Do not dismiss the possibility of going to graduate school solely for financial reasons, as your graduate school may be able to help you find the funding you need to attend graduate school. Other good sources to keep in mind are

- The Grad Division Fellowship Website: [http://www.grad.berkeley.edu/financial/fellowships\\_resources.shtml](http://www.grad.berkeley.edu/financial/fellowships_resources.shtml)
- The Scholarship Connection: <http://scholarships.berkeley.edu/>
- The EECS Scholarship/Fellowship/Award Information Page: <http://www.eecs.berkeley.edu/Programs/scholarship/>



## Chapter 10: Policies on Conduct

For a more comprehensive list of policies that pertain to you as an EECS student please see <http://www.eecs.berkeley.edu/Policies/>.

### 10.1 Policy on Academic Dishonesty

Copying all or part of another person's work, or using reference materials not specifically allowed are forms of cheating that will not be tolerated. If we find that you were involved in an incident of cheating, your instructor will notify you and the following policy will apply. Below you will find the departmental policy on academic dishonesty. For further information refer to the Berkeley [Campus Code of Student Conduct](#).<sup>86</sup>

The instructor may take actions including:

- a) Requiring repetition of the subject work,
  - b) Assigning an F grade or a "zero" grade to the subject work, and
  - c) For serious offenses, assigning an F grade to the course.
1. The recommended action for cheating on examinations, term papers or projects is 1(c).
  2. The instructor must document and inform the student and Department Chair in writing of the incident, the action taken, if any, and the right of the student to appeal to the Chair of the Department Grievance Committee the actions taken by the instructor or to have the matter resolved by Student Judicial Affairs.
  3. The instructor must retain copies of any written evidence or observation notes.
  4. The Department Chair must inform Student Judicial Affairs of the incident in both cases where the matter was resolved between the instructor and student as well as cases referred to Student Judicial Affairs to investigate and resolve.
  5. Student Judicial Affairs offers the student both the opportunity to resolve the incident informally or by a formal hearing process in determining whether there has been a violation of the Code of Student Conduct and any sanctions that may follow.
  6. The Department will recommend that students involved in a second incident of cheating be dismissed from the University.
  7. Courses for which academic dishonesty has been verified by established campus procedures may not be dropped from the record. Grades for such courses will be reinstated to the record when dishonesty is verified subsequent to a drop transaction.

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<sup>86</sup> <http://students.berkeley.edu/uga/conduct.asp>

## 10.2 Respect and Civility Within the Campus Community

The University of California at Berkeley is a public institution of higher education committed to excellence in teaching, research, and public service. Our student body represents the diversity of our state, and will provide its future leaders. Together, the students, faculty and staff form our campus community, which reflects a variety of backgrounds and cultures. The quality of life on and about the campus is best served by courteous and dignified interaction between all individuals, regardless of sex, ethnic or religious background, sexual orientation, or disability.

Therefore, the administration of this University publicly declares its expectation that all members of the campus community will work to develop and maintain a high degree of respect and civility for the wealth of diversity in which we are all fortunate to live and work together. This civility and respect for diversity ought to flourish in an atmosphere of academic freedom that is considerate and tolerant of the ideas of others. The administration of this University expects you to consult the student conduct code for specific regulations regarding respect and civility.

For more information on the student conduct code, visit their website at <http://students.berkeley.edu/uga/conduct.asp>.

### ***Sexual Harassment***

Every member of the University community should be aware that the University is strongly opposed to sexual harassment and that such behavior is prohibited both by law and by University policy. For more information on the Berkeley Campus Policy on Sexual Harassment and Complaint Resolution, please see <http://ccac.berkeley.edu/policies.shtml>.

## 10.3 Code of Ethics

Engineers apply scientific principles to satisfy human needs. Engineers need to act ethically with their colleagues, employers, employees, competitors, and society as a whole. The Institute of Electrical and Electronics Engineers, Incorporation (IEEE), the largest professional organization of electrical engineers and computer scientists, has adopted the following code of ethics to guide our profession.

1. To accept responsibility in making engineering decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment.
2. To avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist.
3. To be honest and realistic in stating claims or estimates based on available data.
4. To reject bribery in all its forms.
5. To improve the understanding of technology, its appropriate application, and potential consequences.

6. To maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations.
7. To seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others.
8. To treat fairly all persons regardless of such factors as race, religion, gender, disability, age or national origin.
9. To avoid injuring others, their property, reputation, or employment by false or malicious action.
10. To assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

## 10.4 Computer Use Policy

In support of the University's mission of teaching, research, and public service, [Information Systems and Technology \(IST\)](#)<sup>87</sup> provides computing, networking, and information resources to the University community of students, faculty, and staff.

Campus computer use and network access is a privilege, and requires that individual users act responsibly. Users must respect the rights of other users, respect the integrity of the systems, data, and related physical resources, and observe all relevant laws, regulations, and contractual obligations. For full documentation of the policies that pertain to you as a student, please see <http://technology.berkeley.edu/policy/> and <http://www.eecs.berkeley.edu/Policies/>.

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<sup>87</sup> <http://ist.berkeley.edu/>

## Chapter 11: Resources

### 11.1 In Times of Stress...

If you find that you're overwhelmed and cannot devote your full energies to your studies, here are some people you can talk to:

- [Office of Student Services](#)<sup>88</sup>, 205 Cory Hall
- Academic Adviser, 230 Bechtel Hall
- [EECS Peer Advising](#)<sup>89</sup>
- [UCB Peer Advising](#)<sup>90</sup>, 119 Cesar Chavez
- [Student Life Advising Services](#)<sup>91</sup>, 119 Cesar Chavez
- [Instructors](#) (office hours and locations)
- [Tang Center](#)<sup>92</sup>, 2222 Bancroft Way, 510-643-7197.
- [Tutoring Services](#)<sup>93</sup>, Cesar Chavez Center in Lower Sproul Plaza  
They can discuss your options with you such as reduced study load, incompletes, and withdrawals.

### 11.2 Emergency Building Evacuation

In case of fire or other emergency, Cory Hall and/or Soda Hall will be evacuated. The following things will happen: a loud alarm will sound; evacuation procedures may be announced over the public address system (if you hear the alarm and no instructions follow, leave the building in a controlled and deliberate manner); an evacuation message will appear on all computer terminals; safety monitors in yellow helmets will direct you to the nearest safe exit.

#### *Evacuation Procedures*

1. Quickly gather all your personal valuables.
2. Close all windows and doors (do not lock doors).
3. Move calmly and carefully out of the building. Do not run. Do not use the elevators.
4. Move at least 100 feet from the building. Do not block the exits.

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<sup>88</sup> <http://www.eecs.berkeley.edu/Students/csa.shtml>

<sup>89</sup> <http://www.eecs.berkeley.edu/Programs/facadvising.html>

<sup>90</sup> <http://slas.berkeley.edu/advising.html>

<sup>91</sup> <http://slas.berkeley.edu/index.html>

<sup>92</sup> <http://www.eecs.berkeley.edu/Faculty/Lists/list.shtml>

<sup>93</sup> <http://slc.berkeley.edu/general/index.htm>

5. Follow the instructions of the safety monitors in yellow helmets.

### 11.3 Earthquakes

Earthquakes are a geological fact in California. A few precautions will enable you to live in earthquake country with peace of mind. Depending upon where you are and the nature of the tremor, it may feel like the building is swaying in a high wind, or trembling, or the ground is sharply jolting or rolling. Most earthquakes only last several seconds, but what you do during that time may be very important.

- If you are outside, move to an open area. Stay away from buildings where cornices, glass, or other objects could fall, and stay away from lampposts and other structures, which might topple.
- If you are inside, get under a sturdy piece of furniture or building support, such as an arch or doorway. Stay away from windows, open bookshelves, and other objects, which may topple or slide. Wait until the shaking is over and listen for evacuation announcements. Do not use the telephone. Emergency personnel may need clear communication lines.

### 11.4 Building Security and After Hour Access

#### *Building Security*

If you see a box, letter, briefcase, or package, and you don't know where it came from or how it got there, **DO NOT TOUCH IT!** Contact the receptionist in 231 Cory or the University Police (642-3333). If this should occur in Soda Hall, contact the receptionist in 387 Soda; or the University Police (642-3333). Do not leave any packages or boxes in the hallways to be disposed of; leave them in your office or lab with a note for the custodians. The custodians will not take away boxes left in the corridor. Your cooperation will reduce the frequency of reports of suspicious articles and will thereby reduce confusion when an article of a suspicious nature must be investigated. In case of fire, extinguishers can be found on every floor at the corners of the main corridors. Emergency assistance may be obtained by calling 642-3333.

#### *After Hours Building Access*

The doors to both Cory and Soda Halls are unlocked from 7:30 a.m. until 6:30 p.m., after which time you will need an electronic card key, issued by the Department, to enter parts of the buildings other than terminal rooms available 24 hours. Cory Hall is protected by an electronic security and surveillance system with cameras monitoring each door 24 hours a day. Students needing keys must fill out applications to be signed by their Adviser, the person in charge of teaching labs, and the Department Building Manager. Applications are available in Room 253 Cory or 387 Soda Hall. Immediately report lost keys to these offices.

### ***Important Notes***

- Lending out cardkeys or letting people you don't know into Cory or Soda Halls after regular building hours is prohibited.
- During special events on campus, especially those held at the Greek Theatre, a private security firm might be employed to patrol Cory Hall entrances. Uniformed guards may request that students present their electronic card keys and student identification cards to obtain access to the building. We appreciate students' cooperation.

## **11.5 Health and Safety Questions**

The EECS Department Building Managers will be happy to answer inquiries in Room 253 Cory (642-1527) and 393 Soda (643-6619). An active Safety Committee includes graduate student representatives who can also provide answers to your safety questions.

## **11.6 University Facilities**

### ***Student Facilities***

Student Housing <sup>94</sup>	(Please see website for specific contact info.)	
University Health Services <sup>95</sup>	Tang Center, 2222 Bancroft Way	642-2000
Optometry Clinic <sup>96</sup>	Minor Hall	642-2020
Counseling Center <sup>97</sup>	Tang Center, 2222 Bancroft Way	642-9494
Career & Grad Schl Srvc <sup>98</sup>	2111 Bancroft Avenue	642-1716

### ***Recreational Facilities***

Hearst Gymnasium <sup>99</sup>	642-3288
Strawberry Canyon Recreational Area <sup>100</sup>	643-6720
Recreational Sports Facility (RSF) <sup>101</sup>	642-8342
Pool Hotline <sup>102</sup>	642-6400
Cal Fit Classes <sup>103</sup>	643-5151
Cal Adventures <sup>104</sup>	642-4000

Full lists can be found at:

<sup>94</sup> <http://www.housing.berkeley.edu/livingatcal/contactus.html>

<sup>95</sup> <http://www.uhs.berkeley.edu/students/index.shtml>

<sup>96</sup> <http://www.caleyecare.org/>

<sup>97</sup> <http://www.uhs.berkeley.edu/students/appointments/Counseling.shtml>

<sup>98</sup> <http://career.berkeley.edu/>

<sup>99</sup> <http://calbears.berkeley.edu/insidepage.aspx?uid=64c465f2-fd68-41ed-bfc1-8d52b5691508>

<sup>100</sup> <http://calbears.berkeley.edu/insidepage.aspx?uid=50349c80-10ab-43c4-a9c9-07ea2ec38e86>

<sup>101</sup> <http://calbears.berkeley.edu/insidepage.aspx?uid=01b56616-62e4-47d4-b46a-2fa1b0cbca54>

<sup>102</sup> <http://calbears.berkeley.edu/insidepage.aspx?uid=8b388038-199d-42b6-b9b2-7537ffc0e6f5>

<sup>103</sup> <http://calbears.berkeley.edu/insidepage.aspx?uid=a9e9918f-4493-4c6d-9bee-0aa39b7acf66>

<sup>104</sup> <http://calbears.berkeley.edu/insidepage.aspx?uid=86e8bfd8-b831-41aa-9308-8cf679275745>

<http://calbears.berkeley.edu/insidepage.aspx?uid=67ce8b4e-44e6-42f6-bba8-5b83a31b5309>

### ***Campus Dining Commons***

Dining Commons include the Golden Bear, located in the Student Union area. Also available to students are the cafeterias at International House, the Den at Bowditch and Channing, the Terrace Cafe located on the rooftop of the Bechtel Center, Pat Brown's Grille located in the Genetic/Plant Pathology Building, and Ramona's Cafe located in Wurster Hall.

For more information, please see:

<http://caldining.berkeley.edu/>

### ***Lost and Found***

Police Department	2427 Dwight Way (Hours: 10-4pm)	642-4936
EECS Department Office	231 Cory (Hours: 8-12, 1-5)	642-3214
CS Division Office	387 Soda (Hours: 8-12, 1-5)	642-1042

### ***Student Parking***

Information and the necessary permit may be obtained at Parking Services:

2150 Kittredge Street  
First Floor  
Berkeley, CA 94720-5740  
(510) 643-7701

Information is also available on the web: <http://pt.berkeley.edu/> and at <http://www.eecs.berkeley.edu/Directions/parking.shtml>.

### ***Libraries and Reading Rooms***

<a href="#">Doe Library</a> <sup>105</sup>	642-6657
<a href="#">Moffitt Undergraduate Library</a> <sup>106</sup>	642-5070
<a href="#">Kresge Engineering Library</a> <sup>107</sup> , Bechtel Engineering Center	642-3339
<a href="#">Math-Stat Library</a> <sup>108</sup> , 100 Evans Hall	642-3381
<a href="#">Physics-Astro Library</a> <sup>109</sup> , 351 LeConte Hall	642-3122
<a href="#">Chemistry Library</a> <sup>110</sup> , 100 Hildebrand Hall	642-3753

For more information, please see: <http://www.lib.berkeley.edu/>.

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<sup>105</sup> <http://www.lib.berkeley.edu/doemoff/>

<sup>106</sup> <http://www.lib.berkeley.edu/doemoff/>

<sup>107</sup> <http://www.lib.berkeley.edu/ENGI/>

<sup>108</sup> <http://www.lib.berkeley.edu/math/>

<sup>109</sup> <http://www.lib.berkeley.edu/PHYS/>

<sup>110</sup> <http://www.lib.berkeley.edu/CHEM/>

By the beginning of the semester, each library should have a printed schedule, which gives the hours of operation for all the libraries, including schedule changes for holidays and semester breaks.

***Student Commons, Lounges, and Conference Rooms***

- Hogan and Hughes Room: Cory Hall. Used for seminars and colloquia. Reservations can be made by emailing [cory-room@eecs](mailto:cory-room@eecs).
- Student Commons Room: (Davidson Room), 240 Cory Hall. This is not meant to be a quiet room but is for conversation and relaxation.
- The Moore Room: (entry through room 240). This student lounge is used for informal & Special events and as a seminar room. Arrange for use through IEEE, 246 Cory.
- Computer Sciences 430 Soda Hall. This room is used as Division Lounge: a lounge and for informal seminars. Arrange for use through the CS Division office, 379 Soda ([soda-rooms@cs](mailto:soda-rooms@cs)).

***Research Laboratories***

The following list of research laboratories is included to give an idea of the extent and nature of these facilities.

AI Robotics	410 Soda
Bioelectronics	144,144M, 145 Cory
Bioengineering	151m Cory
Cryoelectronics	355 Cory
Graphics	544 Soda
High & Low Temp. Plasmas	178A, 188,188A Cory
IC Systems	440 Soda
MBE Labs	147,149 Cory
MEMS, Sensors & Actuators	373 Cory
Microelectronics Fabrication	406 Cory
MOCVD Lab	173 Cory
Multimedia	514 Soda
Networks	420 Soda
Nonlinear Electronics	258M Cory
PC Lab	123 Cory
Plasmas	188A Cory
Power Systems	143 Cory
Quantum Electronics	155,173 197M, 199M Cory
Robotics	333 Cory
Scanning Electron Microscopy	144B Cory
Semiconductors	550 Cory
Solid-State Devices	355,373 Cory
Superconductor Electronics	355 Cory



### ***Computer Facilities***

The department has access to a variety of computer systems for use by EECS classes, professors, researchers and staff. All of the systems are on the Ethernet (provides local networking), and most are linked to the Internet (provides world-wide networking). Individual systems may be maintained by a departmental administrative group or by a research group. Typical systems include large time-sharing systems as well as color workstations sharing file servers. These systems all run the UNIX operating system. They share e-mail, can be reached via modems and have access to the USENET network news service.

EECS operates independently of the Central Computing Services (CCS), but users can buy time on the CCS IBM 3090 and other large systems. There is a grant program to provide access to the CCS Cray X-MP. By special arrangement, computing facilities at the Lawrence Berkeley Lab and the Lawrence Livermore Lab (including several CDC 7600s and a Cray-1) are available for research.

## **11.7 Campus Directory**

The Campus Directory is located at <https://calnet.berkeley.edu/directory/>.

## **11.8 Berkeley International Office (BIO)**

BIO is located at:  
2299 Piedmont Avenue (at International House)  
UC Berkeley  
Berkeley CA 94720-2321  
(510) 642-2818  
[InternationalOffice@berkeley.edu](mailto:InternationalOffice@berkeley.edu)

Hours:  
Monday through Friday,  
9-12 and 1-4 p.m.

More information can be found at: <http://internationaloffice.berkeley.edu/>.

## **11.9 Key Administrative Offices**

### ***EECS Department***

215 Cory Hall	EECS Vice-Chairman, Graduate Matters	2-3694
205 Cory Hall	EECS Center for Student Affairs Directory	2-3694
205 Cory Hall	EECS Center for Student Affairs	3-3068
205 Cory Hall	EE Graduate Assistant	3-8347
205 Cory Hall	EECS Graduate Fellowships	2-6285

205 Cory Hall	EE Course Scheduling & Room Reservations	2-1786
205 Cory Hall	EE GSI Assignments	2-9265

***CS Division***

387 Soda Hall	CS Division Administrative Office	2-1042
393 Soda Hall	CS Division Building Manager	3-6619
383 Soda Hall	CS Division Management Services Officer	3-6688
325 Soda Hall	Infrastructure Development & Support Grp	2-0267
449 Soda Hall	CS Division Graduate Assistant	2-9413
379 Soda Hall	CS Course Scheduling & Info	3-6002
339 Soda Hall	CS GSI Assignments	2-9044
395 Soda Hall	CS Faculty Mailboxes	
396 Soda Hall	CS Graduate Student Lecturer & Staff Mailboxes	

***University Offices***

318 Sproul Hall	Graduate Division – Degrees	2-7330
318 Sproul Hall	Fellowships	2-0672
309 Sproul Hall	Admissions	2-7405
120 Sproul Hall	Registrar	2-0200
123 Sproul Hall	Transcripts	2-4721
201 Sproul Hall	Financial Aid	2-0485
140 Univ. Hall	Cashier	3-9803

Emergencies 911 or 2-3333

***Instructional Laboratories***

EECS 100	Electronic Techniques for Engineering	143 Cory
EECS 117	Electromagnetic Fields and Waves	143 Cory
EECS 125	Robotics	127 Cory
EECS 128	Feedback Control, Robotics	127 Cory
EECS 140	Analog Integrated Circuits	353 Cory
EECS 141	Digital Integrated Circuits	353 Cory
EECS 143	Processing & Design of IC's	218 Cory
EECS 145L	Introductory Electronic Transducer	143 Cory
EECS 145M	Introductory Microcomputer Interfacing	143 Cory
EECS C149	Spectrum Analysis Lab	140 Cory
EECS 217	Microwave & Optical Distrib. Netwks.	123 Cory
EECS 244	Computer-Aided Analysis & Design of IC's	119 Cory
CS 150	Digital Design Laboratory	123 Cory
CS 154	Hardware/Software Microprocessor Lab	140 Cory

## 11.10 Getting Around Campus

### *Campus Shuttles*

Bear Transit is UC Berkeley's shuttle system, servicing the campus and vicinity. Anyone can ride our shuttles, which provide convenient transportation between campus, Downtown Berkeley BART, parking lots, Clark Kerr campus, the Hill area, residence halls, Richmond Field Station (RFS), and north and south sides of campus.

On the P, R, C, and Hill Bus Lines, Bear Transit is free to campus affiliates holding a current campus ID, such as the Cal 1 Card. However, on the RFS line, all riders must pay a fare regardless of affiliation. Riders without campus ID must pay a nominal fare on all Bear Transit lines. Bear Transit is operated by the Parking & Transportation Department. For more information, and to find out how to obtain a pass, please see <http://pt.berkeley.edu/around>.

### *Bear Walk (Night Escort) Service*

Uniformed, radio-equipped and trained student employees of UCPD, Community Service Officers (CSOs) provide a walking escort in conjunction with the Night Safety Shuttle to nearby residences, public transportation or parking facilities during the evening hours. This service is available to all and is proven to make a difference in your safety. Program boundaries are:

Cedar (N)  
Prospect/Highland Place (E)  
Parker (S)  
Shattuck (W)

For more information about this and other safety programs provided by our police department, please see:

[http://police.berkeley.edu/programsandservices/campus\\_safety/index.html](http://police.berkeley.edu/programsandservices/campus_safety/index.html).

### *Campus Map*

The campus map can be found at: <http://www.berkeley.edu/map/>.