

Sample Electrical and Computer Engineering (ECE) Program with a Biology Minor

FIRST YEAR	
Fall Semester	Spring Semester
1. WRITING 20/SS-H 1	1. SS-H 1/WRITING 20
2. CHEM 31L, Core Concepts in Chemistry	2. PHYSICS 61L, Mechanics
3. MATH 31, Calculus I	3. MATH 32, Calculus II
4. EGR 53L, Computational Methods in Engineering	4. ECE27L, Fundamentals of ECE
SOPHOMORE YEAR	
Fall Semester	Spring Semester
1. COMPSCI 100E, Program Design & Analysis II	1. ECE 51L, Microelectronic Devices & Circuits
2. ECE 52L, Digital Systems	2. ECE 54L, Signals & Systems
3. MATH 103, Intermediate Calculus	3. MATH 107, Linear Algebra & Differential Equations
4. BIOLOGY 101L, 102L, 144, <i>or</i> 147 <i>but not</i> BIOLOGY 19, AP credit Biology	4. BIOLOGY 26L, Organismal Diversity, <i>or</i> BIOLOGY Elective (see NOTE)
5. PHYSICS 62L, Electricity, Magnetism & Optics	
JUNIOR YEAR	
Fall Semester	Spring Semester
1. ECE 53L, Electromagnetic Fields	1. ECE Elective (see NOTE)
2. ECE Concentration Elective (1)	2. ECE Concentration Elective (2)
3. MATH 108, Ordinary & Partial Differential Equations	3. STA 113, Probability & Statistics <i>or</i> MATH 135, Probability <i>or</i> ECE 255, Probability for ECEs (see NOTE)
4. BIOLOGY Elective (see NOTE)	4. SS-H 3
5. SS-H 2	
SENIOR YEAR	
Fall Semester	Spring Semester
1. ECE Concentration Elective (3)	1. ECE Concentration Elective (4)
2. ECE Elective <i>or</i> Approved ECE Design Elective (see NOTES)	2. Approved ECE Design Elective <i>or</i> ECE Elective (see NOTES)
3. BIOLOGY Elective (see NOTE)	3. BIOLOGY Elective (see NOTE)
4. SS-H 4	4. SS-H 5

NOTES:

- Departmental Requirements for a BIOLOGY minor:** Five courses in Biology, which may include BIOLOGY 101L, 102L, 144, *or* 147 and BIOLOGY 26L (A or B), **but not advanced placement credit (BIOLOGY 19)**. Of these, a minimum of 3 courses must be at the 100 level or above in BIOLOGY. A maximum of one course from approved courses in the basic science departments of the School of

Medicine or from approved courses of a basic biological character in related departments. A maximum of one independent study or tutorial course may be counted toward the five courses. These requirements are reflected in the above sample program. *It is strongly recommended that students discuss their BIOLOGY course selections with the Director of Undergraduate Studies (DUS) in BIOLOGY.*

- **Free Electives:** This sample program does not include any Free Electives (any Duke course counting toward the BSE degree beyond those courses required for the dual major). Free electives, increased flexibility for Study Abroad or for Independent Study could result, for example, from AP credit in mathematics (e. g., MATH 31 and/or 32), from AP credit for SS-H courses (see the SS-H Note below), from additional program overload (5 or more courses in a semester), or from summer courses. Overload is not recommended for the First Year.
- **WRITING 20:** University Writing Program, required in first year.
- **SS-H:** Social Sciences and Humanities, 5 required semester-course electives, appropriately distributed: Choices must cover 3 of 4 Areas of Knowledge (ALP, CZ, FL, SS), must include at least one SS course, and must include at least two courses from a single department (with at least one at the 100 level or above).
- **CHEM 31L:** AP credit CHEM 19 is also acceptable. Students who have successfully completed CHEM 21L need not take CHEM 31L.
- **PHYSICS 61L & 62L:** Matriculating students who have AP credit for PHYSICS 61L (but not 62L) take PHYSICS 62L; those who have AP credit for PHYSICS 61L and 62L take PHYSICS 63L; and international students who have IPCs for GCE A-level physics take PHYSICS 63L *or* 143.
- **STA 113** *is recommended* but students may substitute MATH 135 or ECE 255. If ECE 255 is elected, it may not simultaneously also count as an ECE Concentration Elective, ECE Elective, or Approved Design Elective.
- **BIOLOGY Elective:** Any BIOLOGY course at the 100-level or above, See the **Departmental Requirements for the BIOLOGY minor** NOTE above.
- **ECE Concentration Electives:** Four courses selected from the set approved for the ECE program. Courses must be selected from at least two Concentration Areas, and at least two courses must be from the same Area.
- **ECE Elective:** Any ECE course at the 100 level or above except ECE 148L, which latter may be taken as a Free Elective.
- **Approved Design Elective:** Approved Electrical Engineering Design Elective, required in Senior year (or in Junior year if the student has *senior status*). Currently ECE 123, 135, 154, 164, 251, and 261 are approved. The same course may not be used as a required Concentration Elective, a required ECE Elective, or a required Design Elective.
- **Independent Study:** Accepted for up to two of the Elective ECE Courses and for any of the Free Electives, but not for any other required course in the ECE Program. Up to one course may be in biology (see NOTE on Departmental Requirements).