Sample Electrical & Computer Engineering (ECE) and Biomedical Engineering (BME) Dual Major for Classes 2010 & 2011

[with AP credit for MATH 31 and one SS-H Course]

FIRST YEAR	
Fall Semester	**Spring Semester**
1. CHEM 21L General Chemistry	1. CHEM 22L General Chemistry
2. MATH 32 Calculus II	2. PHYSICS 61L Mechanics
3. EGR 53L Computational Methods in Engineering	3. MATH 103 Intermediate Calculus
4. WRITING 20/SS-H 1	4. SS-H 1/WRITING 20
SOPHOMORE YEAR	
Fall Semester	**Spring Semester**
1. PHYSICS 62L Electricity, Magnetism & Optics	1. ECE 51L Microelectronic Devices & Circuits
2. ECE 27L Fundamentals of ECE	2. ECE 54L Signals & Systems*
3. MATH 107 Linear Algebra & Differential Equations	3. MATH 108 Ordinary & Partial Differential Equations
4. COMPSCI 100E Program Design & Analysis II	4. BME 110L Biomechanics *or* EGR 75 Mechanics of Solids
5. SS-H 2	5. SS-H 3
JUNIOR YEAR	
Fall Semester	**Spring Semester**
1. BME 83L Biomaterials or ME 83L Structure & Properties Solids*	1. ECE 53L Electromagnetic Fields
2. ECE 52L Digital Systems	2. BME 154L Biomedical Electronic Measurements II
3. STA 113 Probability & Statistics	3. ECE Concentration Elective (1)*
4. BIOLOGY 25L Principles of Biology*	4. BME 100L Modeling Cellular & Molecular Systems
SENIOR YEAR	
Fall Semester	**Spring Semester**
1. ECE Concentration Elective (2)*	1. ECE Elective*
2. One of the BME Design Courses {236L, 261L, *or* 264L} *or* BME Elective*	2. BME Elective* *or* one of the BME Design Courses {236L, 261L, *or* 264L}
3. SS-H 4	3. BME Elective*
4. BME 101L Electrobiology	4. Life Science Elective*

*** See NOTES for explanation.**

NOTES:

- **Chemistry:** All BME majors are required to take two chemistry courses. Students who receive and accept AP credit (CHEM 19) for chemistry must take a second course, typically CHEM 22L or CHEM 23L, and, if planning to attend medical school, the two courses CHEM 151L and CHEM 152L, these latter usually in sophomore or junior year.
- **WRITING 20:** University Writing Program, required in the first year.
- **SS-H (Social Sciences and Humanities):** Five SS-H semester-course

electives, appropriately distributed, are required. The illustrated sample program assumes that one of the required SS-H courses is covered by an AP credit.

- **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.
- **BIOLOGY 25L:** Students may **not** substitute BIOLOGY 147 for BIOLOGY 25L in this dual major, but AP credit BIOLOGY 29 is acceptable.
- **ECE 54L:** Students who successfully completed BME 171 in Spring 2006 or earlier need not take ECE 54L.
- **ME 83L:** If ME 83L is elected, EGR 75 or BME 110 should be taken first (prerequisite).
- **Life Science Elective:** Semester course selected from approved list of Life Science Electives in the current edition of BME Undergraduate Program Handbook.
- **Pre-Med Students:** Students planning to attend medical school should consult with the Duke Office of Health Professions Advising about course planning. Premeds will need to take CHEM 151 and 152, normally during sophomore or junior year. Fitting these courses into the schedule may require an overload or summer school.
- **ECE Concentration Electives:** Two courses from the same Concentration Area from the set of approved concentration courses for the ECE program. (The three required courses BME 100L, 100L and 154L together are considered to be two ECE Concentration Electives in a special biomedical ECE Concentration and a special ECE Elective course, a fact already reflected in the sample program. The total program meets all ECE Program Requirements.)
- **ECE Elective:** Any ECE course at the 100 level or above except ECE 148L, which latter course may be taken as a general Elective.
- **BME Elective:** At least one BME Elective must be at the 200 level. The program must also include at least one of the BME-ECE Design Electives BME 236L, 261L, or 264L, here shown in either the Fall or Spring semester.
- **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. Independent Study and Undergraduate Research are encouraged for qualified students, and required for Graduation with Departmental Distinction, but may require overload or summer study to fit into the above dual-major program.