# Computer Engineering BS Degree
# Curriculum Chart 2012-2013

## Math

- MATH 19A Calculus
- MATH 19B Calculus
- AMS 10* Math Methods for Engineers I
  **OR**
  MATH 21 Linear Algebra
- AMS 20 Math Methods for Engineers II
- MATH 23A Multivariable Calculus
- EE 103 Signals & Systems
- CMPE 16 Discrete Math
- CMPE 107 Stochastic

## Core Courses

- CMPE 13/L* Computer Sys. & C Prog.
  **OR**
  CMPS 12A/L† Intro to Programming
- CMPS 12B/M Data Structures
- CMPS 101 Abstract Data Types & Algorithms
- CMPE 12/L Computer Systems & Assembly Language
- CMPE 100/L Logic Design
- CMPE 110 Computer Architecture
- CMPE 121/L Micro Systems
- EE 101/L Electronics
- CMPE 185# Tech Writing
- CE 80E Engineering Ethics (or other approved Ethics course)

## Science

- PHYS 5A/L Mechanics
- PHYS 5B/M Waves
  **OR**
  CMPE 9 Statics, Dynamics, and Biomechanics (recommended for Robotics and Control concentration)
- PHYS 5C/N Electricity & Magnetism

## Concentrations (choose one)

### Systems Programming

- CMPS 111 OS
- CMPS 115 Software Methodology
- CMPE 150/L Intro to Computer Networks
- **One of the following:**
  - CMPS 104A Compilers
  - CMPE 113 Parallel Programming
  - CMPE 156/L Network Programming
- Elective: Upper Division or graduate elective from Approved List

### Robotics and Control

- **Any two of the following:**
  - CMPE 118/L, Mechatronics/Lab
  - CMPE 167/L, Sensing & Sensor Technologies/Lab
  - EE 154, Feedback Control Systems
- **Third course from above or any one of the following:**
  - CMPE 153, Digital Signal Processing
  - AMS 114, Dynamical Systems
  - CMPE 215, Models of Robotic Manipulation
  - CMPE 240, Intro to Linear Dynamical Systems
  - CMPE 264 Image Analysis & Computer Vision
  - CMPE 242, Feedback Control
- Elective: Upper Division or graduate elective from Approved List

### Computer Systems

- CMPS 111 OS
- CMPE 125/L Logic Design w/ Verilog
- CMPS 109 Advanced Programming
  **OR**
  CMPS 115 Software Methodology
- Elective: Upper Division or graduate elective from Approved List

### Networks

- CMPE 150/L Networks
- CMPE 156/L Network Programming
- CMPS 111 OS
- CMPE 151/L Network Administration
  **OR**
  Upper division or graduate elective from Approved List

### Digital Hardware

- CMPE 125/L Logic Design w/ Verilog
- EE 171/L Analog Electronics
- **One of the following:**
  - CMPE 122 Intro VLSI
  - CMPE 222 Advanced VLSI
  - CMPE 173/L High Speed
- Elective: Upper Division or graduate elective from Approved List

## Capstone (choose one)

- CMPE 123A and 123B CE Design Project I & II
- CMPE 129A, 129B and 129C Capstone Project I, II & III
- CMPE 123A CE Design Project I
  **OR**
  CMPE 129A Capstone Project I:
  CMPE 195 Senior Thesis
  Submission of approved thesis

## Exit Requirements:

- Portfolio (www.ce.ucsc.edu/portfolio)
- Exit survey
- Exit interview

* Preferred
† May substitute with CMPS 5J AND CMPS 11
# Satisfies the DC requirement

COMPUTER ENGINEERING BS
DEGREE CURRICULUM

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| Fall _____ | Winter _____ | Spring _____ | Summer _____ |
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| Fall _____ | Winter _____ | Spring _____ | Summer _____ |
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**Approved List of Upper Division Electives**

AMS 147 Computational Methods and Applications
CMPE 108 Data Compression
CMPE 112 Computer and Game Console Architecture
CMPE 113 Parallel Programming
CMPE 118/L Intro to Mechatronics
CMPE 125/L Logic Design with Verilog
CMPE 131 Human-Computer Interaction
CMPE 150/L Intro. to Computer Networks
CMPE 151 Network Administration
CMPE 156/L Network Programming
CMPE 167/L Sensor and Sensor Technologies
CMPE 173/L High Speed Digital Design
CMPE 177 Applied graph Theory/Algor.
CMPS 102 Analysis of Algorithms
CMPS 104A Compiler Design I
CMPS 104B Compiler Design II
CMPS 109 Advanced Programming
CMPS 111 Operating Systems
CMPS 112 Comparative Prog. Langs.
CMPS 115 Software Methodology
CMPS 116 Software Design Project
CMPS 122 Computer Security
CMPS 129 Data Storage Systems
CMPS 130 Computational Models
CMPS 132 Computability and Complexity
CMPS 140 Artificial Intelligence
CMPS 142 Machine Learning and Data Mining
CMPS 146 Game AI
CMPS 160/L Computer Graphics
CMPS 161/L Visualization & Computer Animation
CMPS 164/L Game Engines and Game Engines Lab
CMPS 180 Database Systems
CMPS 181 Database Systems II
CMPS 183 Hypermedia and the Web
CMPS 190X Methods of Cryptography
EE 130/L Optoelectronics & Photonics
EE 135/L Electro. Fields and Waves
EE 136 Engr. Electromagnetics
EE 145/L Properties of Materials
EE 151 Communications Systems
EE 152 Introduction to Wireless Communications
EE 153 Signal Processing
EE 154 Feedback Control Systems
EE 171/L Analog Electronics
EE 172 Advanced Analog Circuits
EE 175/L Energy Generation and Control
TIM 206 Optimization Theory and Appl.

**Or Any 5-Credit CS, CE, or EE Graduate Course**: At most, one elective may be substituted by an upper-division individual or field study (CMPE, CMPS, EE 193 or 198) with approval.

**Approved List of Ethics Courses**: CMPE 80E Engineering Ethics; PHIL 22 Intro to Ethical Theory: Contemporary Moral Issues; PHIL 24 Intro to Contemporary Ethics; PHIL 28 Environmental Ethics; BME 80G/PHIL80G/CHEM80G Bioethics in the 21st Century: Science, Business, and Society.

☐ I have discussed the BS/MS program with my advisor.

**STUDENT'S NAME:**_____ **FACULTY ADVISOR:**_____

**STAFF ADVISOR:**_____

**Watch for CEFULs: CE Faculty-Undergraduate Lunches, regularly scheduled throughout the year, CE's free lunch program**