### INTRODUCTORY REQUIREMENTS

**Calculus:**  MATH 19A (FWS) ___ + 19B (FWS) ___

**Linear Algebra:**  MATH 21 (FWS) ___

**Vector Calculus:**  MATH 23A (FWS) ___ + MATH 23B (FWS) ___

**Ordinary Differential Equations:**  Math 24 (S) ___

### ADVANCED REQUIREMENTS

**Math:**  MATH 100 Introduction to Proof and Problem Solving (FWS) ___

**Differential Equations:**  ONE from the following...

- Math 106 Systems of Ordinary Differential Equations (W) ___
- Math 107 Partial Differential Equations (*) ___

**Analysis:**  ONE from the following...

- MATH 103A Complex Analysis (WS) ___
- MATH 105A Real Analysis (FW) ___

**Computational:**  ONE from the following...

- Math 106 Systems of Ordinary Differential Equations (S) ___
- MATH 145/L Introduction to Chaos Theory (*) ___
  
  (cannot receive credit for both MATH 145 and AMS 114)
- AMS 114 Introduction to Dynamical Systems (formerly AMS 146) (W) ___
  
  (cannot receive credit for both AMS 114 and MATH 145)

**Electives:**  TWO from the following...

- Any AMS course numbered 100 and above ___
- BME 110 Computational Biology Tools (FW) ___
- CMPE 107 Mathematical Methods of Systems Analysis Stochastic (WS) ___
- CMPE 108 Data Compression (*) ___
- CMPE 153 Digital Signal Processing (S) ___
- CMPE 177 Applied Graph Theory and Algorithms (*) ___
- CMPS 101 Algorithms and Abstract Data Types (FWS) ___
- CMPS 102 Introduction to Analysis of Algorithms (WS) ___
- CMPS 104A Fundamental of Compiler Design I (FS) ___
- CMPS 109 Advanced Programming (WS) ___
- CMPS 112 Comparative Programming Languages (FW) ___
- CMPS 122 Computer Security (F) ___
- CMPS 130 Computational Models (FS) ___
- CMPS 132 Computability & Computational Complexity (*) ___
- CMPS 142 Machine Learning and Data Mining (W) ___
- EART 172 Geophysical Fluid Dynamics (S) ___
- ECON 113 Introduction to Econometrics (FWS) ___
- EE 103 Signals and Systems (FS) ___
- EE 130 Introduction to Optoelectronics and Photonics (F) ___
- EE 135/L Electromagnetic Fields and Waves Laboratory (W) ___
- EE 151 Communications Systems (W) ___
- EE 154 Feedback Control Systems (F) ___
- PHYS 115 Computational Physics (S) ___

### DISCIPLINARY COMMUNICATION REQUIREMENT

Satisfied by the successful completion of MATH 100 and 194 or 195.

**NOTE:** This requirement MUST be completed at UCSC.

### COMPREHENSIVE REQUIREMENT

- MATH 194 Senior Seminar (WS) ___ OR MATH 195 Senior Thesis (IS) ___