

Computer Engineering

Proposed Changes for 2002-2004
and beyond

The Committee

- Committee Membership – Adnan Aziz, Yale Patt, Dewayne Perry, Nur Touba and Craig Chase
- Charter – Recommend Changes to the CE Curriculum.

Problems To Address

- Too many required courses, too few electives.
- Ineffective programming sequence.
- No (credible) area option for Software Engineering.

Software Engineering Curriculum

- Software Engineering is an important field of study and should be given thorough treatment within the departmental curriculum.
- A new committee should be formed to recommend a SE curriculum.
- In the interim, SE will be addressed as a specialty within the CE curriculum.

Basic Science and Math

- Math and Physics are essential for Engineering, including Computer Engineering.
 - One full year of calculus, one semester of discrete mathematics.
 - One full year of physics, including statics, electrostatics and electromagnetism.
- No *direct* justification for chemistry and differential equations.

Core Engineering

- Freshmen courses
 - Intro to EE (EE302) and Intro to CE (EE306)
- Circuits, Signals and Systems are essential.
 - EE411, EE313, EE438.
- Probability and Statistics
 - EE351K

Programming Sequence

- We Need a Philosophical Shift
 - Teach underlying technology
 - “Bottom-Up” approach, analysis (and experience) before design.
- EE306 – Basic Principles of Computation
- EE312 – Basic Principles of Programming
- EE322 – Programming with Abstraction

How Does EE312 Change?

- Course content should emphasize how things work at the machine level (not on an abstract mathematical level).
 - Memory management and parameter passing.
- Students should learn to debug/analyze programs.
- Internalizing is the key to understanding, Understanding is the key to retention.

How Does EE360C Change?

- EE360C serves two masters
 - Teaching C++
 - Data structures and analysis of algorithms.
- EE322 Would address teaching C++
 - Common algorithms and data structures would be covered (e.g., C++ STL).
- EE360C Would be elective and advanced.

Computer Design Sequence

- Improve a good thing.
- EE306 – Basic Principles of Computation
- EE316 – Digital Design
- EE319K – Introduction to Microcontrollers
- EE345L – Microcontroller Applications and Computer Organization

Changes to the Major Sequence

- Eliminate 4 EE courses (325, 321, 338K, 339) and Modern Physics (PHY355).
- Make 360P and 360N area courses (not required).
- Require EE345L as substitute for EE321K
- Require two areas (six courses). EE345L is not an area course.
- Add a laboratory to EE338 (becomes 448).

Technical Areas

- Students must choose at least one CE area, and one (either CE or EE) other area.
- Areas are defined by the area committee.
 - Computer Design (360N, 345M + one more)
 - VLSI Design (339, 360S, 360R)
 - Software Development (360P, 360C, 360F)
 - Software Systems (Databases, Compilers, Networking)

Curriculum Changes Summary

- Total of 123 credit hours (down from 128)
- Two technical electives (up from one)
- Students must choose two technical areas (EE345L advanced lab is not an area course).

Differences With Proposed EE

- First two years virtually identical
 - EE316 (CE) instead of EE325 (EE)
 - M325K (CE) instead of M340L(EE)
- CE requires EE316 and EE345L, EE requires EE325, EE339 and EE362K
- EE requires EE366, CE requires an “Engineering Science Elective”.
- EE has 1 free, 2 tech electives, CE has 2 free and 2 tech electives.