Career Builder, Arbiter of Curriculum and Pedagogy

An approach by Professor Burger, Department of ECE

- Old-style Engineer works with hands, does heavy lifting
  - * Operates and maintains Steam Engine Locomotive
- Modern ECE works with the unseen
  - * Exponential growth in technology and knowledge
  - * Has major impact on society (Cell Phones, PCs, DVDs)
  - * High tech can go from rags to riches

- Faculty must know what is important

* Analyze want ads in Web Databases, Newspapers, and Magazines
  - * Go nationwide, if not worldwide
  - * Study reports on manpower needs
  - * Stay up to date

- Communicate findings to students
  - * What do you want?
    - * Avoid Physical Labor?
    - * Private office?
    - * Modern equipment?
    - * Expense account?
    - * Professional future?
    - * Improve society?
  - * What is possible

* What expertise will you contribute?
* For example, circuit design

CURRICULUM (Data # openings at a point in August 04)

- Analysis dictates Circuits specialties to be included

Circuit Design 871
Digital Circuit Design 314
HDL 26
DSP 207
Analog Circuit Design 312
ASIC 138
VLSI 35
RF Circuit Design 172
Microwave Circuit Design 51
RFIC 25

- Analysis suggests technology examples required in a each area

*Bipolar Circuit Design 13
*CMOS Circuit Design 72

PEDAGOGY

- Job listings send important messages:
    - * Individuals required. Be wary of group work
    - * Expertise required. Do not teach the superficial
    - * Ability to communicate not a big factor
    - * Engineers and engineering technicians do not mix in the want ads
        - * Engineers need brainpower

- Details tell you things of importance
    - * Knowledge areas quite extensive; depth desired
    - * Creativity is frequently requested. Cookbook engineering out
    - * Formal degree required
    - * Work experience required
    - * Modern tools required

CONCLUSIONS

Curriculum

- Cover only career-relevant topics, weighted accordingly.
- Integrate computers heavily

Pedagogy

- Instructor must be enthusiastic.
- Cover and test as much as possible; cannot waste time
- Force involvement via frequent quizzes; demand meaningful achievement

Constantly Remind Students

- of the importance of individual work
- of the need for meaningful (lab) experience
- of the need for knowledge relating to their specialties and goals
- of the need to use their heads more than their hands
- of the need for a degree