# BSEE and BS Comp. Eng. Degrees: Ideas for the 2002-2004 Catalog


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*On Behalf of the BSEE Curriculum Committee*

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# Motivations to Pursue BSEE

- Early 1980s: home computers, MTV, voiceband data modems, bulletin boards
- Late 1980s: PCs, analog cell phones, audio CD players, bulletin boards
- Early 1990s: laptops, digital cell phones, video CDs, Internet browsing
- Late 1990s: palm pilots, Internet cell phones, DVD players, MP3 players, ADSL and cable modems, Internet multimedia

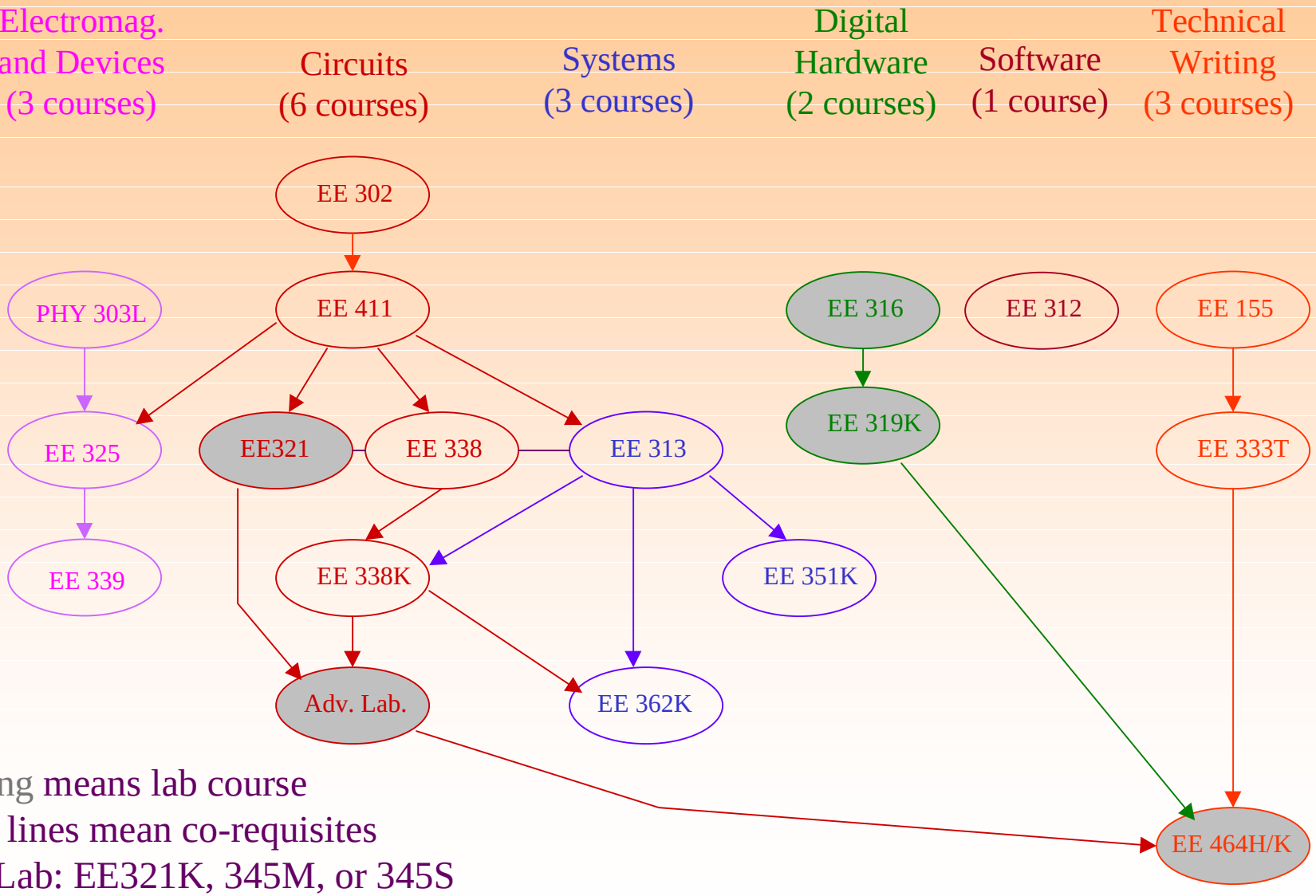
# Trends in Consumer Electronics

- Increasing amount of communications, signal processing, networking capabilities
- Increasingly digital: software has larger role
- Analog, RF, and optical subsystems needed to interface systems to physical world
- Devices and semiconductor manufacturing
  - Shrinking area, volume & power consumption
  - Exponential increase in processor speeds

# Dressed for Success Tomorrow

- Mastery of "hard" skills
  - Fundamentals of mathematics, physics, *biology*
  - Theory and practice of electromagnetics, devices, circuits, systems, software, *networking*
  - *Design principles, abstraction, and complexity*
- Mastery of "soft" skills
  - Oral and written engineering communication
  - Business practice of marketing, budgeting, product development, and ethics

# 1998-2000 BSEE Degree




- Shading means lab course
- Black lines mean co-requisites
- Adv. Lab: EE321K, 345M, or 345S

# 1998-2000 BSEE Curriculum

| *Topic* | *Percentage* | *Credit Hours* | *Courses* |
|---|---|---|---|
| ***analog circuits/systems*** | 40% | 24.3 | 3/5 EE302 + 2/3 EE313 + EE411 + 1/2 EE321 + EE321K + EE338 + EE338K + EE351K + EE362K |
| ***specialization*** | 18% | 11.0 | 1/2 EE464H/K + 3 tech. area electives |
| ***analog devices/ electromagnetics*** | 10% | 6.0 | EE325 + EE339 |
| ***technical communication*** | 9% | 5.6 | EE155 + EE333T + 4/10 EE464H/K |
| ***digital logic/microprocessors*** | 8% | 5.0 | 1/6 EE302 + EE316 + 1/2 EE319K |
| ***programming*** | 8% | 4.5 | EE312 + 1/2 EE319K |
| ***discrete-time processing/ data acquisition*** | 4% | 2.5 | 1/3 EE313 + 1/2 EE321 |
| ***business practice*** | 2% | 1.1 | 0.2333 EE302 (ethics) + 1/10 EE464H/K (ethics) |
| **Total** | 100% | 60.0 | |

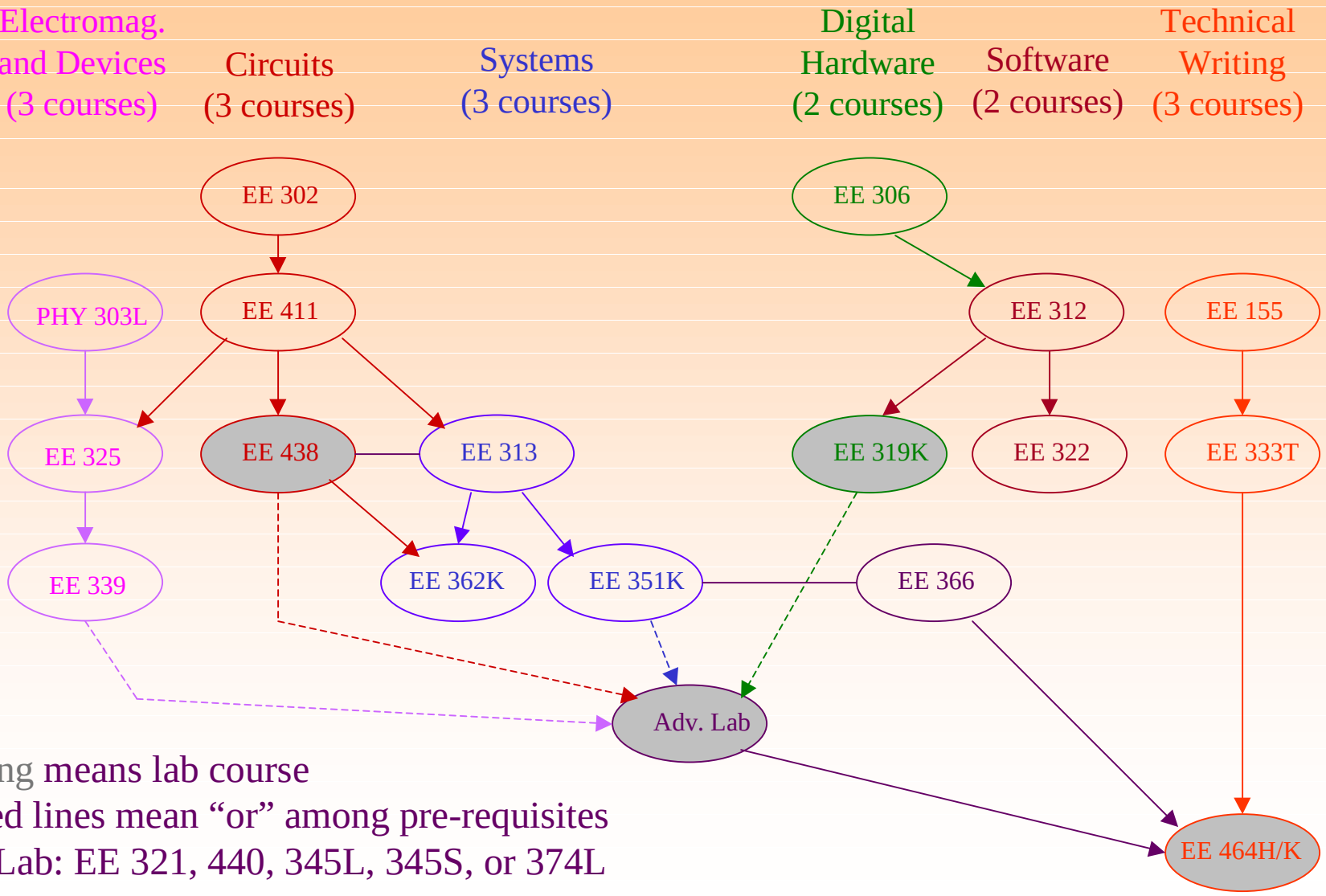
Required EE courses: 51 hours

Technical area electives: 9 hours

Hard skills: 53.3 hours

Soft skills: 6.7 hours

# Possible 2002-2004 BSEE Degree




- Shading means lab course
- Dashed lines mean “or” among pre-requisites
- Adv. Lab: EE 321, 440, 345L, 345S, or 374L

# Possible 2002-2004 Curriculum

| *Topic* | *Percentage* | *Credit Hours* | *Formula* |
|---|---|---|---|
| ***specialization*** | 30% | 20.0 | Advanced Lab + 1/2 EE464H/K + 5 technical area electives |
| ***analog circuits/systems*** | 24% | 16.5 | 1/2 EE302 + 2/3 EE313 + EE411 + 3/4 EE438 + EE351K + EE362K |
| ***digital logic/ microprocessors*** | 10% | 6.5 | 1/6 EE302 + EE306 + EE319K |
| ***programming*** | 9% | 6.0 | EE312 + EE322 |
| ***analog devices/ electromagnetics*** | 9% | 6.0 | EE325 + EE339 |
| ***technical communication*** | 8% | 5.6 | EE155 + EE333T + 4/10 EE464H/K |
| ***business practice*** | 6% | 3.9 | 0.2333 EE302 (ethics) + 1/10 EE464H/K (ethics) + EE366 (economics) |
| ***discrete-time processing/ data acquisition*** | 4% | 2.5 | 1/6 EE302 + 1/3 EE313 + 1/4 EE438 |
| **Total** | 100% | 67.0 | |

Required EE courses: 49 hours
Technical area electives: 18 hours

Hard skills: 57.5 hours
Soft skills: 9.5 hours

# 2002-2004 BSEE Curriculum

| *Topic* | *1998-2000 Credit Hours* | *2002-2004 Credit Hours* |
|---|---|---|
| ***specialization*** | 11.0 | 20.0 |
| ***analog circuits/systems*** | 24.3 | 16.5 |
| ***digital logic/ microprocessors*** | 5.6 | 6.5 |
| ***programming*** | 4.5 | 6.0 |
| ***analog devices/ electromagnetics*** | 6.0 | 6.0 |
| ***technical communication*** | 5.6 | 5.6 |
| ***business practice*** | 1.1 | 3.9 |
| ***discrete-time processing/ data acquisition*** | 2.5 | 2.5 |
| **Total** | 60.0 | 67.0 |

Changes are shown in yellow

# More Choices, Faster Finish

- Students can now choose 2 technical areas
  - BSEE students could only choose one before
  - BS Comp. Eng. students used to have no choice
- More technical areas (15 instead of 12)
- 5 choices instead of 3 for advanced lab
- Students can graduate faster
  - Total credit hours reduced from 128 to 125
  - Transfer students can finish in two years

# Advanced Laboratory Course

- Prepare a student for Senior Design Project while leveraging student's technical area:
  - EE321 Electrical Engineering Lab I
  - EE440 Microelectronics Fabrication Tech.
  - EE345L Microprocessor Interfacing Lab
  - EE345S Real-Time Digital Sig. Proc. Lab *OR*
  - EE374L Applications of Biomedical Eng.
- May be counted as technical area elective

# Tech Areas: EE Emphasis

- Biomedical Engineering
- Communications and Networking
- Electromagnetic Engineering
- Electronics
- Electronic Materials and Devices
- Management and Production
- Power Systems and Energy Conversion
- Premedical
- Robotics and Controls
- Signal and Image Processing

# Tech Areas: Comp. Eng. Emphasis

- Computer Design
- Embedded Systems
- Software Development
- System Software
- VLSI Design