



Summary of Faculty and Student Discussions for the BSEE Curriculum for the 2002-2004 Catalog

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On Behalf of the BSEE Curriculum Committee

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<http://www.ece.utexas.edu/~bevans/eereform/>



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

Top Occupations for BSEEs

- 346,000 high-tech jobs unfilled in US
[Semiconductor Industry Association]
- 25,000 - 30,000 BS EE & BS Comp. Eng. graduate each year in US
- Top occupations
[The College Majors Handbook]

Electrical and electronics eng.	44.1
Mid-level Managers, executives	12.9
Computer Eng.	10.0
Other Misc. Eng.	4.3
Other Management	2.6
Marketing & sales	1.9
Other	5.4



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

Electromag.
and Devices
(3 courses)

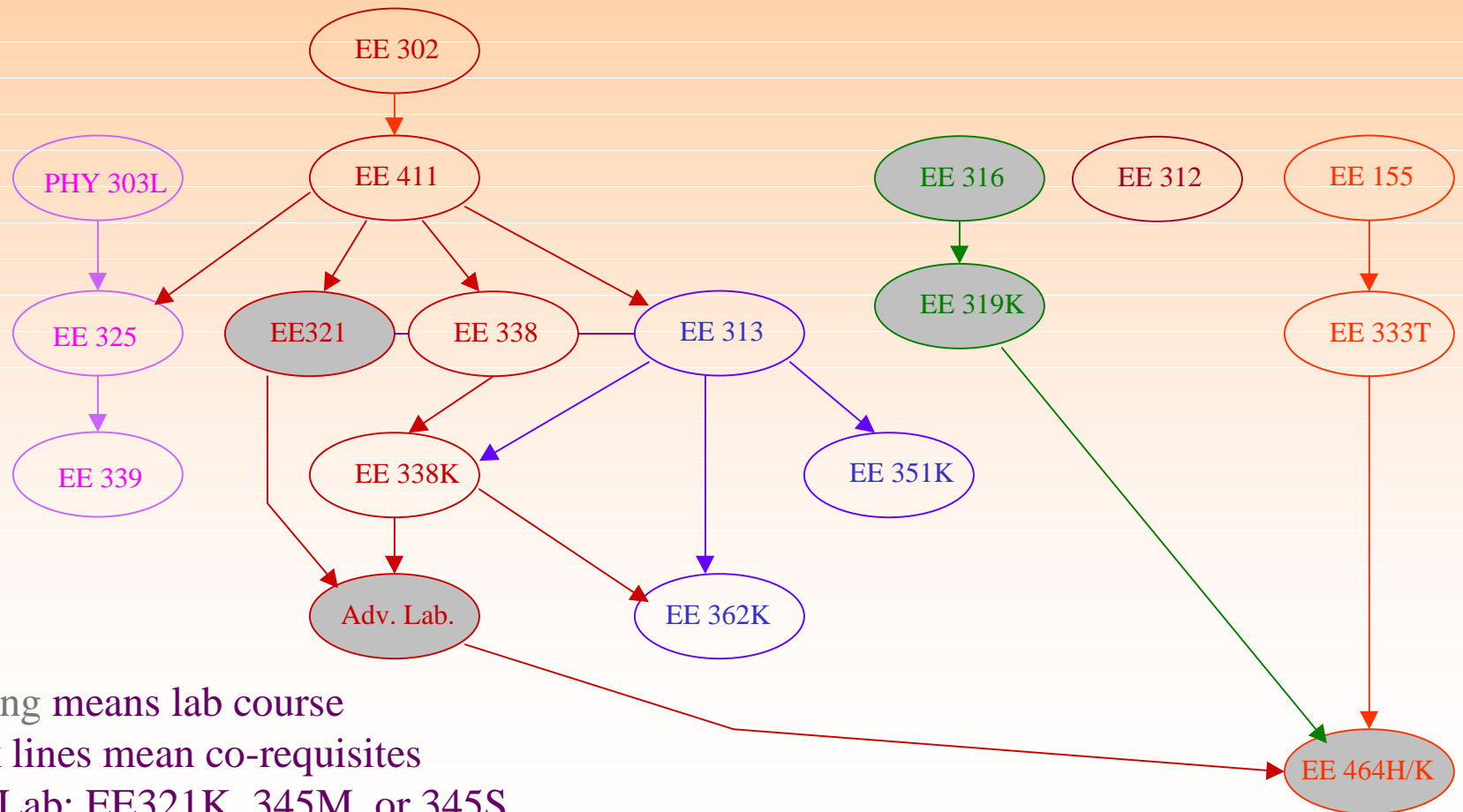
Circuits
(6 courses)

Systems
(3 courses)

Digital
Hardware
(2 courses)

Software
(1 course)

Technical
Writing
(3 courses)



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

1998-2000 BSEE Curriculum

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

Electromag.
and Devices
(3 courses)

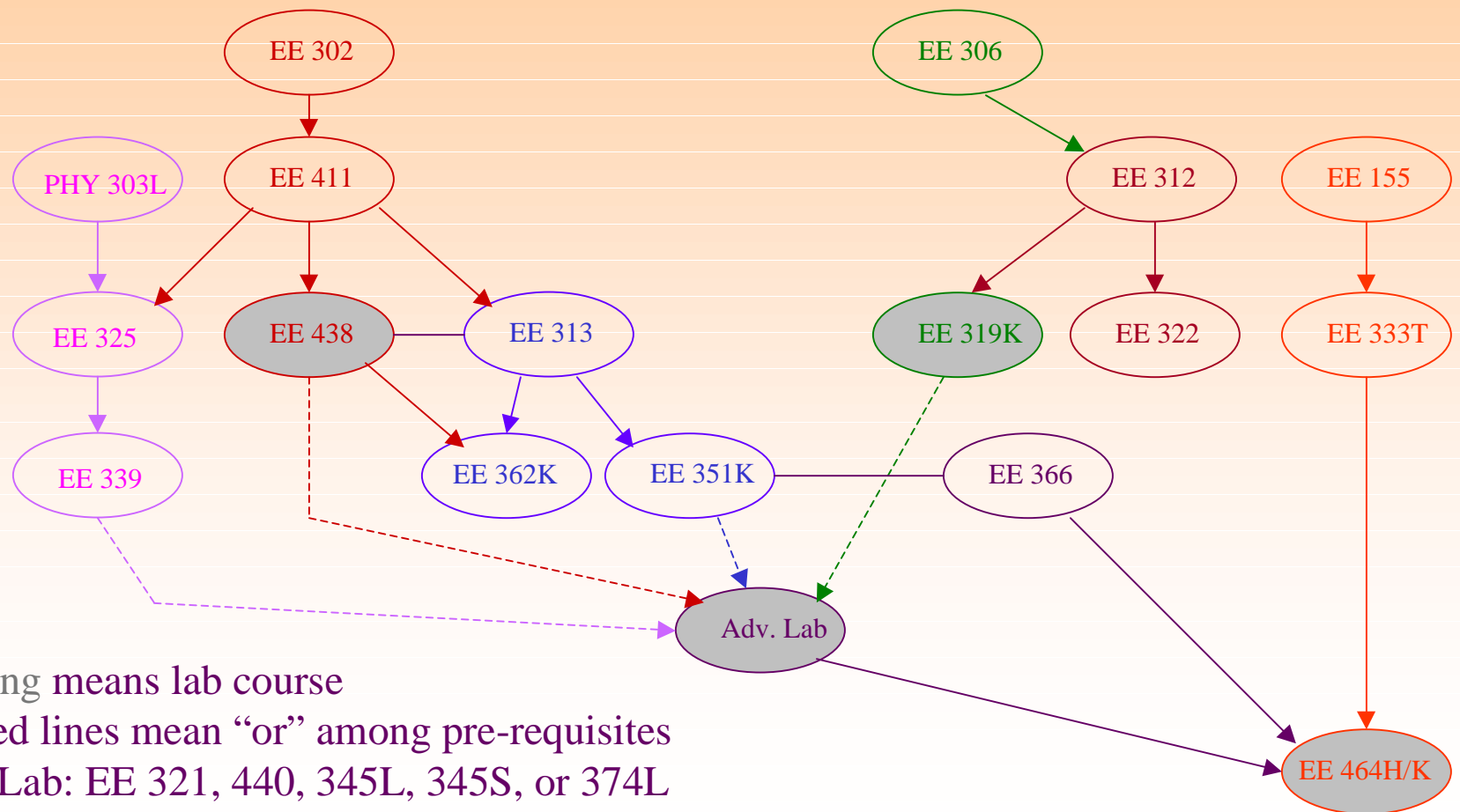
Circuits
(3 courses)

Systems
(3 courses)

Digital
Hardware
(2 courses)

Software
(2 courses)

Technical
Writing
(3 courses)



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

Possible 2002-2004 Curriculum

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

<i>Topic</i>	<i>1998-2000 Credit Hours</i>	<i>2002-2004 Credit Hours</i>
<i>specialization</i>	11.0	20.0
<i>analog circuits/systems</i>	24.3	16.5
<i>digital logic/ microprocessors</i>	5.6	6.5
<i>programming</i>	4.5	6.0
<i>analog devices/ electromagnetics</i>	6.0	6.0
<i>technical communication</i>	5.6	5.6
<i>business practice</i>	1.1	3.9
<i>discrete-time processing/ data acquisition</i>	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)
- Five choices instead of three for advanced laboratory (preparation for senior design)
- Access to electives in junior year



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

Possible Impact of Reform

- Transfer students in 1999-2000
 - 18.9% of new ECE students in 1999-2000
 - 11 fresh., 39 soph., 24 juniors, 12 seniors
- Transfer students could finish in two years if they completed two years elsewhere
- Total number of hours (128 hours now)
 - Possible BSEE degree at 126 hours
 - Possible BS Comp. Eng. degree at 120 hours