

# **Advisement Circus 2008**

**Dr. James J. Whalen**

**EE Director of Undergraduate Studies  
Electrical Engineering**

**March 3 at 10 AM in NSC 220**

**Choice of TE's**

**Dr. Yoon: EE 401 RF & Microwaves**

**Presentations by Faculty Who Teach  
EE Technical Electives**

## Choice of Technical Electives and Free Elective

### **Technical Electives (minimum 21 credits)**

#### **7 Technical Electives (TE's) Required.**

**At least six must be upper division technical electives.**

**No more than one may be a lower division technical elective such as EE 101.**

#### **1 Free Elective (minimum 3 credits)**

## **Two TE's with Significant Design Content**

**At least two of the upper division technical electives must be courses with significant design content from an approved list. The current approved list includes**

**EE 401 RF & Microwave Circuits I**

**EE 410 Electronic Instrument Design**

**EE 413 Communications Electronics**

**EE 425 Electrical Devices**

**EE 449 Analog Integrated Circuit Layout**

**EE 453 Microelectronic Fabrication**

**EE 455 Photonic Devices;**

**EE 456 RF & Microwave Circuits I & II**

**EE 482 Energy Systems & Power Engineering**

**EE 483 Communications Systems I**

**EE 491 Analog Circuits**

**EE 494 Senior Capstone Group Design Project**

**CSE 442 Software Engineering**

**CSE 453 Hardware/Software Integrated Systems Design**

**CSE 493 Introduction to VLSI Electronics**

## **Two Restricted TE's**

**In addition to the two technical electives with significant design content at least two other upper division technical electives must be: EE courses or CSE courses or MAE 340 Systems Analysis or MAE 443 Continuous Control Systems or MAE 444 Digital Control Systems.**

## **Two Unrestricted TE's**

**Two upper division technical electives are unrestricted.**

**Biology**

**Chemistry**

**Computer Science**

**Geology**

**Math**

**Physics**

**EAS**

**SEAS (Chem E, Civil E, Comp E, EE, IE, & MAE)**

## EXAMPLE ELECTIVE SEQUENCES

Examples of technical elective (TE) sequences follow. Each TE elective sequence contains at least two TE's with significant design from the approved list, at least two TE's that are EE, CSE or one or more of the allowed MAE courses, two unrestricted TE's and one free elective. Some of the sequences may have one more course than the minimum necessary for the BSEE degree. These are not the only acceptable sequences. Working with your faculty advisor, you may be able to work out an alternative sequence that meets the requirements for technical electives.

\*The asterisk after the credit hours indicates that the course is on the list of technical electives with significant design content. Two such courses are required.

## 1. **Communications and Signals**

### *Junior Year*

Fall	Hrs	Spring	Hrs.
EE 310 Elec. Dev. & Cir. I	3	EE 311 Elec. Dev. & Cir. II	3
EE 352 Intro to Elec. Lab.	3	EE 353 Elec. Circuits Lab.	3
EE 378 Digital Principles	3	CSE 379 Intro. Microcomp.	3
EE 303 Signal Analysis	4	CSE 380 Microcomp. Lab.	3
Gen Ed	3	EAS 305 Applied Probability	4
<b>Total</b>	<b>16</b>	<b>Total</b>	<b>16</b>

### *Senior Year*

EE 408 Senior Seminar	1		
EE 483 Comm. Systems 1	4*	EE 484 Comm. Sys. II	3
EE 401 RF & Microwave Circuits	3	CSE 489 Mod. Net. Con.	3
EE 324 EM Theory	4	EE 413 Comm. Electronics	4*
EE 489 Lasers & Photonics	4	EE 449 Analog Integrated Circuit Layout or EE 491 Analog Circuits	3*
		Gen. Ed.	3
<b>Total</b>	<b>16</b>	<b>Total</b>	<b>16</b>

Communications and Signals Elective sequence contains 7 TE's and meets the requirements on selection of TE's for the BSEE.

## 2. Digital Electronics and Instrumentation

### *Junior Year*

Fall	Hrs.	Spring	Hrs.
EE 310 Elec. Dev. & Cir. I	3	EE 311 Elec. Dev. & Cir. II	3
EE 352 Intro to Elec. Lab.	3	EE 353 Elec. Circuits Lab.	3
EE 378 Digital Principles	3	CSE 379 Intro. Microcomp.	3
EE 303 Signal Analysis	4	CSE 380 Microcomp. Lab.	3
Gen. Ed.	3	EAS 305 Applied Probability	4
Total	16	Total	16

### *Senior Year*

EE 408 Senior Seminar	1	EE 324 EM Theory	4
EE 410 Elec. Instr. Design	4*	EE 413 Comm. Electronics	4*
EE 419 Industrial Controls	3	CSE 452 VLSI Testing	4
CSE 442 Software Engineering or EE 494 Senior Capstone Group Design Project	3*	CSE 453 Hardware /Software Integrated Systems Design or EE 494 Senior Capstone Design Project: Continuation	3*
CSE493 Intro. VLSI	4*	Gen. Ed.	3
Total	15	Total	18

**Digital Electronics and Instrumentation** Elective sequence contains 7 TE's and meets the requirements on selection of TE's for the BSEE.

### 3. Microelectronics and Photonics

#### *Junior Year*

Fall	Hrs.	Spring	Hrs.
EE 310 Elec. Dev. & Cir. I	3	EE 311 Elec. Dev. & Cir. II	3
EE 352 Intro. to Elec. Lab.	3	EE 353 Elec. Circuits Lab.	3
EE 378 Digital Principles	3	CSE 379 Intro. Microcomp.	3
EE 324 EM Theory	4	CSE 380 Microcomp. Lab.	3
Gen Ed or EE340/EE342 Nanotechnology & Science	3/4	EE 303 Signal Analysis	4
Total	16/17	Total	16

#### *Senior Year*

EE 408 Senior Seminar	1		
EE 401 RF&Microwave Cir I	3	EE 456 RF&Microwave Cir II	3*
EE 448 Micro. Devices	3	EE 449 Analog Integrated Circuit Layout or EE 491 Analog Circuits	3*
EE 455 Photonic Devices	3*	EE 424 Intro to Nanoelectronics	3
EE 489 Lasers & Photonics or EE340/EE342 Nanotechnology & Science	4	EE 490 Consumer Optoele.	4
EAS 305 Applied Probability	4	Gen. Ed.	3
Total	18	Total	16

**Microelectronics and Photonics** Elective sequence contains 8 TE's and meets the requirements on selection of TE's for the BSEE. Those students who will pursue a Master's degree in EE at UB may take the graduate version of one of the courses listed and count that course toward their graduate degree.

## 4. Energy Systems

### *Junior Year*

Fall	Hrs.	Spring	Hrs.
EE 310 Elec. Dev. & Cir. I	3	EE 311 Elec. Dev. & Cir. II	3
<u>EE 352 Intro. to Elec. Lab.</u>	3	EE 353 Elec. Circuits Lab.	3
EE 378 Digital Principles	3	CSE 379 Intro. Microcomp.	3
EE 324 EM Theory	4	CSE 380 Microcomp. Lab.	3
Gen. Ed.	3	EE 303 Signal Analysis	4
Total	16	Total	16

### *Senior Year*

EE 408 Senior Seminar	1		
EAS 305 Applied Prob.	4	EE 494 Senior Capstone Group Design Project	3*
EE 403 Intro. Plasma Proc.	3	EE 425 Electrical Devices	4*
EE 419 Industrial Controls	3	EE 465 Current Research Topics Pulse Power Applications	4
EE 429 Intro to EMC	3		
EE 460 Current Research Power Modulator Applications	4	EE 476 High Voltage Eng.	3
EE 482 Power Engineering I	4*	Gen. Ed.	3
Total	18	Total	17

**Energy Systems** Elective sequence contains 9 TE's and meets the requirements on selection of TE's for the BSEE. Those students who will pursue a Master's degree in EE at UB may take the graduate version of two of the courses listed and count those courses toward their graduate degree.

## 5 RF/Microwave and Communications Electronics

### *Junior Year*

Fall	Hrs	Spring	Hrs.
EE 310 Elec. Dev. & Circuits I	3	EE 311 Elec. Dev. & Cir. II	3
EE 352 Intro. to Elec. Lab.	3	EE 353 Elec. Circuits Lab.	3
EE 378 Digital Principles	3	CSE 379 Intro. Microcomp.	3
EE 324 EM Theory	4	CSE 380 Microcomp. Lab.	3
Gen. Ed.	3	EE 303 Signal Analysis	4
Total	16	Total	16

### *Senior Year*

EE 408 Senior Seminar	1		
EAS 305 Applied Probability	4	EE 413 Communications Electronics	4*
EE 401 RF&Microwave Cir I	3	EE 456 RF&Microwave Cir II	3*
EE 458 RF/Microwave Lab	3	Gen. Ed.	3
EE 483 Comm. Sys. I	4*	EE 484 Comm. Sys. II	3
EE 494 Senior Capstone Group Design Project	3*	EE 449 Analog Integrated Circuit Layout or EE 491 Analog Circuits	3*
Total	18	Total	16

**RF/Microwave and Communications Electronics** Elective sequence contains 8 TE's and meets the requirements on selection of TE's for the BSEE. Those students who will pursue a Master's degree in EE at UB may take the graduate version of

one of the courses listed and count that course toward their graduate degree.

## 6 Analog & Digital Electronics & Instrumentation

### *Junior Year*

Fall	Hrs.	Spring	Hrs.
EE 310 Elec. Dev. & Circuits I	3	EE 311 Elec. Dev. & Cir. II	3
EE 352 Intro. to Elec. Lab.	3	EE 353 Elec. Circuits Lab.	3
EE 378 Digital Principles	3	CSE 379 Intro. Microcomp.	3
EE 324 EM Theory	4	CSE 380 Microcomp. Lab.	3
Gen. Ed.	3	EE 303 Signal Analysis	4
Total	16	Total	16

### *Senior Year*

EE 408 Senior Seminar	1		
EAS 305 Applied Probability	4	EE 413 Communications Electronics	4*
CSE493 Intro. VLSI	4*	CSE 452 VLSI Testing	4
EE 410 Electronic Instrument Design	4*	EE 449 Analog Integrated Circuit Layout or EE 491 Analog Circuits	3*
EE 429 Intro. To EMC	3	Gen. Ed.	3
CSE 442 Software Engineering or EE 494 Senior Capstone Group Design Project	<b>4</b> <b>or</b> <b>3</b>	CSE 453 Hardware /Software Integrated Systems Design or EE 494 Senior Capstone Design Project: Continuation	<b>4</b> <b>or</b> <b>3</b>
Total	19/20	Total	18/19

### **Analog & Digital Electronics & Instrumentation Elective**

sequence contains 8 TE's and meets the requirements on selection of TE's for the BSEE. Those students who will pursue a Master's degree in EE at UB may take the graduate version of one of the courses listed and count that course toward their graduate degree.

## **Using Graduate Courses to Satisfy Elective Requirements**

It may sometimes be appropriate for Seniors to use graduate courses as Technical Electives. This takes some advance planning. Obtain and complete a "petition" from DUAS, 255 Capen Hall. Undergraduates need a QPA of 3.0 or better to take graduate courses. Students may obtain a petition also at the Office of Engineering Student Services, 410 Bonner Hall.