Lecture “Introduction”  
(Wednesday; January 22, 2020)

“Theoria cum praxi”

Berlin Academy of Science  
(Leibniz 1700)

Check Amazon.com for prices.
EE 442 Analog and Digital Communication Systems
Spring 2020

Course Description  (4 Units; 3 hours lecture; 3 hours laboratory)

Covers both analog & digital signals & transmission; analog AM and FM; digital PCM & DM. Digital data transmission, data encoding, BER, modulation techniques such as ASK, FSK, PSK and QAM and the effects of noise and bandwidth. Addresses modern satellite, cellular and cable communication systems. One unit of credit for the accompanying communications laboratory (EE442L).

Prerequisite: EE 400 Linear Systems Theory, or consent of the instructor


EE442 Class Website: The EE442 Website is found at:

http://web.sonoma.edu/eseecourses/ee442/
## Lectures

<table>
<thead>
<tr>
<th>Lectures</th>
<th>Room</th>
<th>Instructor</th>
<th>Office</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Mon &amp; Wed 2:30 am to 3:45 am</td>
<td>Salazar 2001</td>
<td>Dr. Donald Estreich</td>
<td>Salazar Room 2008 B</td>
<td>Monday 12:30 pm to 2:25 pm; immediately after class from 3:45 pm to 4:15 pm on both Monday &amp; Wednesday; or by special arrangement</td>
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</tbody>
</table>

### Best way to reach me

- Email: [dbe@sonic.net](mailto:dbe@sonic.net)
- Tel: (707) 664-2030

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**You can always e-mail me at** [dbe@sonic.net](mailto:dbe@sonic.net)

or [estreich@Sonoma.edu](mailto:estreich@Sonoma.edu)

**My office is Salazar 2008 B and office hours are:**

- **Monday**: 12:30 pm to 2:25 pm
- **Mon/Wed**: 3:45 pm to 4:15 pm (after class period)

or

- by special arrangement
Office Hours For EE 442

**MONDAY**
- 12:30 to 2:25
- 3:45 to 4:15

**WEDNESDAY**
- Department Meeting
- 3:45 to 4:15
Course Grading:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Homework assignments (10 or 11 assignments)</td>
<td>30%</td>
</tr>
<tr>
<td>2 midterms</td>
<td>20%</td>
</tr>
<tr>
<td>Final examination</td>
<td>25%</td>
</tr>
<tr>
<td>Laboratory exercises (connecting EE442 to EE442L)</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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</table>

**Homework** will be assigned approximately weekly.

(New: Late homework marked down 10% for first day late and then 10% per day late after that – no credit after 10 days)

**Examinations:** Two midterms and final examination (in Salazar 2001)

**Class attendance** – Strongly encouraged – I want questions during lectures. I also encourage coming to my office hours!

**Reading Assignments** – Reading assignments listed on syllabus.
# EE 442 Analog and Digital Communication Systems

Spring 2020 Class Lecture and Exam Schedule

<table>
<thead>
<tr>
<th>#</th>
<th>Date</th>
<th>Day</th>
<th>Topic</th>
<th>Textbook Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 22</td>
<td>Wed</td>
<td>Course Introduction: Preliminaries, course content and goals of EE442; Operating rules for EE442 homework and examinations</td>
<td>Handout and information on the EE442 Course Website</td>
</tr>
<tr>
<td>2</td>
<td>Jan 27</td>
<td>Mon</td>
<td>Modern communication systems; Shannon-Weaver Model; Definition of data &amp; information; Channels; Use of decibels (logarithmic)</td>
<td>Chapter 1 – pp. 1-14; Class Handouts</td>
</tr>
<tr>
<td>3</td>
<td>Jan 29</td>
<td>Wed</td>
<td>Information capacity; Signal &amp; system review; Signal classifications; Review of phasors; Unit step and impulse inputs;</td>
<td>Chapter 2 – pp. 15-33; Sections 2.1 to 2.4 &amp; 2.6; Handouts</td>
</tr>
<tr>
<td>4</td>
<td>Feb 3</td>
<td>Mon</td>
<td>Review of Fourier Series and Fourier Transforms; Physical interpretation; Examples of most useful transform pairs; Negative frequency concept</td>
<td>Chapter 2 – pp. 26-46; Sections 2.5 &amp; 2.7; Handouts</td>
</tr>
<tr>
<td>5</td>
<td>Feb 5</td>
<td>Wed</td>
<td>Fourier Transform properties; Exponential expressions for signals; Operations upon signals; Convolution</td>
<td>Chapter 2 – pp. 46-58; Section 2.8</td>
</tr>
<tr>
<td>6</td>
<td>Feb 10</td>
<td>Mon</td>
<td>Finish Fourier Transform discussion; Signal transmission; Filters &amp; AWGN signal corruption &amp; Interference</td>
<td>Chapter 2 – pp. 58-65; Section 2.9</td>
</tr>
<tr>
<td>7</td>
<td>Feb 12</td>
<td>Wed</td>
<td>Amplitude Modulation: Baseband signals; Modulation (Tone &amp; message); Generation of AM and Demodulation</td>
<td>Chapter 3 – pp. 82-99 Sections 3.1 &amp; 3.2</td>
</tr>
</tbody>
</table>

Midterm 1 is March 4th; Midterm 2 is April 15th; Final Exam is May 11th

See syllabus for complete schedule.
Grading:

94 to 100 is an A
88 to 93 is an A-

84 to 87 is a B+
80 to 83 is a B

76 to 79 is a B-
70 to 75 is a C+

62 to 69 is a C
56 to 61 is a C-

51 to 55 is a D+
42 to 50 is a D

36 to 41 is a D-
0 to 35 is an F

However, I do from sometimes make allowances based upon the difficulty of the examinations and class distributions.


As of January 15, 2020; Amazon.com prices were

1. **New** hardcopy at $58.84 + shipping & tax
   (Using Amazon.com through Book Depository US)
2. **Used** hardcopy starts at even higher prices
3. **Rent** ($29.47)
Questions regarding EE 442 of Spring 2020

1. Do you have questions not addressed yet?

2. Any questions or concerns you have about the operational aspects of EE 442? For example, is everyone comfortable with using the EE 442 Webpage for lecture slides and homework?

3. What would you find helpful in EE 442?

4. Do the Office Hours work for you?

https://www.credit.com/blog/2013/03/the-11-most-commonly-asked-credit-questions-65299/