ELEC 3060 – WIRELESS DESIGN LAB

2002 Catalog Data: Laboratory experiments geared towards understanding the implementation and testing of components used in wireless communication systems.


ELEC 3060 Laboratory Manual.

References: Information on Bluetooth technology and standards: http://www.bluetooth.com


Coordinator: Stuart M. Wentworth, Associate Professor of Electrical Engineering

Goals: Explore both the hardware and the software aspects of wireless telecommunications systems. Practice in written and oral technical communication, development of engineering design experience, and exposure to cross-functional issues including teaming and ethical decision making.

Prerequisites by topic:
1. Communications systems
2. Electromagnetic Waves

Topics (one laboratory period each):
1. An overview of Bluetooth and Wireless communications technology
2. The Bluetooth packet structure, link types and protocol
3. Bluetooth application examples
4. Test equipment training
5. Transmitter measurements
6. Receiver measurements
7. Team project introduction; processes of effective teams
8. Making effective oral presentations
9. Oral proposal presentations
10. Taking the Ethics Challenge
11. Antenna propagation tutorial
12. Open for team project activity
13. Team project oral presentations; final written reports due
Typical method for evaluating student performance:  

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Laboratory practice</td>
<td>25%</td>
</tr>
<tr>
<td>Engineering notebook</td>
<td>20%</td>
</tr>
<tr>
<td>Written reports</td>
<td>35%</td>
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<tr>
<td>Oral communications</td>
<td>20%</td>
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</tbody>
</table>

Typical grading scale:  

- A: 90-100%  
- B: 80-89%  
- C: 70-79%  
- D: 60-69%  
- F: 0-59%

Computer usage:

- Students use computer hardware interfaced with computers and software to test the interface  
- Students use computer tools to author reports and presentations.

Laboratory projects (including major items of equipment and instrumentation used):

- Equipment and instrumentation - The Ericsson Bluetooth Development Kit, personal computer for hardware interfacing and software implementation, signal generators, signal analyzers, spectrum analyzers

- Lab Projects – see “Topics” above.

Class attendance:  Class attendance and its effect on course grade is the prerogative of the individual instructor and will be part of the course outline and announced the first day of class.

Policy on unannounced quizzes:  Unannounced quizzes and their effect on course grade are the prerogative of the individual instructor and will be part of the course outline and announced the first day of class.

ABET category content as estimated by faculty member who prepared this course description:

- Engineering science: 0.2 credit or 20%  
- Engineering design: 0.8 credit or 80%

Students who need special accommodations should make an appointment to discuss their needs as soon as possible.

Prepared by: Stuart M. Wentworth  Date: May 17, 2001