# Physics 521 / Engineering 515

Professor:	Dr. Cecille Labuda	Phone:	1 (662) 915-3945
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Office Hours:	MW 11:00 – 12:00 pm NCPA; T 1:00 – 2:45 pm Lewis 209; By appointment in NCPA except Thursdays.	Time/Location:	MWF 10:00 am NCPA 1128

#### Text:

Kinsler, Frey, Coppens and Sanders. Fundamentals of Acoustics. Wiley; 4th edition, ISBN-10: 0471847895, ISBN-13: 978-0471847892. (Earlier editions are acceptable but homework from the text will be assigned from the 4<sup>th</sup>).

#### Description:

This course is an introduction to oscillatory motion, waves, vibrations and sound.

#### Prerequisites/Corequisites

Phys 402 or graduate status.

#### Course Objectives:

- Simple vibrations.
- Basic physical aspects of sound waves.
- Applications.

#### Grading Scale: Total points – 1000.

- A: 90 100%
- B: 80 89.9%
- C: 70 79.9%
- D: 55 69.9%
- F: < 55%

#### **Evaluation**:

<u>Tests (45%)</u>

• 2 or 3 closed-book tests; equally weighted.

#### <u> Homework (40%)</u>

- Homework sets will be assigned and must be turned in at the beginning of class on the due date. No late homework will be accepted.
- Students are encouraged to work together to solve homework problems however, no student should copy solutions from another student or from online solutions wholesale.
- Students may be asked to present solutions to homework problems in class.

# Presentation (15%)

• Each student must select an acoustics topic for classroom presentation. This can be the student's own research or an application of acoustics. Students should get approval for their topic before presenting to determine whether it is appropriate. Presentations should be no longer than 15 minutes and should be accompanied by a written paper to be turned in before the presentation. The grade will be based on content and the quality of the presentation (oral, visual, organization, clarity). Computers and projectors will be available in the classroom for Powerpoint presentations.

# Final exam (optional; to replace one test)

• A student may opt to take the final exam if he/she would like to replace an earlier test grade.

# Policies

- Class attendance is advised. On days when tests are scheduled, attendance is required. If you must be absent on a test day, you must speak to me before the test to determine whether the absence will be excused and the test will be rescheduled. If the absence is unexpected, you must contact me by email or telephone within 24 hours subsequent to the absence or **no** tests will be rescheduled under any circumstances.
- Cheating on homework, tests or any assignments is, will result in a zero grade for the given assignment. If a second case of cheating is discovered, the student will receive a grade of F for the course.

#### Important Dates

- August 20 classes begin
- August 31 last day to add
- October 1 deadline for course withdrawals
- November 19 23 Thanksgiving break
- November 30 last day of class
- December 3 (8:00 am) final exam

# Tentative Course Schedule (Subject To Change):

Week	Торіс	Textbook Sections
01:08/20-08/24	Fundamentals of vibration	Ch 1
02: 08/27 – 08/31	1-D wave equation; Vibrating string	Ch 2
03: 09/03 – 09/07	2-D wave equation; vibrating membrane	Ch 4
04:09/10-09/12	Acoustic wave equation	Ch 5
05:09/17-09/19	Reflection and transmission	СН 6
05: 09/21	Test 1	
06:09/24 - 09/27	Radiation of acoustic waves	Ch 7
09/28 10/01 07: 10/03 10/05	Prep for student presentations Prep for student presentations Attenuation and absorption Prep for student presentations	Ch 8
08: 10/08 – 10/12	Radiation of acoustic waves	Ch 7
09: 10/15 – 10/17	Waveguides; Pipes	Ch 9, 10
09: 10/19	Test 2	
10: 10/22 – 10/26	Waveguides; Pipes	Ch 9, Ch 10
11: 10/29 – 11/02	Waves in water; Ultrasound	
12: 11/05 – 11/09	Ultrasound	
13: 11/12 – 11/14	Ultrasound, student preparations	
13: 11/16	Test 3	
13: 11/19 – 11/23	THANKSGIVING BREAK	
14: 11/26 – 11/30	Student presentations	

**Examinations:** Except for the final exam, <u>test dates and topics are subject to change</u>.

Test 1:	09/21
Test 2:	10/19
Test 3:	11/16

Final Exam: Friday December 7, 8:00 am

