VIBRATIONS AND WAVES (PHYS 224)
SYLLABUS, FALL 2015

Instructor: Markos Georganopoulos (georgano@umbc.edu, tel:410-455-8149)

Lectures, time and place: MoWeFr 11:00AM - 11:50AM in PHYSICS 201

Office Hours:  MoWeFr 1:00AM - 2:00 PM in my office, PHYSICS 415.

Class web page: http://jca.umbc.edu/~markos/courses/ 224_Fall_2015

Textbook: George C. King, Vibrations and Waves

Course Overview. This course emphasizes vibrations, wave motion and optics. Topics include mathematical characterization of vibrations and waves, sound, superposition of standing waves, geometrical and physical optics, diffraction, interference and polarization of light.

In particular, we will discuss most of the following:

Part 1: Simple harmonic oscillators, damped harmonic oscillators, driven oscillators and resonance, coupled oscillators and normal modes.

Part 2: Traveling waves, standing waves, Fourier analysis, dispersion of waves.

Part 3: Maxwell’s equations, electromagnetic waves, reflection and refraction of waves, interference and diffraction of electromagnetic waves, polarization.

Resources. We will rely on the required book “Vibrations and Waves” by B.W. George C. King. Additional material will be provided through notes. The class web page will be the announcement board of the course, where notes, homework, and announcements will be posted. You are expected to always be familiar with the contents of the web page.

Academic Integrity: By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC’s scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook, the Faculty Handbook, and the UMBC Policies section of the UMBC Directory.
GRADING

**Grading scale:** Your final grade will be determined by a numerical score, calculated as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam</td>
<td>30%</td>
</tr>
<tr>
<td>2 mid-term exams</td>
<td>25% each</td>
</tr>
<tr>
<td>Homework</td>
<td>20%</td>
</tr>
</tbody>
</table>

To convert the numerical score to a letter grade, I will first calculate the average numerical score of the top 3 students in the class. This will be the benchmark for determining letter grades as follows:

- **A:** >90% of the benchmark
- **B:** 80-89% of the benchmark
- **C:** 70-79% of the benchmark
- **D:** 50-69% of the benchmark
- **F:** <50% of the benchmark

**Homework (20%):** Homework questions will provide good practice for the types of questions likely to be posed in the mid term and final exams. A homework will be assigned every week. Your lowest homework grade will be dropped in determining the homework portion of your grade. Students are expected to solve all the problems of the homework but are not required to turn them in. In the beginning of the class on the due day of the homework, students will be given 10 min to clearly reproduce the solution of one of the homework problems selected by me.

**Mid Term exams (25% each):** The first one will cover the material from the beginning of the class up to the lecture before the first mid term. The second one will cover the material taught after the first mid term, all the way to the lecture before the second mid term. The times of the mid term exams will be announced in class at least a week in advance of the exam.

**Final Exam (30%):** An exam at the end of the course on all the course material.

Clear handwriting, proper English grammar and syntax, as well as logical flow of your arguments and no missing steps are required in all exams and homework.

Please let me know in advance if you cannot participate in any of the exams due to religious or personal or any other reasons.