Fayetteville State University  
College of Arts and Sciences  
Department of Chemistry and Physics  
PHYS 211-01 Mechanics  
Fall 2011

I. Locator Information:

Instructor: Dr. Abdirahman Y Abokor  
Course # and Name: PHYS 211-01 Mechanics  
Semester Credit Hours: 4.0

Office Location: LS 210  
Office hours: MWF 09:00 AM – 12:00 PM  
R 09:00 AM – 11:00 AM  
MF 02:00 PM – 03:00 PM  
T 12:30 PM – 02:00 PM

Day and Time Class Meets: TR 11:00 – 12:15 PM Room LS 203  
T 09:00 – 10:50 AM Room LS 207  
Total Contact Hours for Class: 5.0

Tel.: (910) 672-1358  
Email address: aabokor@uncfsu.edu

Departmental Office Location: LS Annex 330  
Departmental Office Telephone: 672-2441

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account (username@uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail. Rules and regulations governing the use of FSU email may be found at http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf

II. Course Description:

An intermediate-level concentration in mechanics dealing with vector analysis, central force problems, rotational motion, and time, position, and velocity dependent forces, steady state and time varying forced oscillations and the Lagrangian method, with laboratory exercises complementing theory.

Prerequisites: PHYS 121, MATH 242. Co-requisite: MATH 331.

III. Disabled Student Services: In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability to please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

V. Student Learning Outcomes:

Upon completion of this course, students will be able to:

1. Understand the relationships between matter, energy, and motion. 
   - List the International System units of measure for length, mass, volume, time, and force; and apply the basic metric system prefixes to these measurements. 
   - Define mechanics, vector and scalar quantities, speed, velocity, acceleration, work, potential energy, kinetic energy, power, and momentum; and calculate any of these when given sufficient data. (Physics 30) [Physics 1.3] [Physics 1.4]
   - State Newton's three laws of motion and the Lagrangian mechanics, and use each to analyze the implications for objects at rest or in motion (inertial and non-inertial frames of references). (Physics 31) [Physics 1.2]
2. Define mechanics, vector and scalar quantities, speed, velocity, acceleration, work, potential energy, kinetic energy, power, and momentum; and calculate any of these when given sufficient data. (Physics 30) [Physics 1.3] [Physics 1.4]
3. State Newton's three laws of motion and the Lagrangian mechanics, and use each to analyze the implications for objects at rest or in motion (inertial and non-inertial frames of references). (Physics 31) [Physics 1.2]
4. List and describe the properties of waves and waveforms, oscillations, etc. and (Physics 29) [Physics 1.1]
5. Explain and interpret heat, temperature, specific heat, heat capacity, entropy, plasma, latent heat of fusion, latent heat of vaporization, and the laws of thermodynamics. (Physics 29) [Physics 1.1]

VI. Course Requirements

The instructor will respect all students and will make every effort to maintain a classroom climate that promotes learning for all students. Students must accept their responsibility for maintaining a positive classroom environment by abiding by the following rules:

1. Attend all lecture and laboratory sessions, except in cases of illness and other unforeseen emergencies. It is the student’s responsibility to contact the instructor about the steps that must be taken for making up any and all missed work. It is recommended that contact with the instructor take place within twenty-four (24) hours of having missed class. The University policy concerning absences from class will be strictly enforced. Absences exceeding 10% of the total contact hours the course meets during the semester (that amounts to approximately seven (7) total hours of unexcused absences) will fall in the category of ‘EXCESSIVE ABSENCES-EA’. As per new guidelines, ‘WN’ grade has been eliminated and it is the STUDENT’S RESPONSIBILITY TO WITHDRAW FROM THE CLASS. Please refer to ‘Revision of Grades-Student Responsibilities’ at www.uncfsu.edu/fsurentension/policiesprocedures.
2. Be punctual. Attendance will be taken promptly at the beginning of each session. Any student coming in after the roll has been called will have been marked absent. It is the student's responsibility to see that all tardies have been duly noted. Students will also be charged with a tardy for departure from the class before the specified end of class. The accumulation of three (3) tardies will result in the student being charged with one (1) absence.
3. Participate actively in classroom discussions and activities. Two key ingredients of every student's learning are sharing opinions and experiences with others, and interacting with others in the teaching-learning situation.
4. Read over and take notes on the indicated chapters BEFORE they are presented in class. This activity mentally prepares one for the learning experience. It also is important because it raises questions that one needs to have answered in order to fully understand concepts presented.
5. Take notes in class. Recopy these notes at the first opportunity after class and certainly the same day as the class in which the notes were taken. Reconcile any discrepancies in the notes taken in class as well as with notes taken in initial reading. Add explanations or drawings or other examples for clarity.
6. Study about two hours for each hour of lecture. This is an absolute minimum for maximum success in a class.
7. Avail yourself of all pertinent audiovisual and computer-assisted instructional materials.
8. Take examinations **ON THE SCHEDULED DATES**. No make-up examinations will undertake. An automatic grade of ZERO is recorded for any exam missed for any reason.

9. Be in compliance with the university policy on drugs which prohibits the possession or use of alcoholic beverages or illegal drugs on any part of the campus.

10. Students are permitted to use calculators in the class. However, "**CELL PHONES ARE NOT ALLOWED TO BE USED AS CALCULATORS**" in the classroom.

11. Students are not permitted to wear headphones or other paraphernalia that may be distracting to the classroom environment.

12. Students must refrain from any activity that will disrupt the class; this includes turning off cell phones and pagers.

13. Students are not permitted to use profanity in the classroom. They must not pass notes or carry on private conversations while class is being conducted.

14. **SEE THE INSTRUCTOR IMMEDIATELY WHEN SPECIFIC DIFFICULTIES ARE ENCOUNTERED.**

### Evaluation Criteria

The progress of each student will be evaluated by means of **FIVE exams** to be given during the semester, quizzes, reports related to the laboratory exercises to be performed, and a comprehensive final examination. The lowest exam may be dropped at the discretion of the instructor.

**A. Grade Distribution:**

Final grades will be determined by weighting the averages and scores from the above-mentioned evaluative activities.

- **Four Exams** 40%
- **Quizzes and Homeworks** 15%
- **Laboratory Exercises** 25%
- **Final Examination** 20%

**B. Grading Scale:**

The final letter grade assigned to the student will be based upon the following numerical equivalencies as stated in the University Catalog.

- **A** = 90 - 100 Superior
- **B** = 80 - 89 Good
- **C** = 70 - 79 Marginal
- **D** = 60 - 69 Below marginal
- **F** = Below 60 Failure

**Please note:** If these evaluation criteria must be revised because of extraordinary circumstances, the instructor will distribute a written amendment to the syllabus.
REVISION OF GRADES – STUDENT RESPONSIBILITIES
The following revisions become effective on August 16, 2007.

WN GRADE DISCONTINUED:


STUDENTS: Do not expect faculty to withdraw you for non-attendance. Drop or withdraw* from classes according to the deadlines published in the catalog. *See warning below about class withdrawals.

NEW TYPE OF GRADE: INTERIM GRADES – (New name for “midterm grade,” with additional purposes). Interim grades will be assigned from the first week of the semester until the deadline for class withdrawals. Interim grades are used for informational and warning purposes only; they are not part of your permanent transcript and have no effect on your GPA. Instructors may assign interim grade of F to warn students of poor academic performance or they may assign “X” or “EA” grades. (See below for explanations) After midterm, faculty will assign all students an interim grade of A – F to inform students of their academic status as of midterm.

➢ INTERIM GRADE X = NO SHOW – Assigned to students who are on a class roster, but never attend class. For warning purposes only; NOT a final grade.

STUDENTS: Check interim grades early in the semester. If you have an X grade, either begin attending the class or withdraw* from it. *See warning below about class withdrawals. If you do not take action in response to an X grade, you will receive a final grade of FN. (See “FN” below)

➢ INTERIM GRADE EA = EXCESSIVE ABSENCES - Assigned to students whose class absences exceed 10% of the total contact hours. For warning purposes only, NOT a final grade.

STUDENTS: Check your interim grades often. If you have an “EA” grade for a class, you are in jeopardy of failure if you do not take immediate actions. Either resume attending the class or withdraw from it. *See warning below about class withdrawals.

NEW FINAL GRADE:

➢ FN = FAILURE DUE TO NON-ATTENDANCE – Assigned to students who are on class roster, but never attend the class. An FN grades is equivalent to an F grade in the calculation of the GPA.

STUDENTS: You must attend (or withdraw* from) all the classes for which you are enrolled. *See warning below about class withdrawals.

WARNING ABOUT CLASS WITHDRAWALS:
When you withdraw from a class, you are wasting your money and time. You receive no refund for withdrawing from individual classes and you slow your progress toward degree completion.

➢ If you withdraw from or fail more than one-third of your classes, you will no longer be eligible for financial aid.

➢ STRIVE TO EARN CREDIT FOR ALL THE CLASSES IN WHICH YOU ENROLL; WITHDRAW FROM CLASSES ONLY WHEN IT IS ABSOLUTELY NECESSARY!

VII. Academic Support Resources – Frequently access Blackboard for Lecture Notes, Assignments, On-Line Quizzes, Grades, etc.

VIII. Course Outline and Assignment Schedule

Lectures and laboratory exercises will be undertaken in accordance with the following assignment schedule. It is also assumed that in addition to the topics listed below, the student is assigned both the textual material as well as the exercise problems at the end of the chapters. Any item listed below may be arbitrarily changed by the instructor for his/her convenience, or as the constraints imposed by equipment and space limitations may compel.

Topic Outline: This course will cover Chapters 1, 2, 3, 4, 5, 6, 7, 8, and 10. The syllabus is as follows:

<table>
<thead>
<tr>
<th>Date (Tentative)</th>
<th>Topic</th>
<th>Assignment (attempt as many as you can)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 18 to Aug. 29</td>
<td>Chapter 1: Fundamental Concepts. Vectors.</td>
<td>1, 2, 3, 7, 9, 14, 17, 19, 22, 23, 25, 27</td>
</tr>
<tr>
<td>Aug 30 to Sept. 12</td>
<td>Chapter 2: Newtonian Mechanics. Rectilinear Motion of a Particle.</td>
<td>2, 6, 8, 11, 14, 18</td>
</tr>
<tr>
<td>Sept. 13 to Sept. 27</td>
<td>Chapter 3: Oscillations</td>
<td>2, 3, 5, 7, 9, 10, 12, 13, 15, 18</td>
</tr>
<tr>
<td>Sept. 28 to Oct. 10</td>
<td>Chapter 4 General Motion of a Particle in 3 Dimensions § 4.1 through 4.6</td>
<td>2, 3, 4, 5, 8, 13, 17</td>
</tr>
<tr>
<td>Oct. 11 to Oct. 22</td>
<td>Chapter 5 Non-Inertial Reference Systems § 5.1 through 5.6</td>
<td>1, 2, 3, 4, 6, 8, 10, 13, 14, 16, 21</td>
</tr>
<tr>
<td>Oct. 23 to Nov. 02</td>
<td>Chapter 6 Gravitational and Central Forces § 6.1 through 6.14</td>
<td>2, 3, 5, 7, 10, 12, 13, 16, 18, 21, 27, 28</td>
</tr>
<tr>
<td>Nov. 3 to Nov. 17</td>
<td>Chapter 7 Dynamics of Systems of particles § 7.1 through 7.6</td>
<td>1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 23</td>
</tr>
<tr>
<td>Nov. 18 to Nov. 29</td>
<td>Chapter 8 Mechanics of Rigid Bodies. Planar Motion. § 8.1 through 8.7</td>
<td>3, 5, 7, 8, 11, 15, 21, 25, 27</td>
</tr>
<tr>
<td>Nov. 30 to Dec. 2</td>
<td>Chapter 10 Lagrangian Mechanics</td>
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IX. Teaching Strategies

The primary teaching strategy for this course will take the form of lectures and demonstrations of the specific processes and effects related to the topics of interest.

X. BIBLIOGRAPHY

The textbook will be considered the primary resource in this class. However, textbooks often do not contain enough information or information in the manner that will be most advantageous for student learning. In light of these shortcomings, it is recommended that each student perform additional reading on each topic covered in class. This may be accomplished by seeking other physical science texts in the library or the instructor's office. It is recommended that the student read the following books:


During the time frame in which this course is taught, far more exciting discoveries and interpretations will undoubtedly occur which will not be in texts. It is therefore recommended that the student routinely examine periodical literature such as: Science News, Science, Scientific America, American Journal of Physics, Physics Today, Physical Review, Physical Review Letters, and many others.
FSU Policy on Disruptive Behavior in the Classroom

The Code of the University of North Carolina (of which FSU is a constituent institution) and the FSU Code of Student Conduct affirm that all students have the right to receive instruction without interference from other students who disrupt classes.

FSU Core Curriculum Learning Outcome under Ethics and Civic Engagement (6.03): All students will “prepare themselves for responsible citizenship by fulfilling roles and responsibilities associated with membership in various organizations.” Each classroom is a mini-community. Students learn and demonstrate responsible citizenship by abiding by the rules of classroom behavior and respecting the rights all members of the class.

The FSU Policy on Disruptive Behavior (see FSU website for complete policy) identifies the following behaviors as disruptive:

1. Failure to respect the rights of other students to express their viewpoints by behaviors such as repeatedly interrupting others while they speak, using profanity and/or disrespectful names or labels for others, ridiculing others for their viewpoints, and other similar behaviors;
2. Excessive talking to other students while the faculty member or other students are presenting information or expressing their viewpoints.
3. Use of cell phones and other electronic devices
4. Overt inattentiveness (sleeping, reading newspapers)
5. Eating in class (except as permitted by the faculty member)
6. Threats or statements that jeopardize the safety of the student and others
7. Failure to follow reasonable requests of faculty members
8. Entering class late or leaving class early on regular basis
9. Others as specified by the instructor.

The instructor may take the following actions in response to disruptive behavior. Students should recognize that refusing to comply with reasonable requests from the faculty member is another incidence of disruptive behavior.

1. Direct student to cease disruptive behavior.
2. Direct student to change seating locations.
3. Require student to have individual conference with faculty member. At his meeting the faculty member will explain the consequences of continued disruptive behavior.
4. Dismiss class for the remainder of the period. (Must be reported to department chair.)
5. Lower the student’s final exam by a maximum of one-letter grade.
6. File a complaint with the Dean of Students for more severe disciplinary action.

Students who believe the faculty member has unfairly applied the policy to them may make an appeal with the faculty member’s department chair.