Course Instructor: M.K. Balasubramanya, Ph.D.  
Office: Science & Technology Building (ST) 313  
Class Meeting Times: Tues, Thurs 12:30 - 1:45 pm  
Phone: (361) 825- 6020  
E-Mail: mirley.balasubramanya@tamucc.edu  
url: www.tamucc.edu/~bala

Class Meeting Location: CS 115  
Class Meeting Location: ST - 101  
Office Hours: TR 2:00 - 3:20 pm, W 4-5 (or by appointment)

Course Homepage on the Web: [http://www.sci.tamucc.edu/~physweb/physics/physics-courses/phys1402/Physics1402-homepage.html](http://www.sci.tamucc.edu/~physweb/physics/physics-courses/phys1402/Physics1402-homepage.html)

Physics 1402 carries 4 credits. Concurrent registration in lecture and lab sections is required. Letter grade will be awarded to you in the lecture section Phys 1402-001 only; 25% weight will be given to lab work in determining your final letter grade.

Course Description: This course involves an intensive study of oscillations, wave motion, electricity and magnetism and their applications. This study will be both conceptual and quantitative, using algebra and trigonometry.

Student Learning Objectives: After successfully completing this course you will be able to recognize the physical principles governing the behavior of oscillating objects and waves, electric charges, electric and magnetic fields, and light. You will be able to scientifically explain the nature of these phenomena qualitatively, answer elementary quantitative questions on these phenomena, and design simple experiments to test the physical principles governing these phenomena.

Prerequisites: Proficiency in college level algebra and basic trigonometry is very essential to successfully complete this course. Physics 1401 should have been successfully completed before registering for this course.

Curricular Resources: 'General Physics II Lab Manual' by M.K.Balasubramanya is required. It contains the physics necessary for all experiments and the details of these experiments.

No text book is required for this course though the instructor encourages you to get one. You may refer to any edition (including previous ones) of several physics texts which only use algebra and trigonometry but not calculus; a partial list of such texts is given below:

- Physics: Algebra/Trig, by Hecht
- Physics, by Cutnell & Johnson,
- Physics, by Walker,
- Physics, by Serway & Faughn,
- College Physics, by Urone,
- Introductory College Physics, by Mulligan.

The instructor encourages diligent note taking in class, and relies heavily on online quizzes available from the University of Texas at Austin for weekly assessment of learning.

Additional helpful physics books at the Reserve Desk in Bell Library:

Other Physics texts available in the library that you may refer to for alternate explanations:


**Bring a scientific calculator to every lecture and laboratory.**

**Schedule of Lecture Topics and Exams:**

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<thead>
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<th>Jan 12</th>
<th>Jan 17</th>
<th>Jan 19</th>
<th>Jan 24</th>
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<tbody>
<tr>
<td>Introduction</td>
<td>Module 1: Oscillations</td>
<td>Module 1, Continued</td>
<td>Module 1, Continued</td>
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<td>Jan 26</td>
<td>Jan 31</td>
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<td>Feb 9</td>
<td>Feb 14</td>
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<td>Feb 23</td>
<td>Feb 28</td>
<td>March 1</td>
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<td>March 8</td>
<td>March 20</td>
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<td>March 29</td>
<td>April 3</td>
<td>April 5</td>
<td>April 10</td>
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<tr>
<td>Module 3: Electricity, Contd.</td>
<td>Module 3: Electricity, Contd.</td>
<td>Exam 2</td>
<td>Module 4: Magnetism</td>
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<td>April 12</td>
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<td>April 24</td>
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<tr>
<td>April 26</td>
<td>May 8 (Tuesday)</td>
<td>May 8 (Tuesday), 11:00 a.m. - 1:30 p.m.</td>
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<tr>
<td>Module 4: Magnetism, Contd.</td>
<td>Module 5: Atomic Physics</td>
<td>Final Exam</td>
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**Sources of Help:** The instructor strongly encourages you to visit him on a regular basis to clarify your understanding of the course material and to seek his help in completing the homework. FREE mathematics and physics tutoring services are available via the CASA, GSSC 119, Phone 825-5933; you are strongly encouraged to make use of this service. You should also form a peer group of your classmates to collectively study and understand physics. The instructor will assist you in forming such groups.

**Communicating with the Instructor and Classmates:** You are encouraged to see the instructor personally during his office hours. You are also welcome to communicate with him by phone and/or e-mail with physics questions. A listserv has been set up exclusively for students of this course, to interact with each other on issues related to the course. **Subscription to this email list is required.** To subscribe to the list for Physics 1402, email, using your Islander email account, phys1402-request@listserv.tamucc.edu with the word "subscribe" as the subject. If you want to send mail to all the list's subscribers, email phys1402@listserv.tamucc.edu. This will forward the message to all
subscribed users. If you want to unsubscribe from the list, email phys1402-request@listserv.tamucc.edu with the word "unsubscribe" as the subject. Some documents will be accessible only with a user-id and password; details will be explained in class. Note these two down for later use. The instructor often posts course related announcements on the listserv and/or on the course web site. It is your responsibility to keep yourself informed of these announcements. Read the latest version of posted documents by frequently using the "reload" or "refresh" button on your web browser. The grades for this class will be posted periodically on the web. Do ensure that your spam control measures allow the entry of email messages from the above list to your mailbox.

The subject of your e-mail messages to the instructor must begin with "General Physics II-" followed by a short description in the subject field. For example - 'Subject: General Physics II-Difficulty with Question 3 of Quiz 2', or 'Subject: General Physics II-Web page not accessible'. If you do not follow this convention there will be a delay in your instructor replying to your message.

Quizzes: There will be several online quizzes with published deadlines. Each student will get web downloadable customized quizzes, the answers to which should be submitted online. The solution to the quiz will be available in a web downloadable format the day after the quiz is due, if the quiz server is functioning normally. Details on how to access the online service will be explained in class and announced on the announcement page. You are required to register for online quizzes, download the quizzes, and submit answers by going online to quest.cns.utexas.edu/student. This is a free service provided by the College of Natural Sciences, The University of Texas, Austin, to the academic community. See the 'Announcements' page for the course unique id number required to register for quizzes in PHYS 1401. One quiz will be due on Reading Day.

The overall quiz grade is obtained by adding up your raw scores on each quiz, dividing that score by the maximum possible score you could have obtained, and multiplying this fraction by 100 to get a percentage. For example, if there were 4 quizzes with maximum possible scores of 120, 80, 110, and 90, and your raw scores on these quizzes were 100, 78, 102, and 80, then your overall quiz grade is

100*(100+78+102+80)/(120+80+110+90) = 90%.

Each question on every quiz is worth the same as any other question on the same or another quiz. Thus, a quiz with more questions counts more than a quiz with less questions. Read the instructions at the quiz website carefully on how your responses will be graded for multiple tries on a question.

If you are unable to submit answers to a quiz online for any reason the only way you can get any credit for your work on that quiz is by emailing the instructor your answers to quiz questions before the deadline, followed by submission of your written work on the questions to the instructor the day following the deadline.

Lab: You must complete the Laboratory Safety Seminar - SMTE 0091 successfully to be able to work in the physics laboratory. Documentation on having successfully completed this seminar during a previous semester is acceptable. Your documentation on successful completion of the lab safety seminar has to be with your lab instructor one week after the start of classes. It is the student's responsibility to get any help needed by calling TAMUCC Island Online Help Desk at (361)825-2825 or long distance 1-866-353-2491 to successfully log in to this WebCT based course and complete all the modules. Failure to complete this requirement by the deadline may result in the student being deleted from the class.

You will be assigned pre-lab exercises, with a multiple choice quiz based on those exercises at the beginning of the lab period, as well as a post-lab quiz which tests your ability to interpret and analyze data related to that experiment. You can use only the lab manual to answer these pre- and post- lab quizzes.

All experiments will be performed in groups and will require a group lab report. Each one of you is individually responsible for recording experimental observations and data. If your lab partner recorded experimental data and you did not, and if your lab partner dropped the course or is unreachable and uncommunicative, you are still responsible for completing work on that lab on time.
You will not be allowed a lab make up opportunity unless you have been granted the instructor's prior approval for an absence for reasons of sickness (backed by your doctor's note) or family emergency.

The lab report on an experiment should be comprehensive, including a clear analysis of the experimental results. The required structure of the lab report will be explained to you in the lab. The lab instructor will evaluate your group's quality of work, the care taken in collecting data and in performing the experiment, and your understanding of physics evident from the analysis of your data and your discussion in the report. Your lab report on an experiment is due at the beginning of the next lab period.

**Computer Skills for Physics Lab Test:** At the end of the semester there will be a required Computer Skills for Physics Lab Test where your computational skills with the spreadsheet, and your ability to gather and analyze data generated by electronic sensors and collected by the computer will be tested.

**Lab Grading Scheme:** The lab grade will be evaluated according to this scheme: Lab Reports 80%, Pre- and Post-Lab quizzes 15%, and the Computer Skills for Physics Lab Test 5%.

**Exams:** Two term exams will be held during the lecture period. The final exam will be in the lecture room. Term exams will be closed book and the only resource you can use are hand written material and a calculator but nothing else. There is a limit on the number of hand written material: 4 pages for Exam 1, 6 pages for Exam 2, and 8 pages for the final exam. There will be both conceptual questions and numerical problems on the exams, as well as questions based on the physics and measurement techniques you have learnt in the lab. All topics covered up to the class prior to a term exam constitute potential material for the term exam. More specific guidance on material for the two term exams will be provided later during the term. Your answers to exam questions should be clearly and legibly written on the exam on the margin or on attached sheets. For the multiple choice questions on the exams which have a numerical answer, you will need to show your work and calculations on a work sheet. If you worked a problem on a term exam correctly, but marked its answer incorrectly, you will get partial credit for that problem based only on the work shown on the worksheet. The only other valid reason for partial credit is a simple misreading of given data such as reading 10 m as 100 m and no other. Sign errors, partially worked out problems, or any other errors will not qualify for partial credit. No partial credit will be awarded for questions on the final exam. Practice exams have been posted on the course web site. *Graded term exams, and their answer keys, will be made available for inspection and study in class or in the instructor's office but they will not be returned to the student and the student cannot copy them or the exam answer keys and solutions.*

**Term Exams will be held during the lecture periods.**

**Use of Computers:** Many experiments require the use of PCs in the physics laboratory. Computer skills that the student should acquire in this course include (a) the use of available physics software, and (b) creating and using a spreadsheet, including graphing and linear regression. You should bring a portable data storage device to the lab to save the files you and your group created. Alternately, save your work on remote drives accessible through a network. Each student must have access to a copy of the files the group created. Spend a few minutes at the end of the lab period to copy, for your use, the files you have created. The instructor cleans the desk top on the physics lab microcomputers frequently and student created files will be deleted at that time.

**Policy on Make Ups for Labs, Quizzes and Exams:** There are NO provisions for making up exams, quizzes or laboratories except in cases where prior arrangements have been made with the instructor. The only valid reasons for missing a lab, quiz or an exam are (1) health related, backed by a doctor's note, (2) family emergency which can be documented, (3) job interview (letter of invitation for the interview required by the instructor), and (4) participation in a previously scheduled athletic, or university event or travel to a conference. In case of emergency resulting in not informing the instructor of your absence from class, contact the instructor at your earliest convenience. If you have to miss a laboratory, contact the laboratory instructor by phone or e-mail immediately. The instructor emphasizes that reasons for an absence for a class, a lab or an exam must be reported prior to the respective meeting time and not after the class, lab or exam.

**Grading policy:** Your final composite numerical grade is based on the following weights to the different components
of the course:- (i) Lab 25% (ii) Quizzes 26% (iii) Two Term Exams, 12% each (iv) Comprehensive Final Exam 25%.

Your letter grade will be determined using the university catalog's interpretation of the meaning of each letter grade. (See the catalog's section on 'Grades'; A = Excellent, B = Good, C = Average, D= Passing, F = Failure; work not passed). The definition of excellent, good, average, passing and failure will be based on the statistics of prior student performance in this course. The scheme for awarding letter grades will be as follows:

\[
(x = \text{Historical Class Average}, \; s = \text{Historical Standard Deviation}, \; G = \text{Your Numerical Grade})
\]

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Catalog Meaning</th>
<th>Statistical Criterion</th>
<th>Numerical Range for Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Excellent</td>
<td>( G &gt; \bar{x} + s )</td>
<td>Above 84.15%</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td>( \bar{x} + s/4 &lt; G &lt; \bar{x} + s )</td>
<td>Between 72.38% and 84.15%</td>
</tr>
<tr>
<td>C</td>
<td>Average</td>
<td>( \bar{x} - s/2 &lt; G &lt; \bar{x} + s/4 )</td>
<td>Between 60.61% and 72.38%</td>
</tr>
<tr>
<td>D</td>
<td>Passing</td>
<td>( \bar{x} - 5s/4 &lt; G &lt; \bar{x} - s/2 )</td>
<td>Between 48.84% and 60.61%</td>
</tr>
<tr>
<td>F</td>
<td>Failure</td>
<td>( G &lt; \bar{x} - 5s/4 )</td>
<td>Less than 48.84%</td>
</tr>
</tbody>
</table>

A spreadsheet grade calculator is available for download; insert into this calculator your present grades or the grades you think you will realistically accumulate and the spreadsheet will calculate your overall projected numerical grade.

Policy on Making Up Lost Work Days due to University Closure: In the event of the university closing down temporarily due to acts of nature or any other reason, the instruction will be through notes circulated by the instructor online and quizzes and exams conducted online. The instructor will announce details on the actual implementation of the policy at the time of the suspension of classes.

Policy on Academic Integrity: The instructor expects a high level of personal integrity on the part of students enrolled in the course. He further assumes that students have qualities of personal worth, dignity and the capacity for self direction in personal behavior. Plagiarism and academic dishonesty, demonstrated by work copied from other students or sources not authorized by the instructor, on labs, exams or quizzes, will result in the award of 0 for that lab, exam or quiz, a written reprimand to the student, and a recommendation for a more severe disciplinary action to the appropriate department chair/dean.

Notice to Students with Disabilities and Veterans: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Driftwood 101. Certain accommodations for the successful completion of the course by students with disabilities, like testing in a quiet, secluded room, or providing extra time as deemed appropriate, can be made, after the above office has determined the appropriateness of such accommodations for the disabled student. Any action regarding such accommodation will require prior written notice to the instructor by the Office for Students with Disabilities.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

Dropping a Class: The Instructor hopes that you never find it necessary to drop this or any other class. However, unforeseen circumstances in the middle of the term may make dropping a course necessary or wise. Please consult with the Instructor before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. This term March 30 is the last day to drop a class with an automatic grade of W.
Grade Appeal Process: As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

IF ANY CHANGES TO ANY OF THE ABOVE STIPULATIONS ARE MADE, THEY WILL BE ANNOUNCED IN CLASS AND/OR ON THE COURSE LISTSERVER AND/OR THE WEB, AND YOU ARE RESPONSIBLE FOR KEEPING YOURSELF INFORMED OF SUCH CHANGES.