

## **PHY 3101: Introduction to Modern Physics, Spring 2016**

### **Course objective:**

Our universe follows the rules from two very counter-intuitive and abstract concepts in modern physics, relativity (for very fast-moving objects) and quantum mechanics (for very tiny objects). This course explores the foundations of relativity and quantum mechanics and some of their exciting consequences, at a level that can be understood and appreciated by physics as well as non-physics majors.

### **Meetings:**

MWF 9:35 am - 10:25 am (period 3), at NPB 1002

### **Instructor:**

Khandker Muttalib; NPB 2140; Tel: 392-6699; Email: muttalib@phys.ufl.edu

**Graders:** To be announced

### **Office Hours:**

Instructor: MWTh 3:00 pm – 3:50 pm (period 8), at NPB 2140, and by appointment.

Graders: To be announced

### **Textbook:**

Modern Physics (6th Ed): Paul A. Tipler and Ralph A. Llewellyn (Freeman, 2012).

### **HITT clickers:**

We will use HITT clickers for daily in-class quizzes. You will need to register your HITT clickers at <http://www.phys.ufl.edu/~hitt/> . Please contact John Mocko at [mocko@phys.ufl.edu](mailto:mocko@phys.ufl.edu) if you have questions or problems.

### **Materials and supplies fees:**

There are no additional fees for this course, other than the cost of the clickers.

### **Quizzes:**

There will be *daily* quizzes, so please *remember to bring your HITT clickers in each class*. The quizzes will constitute 10% of your total grade. Since clickers can sometimes fail to operate properly, 10% of the total number of quiz questions asked during the semester will be allowed as 'technical drops'. Thus, if 50 total questions are asked, 5 of your lowest scoring responses will be dropped in the final count.

### **Reading Assignments:**

Tentative schedule of lectures based on chapters/sections of the text will be posted. You are expected to read the material to be covered in each lecture before coming to the class. The lectures will not cover all the material listed in the schedule, and they are not designed to be a substitute for the text. The lectures will consist mainly of illustrating concepts with experiments and demonstrations, discussing any additional material omitted in the text, pointing out subtle points and common mistakes, and asking questions to find out and clarify misconceptions. The homework and exams will be based on materials covered in lectures as well as those listed in the schedule.

### **Homework:**

There will be *weekly* homework assignments, due on dates shown on the homework assignment page. These will be graded and returned, and will constitute 15% of your total grade. For medical or other excused absences, see me for approval to submit late.

### **Expectations:**

You are expected to attend classes regularly. You will benefit enormously if you study the scheduled sections from the text *before* coming to each lecture. Modern physics contains many concepts that are apparently quite counter-intuitive; some of them are downright 'crazy'. The daily quizzes are not only important for grades, but they are also an integral part of the course and will allow you as well as the instructor to detect any gaps in your understanding of these novel concepts early. You will not be able to understand later materials if you have problems with previously introduced concepts.

You are expected not to copy any homework solution from anyone else, and not to ask for help *until* you have tried hard to do it all by yourself. If you fail to do after sincere efforts, you may get help from fellow class friends, instructor, or anyone else. You are also encouraged to form small study groups and discuss homework assignments, within the above rule. I expect *each* of you to submit *all* homework assignments; they are an integral part of the course. If for any reason you miss an assignment, see me immediately; under certain circumstances you may get approval to submit late for partial credit.

The course will cover a lot of novel material, and you should be prepared to invest a substantial amount of time. There will be a large number of conceptual questions in quizzes and exams, and memorization of problems will not help to earn a good grade.

### **Exams and Grading:**

There will also be three closed-book exams, on dates announced on the course web page. Each exam will constitute 25% of your total grade. Thus the final grade will derive 10% from the quizzes, 15% from homework and 75% from the three exams. The final letter grades will be assigned according to the following criteria:

A:  $\geq 85\%$   
A-: 81 – 84 %  
B+: 77 – 80 %  
B: 71 – 76 %  
B-: 67 – 70 %  
C+: 63 – 66 %  
C: 57 – 62 %  
C-: 51 – 56 %  
D+: 47 – 50 %  
D: 41 – 46 %  
D-: 37 – 40%  
F:  $\leq 36\%$

### **Lecture Notes:**

Outlines of lecture notes (hand-written, for instructor's own use) will be posted on the course web page (e-Learning) before each lecture. However, they should be used as outlines only and not as substitute for actual lectures or for the textbook.

### **Homework Solutions:**

Homework solutions will be posted after the due date.

### **Class attendance and make-ups:**

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

### **Academic Honesty:**

All University of Florida students are required to abide by the University's Academic Honesty Guidelines and by the Honor Code, which reads as follows:

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

Cheating, plagiarism, or other violations of the Academic Honesty Guidelines will not be tolerated and will be pursued through the University's adjudication procedures.

### **Counseling:**

Contact information for the Counseling and Wellness Center is <http://www.counseling.ufl.edu/cwc/Default.aspx/> .

### **Course evaluation:**

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/> . Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available at <https://evaluations.ufl.edu/results/> .

### **Special Accommodations:**

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <http://www.dso.ufl.edu/drc/>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.