PHYS 2101 Laboratory Syllabus

Spring 2017

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DO NOT FORGET TO FILL THE INFORMATION BELOW DURING YOUR FIRST LAB SESSION. YOU WILL USE THIS INFORMATION TO GET IN TOUCH WITH YOUR INSTRUCTOR DURING THE SEMESTER.

Your Instructor's name: _____

Your Instructor's Phone: _____**Email**:_____

COURSE MATERIAL REQUIRED:

- Text; *RealTime Physics Active Learning laboratories, **Module 1**, Mechanics "THE PHYSICS SUITE"* by Sokolof, Thornton, and Laws
- Calculator
- **Index card (5" X 3")**
- Pencil to complete lab report, eraser
- A thin binder to keep your lab reports, homework and quizzes. Retain it until your grade has been posted.

COURSE INFORMATION:

Physics 2101 laboratory is a course in experimental physics which must be taken concurrently with the lecture course, PHYS 2101. The laboratories are chosen to coincide with topical coverage in the lecture as much as possible.
This course uses **Canvas** instead of **Moodle** as a learning management system. Canvas can be accessed at canvas.uncc.edu. You would need to use your uncc credentials to log in.

COURSE OBJECTIVES:

- To conduct an organized and scientific investigation in order to experimentally verify the theoretical concept introduced in the lecture
- To familiarize students with experimental apparatus and scientific method of data collection and analysis
- To derive conclusions from the results based on your understanding of the relevant physics
- To study and understand introductory physics concepts via computer simulation experiments and exercises

LABORATORY ACTIVITIES:

- 5 experimental laboratory sessions
- 5 out-of-class simulation exercises
- One in-class laboratory exam

COURSE GRADING:

In-Class Experiment Lab Reports:

- Pre-Lab Preparation:---------- 5 points
- Report---------- 80 points
  - 50% points for active participation in lab exercise. Deduction will be made for:
    - Tardiness
    - Not having your own calculator
    - Not having lab manual
    - Answering or making a phone call; and/or texting
    - Performing task unrelated to lab (e.g. surfing web, coursework etc)
  - 50% points for the content of your lab report
    - Lab report completed with pencil
    - Showing calculations
    - Properly filled lab report
    - Properly drawn graphs
    - Analysis
    - Writing proper unit of measurement
- Lab Homework---------- 10 points
- Index Card and Communication Exercise ---------- 5 points

Total: 100 points per lab

Simulations:

- Simulation Questions (will be done as homework)------ 50 points
- Simulation Quizzes---------- 50 points

Total: 100 points per simulation lab

Calculation of Overall Lab Grade:

- Lab. Reports from In-Class Experiment: ---------- 50%
- Simulation in-class quizzes + Simulation Questions ---------- 20%
- Laboratory Exam---------- 30%

Total: 100%

(Grade assignment: >= 90%: A, 80-89.9: B, 70-79.9: C, 60-69.9: D, < 60%: F)

LAB ATTENDANCE POLICY/ MAKE-UP LABS:

PLEASE NOTE THAT STUDENTS WHO MISS A LABORATORY MEETING WILL LOSE 10% FOR THE LAB REPORT, AND 4% FOR THE SIMULATION QUIZ AND SIMULATION QUESTIONS. THIS LOSS WILL AUTOMATICALLY PREVENT YOU FROM SCORING ENOUGH POINTS (90) TO ATTAIN A FINAL GRADE OF 'A'!

There are NO Make-up labs:

- If you miss a lab due to reason which classifies as genuine reason for absence as per university policy (http://provost.uncc.edu/policies/classroom-attendance), you should talk with your TA and lab coordinator to find a suitable time to do the make-up lab. All make up labs should be completed before the lab exam.
- If you miss a lab due to reasons beyond your control, it will be upon the discretion of lab instructor whether or not to grant you a make-up lab.

Academic Integrity:

Students have the responsibility to know and observe the requirements of *The UNCC Code of Student Academic Integrity* (*See the UNCC Catalog*.). This code forbids cheating, fabrication or falsification of information, multiple submission of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. Any special requirements or permission regarding academic integrity will be stated by the instructor, and are binding on the students. Academic evaluations in this course include a judgment that the student's work is free from academic dishonesty of any type; and grades in this course therefore should be and will be adversely affected by academic dishonesty. Students who violate the code can be expelled from UNCC. The normal penalty for a first offense is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases the course grade is reduced to F. Copies of the code can be obtained from the Dean of Students Office. Standards of academic integrity will be enforced in this course. Students are expected to report cases of academic dishonesty to the course instructor.

Although the data collection during the lab is a group effort, data analysis and answering the questions related to the obtained data MUST be individual effort. Failure to do so will be treated as a case of academic dishonesty and will be dealt according to the University Policy.

Conducting a Laboratory Investigation

The goal of a physicist is to gain an understanding of our physical universe. To gain this understanding, observations must be made on physical systems. If the understanding is to be anything more than superficial, measurements of the physical properties of the system must be made. These measurements, once made, can then lead to a factual understanding of the system. For example, if our physical system is a bow and arrow, we can gain a factual understanding by examining the results of experiments done with the bow and arrow. To obtain this understanding we might begin by examining the physical appearance of the bow and arrow and by measuring certain properties of the bow and arrow, such as the length and mass of the arrow, the dimensions of the bow, etc. We might want to determine how far the arrow will travel when the bow string is pulled back by different distances or when the arrow is launched at different angles. In order to obtain and utilize the factual information in an efficient manner, certain techniques must be learned concerning the manner in which experimental data is obtained and how it is analyzed. In this laboratory many of the experiments have been designed to allow you an opportunity to develop skills necessary to make meaningful measurements, to extract useful data from a given

physical system, to organize the data so as to reveal the maximum information about the system, and to draw conclusions about the system which are supported by the factual information obtained as a result of having done the experiment. Although your experiences in this class relate to the field of physics, the techniques whereby a problem is approached in a systematic way can carry over into many fields of study.

Simulation Activities & Exercises

The simulation activities are assigned for the purpose of allowing students to interactively explore introductory physics concepts that are presented to them in the lecture portion of the class. Progress in computer simulations has provided an excellent opportunity for students to learn physics in the comforts of their own homes and on their own time schedule.

While only five (5) simulation chapters will be required for the laboratory portion of the class, there are many other chapters in the simulation website that will help tremendously in learning the material that is being covered by your professor in the lecture portion of your class.

YOU ARE REQUIRED TO PERFORM ALL OF THE ILLUSTRATIONS AND EXPLORATIONS FOR THE ASSIGNED SIMULATION CHAPTERS! It is required that you answer the simulation questions before coming to the next lab session. Your work will be graded by your instructor and they will be worth 50 points. The simulation related quiz will be given at the beginning of the lab session and will also be worth another 50 points.

ALL SIMULATION ACTIVITY SHOULD BE INDIVIDUAL WORK.

LABORATORY REPORTS

You will use your lab manual pages to complete the lab reports. Follow the procedure and fill the appropriate tables, draw graphs, do calculations. Once you completed your lab report, print your name, your partner's name and the date. Tear of the associated pages from your manual and hand them to your instructor. **The report will be graded by your instructor and returned back to you at the beginning of the following lab session**. **Please make sure you picked up your graded lab work every lab session**. Your lab report will worth be 80 points. You will complete Pre-Lab Preparation Sheet before coming to the lab and it will be collected for grading by your instructor at the beginning of the lab session. Pre-Lab Preparation will be worth 5 points. Once you finish the experiment, you will complete the related homework in your manual, and hand it to your instructor at the beginning of the following lab session. Homework will be worth 10 points. *Please retain your graded lab reports until the final grade is posted. Make sure you ask for your graded lab report with your TA every lab session. In case of any grade disputes at the end of the semester, it will be student's responsibility to furnish the lab report to the TA or lab coordinator. Thus, make sure you pick up your graded lab report every lab session.*

LABORATORY EXAM

You will be given a lab exam the last week of your lab session. The exam will be closed book, closed lab reports and will be conducted with no lab partners. You will have practical part for your exam related to the experiments that you conduct during the semester and also related to the simulations. The lab exam will weigh 30% of your overall course-grade.

PHYS 2101 Laboratory Schedule
Spring 2017

Group A includes students with Even-numbered lab sections (e.g. L12, L14, etc)
Group B includes students with Odd-numbered lab sections (e.g. L13, L15, etc)
Please see the table below for your lab schedule for the semester.
Lab Location: Burson 153
Lab = *in-class experimental activity*
Sim. = *simulation activity* which is done by the student using Module 1 lab manual.
Simulation requires you have latest flash player and Java installed in your computer. (http://www.java.com/en/)

	Group A activity	Group B Activity
Week of Jan 16th	Submit pre-lab for Lab 1 **Lab 1**- Introduction to Motion (in class)	NONE
Week of Jan 23rd	**Sim 1** –The Moving Man & the Maze Game Complete Sim1 lab report	Submit pre-lab for Lab 1 **Lab 1**- Introduction to Motion (in class)
Week of Jan 30th	Submit Homework for Lab 1 Submit pre-lab for Lab 2 Submit Sim-1 lab report **Lab 2** – Changing Motion (in class)	**Sim 1** –The Moving Man & the Maze Game Complete Sim1 lab report
Week of Feb 6th	**Sim 2** – Projectile Motion Complete Sim 2 lab report	Submit Homework for Lab 1 Submit pre-lab for Lab 2 Submit Sim-1 lab report **Lab 2** – Changing Motion (in class)
Week of Feb 13th	Submit Homework for Lab 2 Submit pre-lab for Lab 3 Submit Sim 2 lab report **Lab 3** – Force and Motion (in class)	**Sim 2** – Projectile Motion Complete Sim 2 lab report
Week of Feb 20th	**Sim 3** – The Ramp Complete Sim 3 lab report	Submit Homework for Lab 2 Submit pre-lab for Lab 3 Submit Sim 2 lab report **Lab 3** – Force and Motion (in class)
Week of Feb 27th	Submit Homework for Lab 3 Submit pre-lab for Lab 4 Submit Sim 3 lab report **Lab 4** – Work and Energy (in class)	**Sim 3** – The Ramp Complete Sim 3 lab report
Week of Mar 6th	**Spring Break (No labs this week)**	**Spring Break (No labs this week)**
Week of Mar 13th	**Sim 4** – Energy Skate Park Complete Sim 4 lab report	Submit Homework for Lab 3 Submit pre-lab for Lab 4 Submit Sim 3 lab report **Lab 4** – Work and Energy (in class)
Week of March 20th	Submit Homework for Lab 4 Submit pre-lab for Lab 5 Submit Sim 4 lab report **Lab 5** – Conservation of Energy (in class)	**Sim 4** – Energy Skate Park Complete Sim 4 lab report
Week of March 27th	**Sim 5** – Ladybug Revolution Complete Sim 5 lab report	Submit Homework for Lab 4 Submit pre-lab for Lab 5 Submit Sim 4 lab report **Lab 5** – Conservation of Energy (in class)
Week of April 3rd	**Lab Exam** Submit Homework for Lab 5 Submit Sim 5 lab report	**Sim 5** – Ladybug Revolution Complete Sim 5 lab report
Week of Apr 10th	**Spring Weekend/ Inclement weather makeup**	**Spring Weekend/Inclement Weather Makeup**
Week of Apr 17th	NONE	**Lab Exam** Submit Homework for Lab 5 Submit Sim 5 lab report