

## PHYSICS 1101 – C90

### Introductory Physics I

This course is a traditional in-class lecture, with exams and homework on paper.

Meetings	<ul style="list-style-type: none"> <li>• Mon/Wed 5:00 pm - 6:15 pm</li> <li>• Lectures meet at Fretwell 100</li> </ul>
Instructor	<p style="text-align: center;"><b>Prof. Menelaos K. Poutous.</b> Office: Grigg Hall 361. email: <a href="mailto:mpoutous@uncc.edu">mpoutous@uncc.edu</a></p>
Office Hrs.	<p>M/W: 3:30 -4:30 pm at Burson 101. Other times by appointment at Grigg Hall.</p>

#### ABOUT THIS COURSE:

*Description:* This is the 1<sup>st</sup> course of the **Algebra-based Physics** introductory sequence. The course covers kinematics, forces & laws of mechanics, work and energy, impulse and momentum, rigid body dynamics, and oscillations. This course is required for most life-science and technology majors.

*Objectives:* To develop students' problem solving skills in a systematic manner, while providing a balance of quantitative reasoning and conceptual understanding of Physical Laws and Scientific methods.

*Outcomes:* Upon the completion of this course, the student should be able to:

- 1) Use calculations involving physical quantities to determine solutions to problems.
- 2) Draw an accurate free-body diagram identifying all forces acting on a particle or rigid object.
- 3) Identify and apply the situation-appropriate laws of physics to solve classical mechanics problems.
- 4) Apply the Physical Principles of: conservation of energy, work-kinetic energy and, impulse-momentum theorems; to solve mechanics problems involving 2-dimensional kinematic, rotational, and oscillatory motion problems, for both single and systems of point-particles and rigid objects.

*Structure:* Students are responsible for all content presented in-class during lectures, and the textbook material listed in this syllabus. Students are required to successfully complete weekly homework assignments, periodic in-class examinations and, a final examination.

*Grading:* Weekly homework hand-in assignments, in-class exams, and a comprehensive in-class Final Exam (all material inclusive). The specific weights are:

- Weekly Homework Assignments = 30% of course grade.
- Monthly in class Exams (4 in total) = 40% of course grade.
- Final Exam (comprehensive) = 30% of course grade.

**Final Exam is on Saturday, December 10<sup>th</sup> 2016, from 8:00 AM – 11:00 AM. Location: TBA.**

**Every student is obligated to take the Final Exam on the scheduled date and time as indicated above. The Final Exam is scheduled by the university, and its time and location cannot be changed.**

**NO EXCEPTIONS ARE MADE, UNLESS THERE IS ANOTHER CLASS EXAM CONFLICT! In that case, there is an official form that has to be filled and the conflict has to be verified by the Registrar.**

**Not participating in the Final Examination will result in a grade of F for the course.**

*Resources:* Students are encouraged to use the following resources in order to increase their competence in the material.

- **Physics Department Resource Center:** Open Mon-Thu from 11am till 4pm at Burson 135A. Other possible hours of operation are posted on the center's door.
- For individual tutoring, visit <http://www.ucae.uncc.edu/> , the **University Center for Academic Excellence** (Fretwell), phone: 704-687-2162. The Department of Physics Office (Burson 100) may also have a list of suggested tutors.
- Students are encouraged to try practice exercises using **Web-Assign**, an internet based service that can be purchased with the book at the bookstore. The exercises are meant to act as means of self-assessment, and their scores will not affect the final grade. The electronic service will provide solutions to the exercises attempted. The service has also a personalized study guide that includes all chapters in the book, exercises and interactive examples.
- The course instructor has scheduled office hours in order to give personal assistance to specific student questions about the course material. Other appointments can be arranged if visits during the scheduled office hours are not possible.
- For students that are more comfortable with a book studying format, the "*Schaum's Outline: College Physics*" is recommended. That book is available in many online and actual bookstores and is a collection of solved examples from the material that will be covered.

*Requirements:* An operational knowledge of **College-level Algebra and Trigonometry are essential** for your success in all science and technology courses, including this one. Certain topics in Analytical Geometry (Vectors) are going to be presented and used throughout the course. Excessive difficulty with this material will increase the difficulty of one's problem solving abilities. Students that find the level of analysis overwhelming are encouraged to take steps to review the required material, using their book and Web-Assign.

## **COURSE FORMAT:**

### **In-Class Meetings:**

- It is the student's responsibility to attend all classroom Lectures in Fretwell 100. All material presented during the lectures is essential and the students should expect to be tested on it.
- Students are encouraged to participate in class by asking/answering questions relevant to the material presented.
- Problem help sessions, beyond what is presented in class, will be offered at the Physics Resource Center. These are meant to help understand how to use the analytical tools and concepts presented in lecture. During these, problem examples could be presented in full, or have their solutions outlined.
- **Homework assignments** will be posted in **Canvas** on a weekly basis. The students are expected to print them and provide **hand-written** solutions, which they should **hand-in the assigned date**. Late submissions of homework will be penalized. The solutions will be provided on Canvas after the assignment deadline.
- The **TEXTBOOK** is the **MAIN RESOURCE** all students have. It includes a large number of solved examples that cover all topics included in the course.

### **Online Material:**

- **Announcements** will be posted **on Canvas**. Very important announcements may also be communicated by email to the entire class.
- StarFish will be used to periodically inform the students concerning their performance. Inadequate performance will be "flagged".
- The online practice exercises are listed on WebAssign (<https://www.webassign.net/>). Even though they don't count towards the course grade, they are useful for practice and a valuable learning tool. On the Canvas site of this course there is a document with instructions on how to get access to WebAssign.

### **TEXTBOOK:**

College Physics 10<sup>th</sup> Edition, by R. A. Serway and C. Vuille (ISBN-13: 978-1-305-30532-8).

It is available in the bookstore, bundled with WebAssign, or as a stand-alone copy elsewhere. Students that will take the 2<sup>nd</sup> part of the sequence (PHYS 1102) will use the full version of the same book.

**Academic Integrity Statement:**

Academic honesty and integrity are essential to the existence and growth of an academic community. Without maintenance of high standards of honesty, members of the instructional faculty are defrauded, students are unfairly treated, and society itself is poorly served. Maintaining the academic standards of honesty and integrity is ultimately the formal responsibility of the instructional faculty; and this responsibility is shared by all members of the academic community. UNC Charlotte strives to create an academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity that includes, but is not limited to ability/disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.

Students have the responsibility to know and observe the requirements of The UNCC Code of Student Academic Integrity (Catalog p. 275). The full document is posted in Canvas. This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. Any special requirements or permission regarding academic integrity in this course 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 for academic dishonesty. Students who violate the code can be expelled from UNCC. The normal penalty for 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. Students are expected to report cases of academic dishonesty to the course instructor.

**Disability Services Statement:**

UNC Charlotte is committed to access to education. If you have a disability and need academic accommodations, please provide a letter of accommodation from Disability Services early in the semester. For more information on accommodations, contact the Office of Disability Services at 704-687-0040 or visit their office at Fretwell 230.

**PHYS 1101 – Section C90 – Prof. M. K. Poutous – Course Schedule**

Classes don't meet on the gray-highlighted dates. Exam dates are highlighted in yellow.

Date	Lecture	Chapter	Sections	Subject
Aug. 22	I	1	1, 3-6	Units, Dimensional analysis, error and significant figures.
Aug. 24	II	2	1-6	Motion in 1D.
Aug. 29	III	2	6	Free fall.
Aug. 29	Last Day to Add/Drop with no grade penalty			
<b>Aug. 31</b>	<b>EXAM I</b>	<b>1,2</b>	<b>1D Kinematics.</b>	
Sept. 5	Labor Day - No class			
Sept. 7	IV	3	1-3	Vectors, displacement, velocity & acceleration in 2D and Ch.1 section 7.
Sept. 12	V	3	4	Projectiles.
Sept. 14	VI	3	5	Relative Velocity.
Sept. 19	VII	4	1-5	1st, 2nd, 3rd Law, Mass, Forces.
Sept. 21	VIII	4	5-6	Applications of Mechanics, Friction.
<b>Sept. 26</b>	<b>EXAM II</b>	<b>3,4</b>	<b>2D motion, Forces.</b>	
Sept. 28	IX	5	1-2	Work & Energy.
Oct. 3	X	5	3-6	Potential Energy, Systems, Power.
Oct. 5	XI	6	1-2	Impulse & Momentum.
Oct. 7	Unsatisfactory Midterm Grades posted			
Oct. 10	FALL RECESS			
Oct. 12	XII	6	3-4	Collisions.
Oct. 17	XIII	7	1-3	Rotational motion.
Oct. 19	XIV	7	4	Centripetal Forces.
<b>Oct. 24</b>	<b>EXAM III</b>	<b>5,6,7(1-4)</b>	<b>Energy, Collisions, Rotations.</b>	
Oct. 26	XV	7	5-6	Celestial Mechanics.
Oct. 31	XVI	8	1-3	Rotational Dynamics.
Nov. 2	XVII	8	4	Mechanical Equilibrium.
Nov. 7	XVIII	8	5-6	Rotational Energy.
Nov. 9	XIX	8	7	Angular Momentum.
Nov. 14	XX	13	1-2	Elastic Energy.
Nov. 16	XXI	13	3-4	Simple Harmonic Motion.
<b>Nov. 21</b>	<b>EXAM IV</b>	<b>7(5-6), 8,13(1-2)</b>	<b>Rotational Dynamics, Elastic Forces.</b>	
Nov. 23	Thanksgiving Holiday			
Nov. 28	XXII	13	5	Pendulum.
Nov. 30	XXIII	13	7-8	Wave motion.
Dec. 5	XXIV	13	9-11	Wave interaction.
Dec. 7	XXV	-	-	Review of Mechanics.
<b>Dec. 10</b>	<b>FINAL EXAM</b>	<b>All</b>	<b>8:00pm-11:00pm Room to be determined.</b>	