

**Course Syllabus / Outline**

<b>Instructor:</b>	Dr. Ian D. Hartley, Professor Ecosystem Science and Management Program / Department of Physics
<b>Office:</b>	Teaching and Learning Building, 10-2098
<b>Office Hours:</b>	Monday & Thursday (exact times to be determined week of Sept 14)
<b>Telephone:</b>	(250) 960-6054; Leave a message – it is sent to my email address.
<b>E-mail:</b>	Ian.Hartley@unbc.ca

**Lectures**

Monday, Wednesday & Friday, 9:30 am – 10:20 am  
Teaching Lab Building 8, Room 166

**Laboratory Sections**

Section L1: 3:30 pm – 6:20 pm, Monday  
Section L2: 11:30 am – 2:20 pm, Tuesday  
Section L3: 3:00 pm – 5:50 pm, Tuesday  
Section L4: 6:30 pm – 9:20 pm, Tuesday  
Section L5: 3:30 pm – 6:20 pm, Wednesday  
Section L6: 8:30 am – 11:20 am, Thursday  
All Labs are held in Teaching Lab 8-227

**Tutorial**

A regular date, time and place will be determined  
during the first full-week of classes.

**Blackboard**

learn.unbc.ca  
Login with your UNBC student credential

**1.0 Course Description**

First part of an algebra-based introductory physics course for majors in life and environmental sciences: physics and measurement, the laws of motion, applications of Newton's second law, work and energy, linear momentum and collisions, static equilibrium, elasticity, law of universal gravitation, laws of thermodynamics, fluid mechanics, sound waves.

**2.0 Course Requirement**

PHYS 115 Minimum Grade of D- or Physics 12 (50%)

**3.0 Laboratory Sections**

There are 6 laboratory sections. Several key points that you must know:

1. You cannot change laboratory sections without permission;
2. You must have completed the lab safety course before the first lab; and,
3. Labs begin the week of September 21, 2015 and are weekly (except if there is a holiday during the week).

Information about the labs is available at: [www.unbc.ca/physics/labs](http://www.unbc.ca/physics/labs). Download the “Physics Laboratory Manual” – the link is on the same page – and bring it with you to the lab.

#### **4.0 Textbook -- Required – Available at UNBC Bookstore & On Reserve at Library**

*College Physics*, 9<sup>th</sup> Edition, by Serway and Vuille (ISBN-13: 978-0-8400-6206-2)  
Used version is okay and cheaper!

#### **5.0 Problem Sets – Practice what you know!!**

In order to understand what you have learned from the material presented in class, weekly problem sets are assigned on Friday (except during the week of the mid-term exam) and they are posted on the course Blackboard site.

For grade, your problem set must be put in the PHYS 100 drop box (1<sup>st</sup> floor of Teaching Lab building) by 4:00 pm the following Friday; due dates will be clearly indicated on the problem set. Since your classmates handed in their work on time, you will be docked 10% as a penalty, if submitted late. No problem set will be accepted after Monday noon (Tuesday noon, if Monday is a holiday); a grade of zero will be recorded.

It is important that your work is presented clearly. Therefore, work that I cannot read, that is, it is illegible, incoherent or otherwise poorly presented, may not be graded; the required format for problem sets is posted on the Blackboard site. Attached is the format guideline document for you to follow when writing out the solutions. (It is a separate file on the Blackboard course page.)

#### **6.0 Academic Dishonesty and Student Misconduct – Don't cheat or copy!!**

Guidelines for Academic Offenses and Student Conduct are detailed in the Undergraduate Calendar which can be found in the printed and on-line versions. The course is governed by these regulations and policies. Please ensure that you are aware and understand the procedures and consequences of actions, such as plagiarism, cheating and disruption of class. If you have any questions, contact me.

That being said, it is common for students to work together in small groups on the assigned problem sets or laboratory sessions for providing assistance and/or encouragement to each other. This does not mean, however, that you are permitted to copy work from each other. If this is found to be true, then the policies outlined in the Undergraduate Calendar will be followed.

#### **7.0 Academic Accommodation – Get help if needed!!**

Access Resource Centre (ARC) is located in the Teaching & Learning Centre (Building 10), in Room 10-1048.

The Centre provides services to students with documented disabilities ranging from permanent to temporary, including but not limited to: mental health disabilities, learning disabilities and attention deficit disorders, chronic health issues, brain injury, hearing and visual impairments, mobility and other physical disabilities. The Access Resource Centre is to assist in reducing the physical, attitudinal and systemic barriers faced by students with disabilities. If there are students in this course who, because of a disability, may have a need for special academic accommodations, please come and discuss this with me, or contact staff at the Access Resource Centre.

#### **9.0 Academic Success Centre and MACE – Get help if needed!!**

The Academic Success Centre (ASC) is located on the second floor of the Teaching and Learning building (Building 10) in Room 10-2584

The Centre offers a variety of one-to-one and drop-in tutoring services, including online support. In addition, specialized services are provided for students who are learning English, and have peer-led learning programs such as Supplemental Instruction. All of the ASC services are absolutely FREE to UNBC students!

For other assistance, you are encouraged to make use of the Mathematical Academic Centre of Excellence (MACE) on the 2<sup>nd</sup> floor of the Teaching and Learning Building, room 10-2088; it is across from my office. It is a space for you to work alone or in groups on coursework from Math and Physics classes. At various times during the week, MACE tutors (wearing green ties!) are available in the room.

### 10.0 Course Format and Evaluation – This is how your overall grade is broken down!!

The course consists of lectures, tutorial and laboratory. The grade is based on the problem sets, quizzes, mid-term exam and final exam as well as the laboratory grade. The course total = 100%; corresponding letter grade is provided below.

Problem Sets	5%, weekly, except for the week of mid-term exam	<b>Letter Grade</b>	<b>Percentage</b>
Laboratory	25%		
Mid-term Exam	15%, 50 min, held in-class Tentative Date: Oct 21, 2015	A+	90 -100%
Quizzes	20%, available on Blackboard (~ 7 quizzes) When you accept the quiz, you will have 30 min to complete it. There will only be up to 10 questions and the quiz can be done in this time.	A	85-89.9%
		A-	80-84.9%
Final Exam	35%, scheduled by the Registrar’s Office	B+	77-79.9%
		B	73-76.9%
		B-	70-72.9%
		C+	67-69.9%
		C	63-66.9%
		C-	60-62.9%
		D+	57-59.9%
D	53-56.9%		
		D-	50-52.9%
		F	0-49.9%

*NOTE: In order to pass the course, you must obtain at least a passing grade (50%) in the labs. If you are repeating the course and passed the laboratory section previously, contact Dr. George Jones – SLI Physics.*

### 11.0 Missed Examinations and Quizzes – Don’t miss out!!

If you miss the mid-term examination or a quiz because of a sudden illness, personal/family emergency or circumstances beyond your control, you must contact me (email or phone call – leave message) as soon as reasonably possible in order to make alternate arrangements.

If you know in advance that you will not be able to write the mid-term examination or quizzes, you should request an alternate examination time or date from me. If no request is made, then a grade of zero will be recorded. If you request a re-test because of medical or compassionate grounds, you are required to present relevant documentation (i.e., medical Doctor’s note).

If you miss the final examination, then the appropriate University regulation will be followed.

### 12.0 My Lecture Style and Topics Covered

The I’s have it! I have a fair and respectful classroom. I will ask for your feedback. I will engage your mind in ‘things’ physics. I will keep it current. I will write on the whiteboard, SmartBoard, etc. I will NOT put the lecture notes on-line in any capacity or format. I will try to answer all questions, with an expectation that I may not know the answer! I will post important course information on the Announcement section of Blackboard.

All extra material – YouTube links, webpage links, etc. – will be put on the PHYS 100 Blackboard site in folder marked as “The Odd Lecture Material”.

The lecture topic will generally follow the first 9 chapters of the required textbook.

### CHAPTER 1 – Introduction

Standards of Length, Mass, and Time; The Building Blocks of Matter; Dimensional Analysis; Uncertainty in Measurement and Significant Figures; Conversion of Units; Estimates and Order-of-Magnitude Calculations; Coordinate Systems; Trigonometry

### CHAPTER 2 – Motions in One Dimension

Displacement; Velocity; Acceleration; Motion Diagrams; One-Dimensional Motion with Constant Acceleration; Freely Falling Objects

### CHAPTER 3 – Vectors and Two-Dimensional

Motion; Vectors and Their Properties; Components of a Vector; Displacement, Velocity, and Acceleration in Two Dimensions; Motion in Two Dimensions; Relative Velocity

### CHAPTER 4 – The Laws of Motion

Forces; Newton's First Law; Newton's Second Law; Newton's Third Law; Applications of Newton's Laws; Forces of Friction

### CHAPTER 5 – Energy

Work; Kinetic Energy and the Work–Energy Theorem; Gravitational Potential Energy; Spring Potential Energy; Systems and Energy Conservation; Power; Work Done by a Varying Force

### CHAPTER 6 – Momentum and Collisions

Momentum and Impulse; Conservation of Momentum; Collisions; Glancing Collisions; Rocket Propulsion

### CHAPTER 7 – Rotational Motion and the Law of Gravity

Angular Speed and Angular Acceleration; Rotational Motion Under Constant Angular Acceleration; Relations Between Angular and Linear Quantities; Centripetal Acceleration; Newtonian Gravitation; Kepler's Laws

### CHAPTER 8 – Rotational Equilibrium and Rotational Dynamics

Torque; Torque and the Two Conditions for Equilibrium; The Center of Gravity; Examples of Objects in Equilibrium; Relationship Between Torque and Angular Acceleration; Rotational Kinetic Energy; Angular Momentum

### CHAPTER 9 – Solids and Fluids

States of Matter; Density and Pressure; The Deformation of Solids; Variation of Pressure with Depth; Pressure Measurements; Buoyant Forces and Archimedes' Principle; Fluids in Motion; Other Applications of Fluid Dynamics; Surface Tension, Capillary Action, and Viscous Fluid Flow; Transport Phenomena