Course Outline

University Studies

PHYS 124A
Introduction to Motion
Fall, 2014

3 CREDITS
3+3+1 HOURS PER WEEK

INSTRUCTOR: Jean-Pierre De Villiers
INSTRUCTOR: Jean-Pierre De Villiers

PHONE NUMBER: (780) 791-4940

E-MAIL: Jean-Pierre.DeVilliers@keyano.ca

OFFICE NUMBER: S211B

OFFICE HOURS:
Monday 02:00 – 02:50 PM
Tuesday 01:00 – 01:50 PM
Thursday 09:00 – 10:50 AM
Friday 10:00 – 10:50 AM

HOURS OF INSTRUCTION:
Monday 11:00 – 11:50 AM Room 239
Tuesday 08:00 – 08:50 AM Room 239
Wednesday 02:00 – 04:50 PM Room 239 (Lab)
Thursday 01:00 – 01:50 PM Room 239
Friday 02:00 – 02:50 PM Room 239

COURSE DESCRIPTION:
This is an algebra-based physics course directed at students in the life and medical sciences. It discusses two distinct types of motion: motion of particles and collective motion (waves). A review of kinematics and dynamics; conservation of momentum and energy; vector forces and bodies in equilibrium; elasticity and fracture; vibrations, circular motion; sound and light; optics; topics in modern physics.

PRE-REQUISITE(S):
Math 30 or Math 30 Pure, and Physics 20 (or equivalent); Physics 30 strongly recommended.

COURSE OUTCOMES:
1. Comprehension. To understand at the conceptual and computational level two basic phenomena of the physical world: motion of material bodies (mechanics) and wave propagation.
2. Practical. To develop problem solving skills ranging from order-of-magnitude estimates to full algebraic/numeric solutions of multi-part verbal (word) problems in mechanics and wave propagation.
3. Practical. To develop basic laboratory skills: how to measure, quantify, and analyse physical phenomena; how to discuss and defend experimental results; how to communicate experimental results with your peers and your instructor.
REQUIRED RESOURCES:

- Physics Laboratory Notebook
- Lecture Notebook and separate bound notebook for assignments

TOPICS TO BE COVERED:

**Please Note:**
This course outline may be modified to facilitate unforeseen time constraints. Date and time allotted to each topic is subject to change.

<table>
<thead>
<tr>
<th>Week</th>
<th>Chapter</th>
<th>Topic</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Intro to Physics</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1, 2</td>
<td>Units, 1D Motion</td>
<td>G1 - Intro to physics lab</td>
</tr>
<tr>
<td>3</td>
<td>3.1 to 3.5, 4</td>
<td>Vectors, Motion in 2D</td>
<td>M1 - Measuring g</td>
</tr>
<tr>
<td>4</td>
<td>5, 6</td>
<td>Newton's Laws</td>
<td>M2 - Non-Uniform Motion</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Newton's Laws</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7, 8</td>
<td>Work and Energy</td>
<td>M3 - Friction</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Midterm</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>9.1 to 9.6</td>
<td>Impulse and momentum</td>
<td>M4 - Pulleys</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>Rotational Kinematics</td>
<td>M5 - Collision Ramp</td>
</tr>
<tr>
<td>10</td>
<td>11.1-11.3, 11.5</td>
<td>Rotational Dynamics</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>13.1 to 13.6</td>
<td>Simple Harmonic Motion</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>14 (except 14.3)</td>
<td>Sound Waves</td>
<td>W2 - SHM (pendulum)</td>
</tr>
<tr>
<td>13</td>
<td>26, 27</td>
<td>Reflection and Refraction of Light</td>
<td>W4 - Thin Lenses</td>
</tr>
<tr>
<td>14</td>
<td>28</td>
<td>Interference of light</td>
<td>Lab Exam</td>
</tr>
</tbody>
</table>

**iLearn**

Go to [http://ilearn.keyano.ca](http://ilearn.keyano.ca)

This course is supported through iLearn. Assignments, readings and handouts will be posted on iLearn. Login information will be provided by your instructor. For further instructions please see the iLearn handout.
EVALUATION:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>2.5%</td>
<td>Weekly, posted at <a href="http://www.masteringphysics.com">www.masteringphysics.com</a></td>
</tr>
<tr>
<td>Tutorials/Quizzes</td>
<td>7.5%</td>
<td>Weekly</td>
</tr>
<tr>
<td>Labs</td>
<td>20%</td>
<td>See below for important conditions</td>
</tr>
<tr>
<td>Midterm</td>
<td>25%</td>
<td>Week of Oct 13, 2014</td>
</tr>
<tr>
<td>Final Examination</td>
<td>45%</td>
<td>Date TBA, in December</td>
</tr>
</tbody>
</table>

GRADING SYSTEM:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Description</th>
<th>Grade Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>A</td>
<td>Excellent</td>
<td>4</td>
</tr>
<tr>
<td>A-</td>
<td></td>
<td>3.7</td>
</tr>
<tr>
<td>B+</td>
<td></td>
<td>3.3</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td>3</td>
</tr>
<tr>
<td>B-</td>
<td></td>
<td>2.7</td>
</tr>
<tr>
<td>C+</td>
<td></td>
<td>2.3</td>
</tr>
<tr>
<td>C</td>
<td>Satisfactory</td>
<td>2</td>
</tr>
<tr>
<td>C-</td>
<td></td>
<td>1.7</td>
</tr>
<tr>
<td>D+</td>
<td></td>
<td>1.3</td>
</tr>
<tr>
<td>D</td>
<td>Minimal Pass</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>Failure</td>
<td>0</td>
</tr>
</tbody>
</table>

Students intending to transfer to other institutions should strive for a ‘C-’ as a minimum. Transfer information on each course is available at the [Alberta Council on Admission and Transfers](http://www.keyano.ca/Academics/Examinations).

Students who do not complete all the required work should not expect to pass the course. Specifically, students must pass the lab component of the course (50% or greater aggregate score on lab reports) in order to receive a passing grade for the course. If a passing grade is obtained in the lab component, then a grade is assigned a grade based on term work using the weighting given above.

*Students should consult:*

http://www.keyano.ca/Academics/Examinations
IMPORTANT DATES:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 10, 2014</td>
<td>Last day to withdraw with a refund (50%).</td>
</tr>
<tr>
<td>Week of October 13, 2014</td>
<td>Mid-term examination</td>
</tr>
<tr>
<td>November 26, 2014</td>
<td>Courses dropped after this date will be designated &quot;W&quot;. (A withdrawal (W) is not reflected in your GPA)</td>
</tr>
<tr>
<td>December 5, 2014</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>December 8-17, 2014</td>
<td>Final Exams</td>
</tr>
</tbody>
</table>

COLLEGE POLICIES

Equality, Equity and Respect
The Keyano College is committed to providing an environment of equality, equity and respect for all people within the College community. All members of this community are considered partners in developing teaching and learning contexts that are welcoming to all. Faculty, staff, and students are encouraged to use inclusive language to create a classroom atmosphere in which students' experiences and views are treated with equal respect and valued in relation to their gender, ethnic and cultural background, and sexual orientation.

Students should consult:
http://www.keyano.ca/StudentLife/StudentConduct/IndividualRightsPolicy

Plagiarism and Cheating
Every student expects to be treated and evaluated fairly in a course. Plagiarism and cheating robs everyone of this right.

No student may submit words, ideas or data of another student or person as his or her own in any writing, project, assignment, quiz, electronic presentation, exam etc. Any work used that is not the student's own must be clearly cited as belonging to someone else. There are penalties for using other's work and not citing it. The Student's Rights & Responsibilities document clearly outlines these penalties and the appeal process.

• No learner can obtain information from another student during an exam.
• No learner can bring unauthorized information (paper or electronic) into an exam or quiz.
• No student can submit work done in another course for grading in this course without the written prior approval of the course instructor.
• No student can submit copyright protected or commercially produced materials as part or all of an assignment without proper citation & permission.

Student Rights & Responsibilities
Students should consult the Keyano College Credit Calendar or online at:
http://www.keyano.ca/Academics/CreditCalendar
Specialized Supports and Duty to Accommodate

Disability Support Services: Learner Assistance Program

If you have a documented disability or you think that you would benefit from some assistance from a Disabilities Counsellor, please call or visit the Disability Supports Office 780-792-5608 to book an appointment (across from the library). Services and accommodations are intended to assist you in your program of study, while maintaining the academic standards of Keyano College. We can be of assistance to you in disclosing your disability to your instructor, providing accommodations, and supporting your overall success at Keyano College.

Specialized Supports and Duty to Accommodate

Specialized Support and Duty to Accommodate are aligned with the office of Disability Support Services: Learner Assistance Program (LAP) guided by federal and provincial human rights legislation, and defined by a number of Keyano College policies. Keyano College is obligated by legislation to provide disability-related accommodations to students with identified disabilities to the point of undue hardship.

COURSE-SPECIFIC POLICIES

iLearn and Lecture Notes

You are responsible for keeping a complete record of classroom work (lecture notes, interactive problems, classroom exercises) in a proper notebook. Lecture overheads are posted to iLearn at the end of each week and do not constitute a complete record of lecture materials.

Attendance Policy

You are expected to attend all lectures, tutorials, and laboratories without exception. Failure to do so may jeopardize your standing in the course; please consult the Keyano College Calendar, also available on-line at http://www.keyano.ca/Academics/CreditCalendar/.

- Valid reasons for absences include illness, medical appointments, and family emergencies.
- You are expected to notify your instructor of your absence by email (preferred) or by telephone on or before the date of the absence; failure to do so will result in your absence being recorded as unexcused.
- You may be required to provide written proof justifying your absence at the instructor’s discretion. Such proof will be required to obtain an excused absence from a quiz, tutorial, lab or exam.

Laboratory Work:

- Students must keep a proper record of experimental results in a hardcover physics laboratory manual (available at bookstore). IF YOU DO NOT BRING YOUR LOGBOOK TO A LAB, YOU WILL BE EXCUSED FROM THE LAB.
- Laboratory attendance is compulsory and no unexcused absences will be tolerated. An unexcused absence will result in a grade of zero for the missed lab and may result in course failure. See attendance policy.
- A properly formatted, laboratory report produced using Microsoft Word and Excel is due at the end of the lab session.
- Pre-lab: you are expected to arrive at a lab having read all advance material (posted on iLearn). A prelab exercise is due one hour before the start of the lab period. If this exercise
is not completed by the deadline, it must be completed during the lab period; the remaining time in the lab period will then be available for the experiment.

- A passing grade must be obtained in the lab portion of the course in order to pass the course. Specifically, students must achieve a 50% or greater aggregate score on lab reports in order to avoid an automatic grade of F. If a passing grade is obtained in the lab component, then a grade is assigned a grade based on term work using the weighting given above.

- **Laboratory safety** is a primary concern.
  - WHMIS certification is a prerequisite for participating in labs.
  - Any unsafe operation or abuse of laboratory equipment will result in expulsion from the lab and a grade of zero.
  - Serious safety breaches may be pursued as an academic matter.

**Assignments, Quizzes, and Tutorials**

**Assignments:**

This course uses web-based assignments: you will need to use the *Mastering Physics access kit* purchased with your textbook to access the assignments; instructions will be provided in the first lecture. Assignments must be completed via the Mastering Physics web site before the posted due dates; partially completed assignments receive the score achieved before the due date.

- **You are expected to keep fully worked out solutions to your assignments in a bound notebook; your instructor may ask to see these solutions at anytime, and you should be prepared to produce these solutions when demanded. The best approach is to have your solution book with you during lectures, labs, and tutorials.**

- You may rework assignments after the due date for practice purposes; this will have no effect on your score.

- **NOTE: missed or incomplete assignments will result in a grade of F for the course.**

**Quizzes:**

You are expected to keep current will lecture materials by reviewing your notes, reading your textbook, and making effective use of office hours. To encourage this, there will be periodic quizzes consisting of simple conceptual questions. These quizzes may be done via Mastering Physics or on paper.

**Exams:**

There will be one midterm exam and a final exam in this course. The midterm exam takes place during a lecture period in the week indicated above. The midterm will cover all topics covered up to the date of the exam. The three-hour final exam will take place during the exam period at the end of the term. The final exam is comprehensive. For all exams, you are expected to know fundamental relations and physical laws. *No formula sheet will be supplied*, although some hints may be given in some problems where a specialized identity or relation may be required.

There will also be a laboratory exam in this course that will take place during the last week of lectures. This exam is a technical exam verifying your ability to carry out common analytical tasks: linearization and error analysis. The exam will take place in the last *lecture period* of the course.
**Tutorials: YOU MUST BRING YOUR TEXTBOOK TO ALL TUTORIAL PERIODS**

- One hour per week will be used for tutorials.
- Tutorials are designed to help you develop your problem solving skills by having you work out a complete, written solution to a textbook problem or selected reading from your text under the guidance of your instructor.
- Assessment of this component will be based on the quality and clarity of the written solution (getting the correct answer is not a significant component of the assessment).
- Tutorial assignments are due at the end of the tutorial period.
- You are expected to work on tutorial problems by yourself, though you may discuss your work with your instructor or a classmate; collaborative solutions are not allowed unless explicitly stated by your instructor.
Course Outline

University Studies

PHYS 124A
Introduction to Motion
Fall, 2014

3 CREDITS
3+3+1 HOURS PER WEEK

Jean-Pierre De Villiers, Instructor   Date

Reviewed and approved by:

Louis Dingley, Chair   Date

Guy Harmer, Dean   Date