Advanced Placement Physics 1 & 2: Course Outline

Dr. Timothy M. Leung [1]

Class Time

The Advanced Placement Physics C course at Olympiads School runs for a total of 40 hours, on Monday and Thursday afternoons from 4:15pm to 6:45pm

Course Pre-requisites

When taking the course, you should be comfortable and competent in the material covered in:

- **Physics 11 and 12:** Student will need to be competent in all the topics covered in the high-school level physics courses. Many topics from Phyiscs 11 and 12 are covered more in-depth in this course.
- **Vectors:** Students need to have basic understanding of vector operations, including addition and subtraction, as well as dot products and cross products.

Course Outline

The course is divided into two parts, and covers all the topics in the two algebra-based exams.

	Topic	Exam
1	Kinematics	1
2	Dynamics	1
3	Work and energy	1
4	Momentum	1
5	Circular motion and gravity	1
6	Rotational motion	1
7	Simple harmonic motion	1
8	Mechanical waves and sound waves	1
9	Fluid mechanics	2
10	Thermodynamics	2
11	Electric force, field, potential and energy	Both
12	Electric circuits with resistors and capacitors	Both
13	Magnetism	2
14	Light and optics	2
15	Quantum physics	2

[1] Ph.D., M.A.Sc. (Toronto), B.A.Sc. (British Columbia), E-mail: tleung@olympiadsmail.ca

Almost all of theese topics are covered in Physics 11 and 12, as well as in Grades 8–10 Science, with the exception of fluid mechanics and thermodynamics. However, the AP Physics cirriculum will study these topics in more depth.

Course Material

- Textbook is not required. However, lecture slides, handouts and any additional resources are posted on the school website each week (please check and download)
- Homework questions are generally based on university-level textbook problems, and past AP C exams
- Students are expected to bring the following to each class:
  - A pen/pencil for note-taking
  - Paper/notebook/binder
  - A scientific calculator for working in-class example problems

Homework Expectation

- Homework is usually assigned after every topic is finished (approximately every week during the fall/winter session, and twice a week during the summer), depending on the length and difficulty of the material for that topic
- Homework questoins, like the AP exams themselves, will include both multiple-choice questions and free-response questions
- Late homework is always accepted. However, the longer you wait, the less meaningful they will be n your learning
- For free-response questions:
  - Show *all* work by providing complete and organized steps. In all AP exams, only part marks are awarded for the correct answer; most of the marks are for applying the correct concepts and diligent work.
  - If a question requires you to *explain*, please do so using short complete sentences with sufficient supporting detail.
  - Proper math format must be used, e.g. proper use of "=" sign, units, etc.
  - Circle or box all your final answers.
- Some of the more difficult questions will be taken up during class. However, this does *not* mean you don't need to do your homework at home. Always do your best.

Notes

To help students with getting comfortable with the format of the AP exams, all effort have been made to ensure that

- Whenever possible, the course material uses American spelling (e.g. meter instead of *metre*, color instead of *colour*)
- The homework questions are formatted to look like the actual AP exams