SAMPLE SYLLABUS #2

AP® Physics 2

Curricular Requirements

CR1	Students and teachers have access to college-level resources, including a college-level textbook and reference materials in print or electronic format.	*See page:* 2
CR2	The course provides opportunities to develop student understanding of the required content outlined in each of the units described in the AP Physics 2 Course and Exam Description.	*See page:* 2
CR3	The course provides opportunities for students to develop the skills related to Science Practice 1: Creating Representations.	*See page:* 2
CR4	The course provides opportunities for students to develop the skills related to Science Practice 2: Mathematical Routines.	*See page:* 2
CR5	The course provides opportunities for students to develop the skills related to Science Practice 3: Scientific Questioning & Argumentation.	*See page:* 3
CR6	Students spend a minimum of 25% of instructional time engaged in hands-on laboratory investigations.	*See page:* 3
CR7	Students engage in hands-on laboratory investigations representative of the topics outlined in the AP Physics 2 Course and Exam Description.	*See page:* 3
CR8	The course provides opportunities for students to record evidence of their scientific investigations in a portfolio of lab reports or a lab notebook (print or digital format).	*See page:* 4

Advanced Placement Physics 2 Sample Syllabus #2

The AP® Physics 2 course is conducted using inquiry-based instructional strategies that focus on experimentation to develop the student's conceptual understanding of physics principles. This syllabus has been designed to follow the seven Curricular Requirements (CRs) outlined in the AP Physics 2 Syllabus Development Guide. Evidence of meeting the CRs will be shown on the pages that follow.

Textbook provided on the AP Course Audit form. **CR1**

The course provides opportunities to develop student understanding of the required content outlined in each of the units described in the AP Physics 2 Course and Exam Description (CED). **CR2**

CR2
The syllabus must include an outline of course content by unit title to demonstrate the inclusion of the required course content listed in the current AP Physics 2 Course and Exam Description.

The AP Physics 2 course will follow the outline for units of study as presented in the CED. These units are:

- Unit 9: Thermodynamics
- Unit 10: Electric Force, Field, and Potential
- Unit 11: Electric Circuits
- Unit 12: Magnetism and Electromagnetism
- Unit 13: Geometric Optics
- Unit 14: Waves, Sound, and Physical Optics
- Unit 15: Modern Physics

The course provides opportunities for students to develop the skills related to Science Practice 1: Creating Representations. **CR3**

CR3
The syllabus must include a section labeled "Science Practice 1" describing one assignment, activity, or lab where students create representations that depict physical phenomena.

Within each unit, students will complete at least one problem-solving activity that involves the use of multiple representations.

Example:
For Unit 10: Electric Force, Field, and Potential, students will be asked to use electric potential data to make a map of equipotential lines.

The course provides opportunities for students to develop the skills related to Science Practice 2: Mathematical Routines. **CR4**

CR4
The syllabus must include a section labeled "Science Practice 2" describing one assignment, activity, or lab where students use mathematical routines.

Within each unit, students will complete at least one problem-solving activity or lab that requires or demonstrates an appropriate use of mathematics to answer questions.

Example:
For Unit 11: Electric Circuits, students will be asked to use Ohm's law to calculate potential difference or current at any given resistor in a circuit.

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The course provides opportunities for students to develop the skills related to Science Practice 3: Scientific Questioning & Argumentation. **CR5**

Within each unit, students will complete at least one activity or lab that requires the use of student designed experimental procedures, data analysis, and supporting claims.

Example:
For Unit 11: Electric Circuits, students will be asked to:

- Design an experiment to determine whether various circuit components are Ohmic or non-Ohmic (SP3).
- Justify their conclusions based on their knowledge of Ohm's law and experimental evidence (SP3).

Students spend a minimum of 25% of instructional time engaged in hands-on laboratory investigations. **CR6**

At least 25% of this class will be spent designing, performing, and analyzing hands-on laboratory investigations. Labs will be incorporated into instruction using inquiry methods when appropriate in the lesson cycle. All student-designed lab procedures will be approved by the instructor prior to data collection. The following labs will be done in this course: **CR7**

- Entropy Game: Students use coins and dice to investigate the meaning of entropy and to develop a model for natural processes.
- Sticky Tape: Students use cellophane tape to investigate relationships between charged objects and neutral objects, and charged objects and other charged objects.
- Coulomb's Law: Students design a procedure to collect simulation data and verify Coulomb's law.
- Potential Mapping: Students use variable power supplies and multimeters to measure and map potential data.
- Circuits Investigation: Students use simulations and real circuit components in order to develop definitions of current, voltage, and resistance. In addition, students will design an experiment to determine how different circuit configurations affect the overall power used by the circuit.
- Resistivity of Conductive Dough: Students design and conduct an experiment to determine the resistivity of conductive dough.
- Homemade Capacitors: Students research capacitors and create their own using waxed paper and aluminum foil. The capacitors will then be incorporated into circuits for testing to determine the capacitance of their device.
- Electric Motors: Students create their own electric motors using basic lab supplies. Students test the effectiveness of their motors and determine the maximum output power.
- Electromagnetic Induction: Students use a simulation to develop rules for electromagnetic induction including the root cause of induction and what affects the amount of an induced current.
- Focus: Students use physical lenses and mirrors to determine the focal length of each.
- What Do I See?: Students determine the relationship between focal length, object placement, and image characteristics.
- Snell's Law: Students design an experiment to determine the index of refraction of an unknown liquid.
- Diffraction and Interference: Students investigate the relationship between wavelength, screen distance, and band distribution for light passing through various slit configurations.

CR5
The syllabus must include a section labeled "Science Practice 3" describing one assignment, activity, or lab where students design experimental procedures, and make and justify claims.

CR6
The syllabus must include an explicit statement that **at least** 25% of instructional time is spent engaged in hands-on laboratory investigations, with an emphasis on inquiry-based labs.

CR7
The syllabus must include a title and brief description for each laboratory investigation. The labs listed should be representative of the topics outlined in the AP Physics 2 Course and Exam Description.

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- Photoelectric Effect: Students design an experiment that will allow them to use a simulation to determine the threshold frequency and stopping potential of an unknown metal.
- Half-Life: Students use candy to simulate radioactive decay and determine a half-life.

The course provides opportunities to record evidence of their scientific investigations in a portfolio of lab reports or a lab notebook (print or digital format). **CR8**

When students perform each lab investigation, they will submit their report (either in full or in part as per instructions) to their instructor either digitally or through the maintenance of a lab notebook.

CR8
The syllabus must include an explicit statement that students are required to maintain a lab notebook or portfolio (hard copy or electronic) that includes all their lab reports.

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