



**LOS ANGELES UNIFIED SCHOOL DISTRICT  
MEMORANDUM**

**TITLE:** Advanced Placement (AP) Science Courses: Integral Role of Laboratories

**NUMBER:** MEM-051098.2

**ISSUER:** Alison Yoshimoto-Towery  
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Division of Instruction

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Advanced Learning Options

**DATE:** August 18, 2020

**ROUTING**  
Local District  
Superintendents  
Administrators of Instruction  
CoS Administrators  
Directors  
Counseling Coordinators  
High School Principals  
Assistant Principals  
AP Coordinators  
AP Teachers

**PURPOSE:** The purpose of this memorandum is to communicate the College Board and District requirements for Advanced Placement (AP) science courses, i.e., AP Biology, AP Chemistry, AP Environmental Science, AP Physics (1, 2, C: Electricity and Magnetism, C: Mechanics).

**MAJOR CHANGES:** This Memorandum replaces MEM-051098.1, dated August 6, 2019, of the same subject. The College Board has developed new resources and updated the course and exam descriptions (CEDs) for AP science courses. The CEDs include: 1) an outline of the exact content and skills covered on the exam, 2) pacing and sequencing suggestions to help teachers integrate material into their courses, and 3) unit weighting to focus instruction on topics that will make the biggest impact.

**INSTRUCTIONS: I. BACKGROUND**

- A. The College Board’s Advanced Placement (AP) program enables students to take introductory college-level courses, earn college credit, advanced placement, or both, while still in high school. Every aspect of AP course and exam development is the result of collaboration between AP teachers and college faculty. College faculty review every AP teacher’s course syllabus submitted to the College Board through the AP Audit.
- B. The AP designation may only be applied to courses offered at or above the 9th grade level authorized through the annual AP Course Audit process. The AP label cannot be affixed to courses and transcripts prior to 9th grade. For additional information regarding the AP Audit, refer to District memorandum, MEM-5561.8, *Advanced Placement (AP) Audit and Annual AP Authorized Course Renewal, 2020-2021*, dated July 24, 2020.
- C. The College Board requires teachers of AP science courses to address related content and the key concepts that define the courses. It is also the College Board’s expectation that instruction encompasses core theories, processes and



# LOS ANGELES UNIFIED SCHOOL DISTRICT MEMORANDUM

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principles of scientific inquiry that promote engaging and rigorous experiences for AP students.

- D. The College Board identifies for each AP science course the percentage of instructional time (minimum) that must be devoted to inquiry-based laboratory investigations. It is the District's expectation that each AP science course teacher adheres to the College Board requirements and that the course requirements are reflected in the teacher's course syllabus which must be distributed to students at the onset of the course.
- E. The teacher's AP science course syllabus must also communicate clearly to students and their families class expectations and policies, including grading, homework, labs, tests/quizzes, absences, participation, etc.
- F. For information regarding the reporting of student progress to parents, refer to District reference guide, REF-4236.16, *Dates for Required Reports of Marks in Secondary Schools, 2019-2020*, dated May 8, 2019.

## II. AP BIOLOGY: COURSE OVERVIEW

- A. AP Biology is equivalent to a two-semester introductory college-level biology course. Students cultivate their understanding of biology through inquiry-based investigations.
- B. The AP Biology course requires that 25 percent of the instructional time is spent in hands-on laboratory work, with an emphasis on inquiry-based investigations that provide students with opportunities to apply the science practices.
- C. Important update: To help more students prepare for—and succeed on—the AP Biology Exam, the College Board has introduced new resources for the AP Biology classroom and has moved exam registration to the fall. For more information regarding the AP Biology Course and Exam Description (CED), go to <https://apstudents.collegeboard.org/sites/default/files/2019-05/ap-biology-course-and-exam-description.pdf> or click this link, [AP Biology: Course and Exam Description](#).
- D. Four big ideas (Evolution, Energetics, Information Storage and Transmission and Systems Interactions) are spiraled throughout these eight units. The AP Biology CED organizes the course into eight commonly taught units:
  1. Chemistry of Life
  2. Cell Structure and Function
  3. Cellular Energetics
  4. Cell Cycle
  5. Heredity



## LOS ANGELES UNIFIED SCHOOL DISTRICT MEMORANDUM

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6. Gene Expression and Regulation
7. Natural Selection
8. Ecology

### III. AP CHEMISTRY: COURSE OVERVIEW

- A. AP Chemistry course is designed to be the equivalent of the general chemistry course taken the first college year. Students cultivate their understanding of chemistry through inquiry-based investigations as they explore the four Big Ideas:
  1. Scale, Proportion, and Quantity
  2. Structure and Properties of Substances
  3. Transformations
  4. Energy
- B. The AP Chemistry course requires that 25 percent of the instructional time engages students in lab investigations that includes a minimum of 16 hands-on labs (at least six of which are inquiry-based). It is recommended that students keep a lab notebook throughout.
- C. Important update: To help more students prepare for—and succeed on—the AP Chemistry Exam, the College Board has introduced new resources for the AP Chemistry classroom and has moved exam registration to the fall. For more information regarding the AP Chemistry Course and Exam Description (CED), go to <https://apcentral.collegeboard.org/pdf/ap-chemistry-course-and-exam-description.pdf?course=ap-chemistry> or click on this link, [AP Chemistry Course and Exam Description](#)

### IV. AP ENVIRONMENTAL SCIENCE: COURSE OVERVIEW

- A. AP Environmental Science is designed to be the equivalent of a one-semester, introductory college course in environmental science, through which students engage with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world. Students cultivate their understanding of the interrelationships of the natural world through inquiry-based lab investigations and field work as they explore concepts like the four Big Ideas; energy transfer, interactions between earth systems, interactions between different species and the environment, and sustainability. AP Environmental Science is interdisciplinary, embracing topics from geology, biology, environmental studies, chemistry, geography and environmental science.
- B. AP Environmental Science requires that a minimum of 25% of instructional time is spent in lab or field work.



## LOS ANGELES UNIFIED SCHOOL DISTRICT MEMORANDUM

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- C. Important update: To help more students prepare for—and succeed on—the AP Environmental Science Exam, the College Board has introduced new resources for the AP Environmental Science classroom and has moved exam registration to the fall. For more information regarding the AP Environmental Science Course and Exam Description (CED), go to <https://apcentral.collegeboard.org/pdf/ap-environmental-science-course-and-exam-description.pdf?course=ap-environmental-science> or click on this link, [AP Environmental Science Course and Exam Description](#).

### V. AP PHYSICS 1: COURSE OVERVIEW

- A. AP Physics 1 is a full-year course that is the equivalent of a first-semester, introductory college course in algebra-based physics. Students cultivate their understanding of physics through classroom study, in-class activity, and hands-on, inquiry-based laboratory work as they explore concepts like systems, fields, force interactions, change, conservation, and waves.
- B. The AP Physics 1 course requires that 25 percent of the instructional time is spent on hands-on laboratory work, with an emphasis on inquiry-based Investigations. Colleges may require them to present their laboratory materials from AP science courses before college credit for laboratory is granted. Therefore, teachers should encourage students to retain their laboratory notebooks, reports, and other materials.
- C. Important update: To help more students prepare for—and succeed on—the AP Physics 1 Exam, the College Board has introduced new resources for the AP Physics 1 classroom and has moved exam registration to the fall. For more information regarding the AP Physics 1 Course and Exam Description (CED), go to <https://apcentral.collegeboard.org/pdf/ap-physics-1-course-and-exam-description.pdf?course=ap-physics-1> or click on this link, [AP Physics 1 Course and Exam Description](#).

### VI. AP PHYSICS 2: COURSE OVERVIEW

- A. AP Physics 2 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics through classroom study, in-class activity, and hands-on, inquiry-based laboratory work as they explore concepts like systems, fields, force interactions, change, conservation, waves, and probability.
- B. The AP Physics 2 course requires that 25 percent of the instructional time is spent on hands-on laboratory work, with an emphasis on inquiry-based investigations that provide students with opportunities to demonstrate the foundational physics and apply the science practices. Colleges may require them to present their laboratory materials from AP science courses before



## LOS ANGELES UNIFIED SCHOOL DISTRICT MEMORANDUM

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college credit for laboratory is granted. Therefore, teachers should encourage students to retain their laboratory notebooks, reports, and other materials.

Important update: To help more students prepare for—and succeed on—the AP Physics 2 Exam, the College Board has introduced new resources for the AP Physics 2 classroom and has moved exam registration to the fall. For more information regarding the AP Physics 2 Course and Exam Description (CED), go to <https://apcentral.collegeboard.org/pdf/ap-physics-2-course-and-exam-description.pdf?course=ap-physics-2-algebra-based> or click on this link, [AP Physics 2 Course and Exam Description](#).

### VII. AP PHYSICS C: MECHANICS

- A. AP Physics C: Mechanics is a half-year course equivalent a semester-long, introductory calculus-based college course, especially appropriate for students planning to specialize or major in physical science or engineering. Students explore topics such as: kinematics; Newton's law of motion; work, energy and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. Introductory differential/integral calculus is used throughout the course.
- B. The AP Physics C: Mechanics should include a hands-on laboratory component comparable to a semester-long introductory college-level physics laboratory. Students should spend a minimum of 20 percent of instructional time engaged in hands-on laboratory work. Each student should complete a lab notebook or portfolio of lab reports.
- C. Important update: To help more students prepare for—and succeed on—the AP Physics C: Mechanics Exam, the College Board has introduced new resources for the AP Physics C: Mechanics classroom and has moved exam registration to the fall. For more information regarding the AP Physics C: Mechanics Course and Exam Description (CED), go to <https://apcentral.collegeboard.org/pdf/ap-physics-c-mechanics-course-and-exam-description.pdf?course=ap-physics-c-mechanics> or click on this link, [AP Physics C: Mechanics Course and Exam Description](#).

### VIII. AP PHYSICS C: ELECTRICITY AND MAGNETISM

- A. AP Physics C: Electricity and Magnetism is a half-year course equivalent a one-semester, calculus-based college course, especially appropriate for students planning to specialize or major in physical science or engineering. Students explore topics such as: electrostatics, conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. Introductory differential/integral calculus is used throughout the course.



## LOS ANGELES UNIFIED SCHOOL DISTRICT MEMORANDUM

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- B. The AP Physics C: Electricity and Magnetism should include a hands-on laboratory component comparable to a semester-long introductory college-level physics laboratory. Students should spend a minimum of 20 percent of instructional time engaged in hands-on laboratory work. Each student should complete a lab notebook or portfolio of lab reports.
- C. For more information regarding AP Physics C: Electricity and Magnetism, Course Description and Essential Resources, click on this link, [AP Physics C: Electricity and Magnetism](#) or go to <https://apcentral.collegeboard.org/pdf/ap-physics-c-electricity-and-magnetism-course-and-exam-description-0.pdf?course=ap-physics-c-electricity-and-magnetism>.

### RELATED RESOURCES:

For additional information regarding the AP Course Audit, refer to:

- MEM-5561.8, *Advanced Placement (AP) Audit and Annual AP Authorized Course Renewal, 2020-2021*, dated August 31, 2020
- The AP Course Audit website: <https://apcentral.collegeboard.org/courses/ap-course-audit>
- Toll-free AP Course Audit Helpline: (877) 274-3570, open Monday through Friday, 8:00 a.m. to 5:00 p.m. ET.
- REF-4236.16, *Dates for Required Reports of Marks in Secondary Schools, 2019-2020*, dated August 17, 2020

### ASSISTANCE:

For assistance or further information please contact Advanced Learning Options:  
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