Chino Valley Unified School District
High School Course Description

CONTACTS	
1. School/District Information:	School/District: Chino Valley Unified School District Street Address: 5130 Riverside Dr., Chino, CA 91710 Phone: (909) 628-1201 Web Site: chino.k12.ca.us
2. Course Contact:	Teacher Contact: Scott R Carter Position/Title: Teacher Phone: (909) 762-3022 E-mail: scott_carter@chino.k12.ca.us
A. COVER PAGE - COURSE ID	
1. Course Title:	AP Physics 2 Algebra-Based
2. Transcript Title/Abbreviation:	AP Physics 2
3. Transcript Course Code/Number:	5428
4. Seeking Honors Distinction:	Yes
5. Subject Area/Category:	Meets the "d" laboratory science requirement
6. Grade level(s):	11-12
7. Unit Value:	5 units per semester /10 credits – physical science
8. Was this course previously approved by UC?	Yes
9. Is this course classified as a Career Technical Education course:	No
10. Is this course modeled after an UC-approved course?	Yes
11. Repeatable for credit?	No
12. Date of Board Approval:	June 11, 2015

13. Brief Course Description:

AP Physics 2 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics through inquiry-based investigations as they explore topics such as fluid statics and dynamics; thermodynamics with kinetic theory; PV diagrams and probability; electrostatics; electrical circuits with capacitors; magnetic fields; electromagnetism; physical and geometric optics; and quantum, atomic, and nuclear physics.

14. Prerequisites:

Students should have successfully completed AP Physics 1 or a comparable physics introductory course. Students should have taken or be concurrently taking pre-calculus or an equivalent course.

15. Context for Course:

AP Physics 1 Algebra-based and AP Physics 2 Algebra-based are the equivalent of the first and second semesters of an introductory, algebra-based college physics course. Because these courses are intended to be yearlong courses, teachers have time to foster deeper conceptual understanding through student-centered, inquiry-based instruction. Students have time to master foundational physics principles while engaging in science practices to earn credit or placement.

16. History of Course Development:

Guided by the National Research Council and National Science Foundation, the AP Program collaborated with college and university educators and AP teachers to develop two yearlong AP Physics courses to replace AP Physics B. The new AP courses are AP Physics 1 Algebra-based and AP Physics 2 Algebra-based. This more closely aligns with the two semester sequence of introductory physics courses found on the vast majority of college campuses.

16. Textbooks:	Addison-Wesley, Physics, 4th AP* Edition by James Walker ISBN-10: 0-13-700734-5
17. Supplemental Instructional Materials:	Prentice Hall, Conceptual Physics, 10th Edition by Paul Hewitt ISBN-10: 0-13-364749-8

B. COURSE CONTENT

Course Purpose:

Provide students with opportunities to:

- Earn credit or placement for qualifying AP Exam grades
- Stand out in the admissions process
- Earn academic scholarships and awards from colleges and universities
- Experience a college-level exam
- Be prepared for college-level course work

Course Outline:

Students explore principles of fluids, thermodynamics, electricity, magnetism, optics, and topics in modern physics. The course is based on seven Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about the physical world.

Big Ideas:

- Objects and systems have properties such as mass and charge. Systems may have internal structure
- Fields existing in space can be used to explain interactions
- The interactions of an object with other objects can be described by forces
- Interactions between systems can result in changes in those systems
- Changes that occur as a result of interactions are constrained by conservation laws
- Waves can transfer energy and momentum from one location to another without the permanent transfer of mass and serve as a mathematical model for the description of other phenomena
- The mathematics of probability can be used to describe the behavior of complex systems and to interpret the behavior of quantum mechanical systems

Key Assignments:

Twenty-five percent of instructional time is devoted to hands-on laboratory work with an emphasis on inquiry-based investigations. Investigations will require students to ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress.

Instructional Methods and/or Strategies:

Students establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Focusing on these disciplinary practices enables teachers to use the principles of scientific inquiry to promote a more engaging and rigorous experience for AP Physics students.

Such practices require that students:

- Use representations and models to communicate scientific phenomena and solve scientific problems
- Use mathematics appropriately
- Engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course
- Plan and implement data collection strategies in relation to a particular scientific question
- Perform data analysis and evaluation of evidence
- Work with scientific explanations and theories
- Connect and relate knowledge across various scales, concepts, and representations in and across domains

Assessment Including Methods and/or Tools:
Students participate is topic-specific period-long assessments that mimic the format of the AP exam throughout the year.

AP PHYSICS 2 EXAM:
Three hour Assessment Overview Exam questions are based on learning objectives, which combine science practices with specific content.
Students learn to:

- Solve problems mathematically — including symbolically
- Design and describe experiments and analyze data and sources of error
- Explain, reason, or justify answers with emphasis on deeper, conceptual understanding
- Interpret and develop conceptual and mathematical models

Format of Assessment

Section I: Multiple Choice: 50 Questions | 90 Minutes | 50% of Exam Score

- Discrete items
- Items in sets
- Multi-select items (two options will be correct)

Section II: Free Response: 4 Questions | 90 Minutes | 50% of Exam Score

- Experimental Design (1 question)
- Quantitative/Qualitative Translation (1 question)
- Short Answer (2 questions, one requiring a paragraph-length response)