OFFICE OF CURRICULUM, INSTRUCTION & PROFESSIONAL DEVELOPMENT

HIGH SCHOOL COURSE OUTLINE

Department	Science	**Course Title**	Lab Physical Science		**Course Code**		4015
Abbreviation	Lab Phys Sci	**Grade Level**	9 - 12		**Grad Requirement**		Yes
Course Length	2 semesters	**Credits/Semester**	5	**Required**	X	**Elective**	
Prerequisites	"C" or better in previous science course and Algebra (completed or concurrent enrollment), or teacher approval						
Articulated with LBCC	No	**Articulated with CSULB**	No				
Meets UC "a-g" Requirement	Yes (g)	**Meets NCAA Requirement**	Yes				

COURSE DESCRIPTION:

Laboratory Physical Science is a laboratory-based approach to science instruction. Students spend a mimimum of sixty percent of their class time engaged in investigative activities. Fundamental principles of physics, chemistry and earth science are explored in a constructive method of teaching as they relate to the environment and technology. A conceptual approach is used to study the laws of mechanics, kinematics, universal gravitation, gravitational interactions, special relativity, elements and their characteristics, chemical reactions, solubilities, acids and bases, metal reactivities, water cycle, natural resources, and plate tectonics. Successful completion of this course will credit ten units towards the high school science graduation requirement and will meet the "f" entrance requirement for the University of California and California State University systems upon completion of one year of Laboratory Physical Science.

GOALS: (Student needs the course is intended to meet)

- To provide practical experience in a conceptual framework of introductory physics.
- To provide experiences that promote student success and esteem through challenging applications of physical, chemical and geological concepts relevant to their lives.
- To enhance critical thinking skills.
- To equip students to competently address the ethical issues of a rapidly advancing technological society.
- To expose students to the availability of various college degree programs and career options which incorporate the principles and thought processes used in computer technology, physics, chemistry, and earth science.

PERFORMANCE OBJECTIVES:

Students will:

- recognize the fundamental physical concepts in motion, time, space, optics, wave and particle energy, propogation of energy, mechanics, gravitation, plantetary motions, electricity, magnetism, and atomic structure.
- recognize that our current understanding of physical laws and hypotheses are based on experimentation and constructed into theories. This preexisting body of knowledge guides further inquiry.
- demonstrate an awareness and practical knowledge of safe laboratory techniques.
- describe, explain and apply the physical science principles behind activities in their everyday lives.
- describe, explain and apply chemical principles behind their use of water and earth's natural resources in everyday life.
- describe, explain and apply principles of tectonics to seismic activity in California stressing earthquake safety procedures for them and their families.
- discriminate between relevant and irrelevant data through problem-solving, laboratory activities, projects, and life situations.
- to apply previous knowledge learned of physical and earth science concepts to previously unencountered situations.
- recognize misconceptions and, with the use of the scientific method, replace them with logical conclusions.
- discuss current events related to science and technology using appropriate scientific principles.
- relate a knowledge of the historical relevance of scientific discoveries to ethical issues using laboratory activities, essays, internet and library research projects.
- debate the environmental and economic concerns such as energy resources, nuclear waste disposal, greenhouse effect, and ozone-layer problems using a conceptual scientific approach.
- demonstrate a realistic view of the rewards and challenges of scientific research, product development and applied technologies through science projects and technical writing projects such as laboratory reports.
- design valid experimental procedures for laboratory or project work.
- look with confidence at the rigor of college level science requirements and make confident decisions about their choice of college and career.

OUTLINE OF CONTENT AND TIME ALLOTMENT

Subjects	Suggested Time	District Standards
1. Measurement, scientific method,density SI and English units	7-9 days	ES #3-1b, PS #1-2a
2. Linear motion velocity and acceleration	7-9 days	PS #3-1b
3. Newton's Laws of Motion	7-9 days	PS #3-1b, 3a

4. Energy a. work, power b. KE, PE c. simple machines	7-9 days	PS #2-1b, PS #2-2c PS #3-2a, b, c
5. Universal gravitation a. Kepler's laws b. Newton's law of Universal Gravitation	7-9 days	PS #3-1a
6. Special relativity a. space and time, 1st & 2nd postulates b. length contraction	7-9 days	PS #1-1e, PS#3-1a
7. Thermodynamics and states of matter	7-9 days	PS #2-1a,c,d, 2a
8. Structure of matter	7-9 days	PS #1-1a
9. Periodicity of elements, element characteristics a. periodic table b. periodic properties of elements	7-9 days	PS #1-1a,c
10. Atoms and bonding	7-9 days	PS #1-1a
11. Chemical reactions	7-9 days	PS #1- 1b,d,e, PS #2-2a,b,c
12. Solution chemistry	7-9 days	PS #1-1a, PS #2-2a
13. Earth's natural resources	7-9 days	ES #2-3a,b,c,d, ES#2-4c,d ES #4-1a,b,c, ES #4-2a,b, c-1,2,3,4, 2d-1, 2e-1
14. Tectonic theory earthquakes and volcanoes	7-9 days	ES #2-1a-1,1a-2,1b,c,e
15. History of the earth	7-9 days	ES #2-1d,e, ES#2-2a,b, ES ES #2-4a,b,#3-2a,b,c,d, ES #3- 1a,b
16. Meteorology	7-9 days	ES #2-2a,b,c,d,e,f
17. Stars and galaxies	7-9 days	ES #1-1a,b, ES #2-2a,b,c
18. Our solar system	7-9 days	ES #2-2b
19. Earth and Moon	7-9 days	ES #1-2d,e,f,g,h

METHODS: A variety of instructional strategies will be utilized to accommodate all learning styles and to reinforce science skills while learning physical science content.

Students will meet the goals and performance objectives through: reading assignments; word problem exercises as homework; student- and teacher-run presentations; discussion; lecture; speakers from industries and universities; use of library and internet as research resources for written and oral reports; cooperative and individual presentations; long-term and short-term projects; computer simulations using computer lab facilities; laboratory experiences including the creation of data tables and graphs.

MATERIALS USED IN TEACHING THE COURSE: In addition to the basic text, a variety of instructional tools will be used to meet the needs of all students.

Basic Text: Conceptual Physics, 2nd Ed; Hewitt, 1992, Addison Wesley
Earth Science; Fariel, 1989, Addison Wesley

A variety of apparatus as appropriate for laboratories. Computer-based simulations. Videos, laser discs, CD Rom, and internet access.

EVALUATION: Student achievement in this course will be measured using multiple assessment tools including but not limited to: (a grading scale and/or rubric should be included)

Student-maintained notebooks with sections containing: portfolio, notes, homework, project work and laboratory write-ups, quizzes and tests, essays.

Group presentations

Revised: 1/98