

NEW COURSE PROPOSAL

PROGRAM: LIBERAL STUDIES

- 1. Catalog Description of the Course.** *[Include the course prefix, number, full title, and units. Provide a course narrative including prerequisites and corequisites. If any of the following apply, include in the description: Repeatability (May be repeated to a maximum of ___ units); time distribution (Lecture ___ hours, laboratory ___ hours); non-traditional grading system (Graded CR/NC, ABC/NC). Follow accepted catalog format.]*

PHSC 170. FOUNDATIONS IN PHYSICAL SCIENCE (4)

Three hours of lecture and three hours of lab per week.

Prerequisite: A passing score on the ELM Examination.

The areas covered include the physical properties of solids, liquids, and gases; physical and chemical changes in matter; atomic theory and the periodic table; the principles of motion and energy; forces and the motion of particles; sources and transformations of energy including heat, electricity, magnetism, light, and sound; renewable and non-renewable energy sources; and the conservation of energy resources. Lab fee required.

GenEd: BI

Note: Formerly CHEM 170/ PHYS 170

2. Mode of Instruction.

	Units	Hours per Unit	Benchmark Enrollment
Lecture	3	1	30
Seminar			
Laboratory	1	3	30
Activity			

- 3. Justification and Learning Objectives for the Course.** (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) *[Use as much space as necessary]*

Meets the multiple-subject standards for physical sciences (Chemistry and Physics) with a focus on (1) the structure and properties of matter and (2) the principles of motion and energy.

This course is intended to prepare students in the Teaching and Learning Option of the Liberal Studies program for a specific portion of the Subject Matter Requirements for the Multiple Subject Teaching Credential. This course will address Domain 1 (Physical Science) of Content Specifications in Science, as specified in "Standards of Program Quality and Effectiveness for the Subject Matter Requirement for the Multiple Subject Teaching Credential" as issued by the California Commission on Teacher Credentialing (September 6, 2001).

The course is designed to provide the student with a basic knowledge of the following:

- The scientific method and how it is used to approach scientific problems in physical science
- History of the development of the field of physical science
- Basic physics concepts including mechanics, momentum, work and energy, gravity, projectile motion, heat, electricity and magnetism, waves, and the atom
- Basic chemistry concepts including elements, mixtures, bonding, molecular mixing, acid-base chemistry, and oxidation and reduction chemistry

Students who successfully complete this course will be able to:

- Plan and conduct a scientific investigation to test a hypothesis;
- Apply principles of experimental design, including formulation of a testable hypothesis, evaluation of accuracy and reproducibility of data;
- Distinguish between dependent and independent variables and between linear and nonlinear relationships on a graph of data;
- Use scientific vocabulary appropriately;

- Select and use a variety of scientific tools and resources (including electronic resources);
- Interpret and analyze results of scientific experiments and to derive conclusions from experimental data;
- Communicate scientific concepts, experimental design, results, interpretations, and conclusions to their peers and to students at K-8 levels;
- Perform classroom demonstrations and experiments and explain the physical science content to their peers and to students at K-8 levels; and
- Organize and express ideas clearly and convincingly in oral and written forms.

4. Is this a General Education Course YES NO

If Yes, indicate GE category:

A (English Language, Communication, Critical Thinking)	
B (Mathematics & Sciences)	X
C (Fine Arts, Literature, Languages & Cultures)	
D (Social Perspectives)	
E (Human Psychological and Physiological Perspectives)	

5. Course Content in Outline Form. [Be as brief as possible, but use as much space as necessary]

The Scientific Method

Physics

Mechanics: Newton's First Law
 Mechanics: Newton's Second and Third Laws
 Momentum
 Work and Energy
 Gravity
 Projectile Motion
 Heat
 Electricity and Magnetism
 Waves - Sound and Light
 The Atom

Chemistry

Elements, Mixtures
 Bonding, Molecular Mixing
 Acids and Bases
 Oxidation and Reduction
 Organic Compounds
 Drugs
 Plastics

Student Classroom Demonstrations

6. References. [Provide 3 - 5 references on which this course is based and/or support it.]

R. Nanes *Inquiry into Physical Science: A Contextual Approach*, 2001.
 P. G. Hewitt, J. Suchocki, L. A. Hewitt *Conceptual Physical Science—Explorations*, Longman, 2003.
 P. G. Hewitt, J. Suchocki, L. A. Hewitt *Conceptual Physical Science*, 2nd Ed., Longman 1999.
 P. G. Hewitt, J. Suchocki, L. A. Hewitt *Conceptual Physical Science Laboratory Manual*, Longman 1998.

7. List Faculty Qualified to Teach This Course.

Dr. Philip Hampton, Dr. Simone Aloisio, Dr. Geoff Dougherty

8. Frequency.

a. Projected semesters to be offered: Fall X Spring _____ Summer _____

9. New Resources Required.

None.

10. Consultation.

Attach consultation sheet from all program areas, Library, and others (if necessary)
(*See Attached Forms*)

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

Geoff Dougherty

1/8/03

Proposer of Course

Date

Consultation:

Prof. Geoff Dougherty

Date