PHY101
SURVEY OF PHYSICAL SCIENCE

5 Credit Hours

Prepared by: Cliff Castle

Revised Date: January 2009
by
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Arts & Science Education
Dr. Mindy Selsor, Dean
PHY101  Survey of Physical Science

I. CATALOGUE DESCRIPTION

A. Prerequisite: None

B. 5 credit hours

C. Survey of Physical Science is a General Education course designed to acquaint students with basic scientific concepts and their application to the physical universe. Three hours of classroom work and four hours of laboratory are included per week. Survey of Physical Science fulfills the laboratory science requirement for the Associate of Arts degree (F, S).

II. EXPECTED LEARNING OUTCOMES/ASSESSMENT MEASURES

<table>
<thead>
<tr>
<th>Students shall be able to demonstrate deductive reasoning in identifying problems or explaining phenomena.</th>
<th>Exams &amp; pop-quizzes &amp; lab reports</th>
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<td>Students shall be able to identify basic concepts and explain their application to everyday experiences.</td>
<td>Exams &amp; lab reports</td>
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<td>Students shall identify the major contributions of selected individuals and their effect on particular scientific models.</td>
<td>Exams, assignments</td>
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<tr>
<td>Students shall be able to define and properly use scientific terminology.</td>
<td>Exams, pop-quizzes, or assignments</td>
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III. COURSE OUTLINE WITH UNIT OBJECTIVES

A. Physics
1. Explain the Greeks’ contributions to the understanding of motion and how the universe functions.
2. Describe how politics and society can affect the development of ideas.
3. Describe how Copernicus’ heliocentric model simply explained the retrograde motion of Mars.
4. Describe how Brahe’s observations led to Kepler’s planetary laws.
5. Explain how Kepler’s laws predict the motion of planets.
6. Explain how Galileo’s contributions made him the “Father of modern science”.
7. Explain the concepts of force, momentum, and gravity.
8. Explain the modern concepts of work, energy and power.
B. Structure of Matter
1. Describe the contributions of various individuals to the basic concept of the atom and its constituent particles.
2. Explain what determines what elements are and how they differ from one another.
3. Describe the Bohr model and how it functions.
4. Explain how atoms combine to form molecules and how molecules bond in different states of matter.
5. Describe the quantum model and how it functions.

C. Astronomy
1. Explain how earth-centered observations (as described by the ancients) relate to everyday life.
2. Explain how perspective changes as one moves to the modern heliocentric view.
3. Describe the modern idea of how the solar system was created and identify its strengths and flaws.
4. Explain the current planetary structure of our solar system.
5. Describe the likenesses and differences between asteroids, meteors, and comets.
6. Explain our current view of the moon and its formation.
7. Explain our current model of the sun and how it functions.
9. Describe our current views of nebulae and galaxies.
10. Describe our current concepts of black holes and quasars.

D. Geology
1. Describe the early model of the Earth and why it remained unchanged until Hutton.
2. Explain how Hutton’s contributions changed the model of the earth.
3. Describe Wegener’s idea of continental drift and why it wasn’t accepted.
4. Explain how Hess’s idea of sea-floor spreading developed.
5. Describe Plate Tectonics and how they explain what we see today.
6. Explain how and why minerals are important, and how we identify them.
7. Explain how rocks form and how we identify them.
8. Describe how fossils form and how they are used to establish the geologic time-line.
9. Interpret basic rock strata.

E. Meteorology
1. Describe the composition and structure of the atmosphere.
2. Explain the causes of rising air.
3. Describe the forces that create weather.
4. Describe the ideal circulation of the air and what affects this pattern.
5. Explain the effects of oceans on the atmosphere.
6. Describe the interaction between pressure systems and how they affect the weather.
7. Explain what creates jet streams and how they affect pressure systems.
8. Describe the types and formations of clouds.
9. Explain the structure, classification, & movement of hurricanes.
10. Explain the structure, classification, and identification of tornadoes.

IV. METHOD OF INSTRUCTION

Lecture, Video, Discussion, Demonstration, Laboratory

V. REQUIRED TEXTBOOK

None

VI. REQUIRED MATERIALS

None

VII. SUPPLEMENTAL REFERENCES

*Physical Science*, Krauskopf and Beiser, McGraw-Hill (most recent edition)

VIII. METHOD OF EVALUATION

A. Exams 40%
B. Assignments/ Pop-quizzes 20%
C. Laboratory 20%
D. Final 20%
E. Random pop-quizzes may be utilized to determine students’ understanding of current material.
F. Exams and labs may be used to evaluate the students’ overall understanding of each section.
G. Should there be a problem with comprehension of a given area, review and retesting may be done.
IX. ADA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library; phone 636-797-300, ext. 169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College Website).