

**JEFFERSON COLLEGE**  
**COURSE SYLLABUS**

**PHY102**  
**TOPICS IN PHYSICAL SCIENCE**  
3 Credit Hours

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## PHY102 Topics in Physical Science

### I. CATALOG DESCRIPTION

- A. Prerequisites: Reading proficiency
- B. 3 semester hours credit
- C. Topics in Physical Science is a lecture-discussion course which focuses on the application of scientific principles to current human concerns and interests. Students cannot apply both PHY101 and PHY102 toward graduation. (F, S, Su, O)

### II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Expected Learning Outcomes	Assessment Measures
Demonstrate deductive reasoning in identifying problems or explaining phenomena	Exams and quizzes
Identify basic concepts and explain their application to everyday experiences	Exams
Identify the major contributions of selected individuals and their effect on particular scientific models	Exams and assignments
Define and properly use scientific terminology	Exams, quizzes, and assignments

### III. OUTLINE OF TOPICS

- 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, & comets
  6. Explain our current view of the moon and its formation
  7. Explain our current model of the sun and how it functions
  8. Describe our current views of stars and their life cycles
  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. METHODS OF INSTRUCTION

- A. Lecture
- B. Video
- C. Classroom discussion
- D. Demonstrations

#### V. REQUIRED TEXTBOOK

Hewitt, Paul; *Conceptual Physical Science* (current edition). Boston: Pearson.

#### VI. REQUIRED MATERIALS

Laboratory Manual (Jefferson College book store)

#### VII. SUPPLEMENTAL REFERENCES

None

#### VIII. METHODS OF EVALUATION

- A. Exams
- B. Assignments and pop-quizzes
- C. Final Exam

#### IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (TC 101; phone 636-481-3169).

## X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, <http://www.jeffco.edu>).

## XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

## XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.