

COURSE SYLLABUS

LAST REVIEW	Spring 2021
COURSE TITLE	Introduction to Physical Science
COURSE NUMBER	NASC-0101
DIVISION	Math, Science, Business & Technology
DEPARTMENT	Physical Sciences
CIP CODE	24.0101
CREDIT HOURS	3
CONTACT HOURS/WEEK	Class: 3
PREREQUISITES	None
COURSE PLACEMENT	None

COURSE DESCRIPTION

The course covers all areas of physical sciences including physics and astronomy, chemistry, and earth science. This is a concept based course. This course is designed to acquaint the student with the scientist's approach to the world. It is not recommended for science majors. No laboratory is required.

General Education Learning Outcome

- ☐ Basic Skills for Communication
- ☐ Mathematics
- ☐ Humanities
- ☒ Natural and Physical Sciences
- ☐ Social and Behavioral Sciences

Institutional Learning Outcomes

- ☐ Communication
- ☒ Computation and Financial Literacy
- ☒ Critical Reasoning
- ☒ Technology and Information Literacy
- ☐ Community and Civic Responsibility
- ☐ Personal and Interpersonal Skills

TEXTBOOKS

<http://kckccbookstore.com/>

METHODS OF INSTRUCTION

A variety of methods is used depending on the content area. These include but not limited to: lecture, multimedia, cooperative/collaborative learning, labs and

demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

The course outline is indicated below and is subject to change as course development dictates.

- I. Motion of Objects
 - A. Distance & Displacement
 - B. Velocity and acceleration
 - C. Newton's Laws
- II. Momentum
 - A. Impulse & Momentum
 - B. Conservation of Momentum
- III. Energy
 - A. Potential & Kinetic Energy
 - B. Work & Energy
 - C. Conservation of Energy
- IV. Gravity, Projectile and Satellite Motion
 - A. Universal law of gravitation
 - B. Satellite motion
 - C. Weight & Weightlessness
 - D. Projectile Motion
- V. Thermal Energy
 - A. General description and phenomena
 - B. Applications to other areas
- VI. Electricity and Magnetism
 - A. Fundamentals
 - B. Interactions
- VII. Waves Mechanics
 - A. General description and phenomena
 - B. Applications to other areas
- VIII. Atomic and Nuclear science fundamentals
 - A. Description of the atomic nucleus
 - B. Description of radioactive materials
 - C. Applications to other areas
- IX. Basic Concepts of Chemistry
 - A. The atom as it relates to matter.
 - B. Use and organization of the periodic table.
 - C. Basics of chemical reactions
- X. Earth Sciences
 - A. Basis of geology.
 - B. The structure of the earth.
 - C. Meteorology in brief.

XI. Astronomy

- A. The solar system.
- B. The stars.
- C. Galaxies and the Universe.

COURSE LEARNING OUTCOMES

Upon successful completion of this course, the student will:

- A. Demonstrate the conceptual knowledge of rest and motion.
 - 1. The learner will be able to demonstrate the knowledge of measurements and units.
 - 2. The learner will be able to demonstrate the knowledge of kinematics.
 - 3. The learner will be able to demonstrate the concepts of Newton's laws
- B. Demonstrate the conceptual knowledge of momentum and energy.
 - 4. The learner will be able to demonstrate the knowledge of momentum, energy, and their conservation principles.
 - 5. The learner will be able to demonstrate the knowledge of work-energy theorem.
- C. Demonstrate the conceptual knowledge of gravity and satellites.
 - 6. The learner will be able to demonstrate the knowledge of universe as applied to the laws of motions of related to the gravity and gravitation.
 - 7. The learner will be able to demonstrate the knowledge of uniform circular motion and elliptical motion with regard to the motion of objects around the earth, sun, and the other terrestrial objects in the universe.
- D. Demonstrate the conceptual knowledge of fluid mechanics.
 - 8. The learner will be able to demonstrate the concept of density and pressure in liquids.
 - 9. The learner will be able to demonstrate the concept of pressure in gases and atmospheric pressure.
 - 10. The learner will be able to demonstrate the concept of Pascal's law, buoyancy force and Archimedes' principle.
- E. Demonstrate the conceptual knowledge of heat and temperature.
 - 11. The learner will be able to differentiate between heat and temperature.
 - 12. The learner will be able to explain conduction, convection, and radiation with example.
 - 13. The learner will be able to explain green house effect and global warming.
 - 14. The learner will be able to understand specific heat capacity and latent heat.
 - 15. The learner will be able to apply concepts of heat and temperature to weather and climate.
 - 16. The learner will be able to demonstrate the knowledge of structural detail of the earth.

17. The learner will be able to demonstrate the knowledge of atmospheric pressure, normal pressure, and the liquid pressure.
 18. The learner will be able to demonstrate the knowledge of laws of thermodynamics and various phenomena as applied to these laws.
- F. Demonstrate the conceptual knowledge of electricity and magnetism.
19. The learner will be able to demonstrate the knowledge of static and current electricity.
 20. The learner will be able to demonstrate the knowledge of electric potential and electric field.
 21. The learner will be able to demonstrate the concept of electric circuit, Ohm's law and electric power.
 22. The learner will be able to demonstrate the knowledge of magnet and magnetic field.
 23. The learner will be able to demonstrate the knowledge of magnetic forces on moving charge and electric current.
 24. The learner will be able to demonstrate the concept of Faraday's law.
- G. Demonstrate the conceptual knowledge of wave properties.
25. The learner will be able to demonstrate the concept of waves.
 26. The learner will be able to demonstrate the concept of sound wave and wave motion.
 27. The learner will be able to demonstrate the concept of reflection, refraction, dispersion, and polarization of electromagnetic waves.
 28. The learner will be able to demonstrate the knowledge of electromagnetic spectrum.
- H. Demonstrate the conceptual knowledge of chemistry.
29. The learner will be able to demonstrate the concept of atomic structure.
 30. The learner will be able to explain elements, compounds, and mixtures.
 31. The learner will be able to demonstrate the knowledge of chemical reactions.
 32. The learner will be able to demonstrate the knowledge of different types of bonds.
 33. The learner will be able to demonstrate the knowledge of periodic table.
 34. The learner will be able to demonstrate the knowledge of radioactive phenomena.
 35. The learner will be able to demonstrate the knowledge of atoms and molecules, atomic and molecular structure, and periodic table.
- I. Demonstrate the conceptual knowledge of earth science.
36. The learner will be able to demonstrate the knowledge of structure of the earth.
 37. The learner will be able to demonstrate the knowledge of rock formation.
 38. The learner will be able to demonstrate the knowledge of plate tectonics.
 39. The learner will be able to demonstrate the knowledge of introductory geology and metrology.
 40. The learner will be able to demonstrate the knowledge of ocean waves and tides.

- J. Demonstrate the conceptual knowledge of astronomy.
- 41. The learner will be able to demonstrate the knowledge of formation of solar system, galaxy, and stars.
 - 42. The learner will be able to demonstrate the knowledge of solar and lunar eclipses.
 - 43. The learner will be able to demonstrate the knowledge of phases of moon.
 - 44. The learner will be able to demonstrate the knowledge of life cycle of stars, black hole and galaxies.
- K. Demonstrate familiarity with the tools and methods of physics experimentation.
- 45. The learner will be able to gather the data and present it in a form showing their analysis.

ASSESSMENT OF COURSE LEARNING OUTCOMES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.