Coffeyville Community College

PHYS-205

COURSE SYLLABUS

FOR

PHYSICAL SCIENCE

Amy Lumley
Instructor

COURSE NUMBER: PHYS-205 **COURSE TITLE:** Physical Science

CREDIT HOURS: 5

INSTRUCTOR: Amy Lumley

OFFICE LOCATION: Room 209, Math/Science Office, Arts and Sciences Building

PHONE: 620-251-7700 ext. 2180

OFFICE HOURS: See schedule posted on office door

EMAIL: amyl@coffeyville.edu

PREREQUISITE(S): None

REQUIRED TEXT AND MATERIALS: Shipman. An Introduction to Physical Science. 10th Ed.
Calculator

COURSE DESCRIPTION: The course is designed for students who need a physical science requirement, especially elementary education majors. Topics include astronomy, atmospheric science, geology and nuclear reactions.

The terminology, processes, and integration of all sciences, with emphasis on the physical sciences, will be studied with the total of encouraging life-long learning and an informed citizenry. Students will be empowered to read and appreciate science related materials from the popular press, while distinguishing valid science from junk science.

EXPECTED LEARNER OUTCOMES: Upon completion of this course, the student will have acquired some of the basic tools required to be able to:

1. Understand science as a way of knowing
2. Understand the ordered universe
3. Understand energy
4. Understand heat and the Second Law of Thermodynamics
5. Understand electricity and magnetism
6. Understand waves and electromagnetic radiation
7. Understand relativity
8. Understand the atom
9. Understand quantum mechanics
10. Understand chemical bonds

11. Understand the properties of materials
12. Understand the nucleus of the atom
13. Understand the ultimate structure of matter
14. Understand the stars
15. Understand cosmology
16. Understand the Earth and other planets
17. Understand plate tectonics
18. Understand the cycles of the Earth
19. Understand ecology, ecosystems and the environment
20. Understand strategies of life
21. Understand molecules of life
22. Understand the living cell
23. Understand classical and modern genetics
24. Understand the new science of life
25. Understand evolution

LEARNING TASKS & ACTIVITIES:

The class will meet during the scheduled class time for lecture and discussion. The class will meet on Tuesdays to write up the labs, discuss the procedures for the lab, and work out any problems from the previous lab. The class will meet on Thursdays for the experimentation.

Other activities include:

1. Videos
2. Molecule Maker
3. Concept a Day Activities
4. Graphing
5. Problem Solving Units
6. Library Research
7. Group Discussion

ASSESSMENT OF OUTCOMES:

The following evaluative techniques will be used:

1. Lecture Exams
2. Lab Quizzes
3. Lecture Quizzes/Attendance
4. Lab Notebook
5. Homework Assignments
6. Lecture Final

All assignments will be assigned points. At the end of the semester, your total points will be divided by the total possible number of points to arrive at a percentage. The grading scale is as follows:

90-100% A

80-89%	B
70-79%	C
60-69%	D
0-59%	F

ATTENDANCE POLICY:

Each student is required to attend all lectures, discussions, and labs. Attendance will be taken daily. It is the responsibility of the student to make definite arrangements with the instructor for make-up work **before** going on a field trip or other college-sponsored events. If a student does not make up the missed work within a week, a **ZERO** will be assigned to the missed work. Only excused absences will be accepted for make-up work.

ACADEMIC INTEGRITY:

Dishonesty of any kind on examinations or on written assignments will render the offender liable to serious consequences such as a zero and possibly suspension from the class. The following are dishonest procedures:

1. Illegal possession of the exam
2. Use of unauthorized notes during an exam
3. Obtaining information from the book, notes, or others during an exam
4. Assisting others to cheat
5. Alteration of grade records
6. Illegal entry or unauthorized entry into office
7. Offering the work of another as one's own

OTHER POLICIES:

Classroom accommodations will be made for students with disabilities at the request of the student. Other policies may be instituted as needed.

HAVE A WONDERFUL EXPERIENCE IN PHYSICAL SCIENCE.

COMPETENCIES:

UNDERSTAND SCIENCE AS A WAY OF KNOWING

1. Understand the scientific method.
2. Identify pseudoscience.
3. Be familiar with how science is organized.

UNDERSTAND THE ORDERED UNIVERSE

1. Understand the history leading to modern astronomy.
2. Understand the history leading to mechanical physics.
3. Recognize Newton's Laws.
4. Distinguish mass and weight.
5. Understand gravity.

UNDERSTAND ENERGY

1. Be familiar with work, energy, and power.
2. Identify forms of energy.
3. Understand the law of Conservation of Energy.

UNDERSTAND HEAT AND THE SECOND LAW OF THERMODYNAMICS

1. Distinguish heat and temperature.
2. Understand heat transfer.
3. Understand entropy.

UNDERSTAND ELECTRICITY AND MAGNETISM

1. Understand electricity.
2. Understand magnetism.
3. Realize the connections between electricity and magnetism.

UNDERSTAND WAVES AND ELECTROMAGNETIC RADIATION

1. Understand the nature of waves.
2. Understand the electromagnetic spectrum.

UNDERSTAND RELATIVITY

1. Understand frames of reference.
2. Attempt some familiarity with special relativity.
3. Attempt some familiarity with general relativity.

UNDERSTAND THE ATOM

1. Distinguish atoms and molecules.
2. Identify elements.
3. Understand spectroscopy.
4. Be introduced to the periodic table.

UNDERSTAND QUANTUM MECHANICS

1. Become aware of differences between large and very small objects.
2. Comprehend wave-particle duality.

UNDERSTAND CHEMICAL BONDS

1. Be introduced to valence electrons.
2. Distinguish types of chemical bonds.
3. Identify states of matter.
4. Recognize types of reactions.

UNDERSTAND THE PROPERTIES OF MATERIALS

1. Distinguish types of material strength.
2. Understand the electrical properties of materials.
3. Become familiar with the development of computers.

UNDERSTAND THE NUCLEUS OF THE ATOM

1. Understand how the nucleus is organized.
2. Understand radioactivity.
3. Distinguish nuclear fission and fusion.

UNDERSTAND THE ULTIMATE STRUCTURE OF MATTER

1. Discover some of what is known about elementary particles.
2. Recognize the four fundamental forces.

UNDERSTAND THE STARS

1. Realize how stars produce energy.
2. Understand the anatomy of stars.
3. Use Hertzsprung-Russell diagrams.
4. Become familiar with the life-cycles of stars.

UNDERSTAND COSMOLOGY

1. Attempt to grasp the nature of the cosmos.
2. Understand the evolution of the universe.

UNDERSTAND THE EARTH AND OTHER PLANETS

1. Recognize the types of objects in our solar system.
2. Be introduced to formation hypotheses.
3. Distinguish characteristics of the inner and outer solar system.

UNDERSTAND PLATE TECTONICS

1. Recognize that the Earth's surface is constantly changing.
2. Become familiar with the processes that produce changes.

UNDERSTAND ECOLOGY, ECOSYSTEMS AND THE ENVIRONMENT

1. Become aware of the characteristics of ecosystems.
2. Identify environmental problems.

UNDERSTAND STRATEGIES OF LIFE

1. Define life.
2. Recognize how living things are classified.
3. Understand some of the strategies used by life forms.

UNDERSTAND MOLECULES OF LIFE

1. Be introduced to the characteristics of organic molecules.
2. Understand proteins.
3. Understand carbohydrates.
4. Understand lipids.
5. Understand vitamins and minerals.

UNDERSTAND THE LIVING CELL

1. Understand how a cell works.
2. Identify some parts of cells.

UNDERSTAND CLASSICAL AND MODERN GENETICS

1. Become familiar with classical genetics.
2. Become familiar with molecular genetics.

UNDERSTAND THE NEW SCIENCE OF LIFE

1. Understand some genetic technologies.

UNDERSTAND EVOLUTION

1. Resolve some of the controversies surrounding evolution.
2. Understand chemical evolution.
3. Understand natural selection.
4. Comprehend geologic time.
5. Develop an awareness of human development.

This syllabus is subject to revision with prior notification to the student by the instructor.