PHYS 1110 - Conceptual Physics (version 201003L)

Course Title	Course Development	Learning Support
Conceptual Physics	Standard	No

Course Description

Introduces some of the basic laws of physics. Topics include systems of units and conversion of units, vector algebra, Newtonian mechanics, fluids and thermodynamics, heat, light, and optics, mechanical waves, electricity and magnetism, and modern physics.

Pre-requisites

ENGL 1101 Composition and Rhetoric AND MATH 1101 Mathematical Modeling OR MATH 1103 Quantitative Skills and Reasoning OR MATH 1111 College Algebra

Regstr. Co-requisites

Regstr. Co-requisites: None

True Co-requisites

True Co-requisites: All Required

PHYS 1110L - Conceptual Physics Lab (201003L)

Course Length

	Lecture Contact Time	Regular Lab Type	Reg. Lab Contact Time	Other Lab Type	Oth. Lab Contact Time	Total Contact Hrs
Contact Hours Per Week	**3 hrs**	**N/A**	**0 hrs**	**N/A**	**0 hrs**	**3 hrs**
Contact Min/Hrs Per Semester	**2250 min**		**0 min**		**0 min**	**45 hrs**

	Lecture Credit Hours	Lab Credit Hours	Total Credit hours	WLU
Semester Credit Hours	**3**	**0**	**3**	**101.25**

Competencies & Outcomes

Order Description

1 **Units of Measurements**

Order	Description	Learning Domain	Level of Learning
1	Define the systems of units.	Cognitive	Knowledge
2	Solve problems involving unit conversions.	Cognitive	Application

2 **Newtonian Mechanics**

Order	Description	Learning Domain	Level of Learning
1	State conditions and solve problems involving equilibrium.	Cognitive	Knowledge
2	Draw free body diagrams.	Cognitive	Knowledge
3	Define and analyze problems involving bodies in motion.	Cognitive	Knowledge
4	Define Newton's laws of motion and analyze problems involving forces.	Cognitive	Knowledge

5	Define work, kinetic energy, potential energy, and conservation of energy.	Cognitive	Knowledge
6	Solve problems involving work, energy, and power.	Cognitive	Application
7	Apply conservation of energy to simple problems.	Cognitive	Application
8	Define simple machines.	Cognitive	Knowledge

3 **Fluids and Thermodynamics**

Order	Description	Learning Domain	Level of Learning
1	Define terms of fluid mechanics and thermodynamics.	Cognitive	Knowledge
2	Solve problems involving fluid mechanics and thermodynamics.	Cognitive	Application
3	Analyze laws of thermodynamics.	Cognitive	Knowledge

4 **Heat**

Order	Description	Learning Domain	Level of Learning
1	Define terms of heat and temperature.	Cognitive	Knowledge
2	Solve problems involving heat and temperature.	Cognitive	Application

5 **Light and Optics**

Order	Description	Learning Domain	Level of Learning
1	Describe the basic properties of light and electromagnetic waves.	Cognitive	Knowledge
2	Apply the laws of reflection and refraction of light.	Cognitive	Knowledge
3	Define types of lenses and mirrors.	Cognitive	Knowledge

6 **Mechanical Waves**

Order	Description	Learning Domain	Level of Learning
1	Describe the basic properties of mechanical waves. Include both sound waves and waves on a string as examples.	Cognitive	Knowledge
2	Demonstrate energy transport through different mediums by mechanical waves.	Cognitive	Application

7 **Electricity and Magnetism**

Order	Description	Learning Domain	Level of Learning
1	Define quantities of electricity and magnetism.	Cognitive	Knowledge
2	Solve problems involving electric and magnetic fields and forces.	Cognitive	Application
3	Define Ohm's law and apply to simple circuits.	Cognitive	Knowledge
4	Define units of magnetism.	Cognitive	Knowledge

5	Describe natural magnetism.	Cognitive	Knowledge

8 **Modern Physics**

Order	Description	Learning Domain	Level of Learning
1	Describe the properties and the dual nature of light.	Cognitive	Knowledge
2	Describe the wave properties of matter.	Cognitive	Knowledge
3	Describe the Heisenberg uncertainty principle.	Cognitive	Knowledge
4	Describe the quantum theory of the atom and subatomic particles.	Cognitive	Knowledge
5	Describe the hydrogen atom and calculate its energy levels.	Cognitive	Knowledge