

Standard  Institutionally Developed College: N/A

EDGE Compatible: No

**Pre-requisites**

ENGL 1101 - Composition and Rhetoric ( 201003 )

MATH 1101 - Mathematical Modeling ( 201003 )

MATH 1111 - College Algebra ( 201003 )

**Co-requisites**

PHYS 1110L - Introductory Physics Lab I ( 201203 )

**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.

**Course Length**

	Minutes	Contact Unit
Lecture:	2250	
Lab 2:	0	
Lab 3:	0	
Practicum/Internship:	0	
Clinical:	0	
Total:	2250	3

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Semester Credit Hours: 3

**Competencies**

Order	Description	Lecture	Lab2	Lab3	Practicum/ Internship	Clinical	Total Minutes	Semester Credit Hrs
1	Units of Measurements	100	0	0	0	0	100	0
2	Newtonian Mechanics	600	0	0	0	0	600	0
3	Fluids and Thermodynamics	450	0	0	0	0	450	0
4	Heat	300	0	0	0	0	300	0
5	Light and Optics	250	0	0	0	0	250	0
6	Mechanical Waves	150	0	0	0	0	150	0
7	Electricity and Magnetism	250	0	0	0	0	250	0

Order	Description	Lecture	Lab2	Lab3	Practicum/ Internship	Clinical	Total Minutes	Semester Credit Hrs
8	Modern Physics	150	0	0	0	0	150	0
	<b>Totals for Course PHYS 1110 - Conceptual Physics ( version 201003 ):</b>	<b>2250</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2250</b>	<b>3</b>

## Learning Outcomes

### 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

### 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

### 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

### 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

### Light and Optics

Order	Description	Learning Domain	Level of Learning
1	Describe the basic properties of light and electromagnetic waves.	Cognitive	Knowledge

Order	Description	Learning Domain	Level of Learning
3	Define types of lenses and mirrors.	Cognitive	Knowledge

#### 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

#### 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

#### 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

#### References

Order	Reference Type	Description
1	Book with Author(s) Listed	Griffith, W.T. & Broising, J.W.. (2008). The Physics of Everyday Phenomena. (6th). New York, NY: McGraw-Hill.
2	Book with Author(s) Listed	Hewitt, P.G. (2010). Conceptual Physics. (11th). New York, NY: Addison Wesley.
3	Book with Author(s) Listed	Serway, R. & Faughn, J. & Vuille, C.. (2009). College Physics. (8th). Belmont, CA: Brooks / Cole.
4	Book with Author(s) Listed	Touger, J. (2006). Introductory Physics, Building Understanding: Version 1.1. (?). New York, NY: John Wiley & Sons.
5	Book with Author(s) Listed	Ewen, D., Schurter, N., & Gunderson, P. (2009). Applied Physics. (9th). Upper Saddle River, New Jersey: Pearson / Prentice Hall.

Order	Reference Type	Description
6	Professional Web Site	North Carolina State University: Advanced Instructional Systems, Inc. (1997-on going). WebAssign: A web-based assessment system providing homework and test delivery, collection, grading, and recording services. Retrieved 11/15/2009, from <a href="http://webassign.net">http://webassign.net</a>