



## DEPARTMENT OF PHYSICAL SCIENCES & ENGINEERING

### MASTER SYLLABUS

**Harry S. Truman College:** Our Mission dedicates us to deliver high-quality, innovative, affordable and accessible educational opportunities and services that prepare students for a rapidly changing and diverse global economy.

**Course (Discipline):** Physical Science 112

#### 1. Title, Number, and Classification

General Course II with lab

076-0112

College Credit – Recommended for General Education Physical Science with Lab Requirement

#### 2. Course Term

16 week Semester or 8 week summer term

#### 3. Credit and Contact Hours

Credit hours: 4

Contact hours: 3 lecture and 2 lab hours

#### 4. Prerequisites

English 101 eligibility

#### 5. Catalog Description

Introduction to scientific phenomena and practices relevant to chemistry and physics, with an emphasis on the structure of matter and energy transformations. Writing assignments, as appropriate to the discipline, are part of the course.

#### 6. Students for whom the course is intended

This is a course required for students seeking an AA degree.

#### 7. Course Objectives

At the completion of this course, the successful student will be able to do the following:

##### In Physics:

1. Draw connections between physics equations and everyday observations.
2. Discuss Newtonian mechanics and give examples of Newton's laws.
3. Use the vocabulary of basics physics correctly explaining terms and defining terms as requested.
4. Demonstrate knowledge of the basic laws of mechanics, heat, sound, electricity and magnetism, and light.
5. Present the main ideas in the theory of relativity.

6. Discuss the role of physics in the acquisition of societal knowledge.

### In Chemistry:

1. Demonstrate knowledge of the periodic table of the elements.
2. Provide examples of chemical and physical changes.
3. Recognize common chemical reactions and classify these reactions by type: redox, acid-base, combustion.
4. Discuss the atomic theory of matter and describe the main types of particles: proton, electron, neutron
5. Describe the unique properties of water.
6. Discuss the role of chemistry in the acquisition of societal knowledge.

### Generally:

1. Discuss the scientific method and give examples of its use.
2. Use laboratory equipment to perform experiments and demonstrations.
3. Work collaboratively in groups exploring physical laws and concepts in the laboratory.
4. Apply the law of the conservation of matter and energy to common situations.

## 8. Learning Outcomes

At the completion of this course, the successful student will be able to do the following:

1. Demonstrate knowledge of the scientific method by discussing examples of theories and laws.
2. Trace the development of Physics as a science.
3. Discuss the periodic table, its use, the kinds of information it contains, and its development.
4. Provide outlines of the major topics in General Physics and General Chemistry
5. Interpret graphical data for general physics and chemistry subjects.
6. Defend the need for scientific literacy.

## 9. Topical Course Outline (suggested)

	Topic
Week One	Newton's Laws of Motion
	Newton's Laws of Motion
Week Two	Linear Motion: Velocity, Speed, Acceleration
Week Three	Newton's Second Law and Third Law of Motion
Week Four	Momentum
	Energy
Week Five	Simple Machines
Week Six	Rotation, Center of Gravity

Week Seven	Rotational Motion, Center of Gravity, Conservation of Angular Momentum
	Gravity
Week Eight	Projectile and Satellite Motion
	Sound
	Electricity and Magnetism
	<b>Chemistry</b>
Week Nine	Particles of Matter
	Elements of Chemistry
Week Ten	Subatomic Particles
	The Atomic Nucleus
Week Eleven	How Atoms Bond
Week Twelve	How Molecules Mix
Week Thirteen	How Water Behaves
	How Chemicals React
Week Fourteen	Acids and Bases in Our Environment
	Oxidations and Reductions Charge the World
Week Fifteen	Organic Compounds
<b>Week Sixteen</b>	<b>Review and Final</b>

## 10. Texts and Materials (suggested)

### For first eight weeks

#### Conceptual Physics 11th Ed.

by Paul G. Hewitt

Prentice Hall ©2010

ISBN-10: 0-321-56809-5

ISBN-13: 978-0-321-56809-0

### For second eight weeks

#### Conceptual Chemistry 4th Ed.

by John A. Suchocki

Prentice Hall ©2010

ISBN-10: 0-136-05453-6

ISBN-13: 978-0-136-05453-5

## 11. Methods of Instruction

Lecture and Notes: Lecture notes will be in the form of PowerPoint presentations and overhead sheets. These will be posted on Blackboard and/or websites.

Group Exercise: Documents on instructions and methodologies will be provided by the instructor. This will include group discussions, presentations, and writing laboratory reports.  
Videos/CDs: The instructor will show or provide cd roms as deemed necessary.

## **12. Methods of Evaluation:**

### Formative Evaluations:

- Exams, Laboratory Reports, Quizzes: There will be quizzes as well as midterm and final examinations.
- Laboratory Reports: Laboratories will be performed during class and, in some cases, on a computer simulator. Experiments and activities will be summarized in written reports.
- Homework/class work: Homework and class works will be at the discretion of the instructor. He/she will assign homework and class work as deemed necessary for the topics outlined in the course objectives.

The suggested grading scale is 90% for an A, 80% for a B, 70% for a C, 60% for a D and any cumulative score below 60% would receive an F.

## **Authorized Signature and File**

**Date:** \_\_\_\_\_