STATE UNIVERSITY OF NEW YORK!
COLLEGE OF TECHNOLOGY!
CANTON, NEW YORK!

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
PHYS 115 – BASIC PHYSICS

Created by: Feng Hong
Updated by: Feng Hong

Canino School of Engineering Technology
Department: PHYSICS
Semester/Year: Fall/2018
A. **TITLE:** Basic Physics

B. **COURSE NUMBER:** PHYS 115

C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

   # Credit Hours: 4 !
   # Lecture Hours: 4 per week !
   # Lab Hours: per week !
   Other: per week

   Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** Yes ☐ No ☒

E. **GER CATEGORY:** None: ☐ Yes: GER 2 Natural Sciences !
   *If course satisfies more than one:* GER !

F. **SEMESTER(S) OFFERED:** Fall ☐ Spring ☐ Fall & Spring ☒

G. **COURSE DESCRIPTION:**

   Topical coverage includes systems of units, scientific method, scientific mathematics !
   (including basic trigonometric functions), vectors, friction, forces and translational equilibrium,
   torques and rotational equilibrium, uniformly accelerated motion, Newton’s Laws, work, energy,
   and power. Emphasis is on development of laboratory and problem-solving skills including
   description, organization, analysis, summarization, and criticism in accordance with the scientific !
   method. !

H. **PRE-REQUISITES:** None ☐ Yes ☒ If yes, list below:

   MATH 100 (Beginning Algebra) or permission of instructor

   **CO-REQUISITES:** None ☒ Yes ☐ If yes, list below:
I. **STUDENT LEARNING OUTCOMES:** (see key below)

By the end of this course, the student will be able to:

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Understand the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement, and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis</td>
<td>N/A</td>
<td>Understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis</td>
<td>2-Crit Think ISLO ISLO</td>
</tr>
<tr>
<td>b. Apply scientific data, concepts, and models in physics</td>
<td>N/A</td>
<td>Application of scientific data, concepts, and models in one of the natural sciences</td>
<td>ISLO 2-Crit Think ISLO</td>
</tr>
<tr>
<td>c. Solve problem in the physical sciences in a logical, defendable manner</td>
<td>N/A</td>
<td>Application of scientific data, concepts, and models in one of the natural sciences</td>
<td>2-Crit Think ISLO ISLO</td>
</tr>
<tr>
<td>d. Demonstrate how the various topics of physics are related to everyday life</td>
<td>N/A</td>
<td>Application of scientific data, concepts, and models in one of the natural sciences</td>
<td>1-Comm Skills 2-Crit Think ISLO</td>
</tr>
</tbody>
</table>

<p>| | | | ISLO ISLO ISLO | Subsets Subsets Subsets Subsets |</p>
<table>
<thead>
<tr>
<th>ISLO #</th>
<th>ISLO &amp; Subsets</th>
</tr>
</thead>
</table>
| 1     | Communication Skills  
Oral [O], Written [W] |
| 2     | Critical Thinking  
Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS] |
| 3     | Foundational Skills  
Information Management [IM], Quantitative Lit./Reasoning [QTR] |
| 4     | Social Responsibility  
Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T] |
| 5     | Industry, Professional, Discipline Specific Knowledge and Skills |

*Include program objectives if applicable. Please consult with Program Coordinator!
J. **APPLIED LEARNING COMPONENT:** Yes ☒ No ☐

If YES, select one or more of the following categories:

- ☒ Classroom/Lab
- ☐ Internship
- ☐ Clinical Placement
- ☐ Practicum
- ☐ Service Learning
- ☐ Community Service
- ☐ Civic Engagement
- ☐ Creative Works/Senior Project
- ☐ Research
- ☐ Entrepreneurship
  (program, class, project)

K. **TEXTS:**


L. **REFERENCES:**

None

M. **EQUIPMENT:** None ☐ Needed: A twelve inch (12 “) clear, flexible, plastic ruler with a centimeter/millimeter scale. A protractor. A simple inexpensive scientific calculator with trigonometric and inverse trigonometric functions. A solar powered calculator is recommended.

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

- Exams
- Quizzes
- Homework
- Projects

P. **DETAILED COURSE OUTLINE:**

I. Introduction
   
   - A. Definition of physics
   - B. Motivation for studying physics

II. Mathematics for physics
   
   - A. Algebra
   - B. Scientific notation
   - C. Graphs
   - D. Plane geometry
   - E. Right triangle trigonometry

III. Measurements in physics
   
   - A. Fundamental quantities and units
   - B. Prefixes
   - C. Significant figures and uncertainty
   - D. Unit conversion
IV. Vectors
   A. Scalar and vector quantities
   B. Graphical methods of vector addition
   C. Vector components
   D. Vector resultants
   E. Analytic vector addition
   F. Subtraction of vectors

V. One Dimensional Motion
   A. Speed versus velocity
   B. Acceleration
   C. Uniform acceleration
   D. One-dimensional uniformly accelerated motion problems and solution methods
   E. Falling bodies

VI. Two-Dimensional Motion
   A. Horizontal and vertical components of projectile motion
   B. Range, maximum height, and time of flight

VII. Translational Equilibrium
   A. Newton's laws
   B. Translational equilibrium
   C. Free-body diagrams
   D. Translational equilibrium problems and methods of solution
   E. Friction

VIII. Newton's Second Law
   A. Force, mass, and acceleration: mathematical relationships
   B. Mass, weight, and the acceleration of gravity, free-body diagrams for constant acceleration

X. Work and Energy
   A. Work
   B. Kinetic Energy, Potential Energy and the Work-Energy Theorem

XI: Electricity
   A. Resistance
   B. Current
   C. Ohm's Law
   D. Electric Power

XII: Light
   A. Law of Reflection
   B. Law of Refraction
   C. Image Formation

Q. LABORATORY OUTLINE: None ☒ Yes ☐