1. **COURSE TITLE\*:** Applied Physics I - Mechanics
2. **CATALOG PREFIX:** PHYS **COURSE NUMBER:** 1117 **COURSE SECTION\*:**
3. **PREREQUISITE(S)\*:** MATH 1118, or the equivalent.

**COREQUISITE(S)\*:** MATH 1120, or MATH 1141, or MATH 1142, or Permission of the Department.

1. **COURSE TIME/LOCATION: (*Course Syllabus – Individual Instructor Specific*)**
2. **CREDIT HOURS\*: 3 LECTURE HOURS\*: 2**

 **LABORATORY HOURS\*: 1 (2 contact) OBSERVATION HOURS\*: 0**

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

An introductory, algebra based, survey course suitable for applied science and pre-med assisting majors, covering the topics of measurement, space, time, vectors, one dimensional and multi-dimensional motion, dynamics, forces, work and energy, conservation of energy, systems of particles, collisions, rotational motion, rotational dynamics. Laboratory component is included.

1. **LEARNING OUTCOMESS\*:**

At the completion of this course, the student will have an understanding of and be able to apply the following topics using algebra concepts and physics concepts where appropriate:

 Kinematics – one and two dimensional

 Vectors – vector Arithmetic

 Force and Newton’s Laws of Motion

 Equilibrium of Forces

Work, Energy, Conservation of Energy

Linear momentum

Collisions

Rotational kinematics and dynamics

Angular momentum and rotational energy

To demonstrate their understanding of the material, the student will:

 1. Construct an ordered relationship between the diversity of forms in which

 matter/energy exists.

 2. Use the fundamental laws of physics to analyze forces acting during:

 a. motion in a straight line

 b. free‑fall

 c. projectile motion

 d. circular motion

 3. Illustrate and resolve kinematic problems involving multiple forces acting simultaneously on one object.

 4. Analyze dynamics problems involving forces, accelerations, and masses with

 the use of Newton's Law's.

 5. Determine unknown forces and torques from the principles of equilibrium.

 6. Use the principles of conservation to solve general problems in mechanics

 including the analysis of data as presented by graphical means.

 7. Apply the basic concepts of rotary motion for the solution of illustrative

 problems

1. **ADOPTED TEXT(S)\*:**

*College Physics,* loose leaf version +enhanced WebAssign

11th edition, 2017.

Serway, and Vuille.

Cengage Learning,

ISBN #9781337741620

OR:

Sections that are offered at OFF-SITE locations can be permitted to use older editions of the current approved text (within 6 years from current editions copyright). These older editions must be approved by curriculum committee and/or the department.

1. **OTHER REQUIRED MATERIALS:**

Scientific calculator is required, graphing calculator is recommended

1. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

A: 90 – 100

 B: 80 – 89

 C: 70 – 79

 D: 60 – 69

 F: Below 60

1. **GRADING PROCEDURES OR ASSESSMENTS: (*Course Syllabus – Individual Instructor Specific)***

Assignments will be evaluated according to instructor directives.

Typically: The grade will be determined by periodic examinations, a comprehensive final examination, homework, participation, and the laboratory reports.

Example:

Class Attendance = 5%

Assignments = 25%

Examinations (4) = 40%

Final Examination = 30%

1. **COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

Course Methodology is at the discretion of the instructor. The course material will be primarily delivered through the lecture/discussion method. Special attention will be given to interactive problem solving. Laboratory experiences are included as well as hands-on demonstration.

1. **COURSE OUTLINE: *(Course Syllabus – Individual Instructor Specific)***

By Concept:

Introduction. Mathematics review.

Measurement. Graphical Solution.

Motion in One Dimension.

Vectors and Two-Dimensional Motion.

The Laws of Motion.

Work.

Energy.

Conservation of Mechanical Energy.

Momentum and Collisions.

Rotational Motion.

Rotational Equilibrium.

Rotational Dynamics.

1. **SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

Suggested pace for the course, by Week:

Week 1: Introduction

Week 2: Measurement (LO 1, 6) Lab 1

Week 3: Motion - One-Dimensional, Rectilinear (LO 2a,b, 6) Lab 2

Week 4: Vectors, Two-Dimensional Motion (LO 2a,b,c, 6) Lab 3

Week 5: Two-Dimensional Motion (LO 2a,b, 6) Lab 4

Week 6: The Laws Of Motion (LO 2a,b,4)

Week 7: Equilibrium (LO 2a,b, 3, 4, 5, 6) Lab 5

Week 8: Energy, Potential and Kinetic Energy (LO 1, 2a,b)

Week 9: Conservation of Mechanical Energy (LO 1, 2 b, 5, 6) Lab 6

Week 10: Momentum (LO 2a,b, 4, 5) Lab 7

Week 11: Collisions (LO 2a,b, 4, 5)

Week 12: Rotational Motion (LO 2d, 6, 7) Lab 8

Week 13: The Law of Gravity (LO 2,a,b,c,d, 4, 5, 6) Lab 9

Week 14: Rotational Equilibrium (LO 2d, 5, 6, 7) Lab 10

Week 15: Rotational Dynamics, Angular Momentum (LO 2d, 4, 5, 6, 7)

Week 16: Final Examination.

**16. FERPA:\***

Students need to understand that your work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**17. DISABILITIES:\***

Students with disabilities may contact the Disability Services Office, Central Campus, at 800-628-7722 or 937-393-3431.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the