1. **COURSE TITLE\*:** College Physics for Scientists & Engineers I (Calculus Based)
2. **CATALOG PREFIX:** PHYS  **COURSE NUMBER:** 2221 **/COURSE SECTION\*:**
3. **PREREQUISITE(S)\*:** MATH 1141 and MATH 1142

**COREQUISITE(S)\*:** MATH 2221 and PHYS 2231

1. **COURSE TIME/LOCATION: (*Course Syllabus – Individual Instructor Specific*)**
2. **CREDIT HOURS\*: 4 LECTURE HOURS\*: 4**

**LABORATORY HOURS\*: 0 OBSERVATION HOURS\*: 0**

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

An introductory, calculus based, survey course suitable for science and pre-med 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, elasticity, fluids, gravitation, waves and sound, heat and thermodynamics. Lab PHYS 2231 must be taken concurrently.

1. **LEARNING OUTCOMES\*:**

According to OSC016 Ohio Transfer Assurance Guidelines, at the completion of this course the student will have an understanding of and be able to apply the following topics using calculus concepts and methods where appropriate:

1. Kinematics – one and two dimensional
2. Vectors – vector Arithmetic
3. Force and Newton’s Laws of Motion
4. Work, Energy, Conservation of Energy
5. Linear momentum
6. Collisions
7. Rotational kinematics and dynamics
8. Angular momentum and rotational energy
9. Simple harmonic motion
10. Waves and sound
11. Solid and fluid properties
12. Heat and thermodynamics
13. Kinetic theory of gases
14. **ADOPTED TEXT(S)\*:**

*Principles of Physics: A Calculus Based Text*

*4th ed., 2006.*

*Serway and Jewett*

*Cengage Learning*

*ISBN #0-534-49143-X*

1. **OTHER REQUIRED MATERIALS:**

A scientific calculator is needed.

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)***

Example:

75% of final grade will be from tests, quizzes, and projects/ presentations

Breakdown of the 75%

60- 70% of your final grade: 6 tests including the final. Each test will consist of a take home and in class portion

5-10% of your final grade: 2-4 quizzes, announced and unannounced

0-10% of your final grade: A possible group project / presentation

25% of final grade will be from homework, attendance, and participation

Breakdown of the 25%

25% of your final grade: homework

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

EXAMPLE:

The course design provides instruction and materials to support the course objectives. Classes may consist of a variety of means to accomplish this including but not limiting to: lectures, class discussions, small group projects, supplemental materials, and outside assignments. Practice is an important part of the learning process. For every one hour of class time, two additional hours of study time should be expected.

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

By Chapter:

1. Introduction and Vectors. (OSC016 – Standard 2)

2. Motion in One Dimension. (OSC016 – Standard 1)

3. Motion in Two Dimensions. (OSC016 – Standard 1)

4. The Laws of Motion. (OSC016 – Standard 3)

5. More Applications of Newton's Laws (OSC016 – Standard 3)

6. Energy and Energy Transfer. (OSC016 – Standard 4)

7. Potential Energy. (OSC016 – Standard 4)

8.Momentum and Collisions. (OSC016 – Standards 5 and 6)

9. Relativity.

10. Rotational Motion. (OSC016 – Standards 7 and 8)

11.Gravity, Planetary Orbits, and the Hydrogen Atom.(OSC016 – Standards 7 and 8)

12. Oscillatory Motion. (OSC016 – Standard 9)

13. Mechanical Waves. (OSC016 – Standard 10)

14. Superposition and Standing Waves. (OSC016 – Standard 10)

15. Fluid Mechanics. (OSC016 – Standard 11)

16. Temperature and the Kinetic Theory of Gases. (OSC016 – Standard 13)

17. Energy in Thermal Processes – 1st Law of Thermodynamics.(OSC016 – Standard 12)

18.Heat Engines, Entropy, the 2nd Law of Thermodynamics.(OSC016 – Standard 12)

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

Suggested pace for the course, by Chapters:

Week 1: 1

Week 2: 2

Week 3: 3

Week 4: 4

Week 5: 5

Week 6: 6

Week 7: 7

Week 8: 8

Week 9: 9, 10

Week 10: 11, 12

Week 11: 13

Week 12: 14

Week 13: 15

Week 14: 16

Week 15: 17, 18

Week 16: Finals

**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