Division/School Approval: 05/01/15 CP
Date Initial

Curriculum Committee Approval: 5/6/15
Date Initial

Faculty Approval: 5/15/15
Date Initial

SCHENECTADY COUNTY COMMUNITY COLLEGE
Course Outline

ACADEMIC DIVISION/SCHOOL: Mathematics/Science/Technology

PREPARED BY: Ben Placek

COURSE CODE: PHY 221 **COURSE TITLE: College Physics I**

LECTURE HOURS/WEEK: 3 **LAB HOURS/WEEK**: 3 **CREDIT HOURS**: 4

PREREQUISITE/S: None
PREREQUISITE or CONCURRENT COURSE: MAT 180
COREQUISITES: None

FINAL EXAM REQUIRED: Yes

COURSE DESCRIPTION: This course is the first part of a one-year sequence. This course uses a calculus-based problem solving approach to describe kinematics, dynamics, and conservation laws. The following topics are covered: force, friction, translational and rotational motion, torque, and periodic motion.

SCCC Core Principle Course	**Yes**
SUNY General Education Course	**Yes**

STUDENT LEARNING OUTCOMES:

Students who have successfully completed this course will:

- Test scientific hypotheses by obtaining and analyzing experimental data using computational and statistical techniques;
- Demonstrate scientific communication and analysis skills through written lab reports;
- Demonstrate a working knowledge of measurement uncertainty and how it affects experimental results;
- Utilize the principles of calculus to analyze the fundamental laws of motion, and apply them to real-world examples; and
- Use the basic laws of motion to think critically and qualitatively in order to describe phenomena observed in nature.

REPRESENTATIVE TEXT/S:

Bauer,W. and Westfall, G.D. (Current Edition) *University Physics with Modern Physics.* New York, NY: McGraw-Hill.

Wilson, J.D. and Hernandez-Hall, C.A. (Current Edition) *Physics Laboratory Experiments.* Boston, MA. Cengage Learning.

SUPPLEMENTARY MATERIALS:

NOTE: Grading and assessment criteria may appropriately differ. Grades focus on what individual students have learned while assessments focus on entire cohorts of students. Each instructor will determine his/her grading criteria for the course and state on the course syllabus.

EVALUATION METHODS: Exams and laboratory reports are required. Other evaluation methods may also be used.

REQUIRED ASSESSMENT METHODS:

Assessment results from these methods will be used for course-level assessment and, where applicable, for SCCC core principles and SUNY General Education Knowledge and Skills areas. This information will be incorporated in program reviews.

Student Learning Outcome	Method(s)
Test scientific hypotheses by obtaining and analyzing experimental data using computational and statistical techniques	Laboratory Report
Demonstrate scientific communication and analysis skills through written lab reports	Laboratory Report
Demonstrate a working knowledge of measurement uncertainty and how it affects experimental results	Laboratory Report
Utilize the principles of calculus to analyze the fundamental laws of motion, and apply them to real-world examples	Examination
Use the basic laws of motion to think critically and qualitatively in order to describe phenomena observed in nature	Examination

NOTE: College policy requires a final exam or final week activity.

COURSE CONTENT OUTLINE:

WEEK	TOPICS
1	Displacement
2	Linear Accelerated Motion and Projectile Motion
3	Newton's Three Laws of Motion
4	Free Body Diagrams and Frictional Forces
5	Force, Work and Energy
6	Kinetic Energy and Potential Energy
7	Conservation of Mechanical Energy
8	Impulse and Linear Momentum
9	Conservation of Linear Momentum
10	Inelastic and Elastic Collisions
11	Rotational Motion and Centripetal Force
12	Torque and Rotational Energy
13	Conservation of Angular Momentum
14	Harmonic Motion
15	Review
16	Final Exam

PHY 221 College Physics I
Laboratory Outline

LAB	TOPICS
1	Experimental Error and Data Analysis
2	Uniformly Accelerated Motion
3	Projectile Motion
4	The Addition and Resolution of Vectors: The Force Table
5	Newton's Second Law: The Atwood Machine
6	Friction
7	Work and Energy
8	Conservation of Spring and Gravitational Potential Energy
9	The Ballistic Pendulum
10	Conservation of Linear Momentum
11	Centripetal Force
12	Rotational Motion and Moment of Inertia
13	Torques, Equilibrium, and Center of Gravity
14	Simple Harmonic Motion