

Physics 114: Mechanics

Overview

Phys 114 is the first of a three-quarter sequence of introductory physics courses targeted for students in life sciences. Upon successful completion of this course, a student will be able to develop algebra-based models to describe the physical world pertaining to motion, dynamics, momentum, and energy, and apply them to other fields of science and everyday phenomena.

The course consists of lecture (3 per week) and tutorial (Tuesday from 5pm to 6pm) components.

Textbook

- *College Physics a strategic approach*, Knight Field Jones (Pearson, 4th edition, 2018)

Lecture Topics (Textbook chapters)

- **Handouts (1 lecture):** Scaling
- **Ch. 1 (1 lecture):** Representation of motion
- **Ch. 2 (3 lectures)** One dimensional kinematics
- **Ch. 3 (2 lectures):** Vectors and two dimensional motion
- **Ch. 4 (2 lectures):** Forces and Newton's laws of motion
- **Ch. 5 (4 lectures):** Applications of Newton's laws
- **Ch. 6 (1 lecture):** Circular motion
- **Ch. 7 (3 lectures):** Torque, rotational dynamics, and center of gravity
- **Ch. 8 (3 lectures):** Static equilibrium and elasticity
- **Ch. 9 (2 lectures):** Impulse and momentum
- **Ch. 10 (5 lectures):** Energy, work, and power

Tutorial Topics (7 or 8 of the following)

- Scaling
- Representation of motion
- Acceleration in one-dimension
- Newton's second and third laws
- Rotational motion
- Biomechanical torque
- Equilibrium of rigid bodies
- Conservation of momentum
- Work and changes in kinetic energy
- Conservation of energy

Evaluation

The grades are calculated based on the following contributions and based on the scale below.

- **Continuous Assessment (40% overall)**
 - **Pre-lecture Reading Quiz Scores: 25%**
 - **Lecture Questions: 10%**
 - **Tutorial Pre-tests: 5%**
- **Exam Assessment (60% overall)**
 - The exam score will be based on the best of the following two methods:
 - Method 1: 40% of the exam score comes from the average of two midterm exams and 20% from your final exam
 - Method 2: 20% of the exam score comes from your best midterm and 40% from your final exam

The following grading scale will be applied to calculate student's final grade. The grade points and their corresponding final course scores are shown below.

grade point	final course score	grade point	final course score	grade point	final course score	grade point	final course score
4.0	93	3.0	78	2.0	63	1.0	48
3.9	91.5	2.9	76.5	1.9	61.5	0.9	46.3
3.8	90	2.8	75	1.8	60	0.8	44.6
3.7	88.5	2.7	73.5	1.7	58.5	0.7	42.9
3.6	87	2.6	72	1.6	57		
3.5	85.5	2.5	70.5	1.5	55.5		
3.4	84	2.4	69	1.4	54		
3.3	82.5	2.3	67.5	1.3	52.5		
3.2	81	2.2	66	1.2	51		
3.1	79.5	2.1	64.5	1.1	49.5		