

HUNTER COLLEGE OF CUNY
Department of Physics
Physics 111

Lecturer: Distinguished Professor Godfrey Gumbs

Web page: <http://www.hunter.cuny.edu/physics/faculty/gumbs/home>

Course Name Introduction to Mechanics, Heat and Sound

Text: The course will follow: **Halliday, Resnick and Walker --
Fundamentals of Physics: Volume 1 --- Ninth edition
2009, Wiley**

Lectures: Three times a week: Monday (9:45-11:00), Wednesday (10:10-11:00), Thursday (9:45-11:00)

Recitations: Once per week (9:10-10:00)

Midterms: **TWO** midterms

End-Term Exam : Cumulative

Outline

1. **Mechanics:** Chapters 1-13.
2. **Waves:** Chapters 14-16.
3. **Heat:** Chapter 18.

DETAILED SYLLABUS

MECHANICS

KINEMATICS—THE STUDY OF MOTION

1. POSITION OR COORDINATES OF A PARTICLE
INSTANTANEOUS VELOCITY / VELOCITY
ACCELERATION
ACCELERATION DUE TO GRAVITY
VECTORS
ADDITION OF VECTORS
THE COMPONENTS OF A VECTOR

VECTORS HAVING UNIT LENGTH ---UNIT VECTOR

2. THE POSITION, VELOCITY AND ACCELERATION COULD BE EXPRESSED IN TERMS OF VECTORS

VELOCITY DIRECTION ON A TRAJECTORY

PROJECTILE MOTION

UNIFORM CIRCULAR MOTION

RELATIVE MOTION

FORMAL TREATMENT OF RELATIVE MOTION

FORCE AND MOTION

3. FORCE AND MOTION

FRICTIONAL FORCES

CIRCULAR MOTION

4. FORCES

5. SYSTEM OF PARTICLES

NEWTON'S SECOND'S LAW FOR A SYSTEM OF PARTICLES

6. COLLISIONS

ELASTIC COLLISIONS

INELASTIC COLLISIONS

COLLISIONS IN TWO DIMENSIONS

7. ROTATION OF A RIGID BODY

KINETIC ENERGY OF ROTATION

HOOP ABOUT CYLINDER AXIS IS

TORQUE

WORK AND ENERGY THEOREM

8. KINETIC ENERGY OF A ROLLING WHEEL

THE YO - YO

ANGULAR MOMENTUM ABOUT A FIXED AXIS

CONSERVATION OF ANGULAR MOMENTUM

9. EQUILIBRIUM AND ELASTICITY

ELASTICITY

10. OSCILLATIONS

DAMPED SIMPLE HARMONIC MOTION

11. GRAVITY

THE SHELL THEOREM

KEPLER'S LAWS

WAVES

1. THE DOPPLER EFFECT

HEAT AND THERMODYNAMICS

1. CONCEPT OF TEMPERATURE

2. THERMAL EXPANSION

3. INTERATOMIC POTENTIAL

4. THE FIRST LAW OF THERMODYNAMICS

5. HEAT CAPACITY

6. FIRST LAW OF THERMODYNAMICS

There will be a total of about Forty lectures.
About seventeen chapters will be covered.

First mid-term: Wednesday March 10, 2010.
Second mid-term: Wednesday April 28, 2010.

Note well:

No classes: Monday February 15: President's Day (College closed)
Monday March 29 to Monday April 5: Spring Recess.
Last day of classes: Monday May 17.
Final Exam: May (to be announced).

Grades Computed as Follows

Quizz # 1: 25%
Quizz # 2: 25%
Final Exam: 35%
Laboratory: 15%