Spring 2019

GENERAL PHYSICS: INTRODUCTION TO MECHANICS, HEAT AND SOUND

Lecturer: Professor Godfrey Gumbs

Office: 1247N; **Phone #: 650-3935**

Text: The course will follow Volume 1 of "Halliday & Resnick, *Fundamentals of Physics, Volume 1, (*
10th edition, Wiley)"

Lecture: Monday 9:45-11:00, Thursdaysday: 9:45-11:00

Recitation: Thursday: 8:50-9:40

NOTE*:*

- *First class: Monday, January 28, 2019.*

- *Monday, February 18, 2019: College closed.*

- *Spring Recess: No classes on Monday April 22, 2019 and Thursday April 25, 2019..*

- *Monda,y May 13, Last class.*

- *There will be a total of* **twenty-eight** *lectures*

Recitations: Problem solving session — VERY IMPORTANT.

First Mid-Term Quiz: Thursday, March 7, 2019 in 1311HN.

Second Mid-Term Quiz: Thursday, April 18, 2019 in 1311HN

*End-Term Exam (*Cumulative*): Time and date to be announced.*

Tentative Outline

1. *Mechanics:* *Chapters 1-13, 15.*

2. *Waves:* *Chapter 16.*

3. *Heat:* *Chapters 18.*

Grades Computed as Follows

First Midterm:	*25%*
Second Midterm:	*25%*
Final Exam:	*35%*
Laboratory:	*15%*
TOTAL	*100%*

NOTE: In weekly recitations, classroom materials will be reviewed and assigned problems will be solved. It is okay to ask questions related to the methodology.

The College requires that the following statement be included in ALL syllabi:

"Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty.

The college is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. "

Formula Sheet

1. $v = v_0 + at$

2. $x - x_0 = v_0 t + \frac{1}{2}at^2$

3. $v^2 = v_0^2 + 2a(x - x_0)$

4. $x - x_0 = \frac{1}{2}(v_0 + v)t$

5. $x - x_0 = vt - \frac{1}{2}at^2$

6. $a_c = \frac{v^2}{r}$

7. $F = ma = \frac{dp}{dt}$

8. $f_k = \mu_k N$

9. $f_s \leq \mu_s N$

10. $1eV = 1.6 \times 10^{-19}\ J$

11. $W = Fd\cos\theta$

12. Hooke's law: $F = -kx$.

13. Spring potential energy: $\frac{1}{2}kx^2$.

14. Gravitational potential energy: mgh.

15. Kinetic energy: $\frac{1}{2}mv^2$.

16. Average Power: $\frac{W}{\Delta t}$

17. Total energy: $E = K + U$

18. $F = -\frac{dU}{dx}$: One dimension.

19. $p = mv$

20. Impulse: $\Delta J = F\Delta t$.

21. $g = 9.80\ m/s^2 = 32\ ft/s^2$

22. $r_{CM} = (1/M)\sum_i m_i r_i$

23. Planck's constant: $h = 6.63 \times 10^{-34}\ J\ s$

24. $\alpha = d\omega/dt;\ \omega = d\theta/dt,\ \theta = ds/dt$.

25. $a_t = \alpha r$; $a_r = \omega^2 r = v_t^2/r$; $v_t = \omega r$

26. $I = I_{\mathrm{CM}} + Md^2$

27. $\vec{\tau} = \vec{r} \times \vec{F}$; $\vec{\ell} = \vec{r} \times \vec{p}$

28. $G = 6.67 \times 10^{-11}$

29. $F = Gm_1 m_2/r^2$

30. $U(r) = -GMm/r$

31. $\rho = \Delta m/\Delta V$; $p = \Delta F/\Delta A$

32. $p = p_0 + \rho g h$

33. $p + (1/2)\rho v^2 + \rho g y =$ a constant

34. SHM: $x(t) = A\sin(\omega t + \phi)$

35. $N_A = 6.02 \times 10^{23}$

36. $k_{\mathrm{B}} = 1.38 \times 10^{-23}\,J/K$