

Lecture 1 Class Notes

PHY401: Classical Mechanics
Fall 2024

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1 Review and Prerequisites

1.1 Linear Algebra: Change of Basis

1.2 Maxwells Equations

a) $\nabla \cdot \mathbf{E} = \frac{1}{\epsilon} \rho$ (Gauss's Law)

b) $\nabla \cdot \mathbf{B} = 0$ (no name)

c) $\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$ (Faradays Law)

d) $\nabla \times \mathbf{B} = \mu_0 J + \epsilon_0 \frac{\partial \mathbf{E}}{\partial t}$ (Amperes Law with Maxwell Correction)

1.3 Maxwells Equations in source free space

a) $\nabla \cdot \mathbf{E} = 0$ (Gauss's Law)

b) $\nabla \cdot \mathbf{B} = 0$ (no name)

c) $\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$ (Faradays Law)

d) $\nabla \times \mathbf{B} = \mu_0 J + \epsilon_0 \frac{\partial \mathbf{E}}{\partial t}$ (Amperes Law with Maxwell Correction)

1.4 Fresnel Formulae

1.5 Harmonic Oscillators

1.6 Quadratures