

# **PHYS 170 Study Notes**

## **Mechanics**

Yecheng Liang

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# 1. General Principles

## 1.1. The Four Horseman of Mechanics

- Length
- Mass
- Time
- Force

So you basically take three of them and solve the 1 left.

## 1.2. US Customary Units

LENGTH	MASS	TIME	FORCE
meter m	kilogram kg	second s	force $\text{kg m s}^{-2}$
foot ft	slug $\text{lb s}^2 \text{ft}^{-1}$	second s	pound lb

Table 1: SI and US Customary (FPS) Units for Mechanics

## 2. Gravity

$$F = G \frac{m_1 m_2}{r^2} \tag{1.1}$$

$$F = ma \tag{1.2}$$

### **3. Force Vectors**

## 4. Equilibrium of a Particle

## **5. Force System Resultants**

## 6. Equilibrium of a Rigid Body



## 7. Friction

## **8. Kinematics of a Particle**

## **9. Kinetics of a Particle: Force and Acceleration**

## **10. Kinetics of a Particle: Work and Energy**

## **11. Kinetics of a Particle: Impulse and Momentum**