

Lecture 1 Note - *Outline and Intro*

Summary: Know sig figs, slugs, FBDs, units in calcs, engineer notation, unit rules.

- Course info:
 - Prof recommends summarizing each lecture into 1 page.
 - Do the lessons and HW at home; ask about the tricky stuff during lecture time.
 - Course lasts for 6 weeks, 12 lectures (2 per week!)

Statics:

- A branch of mechanics: The study of forces acting upon static (non-moving), rigid (non-deforming, non-fluid) bodies.
- There are four fundamental physical quantities in Statics: Length (the size and location of a body), Mass (the quantity of matter - kilograms or **slugs**), Time, and Force.
- There are two unit systems, imperial and SI. **Note that kgs measure mass, while lbs measure force.** Conversion between units isn't expected: Use what you get.

Name	Length	Time	Mass	Force
International System of Units	meter	second	kilogram	newton*
SI	m	s	kg	N $\left(\frac{\text{kg} \cdot \text{m}}{\text{s}^2}\right)$
U.S. Customary	foot	second	slug*	pound
FPS	ft	s	$\left(\frac{\text{lb} \cdot \text{s}^2}{\text{ft}}\right)$	lb

*Derived unit.

- Models and idealizations (assumptions) that are common in Statics:
 - Particle: A substance with mass that's assumed to have negligible size
 - Rigid body: A group of particles assumed to stay fixed together under load.
 - Concentrated force: A force on a rigid body assumed to act on 1 point
- Significant figures and calculations (review):
 - **Only round off your final answer!** Round trailing 5s to the nearest even digit.
 - Use 4 sig figs in calculations, round to 3 in answers by default.
 - Keep units visible in calculations and answers. Note how some units cancel out:
Eg. $V_f = V_i + at \rightarrow \text{m/s} = \text{m/s} + \text{m/s}^2 \times \text{s}$
- Unit rules (already-known rules excluded):
 - Separate units with dot — meter*second = m•s, not ms (millisecond)
 - All symbols are lowercase except **N**ewtons, **P**ascals, **M**egas and **G**igas.