Lecture 1, Sep 13, 2021

Structural Engineering

- Designing structures with economy and elegance to safely resist forces it may be subject to
- Art and science components
- Engineering comes from Latin *inginure* – to create and English *ingenium* – clever

The 3 Principles of Engineering

1. $F = ma$ – we use math equations to model systems
2. You can't push a rope – we can't always rely on just equations; we need common sense too
3. To find the answer, you must know the answer – experience is very important; if you're doing something for the first time, be extremely careful

Significant Digits

- Use 3 significant digits iff first nonzero digit $\neq 1$
- Use 4 significant digits if first nonzero digit is 1
- Using these numbers give us about 0.5% accuracy; because the Earth is not a sphere, g varies between different locations by about this amount, so there's no point to be more precise (for this course use 9.81)
- Use engineering notation (exponents for scientific notation should be multiples of 3) – easier to think about so we know whether numbers are realistic