

## Relevant Reading

- [Computational Aeronautics](#)
  - Chapter 6: Propellers and Turbines (23 pages)  
NOTE: Read 6.3 OR 6.4 depending on your application.

## Problem 1 Vocabulary

Explain the following terms; making sure to use sufficient detail, including any math or helpful figures. In some cases, these terms are simple one sentence definitions, in others, you should include several paragraphs to explain them fully.

### Rotor Geometry

- Hub Radius
- Tip Radius
- Twist
- Pitch
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### Rotor Analysis

- Blade Element Momentum Theory
  - Conservation of Linear Momentum
  - Conservation of Angular Momentum
  - Blade Element
  - Inflow Angle vs angle of attack vs twist vs pitch
  - Assumptions of BEMT
  - Limitations of BEMT
- Blade Loading
- Root Bending Moment

### Rotor Performance

- Thrust Coefficient
- Power Coefficient
- Torque Coefficient
- Rotor Efficiency

## Problem 2 Exploration

Complete the following exploration.

### 2.a Prerequisites

- i. [Install CCBlade.jl](#)
- ii. Complete the [Quick Start Tutorial](#)

### 2.b Load Distributions and Rotor Efficiency

- i. Compare the thrust, torque, and root bending moment vs varying rotor tip radius.
- ii. Compare the thrust, torque, and root bending moment vs varying the rotor section chord length.
- iii. Discuss your results and make especial note of cases that are physically unfeasible, or not fully captured by the BEMT.