

Module No. 4: Wind Energy Technologies
No. of weeks / credits 3

Week 1-3

Part-A

- **Introduction to Wind Turbine Technology**
 - History and Evolution of Wind Turbines, Rotor Aerodynamics:*
 - Axial Momentum Theory
 - Performance Coefficients
 - Airfoils
 - Blade Element Theory
 - Rotor Design

- **Evolution of the Modern Wind Turbine and Its Sub-systems:**
 - Rotor
 - Drive train
 - Pitch and Stall-Regulated Wind Turbines
 - Blade Materials
 - Generation System
 - Yaw System
 - Sensory and Control Systems
 - Tower and Foundation
 - Wind Turbine Size
 - Windfarms
 - Power Evacuation Aspects
 - Problems

Part-B

- **Wind Turbine Technology**
 - Introduction
 - The wind
 - Energy and Power in the Wind
 - Wind Turbines and Its Types

- **Aerodynamics of Wind Turbines**
 - Aerodynamic Forces
 - Aerofoils
 - Relative Wind Velocity
 - Harnessing Aerodynamic Forces
 - Horizontal Axis Wind Turbines
 - Vertical Axis Wind Turbines