

## **Course Syllabus**

The course content for the training has been carefully thought out syllabus with specific subject experts giving lectures and going through specific case studies such that, at the end of the course considerable useful knowledge transfer is perceived.

The course will address the following aspects:

### **1. INTRODUCTION AND WT COMPONENTS**

- Introduction to WET and its Status
- Overview of Wind Turbine Components
- The Aerodynamics aspects of Wind Turbine
- Wind Turbine Generator
- Wind Turbine Gear Box
- Control and Protection System in Wind Turbine
- Wind Turbine Tower and Foundation
- Offshore Wind Energy
- Wind Mill for Water Pumping for Rural Development
- Design, Installation & Maintenance aspects of SWT

### **2. STANDARDS, TESTING & CERTIFICATION**

- Standards pertaining to WT IEC 61400 series
- Type Certification of wind turbine
- Wind Turbine Testing & Measurement Techniques
- Instrumentation for Wind Turbine Testing
- Safety & Function Test & Power Curve Measurements

### **3. RESOURCE ASSESSMENT**

- WRA and sitting guidelines for Wind Measurements
- Site selection for Wind Monitoring Stations
- Wind Measurement and Instrumentation
- Remote Sensing Instruments for WRA
- Wind Data Collection, Validation, Analysis & Reporting
- Design and Layout of Wind Farms
- Solar Radiation Resource Assessment
- Forecasting of Wind and Energy Production
- Indian Wind Atlas: A Case Study

#### **4. ELECTRICAL SYSTEMS & GRID INTEGRATION**

- Grid Integration of Renewable Energy
- Electrical System in Wind Turbines
- Power Quality Characteristics of Wind Farms

#### **5. ERECTION, COMMISSIONING AND O&M**

- Wind Farm Developments and Related Issues
- Installation and Commissioning of WT
- Wind Power Evacuation
- SCADA and Turbine Condition Monitoring
- Operation and Maintenance of Wind Farms

#### **6. ENERGY STORAGE AND HYBRID**

- Wind – Solar Hybrid Systems
- Energy Storage Technologies

#### **7. POLICY & FINANCIAL, ECONOMICAL ANALYSIS**

- Wind Energy Policies and Schemes
- Financial Analysis in Wind Project Development
- Economic Analysis of Wind Power Development

#### **8. ENVIRONMENTAL & SOCIAL ASPECTS**

- Environmental Aspects of WT Technology
- Social Acceptance of Wind Power Projects
- Role of NIWE in Wind Energy Development

Additional lectures would also be organized while visiting wind farms and manufacturing facility to give a complete picture of the know-how and how to go about setting up a coordinated wind energy programme at national level.

Participants will also have opportunity of hands on experience on Wind Energy systems at different laboratories.