

## **ME8072 RENEWABLE SOURCES OF ENERGY**

### DETAILED SYLLABUS

#### **OBJECTIVE:**

- At the end of the course, the students are expected to identify the new methodologies /technologies for effective utilization of renewable energy sources.

#### **UNIT I INTRODUCTION**

World Energy Use – Reserves of Energy Resources – Environmental Aspects of Energy Utilisation – Renewable Energy Scenario in Tamilnadu, India and around the World – Potentials - Achievements / Applications – Economics of renewable energy systems.

#### **UNIT II SOLAR ENERGY**

Solar Radiation – Measurements of Solar Radiation - Flat Plate and Concentrating Collectors – Solar direct Thermal Applications – Solar thermal Power Generation - Fundamentals of Solar Photo Voltaic Conversion – Solar Cells – Solar PV Power Generation – Solar PV Applications.

#### **UNIT III WIND ENERGY**

Wind Data and Energy Estimation – Types of Wind Energy Systems – Performance – Site Selection – Details of Wind Turbine Generator – Safety and Environmental Aspects

#### **UNIT IV BIO - ENERGY**

Biomass direct combustion – Biomass gasifiers – Biogas plants – Digesters – Ethanol production – Bio diesel – Cogeneration - Biomass Applications

#### **UNIT V OTHER RENEWABLE ENERGY SOURCES**

Tidal energy – Wave Energy – Open and Closed OTEC Cycles – Small Hydro-Geothermal Energy – Hydrogen and Storage - Fuel Cell Systems – Hybrid Systems.

#### **TEXT BOOKS:**

1. Rai. G.D., "Non-Conventional Energy Sources", Khanna Publishers, New Delhi, 2011.
2. Twidell, J.W. & Weir, A., "Renewable Energy Sources", EFN Spon Ltd., UK, 2006.

#### **REFERENCES:**

1. Chetan Singh Solanki, Solar Photovoltaics, "Fundamentals, Technologies and Applications", PHI Learning Private Limited, New Delhi, 2015.
2. David M. Mousdale – "Introduction to Biofuels", CRC Press, Taylor & Francis Group, USA 2017
3. Freris. L.L., "Wind Energy Conversion Systems", Prentice Hall, UK, 1990.
4. Godfrey Boyle, "Renewable Energy, Power for a Sustainable Future", Oxford University Press, U.K., 2012.