

Course Type	Course Code	Name of Course	L	T	P	Credit
OE	ESO405	Clean Energies	3	0	0	9

**Course Objective**

To gain fundamental knowledge on clean technologies for energy generation

**Learning Outcomes**

Upon successful completion of this course, students will be able:

To understand role of alternative technologies for energy production

To make interpretation about the energy sources and comprehend them with types

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Energy Alternatives and its Principles	6	To understand need of renewable energy
2	Solar Radiation, availability, measurement and estimation, Solar Thermal Conversion Devices, storage and applications	12	To understand Fundamentals solar energy conversion
3	Hydel power, Tidal Energy, Ocean Thermal Energy, Geothermal Energy, Molten salt energy storage	12	To understand fundamentals other means of Renewable sources
4	Wind Energy Conversion, Bioenergy Technologies, Fuel Cell	12	To understand fundamentals other means or of Renewable sources

**Recommended Text Book**

1. Vaughn C. Nelson, Kenneth L. Starcher, Introduction to Renewable Energy, 2<sup>nd</sup> Edition, CRC press 2015

**Recommended Reference Book**

1. J. Twidell and T. Weir, Renewable Energy Resources, 3<sup>rd</sup> edition, Routledge, London, 2015.
2. B. Viswanathan, M. Aulice Scibioh, Fuel Cells: Principles and Applications 1<sup>st</sup> Edition, CRC press 2006.