

SYLLABUS

CERTIFICATE COURSE: NON-CONVENTIONAL ENERGY RESOURCES

COURSE CODE	HOURS	TIME
PHYNCER 21-22	30	3.30-4.30 PM

CO1: Understand conventional and non-conventional energy resources

CO2: Overview of Solar and wind energy technologies

CO3: Understand biomass production, hydropower and tidal Energy

CO4: Outline of fuel cells and super capacitors

UNIT 1 - Conventional and non-conventional energy resources **8 Hrs**

Introduction, India's energy usage, Energy sources, Classification of energy sources, Requirement of non-conventional energy sources

UNIT 2 – Solar and wind energy technologies **9 Hrs**

Solar spectrum, Solar cells, Solar cell construction, Solar cell characteristic and usage, Photo voltaic devices, Properties of wind, accessibility of wind energy in India, Wind machines, Wind machine characteristics and usage

UNIT 3 – Biomass, hydropower and tidal energy **8 Hrs**

Photosynthesis, Biogas production, Biogas plants, Hydropower, Principle of hydropower technology, Tides as energy source, Mechanics of tidal power and its limitations

UNIT 4 – Fuel cells and super capacitors **5 Hrs**

Types of fuel cells and its parts, Working principle of fuel cells, Electrochemical devices, Super capacitors, Working principle of supercapacitors

Books & Reference:

P. D. Dunn, Renewable Energies: Sources, Conversion and Application, P. Peregrinius Ltd, London, 1986.

J. W. Twidell and A. D. Weer, Renewable Energy Sources, ELBS, 2nd Edition, Taylor & Francis, 2006.

S. Rao and B. B. Parulekar, Energy Technology- Non conventional, Renewable and Conventional 3rd Edition, Khanna Pub, 1999.

B.T. Nijaguna, Biogas Technology, New Age International Pub, 2002.