FACULTY OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING
EMECVAC01 - Renewable Energy and IOT

Unit I Solar Energy

Basic concepts, Solar radiation – Measurement– Flat plate and concentrating collectors - Solar heating and cooling techniques – Solar desalination – Solar Pond - Solar cooker - Solar dryers-Solar furnaces - Solar thermal electric power plant – Solar photo voltaic conversion – Solar cells – PV applications.

Unit II Biomass Energy

Biomass – usable forms- composition- fuel properties – applications, Biomass resources, Biomass conversion technologies - pyrolysis – gasification -anaerobic digestion - Energy farming, Biogas technology-Family biogas plants, Community and institutional biogas plants.

Unit III Other Renewable Energy Sources

Tidal energy – Wave energy – Open and closed OTEC Cycles – wind energy-- Wind power plants-Geothermal energy– Social and environmental aspects.- Fuel cell technology – types.

Unit IV Internet of Things (IoT)

Definition -, Characteristics, Physical design, Logical design, Functional blocks of IoT, Communication models & APIs, Machine to Machine, Difference between IoT and M2M, Software defined Network (SDN). Applications of IoT: Home automation, Industry, Surveillance, other IoT applications. Raspberry Pi Interfaces -Programming Raspberry Pi with Python. Application of IoT on Energy gadgets.

Unit V Performance study of solar systems

Study and performance test on solar air heater -Study and performance test on water heater -Study and Performance test on solar still -Study of solar refrigeration.

Text Books:

Twidell.J.W & Weir.A, "Renewable Energy Sources", EFN Spon Ltd., UK, 1986

Tiwari.G.N, "Solar Energy – Fundamentals Design", Modelling and applications,Narosa Publishing House, NewDelhi,2002

Vijay Madisetti, Arshdeep Bahga, "Internet of Things: A Hands-On Approach" Orient Blackswan Pvt. Ltd., New Delhi, 2015.

References:

Godfrey Boyle, "Renewable Energy", Power for a Sustainable Future, Oxford

Shibu K.V, "Introduction to Embedded System", Tata McGraw-Hill, 2009.

University Press, U.K, 1996.