Rayat Shikshan Sanstha's
KARMAVEER BHAURAO PATIL COLLEGE, VASHI

DEPARTMENT OF PHYSICS

LIST OF SKILL BASED COURSES

MSC-I

1. Title: Solar energy and its conversion

Module 1 (Indian Energy Scenario) : Role of energy in economic development and social transformation, Energy and gross domestic product (GDP), Gross national product (GNP) and its dynamics.

Module 2 (Various types of energy sources) : Energy sources and overall energy demand, Availability of energy sources, Energy consumption in various sectors and its changing pattern, projected energy demands.
Energy Sources: Coal, Oil, Natural gas, Nuclear power, Hydro-electricity, Solar and other renewable sources.

Module 3 (Importance of Solar Energy) : Nature of solar radiation, Sun as a fusion reactor, Spectral distribution of extraterrestrial radiation, Estimation of extraterrestrial solar radiation, Radiation on horizontal and tilted surfaces, Beam, diffuse, global radiation and their measurement, Available solar radiation, Measurement of beam, diffuse, global radiation.

Module 4 (Conversion of Solar Energy in different forms) : Various ways to convert solar energy into different forms, Pyranometer, Pyrhelimeter, Sunshine duration recorder Angstrom relation, Energy consumption and its impact on environmental climatic change.

Module 5 (Future Energy Options) : Sustainable development, Energy crisis, Transition from carbon rich and nuclear energy to carbon free technologies.

Learning Outcomes:

- Explain different sources of energy and how greenhouse effect can be controlled.
- Understand solar energy and other sources of renewable energy
- Classify and explain the functions of different batteries and their characteristics
- Understand battery applications in energy conversion systems
- Install solar panel and inverter
- Test, diagnosis fault and maintain batteries and charge different types of batteries.
- Become proficient in engineering calculations of the performance and preliminary design of various energy conversion systems.