MANGALORE UNIVERSITY

DEPARTMENT OF BIOSCIENCES

M.Sc. ENVIRONMENTAL SCIENCE

ESS 552 ENERGY AND GREEN TECHNOLOGIES

39 hrs

Course Outcomes:

CO1 Introduce various sources of energy.
CO2 Explain green technology as alternate sources of energy.
CO3 Learn energy resources and their management methods.
CO4 Understand the principles and advances of green technology.

UNIT I (13 Hours)

Introduction: Renewable energy sources, non-renewable energy sources, non-conventional and inexhaustible energy resources. Geothermal energy, wind driven power station, tidal power plants, glacier power plants, solar energy, nuclear energy, natural radioactivity, nuclear power plant, fast breeder reactors, nuclear fusion, gober gas plant.

UNIT II (13 Hours)

Energy management – solar energy input conventional fuels – oil, coal, natural gas, uranium, risk of nuclear accidents, bio energy – biomass and biofuels, biogas- biogas technology, petroplants energy plantations and crops. Waste as renewable sources of energy- types of waste, classification based on chemical nature and physical state, composition of the waste, conversion of methane in to synthetic gas, factors effecting methane formation.

UNIT III (13 Hours)

Green Technology: Phytoremediation- Hyperaccumulators- biotic interactions, biofilm. Green chemistry– introduction- inception and evolution- importance of solvents- types of catalysts and their role- Biological alternatives- applications. Principles of green chemistry, advances in green chemistry.

References:

1. Agrawal, K.C. Fundamentals of Environmental Biology, Nidhi Publishers, Bikaner, India (2001)
2. Deka, M.M. Joint Forest Management of Water Projects (2002)
3. Dubey, R.C. Text book of Biotechnology
4. Gangstad, E.O. Environment Managements of Water Projects (2002)
5. Khenshoo, T.N. Environment Concerns and Strategies.
6. Maitra, M.K. Watershed Management; Project, Planning, Development and Implementation (2002)
7. Rajendra Maneria, Environment Conservation and Planning.