

ALIGARH MUSLIM UNIVERSITY, ALIGARH

FACULTY OF ENGINEERING & TECHNOLOGY

SYLLABUS FOR

Master of Technology (M. Tech.) Green Energy & Sustainable Development

Classification of energy sources and reserves, Environmental aspects of energy, Global warming, Greenhouse effect, Sustainable Development, Sustainable Development Goals of United Nations. Energy and sustainable development goals. World Energy Scenario, Indian Energy Scenario, Power sector contributions to CO₂ emissions, Decarbonizing the energy systems.

Electricity generation and global warming, Conventional and renewable sources of electric energy, Basic concepts of electric energy. Electrical Power Generation : Thermal Power Plants, hydroelectric power plants, nuclear power plants, cogeneration and captive power generation. Solar energy, solar cell, solar PV and solar thermal. Different types of solar PV plants : Standalone, Grid Connected, Hybrid. Concepts of MPPT and partial shading, efficiency of solar cells and solar PV plants. Net Metering and Gross Metering. Solar thermal energy conversion and applications, solar thermal collectors. Wind energy conversion concepts. Wind Solar Hybrid Systems.

World scenario of solar and wind energy, Indian scenario of solar and wind energy, National solar mission, National mission on CO₂ emissions reduction.

Energy Efficiency, Energy conservation, Energy efficient appliances, Energy Management, Demand side management, Energy audit, Power factor improvement, Pyramid of Energy Conservation, Green Buildings.

Energy Storage, Electric vehicles, grid to vehicle and vehicle to grid, Fuel cells operations and classification, Biomass energy processes, applications, biogas

plants. Hydrogen Energy, Green Hydrogen, Energy Storage, Micro and Nanogrids. Green computing, Handling of solar PV waste and e-waste.