**BUNDELKHAND UNIVERSITY, JHANSI**

*SYLLABUS* FOR UNDERGRADUATE COURSES B.SC. (HONS.)

**Energy and Environment**

Total Credits: 4

***Unit-I: Basic Introduction about energy***

Introduction about Energy.Classification of Energy sources]. Scenario of Energy Potential in India.Energy Scenario – Global and Indian, development and environment.

***Unit-II : Conventional Sources of Energy***

Non-Renewable Sources of Energy (Advantages & Disadvantages).Fossil Fuel based Energy. Coal Energy,Petroleum Fuel Energy (or crude oil), Natural Gas Energy.Refinery products of petroleum (i.e. Crude oil).Nuclear Fuel Energy and radioactive Hazards.

***Unit-III:Non-conventional Sources of Energy***

Solar Energy and their applications.Solar Energy Advantages & their limitations.Hydro-Electric Energy (Hydro power).Wind Energy.Biomass Energy [wood waste, Biofuels viz; Ethanol & Biodiesel]Biomass and the Environment. Alcohol as a source of Energy (Gasohol, Methanol & Ethanol).Biogas generation Technology.Geothermal Energy and Environment.Various forms of Geothermal energy Reservoirs &their uses.Tidal Energy and Sea-wave Energy.Ocean Thermal Energy Conversion (OTEC).

***Unit – IV: Energy Management***

Definitions and significance, objectives, Energy Management program, Energy strategies and energy planning Energy Audit, Energy management control systems

***Unit – V: Energy conservation***

Principles, Energy economics, Energy conservation technologies, cogeneration, Waste heat recovery,Combined cycle power generation, Energy policies, Energy strategy for future

**Suggested readings**

1. Non-Conventional Energy Sources, Rai, G.D.(2001), Khanna Publishers, New Delhi.
2. Solar Energy, Sukhatme, S.P.(1996), Tata McGraw Hill Publishing Company.
3. Renewable Energy Sources & Conversion Technology, Bansal N. K., Kleemann M. & Michael, Meliss., (1990), Tata McGraw Hill Publishing Company.
4. Biotechnology and Oother Alternative Technologies, Chakraverty, A. (1998.). Oxford and IBH Publishing Co. Pvt. Ltd.,
5. Biomass- Regenerable Energy, D.O. Hall & R.P. Overend (1987), John Wiley.
6. Renewable Energy Sources, Mathur A. N. &Rathore N. S (1992), Bohra Ganesh Publications.