1. **The Global Climate**
The Energy Balance, effects of global warming, elements of weather and climate, Stability and vertical motion of air and clouds, Horizontal motion of air and cloud, Pressure gradient forces, Inertial forces, Climate change and modeling, the ozone layer, The Green house effect.

2. **Energy for Human Use**
Renewable and non-renewable sources of energy, Principle of conservation of energy, Heat transfer, Energy from fossil fuels, Conversion of heat into work and vice-versa, heat engines, efficiency of ideal and practical heat engines, Loss of energy in combustion, Energy storage and energy transport, Refrigeration,

**Renewable sources of energy**: Solar heat and Solar electricity, Solar radiation and solar constant. Hydropower, Wind energy, Fuel cells,

**Nuclear Energy**: Power rom nuclear fission and fusion, nuclear hazards and safety measures, management of the fuel cycle, disposing the nuclear waste.

3. **Radiation and Environment**
A. Introduction, Radioactive decay laws, half-life and mean life of radioactive materials, Radioactive dating methods, determining the age of fossils and rocks, Nuclear reactions, Nuclear fusion and fission, Environmental effects of nuclear radiations.

B. Introduction to Physical instruments, Measurement of ionising radiation — ionization chamber, G. M. Counter, Scintillation counter. Spectrometry— principle of mass spectrometry and optical spectrometry, mass spectrometers and detection of isotopes. Optical emmision and absorption spectrometers

4. **Dispersion of Pollutants**
Introduction to transport phenomena, Transport of mass, momentum and energy: Diffusion, Viscosity and Thermal conductivity in different media, Conservation of mass and equation of fluid dynamics, Navier Stoke's equation, Reynold's number, Effect of turbulence, Plumes in air, plume theory with respect to stack emissions.

5. **Noise and Environment**
Basic acoustics, Decibel scale for sound pressure level, Human perceptions and noise criteria, Reducing the transmission of sound (noise control)— Sound insulation, Sound leaks, Mass laws for sound insulation, Hollow wall, Avoiding contact noise, Active control of sound, anechoic chamber.
Experiments:

1. Measurement of environmental radiation
2. Measurement of plumes
3. Measurement of environmental noise
4. Measurement of relative humidity
5. Measurement of direct solar radiation
6. Measurement of air flow rate

References: