1. Subject Code: **EP-414** Course Title:**Space and Atmospheric Science-II**
2. Contact Hours : L : 3 T : 1 P : 0
3. Examination Duration (Hrs.) : Theory : 3 Practical : 0
4. Relative Weight : CWS : 25 PRS : MTE : 25ETE : 50 PRE : 0
5. Credits : 4
6. Semester : EVEN
7. Subject Area : DEC-7
8. Pre-requisite: Basic knowledge of Space and Atmosphere-I
9. Objective: To impart the fundamental knowledge pertaining to space and atmosphere. Measurement of meteorological parameters using various techniques.Global warming its consequences.The electric Structure of thunderstroms precipitation and related topics will be discussed.

10.Details of Course :

S.No.	Contents	Contact Hours
1.	**Radar Principles and Meteorology:** Introduction to RADAR, types of Radars- Mono-static, pulsed radar, FM-CW radar; Basic principles of pulsed (Wind Profiler) radar- Antenna Basics-radar signal processing; Types of Radar Scattering theory-Wind vector calculations; Wind Profiler Applications-Aviation, Tropical Cyclone, Thunderstorm, Meteorological (Synoptic and Mesoscale) and Environmental.	10
2.	**Air pollution and its measurement techniques:** Primary gaseous pollutants (CO_2, CH4, CO and Nox)-sources and their effects on climate/human health. Secondary gaseous pollutants (Ozone and PAN)-Formation and their effect on human health. Gaseous pollutants measurement techniques-principles, block diagrams and working. Description of aerosols, sources of aerosols, aerosol production mechanisims, effects of aerosols on climate and human health. Measurement techniques-Direct measurements by sampling and remote sensing measurements by Multi wavelength solar radiometer and Lidar.	12
3.	**Atmospheric aerosols:** Continental and Marine (Origin, Physical and Chemical characteristics), Cloud Morphology, Warm Cloud Microphysics (Nucleation and Condensation), Growth of cloud droplets by collision and coalescence, Cold Cloud Microphysics (Nucleation and growth of ice), Ice in the atmosphere.	10
4.	The electrical structure of thunderstorms, Cloud electrification mechanisms, Physics of lightning, lightning and nitrogen fixation. Atmospheric electricity in fair weather (Ions and Atmospheric conductivity, Space charges), Electric field, Air-Earth currents, Precipitation currents and Point discharge currents. Global Electric Circuit (Classical concept, validity and limitations).	10
	Total	**42**

11.Suggested Books