

# 21AGRO103 INTRODUCTORY AGROMETEOROLOGY AND CLIMATE CHANGE

Hours Per Week :

L	T	P	C
1	-	2	2

Total Hours :

L	T	P
15	-	30

## COURSE DESCRIPTION AND OBJECTIVES:

The course provides knowledge on general principles of climate, weather and agriculture and importance of climate change and making agriculture climate smart

## COURSE OUTCOMES:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes
1	Understand the role and importance of weather and climate on Agriculture and hydrological systems and their impact on crop production
2	Enable the students to acquire the skills required to design and implement climate resilient agriculture under variable and changing climatic conditions

## SKILLS:

- ✓ *Handling Agricultural meteorological equipment*
- ✓ *Selection of crops based upon type of soil and water availability*



Source :

[https://www.pau.edu/coa/index.php?\\_act=manageDepartments&DO=viewDepartment&intLinkID=13](https://www.pau.edu/coa/index.php?_act=manageDepartments&DO=viewDepartment&intLinkID=13)

**ACTIVITIES:**

- o Visit to Agro-meteorological station
- o Record all weather parameters by using different equipments
- o Classify the days based on duration of sunshine hours
- o Calculate Annual rainfall
- o Estimation of available moisture content in soil
- o Estimation of water vapotranspiration

**UNIT - 1**

**Introduction:** Earth atmosphere, composition, extent and structure; Atmospheric weather variables; Difference between weather and climate. Atmospheric pressure, its variation with height; Wind, types of wind, daily and seasonal variation of wind speed, cyclone, anticyclone, land breeze and sea breeze

**UNIT - 2**

**Solar Radiation:** Nature and properties of solar radiation, solar constant, depletion of solar radiation, short wave, long wave and thermal radiation, net radiation, albedo; Atmospheric temperature, temperature inversion, lapse rate, daily and seasonal variations of temperature, vertical profile of temperature, energy balance of earth

**UNIT - 3**

**Humidity:** Atmospheric humidity, concept of saturation, vapor pressure, process of condensation, formation of dew, fog, mist, frost, cloud; Precipitation, process of precipitation, types of precipitation such as rain, snow, sleet, and hail, cloud formation and classification; Artificial rainmaking; Monsoon, mechanism and importance in Indian Agriculture

**UNIT - 4**

**Weather hazards:** Weather hazards, drought, floods, frost, tropical cyclones and extreme weather conditions such as heat-wave and cold wave; Agriculture and weather relations, modifications of crop microclimate, climatic normal for crop and livestock production

**UNIT - 5**

**Weather forecasting:** Global circulations, El Nino and La Nina events, Weather forecasting, types of weather forecast and their uses; Climate change, climatic variability, global warming, causes of climate change and its impact on regional and National Agriculture, concentration of gasses, IPCC, History of IPCC, Adaptation and mitigation strategies

**LABORATORY EXPERIMENTS****LIST OF EXPERIMENTS**

1. Visit to Agrometeorological Observatory, criteria for site selection and layout plan for observatory, agrometeorological instruments and manual and automatic data recording
2. Measurement of total, shortwave and longwave radiation and its estimation by using Planck's intensity law
3. Measurement of albedo and sunshine duration
4. Computation of radiation Intensity using bright sun shine hours
5. Measurement of maximum and minimum air temperatures and interpretation of temperature data
6. Tabulation of maximum and minimum air temperatures, trend and variation analysis for climate change of the region
7. Measurement of soil temperature and computation of soil heat flux

8. Determination of atmospheric pressure and vapour pressure
9. Determination of relative humidity
10. Determination of dew point temperature- Measurement of atmospheric pressure and analysis of atmospheric conditions
11. Measurement of wind speed and wind direction, preparation of windroses
12. Measurement, tabulation and analysis of rainfall data
13. Measurement of open pan evaporation and evapotranspiration. Computation of PET and AET-Preparation of synoptic chart and report
14. Computation of climate change and variability
15. Crop planning for climate change; GDD, HTU and PTU calculations and their interpretation using their efficiencies

**REFERENCES:**

1. Radha Krishna Murthy, V. 2016. Principles and practices of agricultural disaster management. B.S Publications, Koti, Hyderabad
2. Reddy, S.R. 2014. Introduction to Agriculture and Agrometeorology. Kalyani Publishers, Ludhiana, Punjab
3. Radha Krishna Murthy, V. 2002. Basic Principles of Agricultural meteorology. B.S Publications, Koti, Hyderabad

