

**Course Code** : AMT 201

**Course Title** : Introductory Agro meteorology

**Credit Hours** : 2(2+0)

**Full Marks: 50**

**Theory: 50**

**Practical: 0**

## OBJECTIVES

Upon the completion of this course, the students will be able to know atmospheric processes that produce various climate and weather conditions, their agricultural significance, and use of agro-meteorological forecasting tools in agricultural decision making.

## I. SYLLABUS

Definitions, scope and role of meteorology in agriculture; meteorological variables and measurements: housing for temperature and humidity measurement; statistical calculations of meteorological variables; evaporation: factors affecting evaporation and transpiration rates and measurements of evapotranspiration demands of crop; precipitation: form, measurement, and significance in crop production; agro-meteorological normals of various crops, crop zonation, human influence on climate change and greenhouse effect on global warming and agriculture; elements and types of weather and climate forecasting for agriculture; use of remote sensing(RS) and geographic information system(GIS) techniques in evapo-transpiration estimation; satellite systems; weather, climate and drought classifications; theory and practices of automatic weather station technologies.

## II. COURSE OULINE

### A. Lecture

S. N.	Topic	No. of Lectures
1.	Definitions, scope and role of Agro- meteorology in agriculture	2
2.	Agro-meteorological variables and its measurement: Air temperature, relative humidity (RH), Solar radiation, Soil moisture, soil temperature, precipitation, wind speed and direction, sunshine duration; evaporation and factors affecting evaporation and transpiration rates; Agro-meteorological station and measurements of these variables; significance of its in Agriculture; Required exposure for measurement. Agro-meteorological normal for main crops.	6
3.	Housing for temperature and humidity measurement, units, maximum, minimum and average values of these parameters required for different crops, calculation of R. H. from dry and wet bulb thermometers, statistical calculation of meteorological variables (average, standard deviation, total rainfall) etc.	3

4.	Weather and climate forecasts for agriculture: Elements of agricultural weather forecast, Types of weather forecasts- Now-casting (NC), Very short-range forecast (VSRF), Short-range forecast (SRF), Medium-range forecast (MRF), Long-range forecast (LRF). Usefulness of weather forecast based on its types; weather forecasting scenario of Nepal;	3
6.	Definition of weather and climate, climatic classifications, Koppens classification, Thronthwaite classification, climates of Nepal	2
7.	Drought and Flood, Major drought and flood events affecting the crop production in Nepal. Types of drought, agricultural drought, hydrological drought, meteorological drought, Drought classification, aridity index	2
8.	Agro-meteorological models such as DSSAT and CROPWAT model etc	2
9.	Climate change and its impacts on agriculture: climate variability, changes in atmospheric composition, observed changes and future climate scenario; impact on hydrology, crop and livestock; impacts in Nepal	3
10.	Agro-climatic zoning of Nepal	2
11.	Automatic weather station technologies: Automatic weather station and its benefits over manual observations and limitations; components of automatic weather station such as data logger, data communications, power and sensors; Sensors for measurement of meteorological variables for agriculture and its working principle.	4
<b>Total</b>		<b>30</b>

## REFERENCES

- Harpal S. Mavi and Graeme J. Tupper. 2004. *Agro-meteorology: Principles and Applications of Climate Studies in Agriculture*. The Haworth Press, Inc.
- Harpal S. Mavi. 1998. *Introduction to Agro-Meteorology*. Oxford and IBH Publishing Co. New Delhi
- Guidelines for Curricula in Agricultural Meteorology. World Meteorological Organization (WMO) No. 258. Geneva – Switzerland. 2008
- Rao G.S.L.H.V. parasad 2008. *Agricultural Meteorology*, Prince Hall of India Pvt. Ltd. New Delhi, India.
- Sabins J.R. (latest edition). *Remote Sensing Principles and Interpretation*. W.H. Freeman and Co.
- Heywood, Ian, Corenelius Sarah and Carver Steve. 1999. *An Introduction to Geographic Information System*. Addison-Wesley-Longman
- Chrisman Nicholas. 1997. *Exploring Geographic Information System*. John Wiley & Sons.