



RAFFLES
UNIVERSITY

TEACHING PLAN: Introductory Agro meteorology and Climate Change

SCHOOL: (SOAS) SCHOOL OF AGRICULTURAL SCINCES		ACADEMIC SESSION: 2023– 2024		FOR STUDENTS’ BATCH: 2022-2026		
1	Course No.	AAG-T-204				
2	Course Title	Introductory Agro meteorology and Climate Change				
3	Credits	2 (1+1)				
4	Learning Hours		Contact Hours	72		
			Assessment	09		
			Guided Study	09		
			Total hours	90		
5	Course Objective	1. To impart knowledge on weather elements and their role in crop production, climate change – its causes and impact and basics of weather forecasting. 2. Development of skill on determination, estimation and measurement of different weather parameters and analysis of atmospheric condition in relation to crop production.				
6	Course Outcomes	1. To understand roles of agro meteorology in agriculture and its relation to other areas of agriculture to acquaint with recent developments in agro meteorology with historical development of climate change. 2. Agro meteorology or Agricultural meteorology studies meteorological and hydrological factors in relation to agriculture. 3. Agro meteorology studies the behaviour of the weather elements that have direct relevance to agriculture and their effect on crop production. 4. Weather and climate are the factors determining the success or failure of agriculture. 5. To develop weather based agro advisories to sustain crop production utilizing various. 6.				
7	Outline syllabus:					
7.01	Paper Code	Unit	Introduction	Page Number s ¹	Lectures	
7.02	AAG-T-204	Unit I	1. Meaning and scope of agricultural meteorology	87-90	1	
			2. Earth atmosphere- its composition, extent and structure	97-98	1	
			3. Atmospheric weather variables; Atmospheric pressure, its variation with height	100-105	2	
			4. Wind, types of wind, daily and seasonal variation of wind speed	105-111	1	
			5. Cyclone, anticyclone, land breeze and sea breeze	108-110	2	
			6. Nature and properties of solar radiation, solar constant, depletion of solar radiation, short wave, long wave and thermal radiation, net radiation, albedo.	112-122	2	
		Unit II	1. Atmospheric temperature, temperature inversion, lapse rate, daily and seasonal variations of temperature, vertical profile of temperature, Energy balance of earth.	123-134	3	
			2. Atmospheric humidity, concept of saturation, vapour ressure, process of condensation	134-140	1	
			3. Formation of dew, fog, mist, frost, cloud.	140-150	1	
Unit III	4. Precipitation, process of precipitation, types of precipitation such as rain, snow, sleet, and hail, cloud formation and classification; artificial rainmaking.		2			
	1. Monsoon- mechanism and importance in Indian agriculture	151-154	1			
2. Weather hazards - drought, floods, frost, tropical cyclones and extreme weather conditions such as heat-wave and cold-wave.	155-160	2				
3. Agriculture and weather relations.		1				

		Unit IV	1. Modifications of crop microclimate, climatic normal’s for crop and livestock production. 2. Weather forecasting- types of weather forecast and their uses. 3. Climate change, climatic variability, global warming, 4. Causes of climate change and its impact on regional and national Agriculture.	160-166 166-175	2 1 1 2
8	Course Evaluation				
8.1	CA: 10%				
8.11	Attendance	75%			
8.12	Homework	Assignments, 5%			
8.13	Quizzes	--			
8.14	Projects				
8.15	Presentation				
8.16	Any other	Practical Examination 30%			
8.2	MTE	20%			
8.3	End-term examination: 50%				
9	Text Books & References				
9.1	Text book	Textbook Of Agricultural Meteorology,			
9.2	References	1. Principles of Agronomy, 5 th edition by Reddy S.R. Kalyani Publication, Ludhiana 2021 2. Fundamentals of agro meteorology and Climate Change by P.K. Kingra, G.S. Mahi Kalyani Publication, Ludhiana			
9.3	Video References				

Mapping of Outcomes v. Topics

Outcome no. → Syllabus topic↓	1	2	3	4	5	6
Paper Code. Unit I (1)	✓					
Paper Code. Unit I (2)						
Paper Code. Unit I (3)	✓				✓	
Paper Code. Unit I (4)	✓				✓	
Paper Code. Unit I(5)	✓				✓	
Paper Code. Unit I(6)	✓	✓	✓	✓	✓	✓
Paper Code. Unit II (1)	✓		✓	✓	✓	
Paper Code. Unit II(2)	✓	✓			✓	✓
Paper Code. Unit II(3)	✓	✓			✓	✓
Paper Code. Unit II (4)	✓	✓			✓	✓
Paper Code. Unit III(1)	✓	✓			✓	✓
Paper Code. Unit III(2)	✓	✓	✓	✓	✓	✓
Paper Code. Unit III(3)	✓				✓	
Paper Code. Unit IV(1)	✓	✓			✓	✓
Paper Code. Unit IV(2)	✓	✓	✓	✓	✓	✓
Paper Code. Unit IV(3)	✓				✓	
Paper Code. Unit IV(4)	✓		✓	✓	✓	

QUESTION BANK

UNIT I

Objective Questions

Who is related with the classification of climate?

- (a). De Condole.
- (b). Koppen.
- (c). Troll.
- (d). All of the above.

Albedo is an energy....?

- (a). Received by the Earth from Sun and absorbed.
- (b). It is received by the Earth from Sun and reflected back to space.
- (c). Some parts are absorbed and some are reflected.
- (d). None of the above.

The average height of troposphere is nearest in..?

- (a). Tropics.
- (b). Middle latitudes.
- (c). Both a and b.
- (d). Polar regions.

Hi does heat flow in liquid..?

- (a). Radiation.
- (b). Conduction.
- (c). Convection.
- (d). All of the above.

Barometer measures..?

- (a). Wind pressure.
- (b). Air flow.
- (c). Rainfall.
- (d). Atmospheric pressure.

Definitions

1. Meteorology
2. Agricultural meteorology
3. Earth
4. Atmosphere
5. Cyclone

Short Notes

1. Write the importance of meteorology.
2. Describe about the meaning and scope of agricultural meteorology
3. Explain earth atmosphere.
4. Make clear about the atmospheric weather variables.
5. Types of wind

Descriptive Questions

1. Explain the daily and seasonal variation of wind speed.
2. Describe about the atmospheric pressure, its variation with height.
3. Make clear about the anticyclone, land breeze and sea breeze
4. What are the properties of solar radiation and describe about the solar constant
5. Difference between short wave and long wave

UNIT II
Objective Questions

Which types of weather forecasting helps in determining cropping pattern?

- (a). Short weather forecast.
- (b). Medium weather forecast.
- (c). Long weather forecast.
- (d). All of the above.

The National Remote Sensing Agency is situated in/at..?

- (a). Bangalore.
- (b). Hyderabad.
- (c). Jaisalmer.
- (d). Patna.

The medium range weather forecasting is done for..?

- (a). 3 – 10 days.
- (b). 10 – 15 days.
- (c). 15 – 20 days.
- (d). None of the above.

The word Monsoon is an..?

- (a). Indian origin.
- (b). Latin American origin.
- (c). Arabic.
- (d). Indo-Malayan origin.

The date of onset of monsoon in India is..?

- (a). 1st June.
- (b). 1st July.
- (c). 1st August.
- (d). 1st May.

Definitions

1. Atmospheric temperature
2. Temperature inversion Earth
3. Lapse rate
4. Seasonal variations of temperature
5. Vertical profile of temperature

Short Notes

1. Write a short note on energy balance of earth.
2. Describe about atmospheric humidity
3. Explain concept of saturation.
4. Make clear about the vapour pressure.
5. Process of condensation

Descriptive Questions

1. Explain the process of precipitation.
2. Describe about the types of precipitation such as rain, snow and sleet.
3. Make clear about the formation of cloud

4. Difference between mist and fog
5. Difference between dew and fog

UNIT III

Objective Questions

Which is a type of kinetic energy?

- (a). Radiant energy.
- (b). Thermal energy.
- (c). Electrical energy.
- (d). All of the above.

What is the size of average rain drop in diameter?

- (a). 3 mm.
- (b). 1 mm.
- (c). 2 mm.
- (d). 1.5 mm.

Which is rainy cloud?

- (a). Nimbo stratus.
- (b). Cumulonimbus.
- (c). Both a and b.
- (d). All of the above.

The Indian Meteorological Department is situated in

- (a). Mumbai.
- (b). Delhi.
- (c). Kolkata.
- (d). Pune.

The warm and cold cloud seeding agent is..?

- (a). Same chemical.
- (b). Different chemicals.
- (c). No chemical is required.
- (d). None of the above

Definitions

6. Monsoon
7. Hazards
8. Weather hazards
9. Drought
10. Flood

Short Notes

6. Write a short note on tropical cyclones.
7. Describe about the importance of monsoon in Indian agriculture
8. How drought affect the agriculture crops.
9. How frost affect the agriculture crops.
10. How flood affect the agriculture crops.

Descriptive Questions

6. Explain agriculture and weather relations.
7. Describe about the types of precipitation such as rain, snow and sleet.
8. Difference between heat waves and cold waves
9. Difference between drought and floods
10. Difference between frost and fog

UNIT IV

Objective Questions

Question 16. The instrument which records meteorological data at any place..?

- (a). Weather machine.
- (b). Automatic Weather station.
- (c). Both a and b.
- (d). None of the above.

Rain gauge is also known as..?

- (a). Udo meter.
- (b). Pluvimeter.
- (c). Ombrometer.
- (d). All of the above.

The optimum temperature for better crop production is..?

- (a). 22 – 25 °C.
- (b). 18 – 24 °C.
- (c). 20 – 30 °C.
- (d). 16 – 18 °C.

Isobar is..?

- (a). Line of equal pressure.
- (b). It is the line of equal rainfall.
- (c). Line of equal temperature.
- (d). None of the above.

Types of rain gauges include..?

- (a). Graduated cylinders.
- (b). Weighing gauges.
- (c). Tipping bucket gauges.
- (d). All of the above.

Definitions

1. Microclimate
2. Livestock
3. Weather forecasting
4. Global warming
5. Climate change

Short Notes

1. Write a short note on tropical cyclones.
2. Describe about the causes of climate change.

3. How climate change affect the agriculture crops.
4. How climatic variability affect the agriculture crops.
5. How global warming affect the agriculture crops.

Descriptive Questions

1. Explain types of weather forecast and their uses.
 2. Describe about the climate change and its impact on regional and national agriculture.
 3. Exemplify the causes of climatic variability
 4. Illustrate the causes of global warming
 5. Difference between global warming and climate change
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