

Punyashlok Ahilyadevi Holkar Solapur University, Solapur



NAAC Accredited-2022
'B'' Grade (CGPA 2.96)

Name of the Faculty: Science & Technology

CHOICE BASED CREDIT SYSTEM

Syllabus: Meteorology (I.D.S.)

Name of the Course: B.Sc. II (Sem.– III & IV)

(Syllabus to be implemented from June 2023)

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

Faculty of Science & Technology Choice Based Credit System (CBCS)(w.e.f. June 2023) Revised Structure for B. Sc.-II

Subject/ Core Course	Name and Type of the Paper		No. of papers/ Practical	Hrs/week			Total Marks Per Paper	UA	CA	Credits
	Type	Name		L	T	P				
Class:	B.Sc.- II Semester – III									
Core Courses (*Students can opt any Three subjects among the Four Subjects offered at B. Sc. I. OR Students can opt any Two subjects among the Four Subjects offered at B. Sc. I and any one from the Additional Interdisciplinary subjects.	DSC 1C	AIC-1A	Paper-V	3	--	--	50	40	10	4.0
			Paper-VI	3	--	--	50	40	10	
	DSC 2C		Paper-V	3	--	--	50	40	10	4.0
			Paper-VI	3	--	--	50	40	10	
	DSC 3C		Paper-V	3	--	--	50	40	10	4.0
			Paper-VI	3	--	--	50	40	10	
Total Sem.-III				18	--	--	300	240	60	12
	\$ SEC-1			4	--	--	100	80	20	4
Class:	B.Sc.- II Semester –IV									
Core Courses (*Students can opt any Three subjects among the Four Subjects offered at B.Sc. I. OR Students can opt any Two subjects among the Four Subjects offered at B.Sc. I and any one from the Additional Interdisciplinary subjects.	DSC 1D	AIC-1B	Paper-VII	3	--	--	50	40	10	4.0
			Paper-VIII	3	--	--	50	40	10	
	DSC 2D		Paper-VII	3	--	--	50	40	10	4.0
			Paper-VIII	3	--	--	50	40	10	
	DSC 3D		Paper-VII	3	--	--	50	40	10	4.0
			Paper-VIII	3	--	--	50	40	10	
	Environmental Studies			3	--	--	50	40	10	NC
Total Sem-IV				18			300	240	60	12
Total (Theory)				36	--	--	600	480	120	24
Core Practical	DSC 1C & 1D	AIC 1A & 1B	Pr. II & III	--	--	8	200	160	40	4.0
	DSC 2C & 2D		Pr. II & III	--	--	8	200	160	40	4.0
	DSC 3C & 3D		Pr. II & III	--	--	8	200	160	40	4.0
Total (Practicals)						24	600	480	120	24
Grand Total				36		24	1200	960	240	48
	\$ SEC-1			4			100	80	20	4

*Core Courses: Chemistry/Physics/ Mathematics/Statistics/Botany/Zoology/ Microbiology/ Electronics/Computer Science/Geology/ Geography/Psychology

Additional Interdisciplinary Courses - Geochemistry/Biochemistry/Meteorology/Plant Protection/NCC etc.

\$The students can choose MOOCs/ NPTEL/SWAYAM/Path Shala/Add-on / Skill based courses of university/college initiated courses of same credits.

\$ These courses are not compulsory, but after completion of these courses students get additional credits on their marklists.

\$ SEC courses run by colleges should be communicated to university for information & necessary action

PAH Solapur University, Solapur
Choice Based Credit System w.e.f .June 2023
B.Sc. Part – II (Sem.III)
Subject: - Meteorology (I. D. S.)
Name of the Paper: - Climatology (Paper-I)

Code No:
 Course No:

Total Lectures: 30
 Total Marks: 40+10=50
 No of Credit: 4.0

Objectives

1. To acquaint the students with basic concept of meteorology.
2. Main objectives of the course are to synthesise with various factors of meteorology.

Unit No.	Title of the Unit	Name of Topic	No. of Lectures
1	Introduction of modern Climatology	a) Climatology Introduction Nature, Scope, b) Content of Climatology c) Climatology and meteorology d) Composition of atmosphere, Vertical structure of Earth's atmosphere.	06
	Global Circulation of the Atmosphere	a) The General circulation primary secondary Tertiary circulation Tropical circulation b) Circulation of Northern and Southern hemisphere c) Surface modification to the idealized General circulation	06
2	Air masses and synoptic climatology	a) Air mass Definition, characteristics b) source region of air mass c) Classification air masses d) Modification of air masses e) Upper air circulation patterns	06
	Atmospheric Disturbance	a) Theories of the origin of cyclonic depressions b) Cyclone, Anticyclone- origin, stage, life cycle	06
	Seasonal disturbances	Special reference to Indian monsoon	06

References:

1. General Meteorology- H.R. Byeres
2. Meteorology William -L. Dorn
3. Climatology -Lal D.s.
4. Introduction to Meteorology -Pellersons
5. Climate and man Environment -Oliver J.E.
6. An Introduction to Climate -Triwarth G. T.
7. Climatology – R.V.Rohli & A.J.Vega
8. Monsoon Meteorology -Sulochana Gadgil
9. Handbook of statistical methods in Meteorology- C. E. P. Brouks and N. Carrotners
10. Elementary Meteorology -G.F. Taylor
11. Ways of the Weather -P.A. Menon
12. Meteorology -D. Brun
13. Fundamentals of Meteorology. V.C. finch G. T. Trewartha M.H. shearer F.L. caudle L.B. Bation

Punyashlok Ahilyadevi Holkar Solapur University, Solapur
Choice Based Credit System w.e.f .June 2023
B. Sc. Part – II (Sem. III)
Subject: - Meteorology (I. D. S.)
Name of the Paper: - General Meteorology (Paper-II)

Code No: -
 Course No:

Total Lectures: 30
 Total Marks: 40+10=50
 No of Credit: 4.0

Objectives

1. To acquaint the students with basic concept of general meteorology.
2. To understand physics behind atmospheric processes.

Unit No.	Name of the Unit	Sub Units	Lectures
1	Atmosphere and Effects of atmosphere	1.1 Composition of Earth's Atmosphere 1.2 Variation of composition of earths atmosphere 1.3 Scattering, Reflection & Absorption of solar radiations 1.4 Effects of Scattering 1.5 Nature & Properties of radiations 1.6 Greenhouse effect.	7
	The ozone layer	2.1 Ozone (O_3) formation photochemical processes 2.2 Absorption of solar radiation by ozone 2.3 Depletion of ozone layer & ozone hole 2.4 Ozone (O_3) in Troposphere 2.5 Smog formation due to ozone. 2.6 Tephigram	8
2	Atmospheric motion	3.1 The pressure gradient force 3.2 Non-inertial frame of reference and pseudo forces 3.3 The Earth's rotational deflective force (Coriolis force) 3.4 Effects of Coriolis force in nature 3.5 Buys Ballot's law 3.6 The geostrophic wind 3.7 Local winds.	7
	Satellite Meteorology and Energy Science	4.1 Satellite and Launching of satellite 4.2 Polar orbiting satellite and Geostationary satellites 4.3 Solar Cell and I-V Characteristics of Solar Cell. 4.4 Energy Science and energy technology 4.5 Various sciences and energy science 4.6 Energy, man and environment 4.7 Laws of conservation of energy 4.8 Energy demand	8

Reference Books:

Sr. No.	Title	Author
1)	ATMOSPHERE, WEATHER AND CLIMATE	R. J. Barry & R. J. Chorley
2)	Climatology	A. A. Miller
3)	Introduction to meteorology	S. Petterson
4)	Physics of atmospheres	J. T. Houghton

5)	Energy Technology non-conventional, Renewable and Conventional	S. Rao & B. B. Parulekar
6)	Environmental Science (Physical principles and applications)	Egbert Boeker & Rienk Van Grondelle.

Solapur University, Solapur
Choice Based Credit System w.e.f. June 2023
B.Sc. Part – II (Sem. IV)
Subject: - Meteorology (I. D. S.)
Name of the Paper: - Applied climatology (Paper-III)

Code No: -

Total Lectures: 30

Course No:

Total Marks: 40+10=50

No of Credit: 4.0

Objective:

1. To acquaint the students with basic concept of meteorology.
2. Main objectives of the course are to synthesize with various factors of meteorology.

Unit No.	Title of the Unit	Name of Topic	No. of Lectures
1	Weather and Health-Human response to climate	The Physiological response, urban Climate.	07
	Climate and Human Activities	Weather application to transportation, Agricultural and industrial activities.	08
2	Weather forecasting and analysis	Historical back ground, types of Weather forecasting – short range, medium range, long range, weather forecasting method, weather modification, satellite studies in Climatology.	08
	Motion in the atmosphere	Atmospheric pressure, pressure gradient, Coriolis effects, rotational Forces, periodic local winds.	07

References:

1. General Meteorology -H.R. Byeres
2. Meteorology William -L. Dorn
3. Climatology- Lal D.s.
4. Introduction to Meteorology –Pellersons
5. Climate and man Environment- Oliver J.E.
6. An Introduction to Climate-Triwarth G. T.
7. Monsoon Meteorology -Sulochana Gadgil
8. Handbook of statistical method in Meteorology-C. E. P. Brouks and N. Carrotners
9. Essentials of Meteorology -D.H. McIntosh & A.S. Thom
10. Ways of the Weather -P.A. Menon

11. Meteorology-D. Brun

12. Fundamental of Meteorology- V.C. finch G. T. Trewartha M.H. shearer F.L. caudle L.B. Bation

13. Climatology – R.V.Rohli & A.J.Vega

Punyashlok Ahilyadevi Holkar Solapur University, Solapur
Choice Based Credit System w.e.f. June 2023

B.Sc. Part – II (Sem. IV)

Subject: - Meteorology (I. D. S.)

Name of the Paper: - Meteorological Instruments (Paper-IV)

Code No: -

Total Lectures: 30

Course No:

Total Marks: 40+10=50

No of Credit: 4.0

Objective:

1. To acquaint the students with basic concept of meteorology.
2. To understand working and use of various meteorological Instruments.

Unit No.	Name of the Unit	Sub Units	Lectures
1	Rain and Temperature Measurement	1.1 Precipitation and Types of rain gauges 1.2 Ordinary rain gauge 1.3 Self-Recording rain gauge 1.4 The float gauge 1.5 Automatic siphon gauge. 1.6 Temperature scales 1.7 Mercury Thermometer 1.8 Six' Thermometer 1.9 Thermograph	8
	Pressure Measurement	2.1 Atmospheric pressure 2.2 Barometer and barograph 2.3 Mercury barometer 2.4 Aneroid barometer 2. Barograph	7
2	Wind measurement	3.1 Wind 3.2 The wind vanes 3.3 Anemometers 3.4 Hooke's Anemometer 3.5 Cup Anemometer 3.6 Constants of Cup Anemometer 3.7 Anemograph	7
	Humidity & Radiation measurement	4.1 Humidity 4.2 Dry and Wet bulb Thermometers 4.3 Hair hygrometer 4.4 Differential air thermoscope 4.5 Ether Thermoscope 4.6 Crooke's Radiometer 4.7 Seebeck effect 4.8 Thermocouple 4.9 Thermopile 4.10 Radiation pyrometer.	8

Reference Books:-

Sr. No.	Title	Author

1)	METEOROLOGICAL INSTRUMENTS	W. E. KNOWLES MIDDLETON & ATHELSTAN F. SPILHAUS
2)	Energy Technology non-conventional, Renewable and Conventional	S. Rao & B. B. Parulekar
3)	Environmental Science (Physical principles and application)	Egbert Bookers & Rienk Van Grondelle.
4)	ATMOSPHERE, WEATHER AND CLIMATE	R. J. Barry & R. J. Chorley
5)	METHODS OF ENVIRONMENTAL ANALYSIS OF WATER, SOIL & AIR	P. K. GUPTA

Practical I Meteorological data representation

List of Experiments Marks 100

- I)** Indian meteorological charts (IMD)
 Isobaric patterns (drawing and identification) sign and symbols on IMD charts, interpretation of IMD charts
 (Pre monsoon, monsoon, post monsoon), description of pressure, wind, sky condition, precipitation, Departure of pressure and temperature
 Beaufort (Scale) Notation
- II)** Roll of GIS and Remote Sensing in Meteorology
- III)** Representation of Meteorological data
 Graphs – line, Bar, Climograph, Histogram, Hythergraph, Crop calender
 Diagrams- star diagram, wind rose, Octagonal wind rose
- IV)** Statistical analysis using climatic data. Measures of central tendency, measure of dispersion, frequency distribution, climatic trends.
- V)** Field visit/Data collection/Project.
- VI)** Journal.

Reference Books: -

Sr. No.	Title	Author
1	Essential of meteorology	D.H. McIntosh and A.S. Thom.
2	Ways of the weather	P.A. Menon
3	Weather and Man	H.H. Neuberger, F.B. Stephens (A/c No. 2023)
4	Meteorology	D.Brune
5	Elementary meteorology	V.C. Finch, G.T. Trewartha, M.H. Shearer, F.C. Caudle
6	Meteorology	W.C. Dorn
7	Monsoon meteorology	Sulochana Gadgil

8	Fundamentals of meteorology Application weather forecasting / weather modification	L.B. Battan
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Practical II (wef June 2023)
List of Experiments
Marks 100

Sr.No.	Title of the Experiment
1	Rain gauge.
2	Mercury Thermometer
3	Six's Thermometer
4	Thermograph.
5	Pressure gradient & Coriolis parameter
6	Fortin's barometer.
7	Barograph
8	Cup anemometer
9	Hair hygrometer.
10	Wet & dry bulb thermometer.
11	Ether thermoscope.
12	Crooke's radiometer
13	I-V Characteristics of photovoltaic cell
14	P-V Characteristics of photovoltaic cell
15	Histogram/bar graph
16	Automatic siphon gauge
17	Differential air thermoscope

Reference Books: -

Sr. No.	Title	Author	Publication	Edition
	METEOROLOGICAL INSTRUMENTS	W. E. KNOWLES MIDDLETON & ATHELSTAN F. SPILHAUS	UNIVERSITY OF TORONTO PRESS	3
	Energy Technology non conventional, Renewable and Conventional	S. Rao & B. B. Parulekar	Khanna Publishers	3
	Environmental Science (Physical principles and application)	Egbert Bookers & Rienk Van Grondelle.		
	Monsoon meteorology	Sulochana Gadgil		
	METHODS OF ENVIRONMENTAL ANALYSIS OF WATER, SOIL & AIR	P. K. GUPTA		
