SOLAPUR UNIVERSITY, SOLAPUR

B. Sc. Part II
Meteorology (I. D. S.)
Semester Pattern Syllabus
(w. e. f. June 2014)

N. B.:-

- **i)** There will be **four** theory papers, each of 50 marks. (Papers I and II for third semester and Papers III and IV for fourth semester).
- **ii)** The practical examination will be annual.
- **iii)** The annual practical examination will be of 100 marks (Practical **I** 50 marks & **Practical II** 50 marks).
- **iv)** The total marks for Meteorology subject will be 300.
- **v)** There shall be 3 theory periods per paper per week i.e. 6 theory periods per week for meteorology subject and 8 periods per week for each batch.
- **vi)** The duration of theory examination for each paper will be 2 Hours each and that for practical will be 6 Hours for each practical. The practical examination will be for two days.
- **vii)** The theory examination of Papers I & II will be held at end of third semester.
- **viii)** The theory examination of Papers III & IV will be held at end of fourth semester.
- **ix)** The practical examination of both semesters will be held at the end of fourth semester.
- **x)** Every student will have to perform two practical.

Semester III **Paper I** **Climatology** Total Marks: 50

Code No. Total Lectures: 45
Course No.

Objectives

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.	Name of the unit	Sub Units	Lectures
I	**Introduction of modern meteorology**	Climatology Introduction Nature, Scope, Content of Climatology, Climatology and meteorology. Composition of atmosphere, Vertical structure of Earth's atmosphere	**10**
II	**Global Circulation of the Atmosphere**	The General circulation primary secondary Tertiary circulation Tropical circulation, Circulation of Northern and Southern hemisphere	**10**
III	**Air masses and synoptic climatology**	Air mass Definition, characteristics, source region of air mass, classification air masses. Modification of air masses, Upper air circulation patterns.	**10**
IV	**Atmospheric Disturbance**	Theories of the origin of cyclonic Depressions cyclone, Anticyclone- origin, stage, life cycle, thunderstorms, hurricane.	**10**
V	**Seasonal disturbances**	Special reference to Indian monsoon	**05**

Reference Books

Sr No.	Name of the Book	Author
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 methods in Meteorology	C. E. P. Brouks and N. Carrotners
9	Elementary Meteorology	G.F. Taylor
10	Ways of the Weather	P.A. Menon
11	Meteorology	D. Brun
12	Fundamentals of Meteorology.	V.C. finch G. T. Trewartha M.H. shearer F.L. caudle L.B. Bation

SEMESTER III PAPER II GENERAL METEOROLOGY Total Marks: 50

Code No. Total Lectures: 45
Course No.

Unit No.	Name of the Unit	Sub Units	Lectures
1	**Effects of atmosphere**	Nature of radiations & Properties, Effects of atmosphere: Scattering, Reflection & Absorption of solar radiations, Effects of Scattering, Terrestrial Re radiation, Green house effect.	**10**
2	**The ozone layer**	Tephigram, Ozone (O_3) formation photochemical processes, Absorption of solar radiation by ozone, Depletion of ozone layer & ozone hole, Ozone (O_3) in Troposphere, Smog formation due to ozone.	**10**
3	**Atmospheric motion**	Forces and motion: The pressure gradient force, Non-inertial frame of reference and pseudo forces, The Earth's rotational deflective force (Coriolis force), Effects of Coriolis force in nature, Buys Ballot's law, The geostrophic wind, Local winds.	**10**
4	**Satellite Meteorology**	Satellite, Launching of satellite, Polar orbiting satellite & Geostationary satellites, Solar Cell, I-V Characteristics of Solar Cell.	**10**
5	**Precipitation**	Condensation nuclei, Bergeron-Findeisen Theory of precipitation, Collision Theories, other types of precipitation, Artificial rain.	**05**

Reference Books:-

Unit No.	Title	Author	Publication	Edition
1)	PHYSICS OF ATMOSPHERES	J. T. Houghton	Cambridge University Press	
2)	Climatology	A. A. Miller		
3)				
4)	An Introduction to climate	G. T. Trewartha	Mc Graw-Hill Book Company	
5)	Introduction to meteorology	S. Petterson		
6)	ATMOSPHERE, WEATHER AND CLIMATE	R. J. Barry & R. J. Chorley	The English Language Book Society & Methuen & Co. L	3 & 5
7)	Energy Technology non conventional, Renewable and Conventional	S. Rao & B. B. Parulekar	Khanna Publishers	3
8)	Environmental Science (Physical principles and applications)	Egbert Boeker & Rienk Van Grondelle.		
9)	METHODS OF ENVIRONMENTAL ANALYSIS OF WATER, SOIL & AIR	P. K. GUPTA		
10)	FUNDAMENTALS OF METEOROLOGY	Luis J. Batton		

Semester IV **Paper III** **Applied climatology** Total Marks: 50

Code No. Total Lectures: 45
Course No.

Objectives

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	Sub Units	Lectures
I	**Weather and Health-Human response to climate**	The Physiological response, urban climate.	**5**
II	**Climate and Human Activities**	Weather application to transportation, Agricultural activities, industry.	**10**
III	**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.	**10**
IV	**Motion in the atmosphere**	Atmospheric pressure, pressure gradient, Coriolis effects, rotational forces, periodic local winds.	10
V	**Marine and Air operations**	Marine activities, fishing, offshore drilling, telecommunications.	10

Reference Books

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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 Introductiion 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. Mclntosh & 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

SEMESTER IV PAPER IV METEOROLOGICAL INSTRUMENTS Total Marks: 50

Code No. Total Lectures : 45
Course No.

Unit No.	Name of the Unit	Sub Units	Lectures
1	**Rain measurement**	Precipitation, Types of rain gauges (Classification), Ordinary rain gauge construction, Measurement of rain, precautions, Self Recording rain gauge, The float gauge, Automatic siphon gauge.	**5**
2	**Temperature Measurement**	Temperature scales, Mercury Thermometer, Sensitivity and accuracy, Six' Thermometer, Thermograph construction & working.	**10**
3	**Measurement of pressure**	Atmospheric pressure, Mercury barometer-construction & working, measurement of atmospheric pressure, Aneroid barometer-construction & working, Barograph-construction & working.	**10**
4	**Wind measurement**	Wind, The wind vanes, Anemometers: Hooke's Anemometer-construction & working, Measurement of wind velocity, Cup Anemometer-construction & working, Measurement of wind velocity, Constants of Cup Anemometer, Anemograph-Construction & Working.	**10**
5	**Humidity measurement & Radiation measurement**	Dry and Wet bulb Thermometers-construction & working, Measurement of humidity, Hair hygrometer-construction & working. Measurement of humidity, Ether Thermoscope, Crooke's Radiometer, Seebeck effect, Thermocouple, Thermopile, Radiation pyrometer.	**10**

Reference Books:-

Sr. No.	Title	Author	Publication	Edition
1)	METEOROLOGICAL INSTRUMENTS	W. E. KNOWLES MIDDLETON & ATHELSTAN F. SPILHAUS	UNIVERSITY OF TORONTO PRESS	3
2)	Energy Technology non conventional, Renewable and Conventional	S. Rao & B. B. Parulekar	Khanna Publishers	3
3)	Environmental Science (Physical principles and application)	Egbert Bookers & Rienk Van Grondelle.		
4)	ATMOSPHERE, WEATHER AND CLIMATE	R. J. Barry & R. J. Chorley	The English Language Book Society & Methuen & Co. L	3 & 5
5)	METHODS OF ENVIRONMENTAL ANALYSIS OF WATER, SOIL & AIR	P. K. GUPTA		

Practical I Meteorological data representation

I) Indian meteorological charts (IMD)

Isobaric patterns (drawing and identification) sign and symbols on IMD charts, interpretation of IMD charts

(Pre monsoon, monsoon, past monsoon), description of pressure, wind, sky condition, precipitation, Departure of pressure and temperature

Beaufort (Scale) Notation

II) Representation of Meteorological data

Graphs – line, Bar, Climograph, Histograph.

Diagrams- star diagram, wind rose

III) Statistical analysis using climatic data Measures of central tendency, measure of dispersion, frequency distribution, climatic trends.

IV) Journal.

Reference Books:-

Sr. No.	Title	Author
1	Essential of meteorology	D.H. Mclntosh 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

Practical II

List of Experiments

Sr.No.	Title of the Experiment
1	Rain gauge.
2	Thermometer..
3	Thermograph.
4	Pressure gradient & Coriolis parameter
5	Fortin's barometer.
6	Cup anemometer
7	Hair hygrometer.
8	Wet & dry bulb thermometer.
9	Ether thermoscope & Crooke's radiometer.
10	Characteristics of photovoltaic cell

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