SOLAPUR UNIVERSITY, SOLAPUR

B. Sc. Part II

Meteorology (I. D. S.)

Semester Pattern Syllabus

(w. e. f. June 2011)

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 250.

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 practicals.

Semester III Paper I Climatology Total Marks: 50

Code No. Lectures per week: 03
Course No. Total periods: 45

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.	8
II	**Global Circulation of the Atmosphere**	The General circulation primary secondary Tertiary circulation Tropical circulation, Circulation of Northern and Southern hemisphere	**8**
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	**9**

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	Climatology and atmospheric science	J.E. Oliver & J.J. Hidore
5	Introduction to Meteorology	Pellersons
6	Climate and man Environment	Oliver J.E.
7	An Introduction to Climate	Triwarth G. T.
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	Essentials of Meteorology	D.H. Mclntosh & A.S. Thom
12	Ways of the Weather	P.A. Menon
13	Weather and man	H.H. Neuberger F.B. stephens
14	Meteorology	D. Brun
15	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. Lectures per week: 03
Course No. Total periods: 45

Unit No.	Name of the Unit	Sub Units	Lectures
1	**Atmosphere**	Meaning and scope of Meteorology, The planetary atmospheres, Equilibrium temperatures, Composition of atmosphere, Variation of composition w. r. t. i) altitude, ii) Latitude and iii)time. Vertical structure of Earth's atmosphere	**9**
2	**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.	**9**
3	**Entropy and ozone**	Tephigram, Ozone (O_3) formation photochemical processes, Absorption of solar radiation by ozone, Depletion of ozone layer & ozone hole, Ozone (O_3) in Troposphere.	**9**
4	**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), Winds: Buys Ballot's law, The geostrophic wind, Local winds.	**9**
5	**Satellite Meteorology**	Satellite, Launching of satellite, Polar orbiting satellite & Geostationary satellites, Solar Cell, I-V Characteristics of Solar Cell.	**9**

Reference Books:-

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

Semester IV Paper III Applied climatology Total Marks: 50

Code No. Lectures per week: 03
Course No. Total periods: 45

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	Periods
I	**Weather and Health-Human response to climate**	The Physiological response, urban climate.	**6**
II	**Climate and Human Activities**	Weather application to transportation, Agricultural activities, industry.	**7**
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.	**12**
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

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4	Climatology and atmospheric science	J.E. Oliver & J.J. Hidore		
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9	Handbook of statistical method in Meteorology	C. E. P. Brouks and N. Carrotners		
10	Elementary Meteorology	G.F. Taylor		
11	Essentials of Meteorology	D.H. Mclntosh & A.S. Thom		
12	Ways of the Weather	P.A. Menon		
13	Weather and man	H.H. Neuberger F.B. stephens		
14	Meteorology	D. Brun		
15	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. Lectures per week: 03
Course No. Total periods: 45

Unit No.	Name of the Unit	Sub Units	Lectures
6	**Rain measurement**	Rain & Types of rain gauges, Ordinary rain gauge construction, Measurement of rain, precautions, Self Recording rain gauge, The float gauge, Automatic siphon gauge.	**9**
7	**Temperature Measurement**	Temperature scales, Mercury Thermometer, Sensitivity and accuracy, Maximum and Minimum Thermometer, Thermograph construction & working.	**9**
8	**Measurement of pressure**	Atmosphere & Atmospheric pressure, Mercury barometer-construction & working, measurement of atmospheric pressure, Aneroid barometer-construction & working, Barograph-construction & working.	**9**
9	**Wind measurement**	Wind, The wind vanes, Anemometers: Hooke's Anemometer, Cup Anemometer-construction & working, Measurement of wind velocity, Constants of Cup Anemometer Anemograph-Construction & Working.	**9**
10	**Humidity measurement & Radiation measurement**	Dry and Wet bulb Thermometers-construction & working, Measurement of humidity, Hair hygrometer-construction & working. Ether Thermoscope, Crooke's Radiometer, Seebeck effect, Thermopile, Radiation pyrometer.	**9**

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, Hypsograph.

Diagrams- star diagram, wind ruse

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

IV) Journal.

Reference books:-

1. Ashis Sarakar : Practical Geography A Systematic approach, Orient Longman Ltd. Kolkatta.
2. Critchifield : Principles of Climatology.
3. Lawrence, G.R.P. : Cartographic methods, Mathur Co. London.
4. Mather J.R. (1974) Climatogogy, Fundamental & applications. Mc Graw Hill Book Co. New York.
5. Monkhouse, F.J.R. : Maps & Diagrams, Wilkinson, H.R. Methuen & Co. London.
6. R. L. Singh & Rana P.B. Singh: Element of Practical Geography, Kalyani Pub. New Dehli.(1999)
7. Trewartha G.T. : An Introduction to climate McGraw – Hill Book Co. , New York.

Practical II

List of Experiments

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

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4)	Monsoon meteorology	Sulochana Gadgil		
5)	METHODS OF ENVIRONMENTAL ANALYSIS OF WATER, SOIL & AIR	P. K. GUPTA		

Nature of Question Paper

As per the nature of question paper for the semester pattern

Q. No. 1: Multiple Choice Question 20 %

Q. No. 2 & 3: Short Answer Type Question 40 %

Q. No. 4 & 5: Long Answer Type Question 40 %

(Science) B. Sc. II Meteorology (Semester Pattern: w. e. f. June 2011)

Time: - 2 hours **Total marks: - 50**

Q. No. 1 Multiple Choice questions 10

i) ----------

a) b) c) d)

ii)
iii)
iv)
v)
vi)
vii)
viii)
ix)
x)

Q. No. 2 Answer **any five** of the following 10

i)
ii)
iii)
iv)
v)
vi)

Q. No. 3 A) Answer **any Two** of the following 6

i)
ii)
iii)

B) Write the Answer/ Solve/ Note/ Problem 4

Q. No. 4 Answer **any Two** of the following 10

i)
ii)
iii)

Q. No. 5 Answer **any Two** of the following 10

i)
ii)
iii)
