DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO.ACAD/SU/Sci./Syllabus/93/2014

It is hereby notified for information of all concerned that, on the recommendations of the Ad-hoc Boards and Dean, Faculty of Science, the **Academic Council at its meeting held on 08-07-2014** has accepted the following revised syllabi as mentioned against their nomenclature for **B.Sc. & M.Sc. under the Faculty of Science** :-

Sr. No.	Revised Syllabus		Semester
[1]	B.Sc. Environment Science	[Optional]	I & II
[2]	B.Sc. Sericulture	[Optional]	I & II
[3]	B.Sc. Automobile Technology	Degree Course	I & II
[4]	B.Sc. Workshop Technology	Degree Course	I & II
[5]	B.Sc. Refrigeration & Air Conditioning	Degree Course	I & II
[6]	B.Sc. Forensic Science	Degree Course	III & IV
[7]	B.Sc. Polymer Chemistry	[Optional]	III & IV
[8]	B.Sc. Environment Science	[Optional]	III & IV
[9]	M.Sc. Plant Breeding & Molecular Genetics		III & IV

This is effective from the **Academic Year 2014-2015** and onwards.

These **syllabi are available on the University Website.**

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.ACAD/SU/B.Sc. & M.Sc./
2014/16264-463
A.C.S.A.I.No.462[18].

Date:- 12-08-2014.

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Director,
Board of College and
University Development.

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Copy forwarded with compliments to :-

1] The Principals, affiliated concerned Colleges,
Dr. Babasaheb Ambedkar Marathwada University.

2] The Director, University Network & Information Centre, UNIC, with **a request to upload the above all syllabi on University Website.**

Copy to :-

1] The Controller of Examinations,

2] The Superintendent, [B.Sc. Unit],

3] The Superintendent, [M.Sc. Unit],

4] The Superintendent, [Eligibility Unit],

5] The Programmer [Computer Unit-1] Examinations,

6] The Programmer [Computer Unit-2] Examinations,

7] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter,
Dr. Babasaheb Ambedkar Marathwada University,

8] The Public Relation Officer,

9] The Record Keeper,
Dr. Babasaheb Ambedkar Marathwada University.

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DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Syllabus of

B.Sc. First Year

Semester – I & II

Environmental Science [Optional]

[With minor changes]

Effective from Academic Year 2014-2015

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

B.Sc. (Environmental Science) in Semester Pattern.

B.Sc. Ist year

Year	Semester	Course Code	Paper Number	Paper Title	Marks
Ist Year	Ist	EVS-111	Paper-I	Concepts of Environments	50
		EVS-112	Paper-II	Ecology	50
		EVS-113	Paper-III	Lab Course-I (Practical based on Paper I &Paper II)	50
	IInd	EVS-121	Paper-IV	Environmental Chemistry and Natural Resources	50
		EVS-122	Paper-V	Population and Environmental Issues	50
		EVS-123	Paper-VI	Lab Course-II(Practical based on Paper IV & Paper V)	50

B.Sc.I year, Semester I

EVS-111 (Paper-I) : Concepts of Environment

Unit-I

1. Introduction :

Definition of Environment and Environmental Science

Environmental Science - Scope and Importance.

Biosphere:

Definitions, Components of biosphere.

2. Evolution of Life :

Origin of the earth;

Evolution of life;

Atmosphere of the primitive earth.

Unit-II: Biotic Components of Environment:

Three kingdom of living world-

a) Classification of Plants
b) Classification of Animals
c) Classifications of Protista

ABIOTIC COMPONETS OF ENVIRONMENT

Unit-III: Atmosphere:

Definition, Structure and composition of atmosphere, Evolution of atmosphere, Composition of air, Atmospheric temperature, Atmospheric pressure

Unit-IV: Lithosphere:

Definition, Structure of lithosphere, Soil composition,

Soil profile, Physical and chemical properties of soil,

Soil formation (pedogensis)- physical, chemical and biological weathering.

Unit – V: Hydrosphere:

Definition, Structure of water molecule,

Properties of water,

Distribution of water on earth,

Hydrological cycle .

EVS-112 (Paper-II) : Ecology

Unit – I : Introduction:

Ecology-Definition and scope,

Ecosystem-Concept and structure of ecosystem, Functions of ecosystem, Biotic Components of ecosystem (producer, consumer and decomposer), Abiotic components of ecosystem (Wind, Temperature, Soil, Minerals, Nutrients, CO_2, Solar radiation, etc), Application of ecology in aquaculture

Unit – II :

Food chain, Food web, Trophic structure, Ecological pyramid, Energy in ecosystem, Energy flow in ecosystem, Laws of thermodynamics.

Unit – III: Types of Ecosystems:

Terrestrial ecosystem - Dessert ecosystem, Grassland ecosystem, Forest ecosystem (Evergreen and Deciduous), Mountain ecosystem and Marsh land.

Unit – IV: Aquatic Ecosystem:

Freshwater ecosystem : i) Lentic ecosystem- Ponds and Lakes;
ii) Lotic ecosystem – Rivers and Streams.

Marine ecosystem: Oceans , Seas, and Estuaries.

Unit – V : Adaptation:

Significance of ecological adaptation ,

Ecological adaptation in Plants :-Hydrophytes, Xerophytes, Mesophytes and Halophytes;

Ecological adaptations in animal.

EVS-113 (Paper-III) : Lab Course-I (Practical paper based on paper I & II)

1. To study the 'Laboratory Safety Rules'.
2. To study the cleaning methods of glass wears.
3. To study the First-Aid and emergency treatment in laboratory.
4. Collection and Preservation of phytoplankton and zooplankton samples from different water bodies (river, pond, lake etc)
5. The qualitative study the phytoplankton's (any 10 specimens).
6. The qualitative study the zooplanktons (any 10 specimens).
7. The quantitative study of zooplanktons -Percentage composition study.
8. Collection of hydrophytes, xerophytes, mesophytic and halophytic plants / animals specimens.
9. Study of xeric adaptation in plants, morphometrically and histologically.
10. Study of xeric adaptations in animal (at least 5 specimens morphometrically)
11. To study the aquatic adaptations in plants morphometrically and histological (at least 5 specimens)
12. Study of mesophytic specimens (at least 5 specimens).

Note:

i) Duration for each practical is of 04 periods.

ii) Study tour /field visits are compulsory.

Reference Books: for paper EVS-111 (Paper-I) : Concepts of Environment

1. Environmental Science-Enger, smith and smith, W.M.C. Brown company publication
2. Environmental Science- Taylar and Millelr
3. Environmental Biology-Vishwaswarup Mukahrji
4. Environmental Science-Botking and Kelter,John Wiley and Sons, New York.
5. Environmental Science-S.C. Santra
6. Principles of Environmental Biology-Nayer
7. Fundamental of Ecology-Odum E.P.
8. Environmental Science-Neble

Reference Books: for paper EVS-112 (Paper-II) : Ecology

1. Principles of Ecology-P.S.Verma and V.K. Agarwal
2. Fundamentals of Ecology-Odum E.P.
3. Principles of Environmental Science-Wart K.E.F.(1973) Mc Graw Hill book Company.
4. Ecology and Environments-P.D.Sharma
5. Elements of Ecology-P.D.Sharma
6. Ecology-M.P.Arora
7. Basic Ecology-E.P. Odum
8. Concept of Ecology-E.J.Koromondy,1996, concept of modern biology series, Prentice Hall.
9. Modern Concepts of Ecology-H.D.Kumar
10. Principles of Environmental Biology-P.K.G.Nair,Himalaya Pub. House, Delhi
11. Ecology by N.S.Subrananayam and A VSS Sambamuthy.

B.Sc.I year, Semester II

EVS-121 (Paper-IV): Environmental Chemistry and Natural Resources

Unit – I: Introduction to Environmental Chemistry:

Definition of Environmental Chemistry;
Concept and Scope of Environmental Chemistry;
Definition and description of various terms :-Contaminant, Pollutant, Sink, Aerosols, RSPM, Particulate matter, DO, COD, BOD, Toxicology, Toxins, Hazardous chemicals, Carcinogens, Sewage, Affluent, Effluents, Potability etc.

Unit – II: Bio-geo chemical cycles in the environment:

Carbon cycles, Oxygen cycle, Nitrogen cycles , Phosphorus cycles and Sulphur cycles.

Unit – III:

Chemistry of ozone layer,
Ozone depletion :- Causes and effects,
Green house effect:- Major green house gases, Causes and effects,
Global warming;
Acid rain: - Causes and effects.

Unit – IV: Natural resources:

Definition, Classification of resources:-Renewable and Non-renewable,
Mineral resources :- Uses and their exploitation,
Energy Resources:- Fossil fuel energy resource, Wind energy , Solar energy, Biomass energy.

Unit – V: Forest and Wild Life Resources:

Forest resource :- Types of forest , Importance of forest, Deforestation, Aforestation, Social forestry,
Wild life :- Important wild species from India, National Parks and Sanctuaries- (Kanha National Park, Tadoba National Park, Jaikwadi Bird Sanctuary).

EVS-122 (Paper-V): Population and Environmental Issues

Unit – I: Introduction:

Definition of Population and Population ecology;
Characteristics of Population: - Natality, Mortality, Density, Migration, Immigration, Age distribution, Age structure.

Unit – II: Population growth:

Population growth curves :- Sigmoid curve and J-Shape curve,
Population fluctuation –Population oscillation,
World's Population and its relation with development and pollution,
Population explosion, Population explosion in India,
Family planning.

Unit – III: Community ecology:

Definition and types of community,
Structure and classification, characteristics of community, Stratification,
Ecotone and Edge effect.

Unit – IV: Ecological Succession:

Definition, types of succession,
Process of succession, Examples of succession: – Succession in plants on rocks and in water body, Concept of climax.

Unit – V: Environmental issues:

Definition and concept of :

- Biodiversity conservation,
- Sustainable development,
- Wetland,
- Mangroves,
- Environmental impact assessment (EIA),
- SEZ (Special Economic Zone),
- Scheme of labeling of environmental friendly products (Eco-marks),
- Wasteland.

EVS-123 (Paper-VI): Lab course-II

(Practical Paper based on Paper IV & Paper V)

1. To study the laboratory equipments and instruments (Oven, Microscope, Incubator, Inoculation chamber, Autoclave, Electronic balance, pH meter, Colorimeter, Turbidity meter, etc).
2. To study the preparation of regents of different Normality and Molarities (i.e. 1 N, 0.1N, 1M,etc).
3. To study the species area curve of plant species from terrestrial ecosystem / college campus.
4. To study the relative density of plant/animals species by quadrate method (by field work or by simulation).
5. To study the relative frequency of plant / animal species by quadrate method (by field work or by simulation).
6. To study the relative abundance of plant / animal species by quadrate method (by field work or by simulation).
7. To study the total population of species by organism removal method (by simulation method)
8. To study the Importance Value Index (IVI) of any tree plant species.
9. Study of primary productivity of macrophytes from water reservoir by harvest method.
10. To study the endangered species (at least 06).
11. To determine the total population of avifauna from unit area of habitat by direct count of their nests and artifacts.
12. Submission of study tour / field visit report.

Note:

i) Duration for each practical is of 04 periods.

ii) Study tour /field visits are compulsory.

Reference books: for paper EVS-121 (Paper -IV): Environmental Chemistry and Natural Resources

1. Environmental Cheistry-B.K.Sharma
2. Environmental Chemistyr- Kanan Krishnan
3. A Tex book of Environmental Chemistry-Dara S.S.,S.Chand, Publication.
4. Encyclopedia Environmental Chemistry-A.K.Day
5. Environmental Pollution-R.K.Trivedi
6. Environmental Science-Botkin and Kelter,John Wiley and Sons, New York.
7. Environmental Chemistry – M.Satake and Y.Meddow.
8. Environmental Pollution-Katyal and Satake, Anmol Publication, New Delhi.
9. Environmental Chemistry- S.C. Santra, New Central book Agency, Kolkata.

Reference books: for paper EVS-122 (Paper -V): Population and Environmental Issues

1. Principles of Ecology –Verma and Agarwal
2. Fundamentals of Ecology-E.P.Odum
3. Basic Ecology-E.P. Odum
4. Environmental Ecology-K.C.Agarwal
5. Science of Ecology-Ehrlic/Roughgarden
6. Population Ecology-C.J.Creb
7. Ecology-Subramanyam
8. Ecology:Principles and Applications-J.L.Chapman and M.J.Reiss
9. Environment and Ecology-Gourkrishna Dasmohapatra
10. Ecology- Ricklefs Miller.
11. Ecology by N.S.Subramanayam and A.V.Ss Sambamurthy.
12. Concepts of Ecology by Edward J Kormondy
13. Introduction to Environmental Science by Y. Anjaneyulu.

Model Question Paper for Theory Paper

Time : Two hours **Total Marks : 50**

Q.1 Long question (on Unit -I) **10**

Or

Write Short notes on : (on Unit- I)

a)_____

b)_____

Q.2 Long question (on Unit -II) **10**

Or

Write Short notes on : (on Unit- II)

a)_____

b)_____

Q.3 Long question (on Unit -III) **10**

Or

Write Short notes on : (on Unit- III)

a)_____

b)_____

Q.4 Long question (on Unit –IV & V) **10**

Or

Write Short notes on : (on Unit- IV & V)

a)_____

b)_____

Q.5 Multiple choice Questions **10**

(on Unit- I to V i.e. 02 questions on each unit)

i).

ii).

iii).

iv).

v).

vi).

vii).

viii).

ix).

x).

Model Question Paper for Practical Paper III and VI

Time : Six hours **Total Marks : 100**

Q.1	Long question (based on Paper III)	**20**
Q.2	Long question (based on Paper III)	**20**
Q.3	Long question (based on Paper VI)	**20**
Q.4	Long question (based on Paper VI)	**20**
Q.5	Tour report submission /collection submission	**05**
Q.6	Record book submission (Lab course I & lab course II)	**10**
Q.7	Viva-voce	**05**

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