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DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

SYLLABUS OF

"Six Months Course in Environmental Science"

(As per directives of Hon'ble Supreme Court)

[EFFECTIVE FROM 2005-06 AND ONWARDS]

SIX MONTHS COMPULSORY CORE MODULE COURSE IN ENVIRONMENTAL STUDIES: FOR UNDERGRADUATES

Teaching Methodologies

The Core Module Syllabus for Environmental Studies includes class room teaching and Field Work. The syllabus is divided into eight units covering 100 lectures. The first seven units will cover 70 lectures which are class room based to enhance knowledge skills and attitude to environment. Unit eight is based on field activities which will be covered in 30 lecture hours and would provide students first hand knowledge on various local environmental aspects. Field experience is one of the most effective learning tools for environmental concerns. This moves out of the scope of the text book mode of teaching into the realm of real learning in the field, where the teacher merely acts as a catalyst to interpret what the student observes or discovers in his/her own environment. Field studies are as essential as class work and form an irreplaceable synergistic tool in the entire learning process.

Course material provided by UGC for class room teaching and field activities be utilized.

The universities/colleges can also draw upon expertise of outside resource persons for teaching purposes.

Environmental Core Module shall be integrated into the teaching programmes of all undergraduate courses.

Annual System: The duration of the course will be 100 lectures. The exam will be conducted along with the Annual Examination.

Semester System: The Environment course of 100 lectures will conducted in the second semester and the examination shall be conducted at the end of the second semester.

Credit system: The core course will be awarded 4 credits.

Exam Pattern: In case of awarding the marks, the question paper should carry 100 marks. The structure of the question paper being:

Part-A, Short answer pattern	-	25 marks
Part-B, Essay type with inbuilt choice	-	50 marks
Part-C, Field Work	-	25 marks

CORE MODULE SYLLABUS FOR ENVIRONMENTAL STUDIES FOR UNDER GRADUATE COURSES OF ALL BRANCHES OF HIGHER EDUCATION.

UNIT 1: The Multidisciplinary nature of environmental studies

Definition, scope and importance (2 lectures)

Need for public awareness.

UNIT 2: Natural Resources:

Renewable and non- renewable resources:

Natural resources and associated problems.

a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

b) Water resources: Use and over-utilization of surface and ground water; floods, drought, conflicts over water, dams benefits and problems.

c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

UNIT 3 : Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Food chains, food webs and ecological pyramids.
- Ecological succession.
- Introduction, types, characteristic features, structure and function of the following ecosystem:-

a) Forest ecosystem.
b) Grassland ecosystem.
c) Desert ecosystem.
d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT 4: Biodiversity and its conservation.

- Introduction – Definition: genetic, species and ecosystem diversity.
- Biogeographical classification of India.
- India as a mega-diversity nation.
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
- Biodiversity at global, National and local levels.
- Hot-spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT 5: Environmental Pollution

Definition

- Causes, effects and control measures of :-

a) Air pollution

b) Soil pollution

c) Water pollution

d) Marine pollution

e) Noise pollution

f) Thermal pollution

g) Nuclear hazards

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- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: floods, earthquake, cyclone and landslides.

(8 lectures)

UNIT 6: Social Issues and the Environment.

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and Control of Pollution) Act.
- Wild life Protection Act.
- Issues involved in enforcement of environmental legislation.
- Public awareness.

UNIT 7: Human Population and the Environment.

- Population growth, variation among nations.
- Population explosion-family welfare programme.

- Human Rights.
- Valuc Education.
- Environment and human health.
- HIV/AIDS.
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.
- Case Studies.

(6 lectures)

UNIT 8: Field work

- Visit to a local area to document environmental assets-river/forest/grassland/hill/mountain.

REPORT COMPULSORY

- Visit to a local polluted sites – Urban Rural / Industrial / Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystem – pond, river, hill slopes, etc.

(Field work Equal to 5 lecture hours)

REFERENCES

1. Agarwal, K. C. 2001 Environmental Biology, Nidi Publ. Ltd.Bikaner
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad-380013, India, Email:mapin@icent.net (R)
3. Bruneer R. C., 1989, Hazardous Waste Incineration, McGraw Hill Inc.480p.
4. Clark R. S., Marine Pollution, Clanderson Press Oxford (TB)
5. Cunningham, W. P. Cooper, T. H. Gorhani, E & Hepworth, M. T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
6. De A. K., Environmental Chemistry, Wiley Eastern Ltd.
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H. P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute. Oxford Univ. Press. 437p
9. Hawkins R. E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V. H. & Watson, R. T. 1995. Global Biodiversity Assessment. Cambridge University Press 114p
11. Jadhav, H & Bhosale, V. M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284p
12. Mckinney, M. L. & Schocl. R. M. 1996 Environmental Science systems & Solution, Web enhanced edition. 639p
13. Mhaskar A. K, Matter Hazardous, Techno-Science Publications (TB)

14. Miller T. G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
15. Odum, E. P. 1971. Fundamentals of Ecology. W. B. Saunders Co. USA, 574p.
16. Rao M: N. & Datta, A. K. 1987. Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p.
17. Sharma B. K.,2001. Environmental Chemistry. Goel Publ. House, Meerut
18. Survey of the Environment, The Hindu (M)
19. Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
20. Trivedi R. K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards; Vol I and II, Enviro Media (R)
21. Trivedi R. K. and P. K. Goel, Introduction to air pollution, Techno-Science Publications (TB)
22. Wagner K. D., 1998. Environmental Management. W. B. Saunders Co. Philadelphia, USA 499p

(M) Magazine

(R) Reference

(TB) Textbook