Rayat Shikshan Sanstha's

Yashavantrao Chavan Institute of Science, Satara

(Autonomous)

Syllabus under Autonomy

For

B. Sc. II (Environmental Studies)

Academic Year 2019 – 2020

Rayat Shikshan Sanstha's
Yashavantrao Chavan Institute of Science, Satara
Department of Environmental Studies
Syllabus for Bachelor of Science (Environmental) Part II
2019-2020

1. SUBJECT: Environmental Studies

2. YEAR OF IMPLEMENTATION: New Syllabi for the B.Sc. II Environmental Studies will be implemented from June 2019 onwards.

3. PREAMBLE:

It is the intention of the parties to establish the Agenda as a cooperative process for collaboration on environmental issues. Both countries recognize that environmental protection, economic and social developments are interdependent and mutually reinforcing components of sustainable development. They acknowledge that human resource development, eradication of absolute poverty and hunger remain challenges everywhere. While managing resources sustainably, an environmental policy that focusses mainly on conservation and protection must take due account of those who depend on the resources for their livelihood.

4. GENERAL OBJECTIVES OF THE COURSE:

1. To demonstrate a general understanding of the breadth and interdisciplinary nature of environmental issues.
2. To share perspectives and positions on key global environmental issues such as global warming, ozone depletion, desertification, biodiversity conservation and hazardous waste.
3. To exchange information on environmentally sound technologies, including sustainable energy generation and use, pollution abatement and prevention, waste management, and water treatment;
4. To recognize the history, structure, function, interactions, and trends of key environmental systems: climate, earth, life.
5. To support implementation of India's Environmental Action Programs.

5. **DURATION: 01 Years (Full Time)**
6. **PATTERN: SEMESTER EXAM**
7. **MEDIUM OF INSTRUCTIONS:ENGLISH**
8. **STRUCTURE OF COURSE:**

1. **THIRD SEMESTER (Sem – III)**

Sr. No.	SUBJECT TITLE	Theory		
		Paper Code	No. of lectures per week	Credits
1	Environmental Studies	BEVS-301	4	2

2. **FOURTH SEMESTER**

Sr. No.	SUBJECT TITLE	Theory		
		Paper Code	No. of lectures Per week	Credits
1	Environmental Studies	EVS- 401	4	2

1. **Structure and Title of Papers of B. Sc. Course: AECC - II**

B. Sc. II Semester III

Semester - III	ESE	ISE –I	ISE – II	FIELD VISIT	TOTAL
Environmental Studies (BEVS – 301)	30	5	5	10	50

B. Sc. II Semester IV

Semester - IV	ESE	ISE –I	ISE – II	PROJECT ON FIELD VISIT	TOTAL
Environmental Studies (BEVS – 401)	30	5	5	10	50

2) Structure and titles of papers of B. Sc. II Course

B. Sc. II Semester I (III) (45 lectures)

Topic

1) Nature of Environmental Studies (9 lectures)

2) Natural Resources and Associated Problems (12 lectures)

3) Ecosystems (10 lectures)

4) Environmental Issues (4 lectures)

5) Field Visit (10 lectures)

B. Sc. II Semester II (IV) (45lectures)

Topic

1) Biodiversity and its conservation (9 lectures)

2) Environmental Pollution (9 lectures)

3) Social Issues and the Environment (8 lectures)

4) Environmental Protection (9 lectures)

5) Project on Field Visit Submission (10 lectures)

Rayat Shikshan Sanstha's

Yashavantrao Chavan Institute of Science, Satara (Autonomous)

Syllabus introduced from June 2019

Bachelor of Science (B. Sc.) Part – II: Environmental studies

B. Sc. II Semester I (III)

Total Lectures 45

1) Nature of Environmental Studies. (9)

Definition, scope and importance.

Multidisciplinary nature of environmental studies

Need for public awareness.

2) Natural Resources and Associated Problems (12)

a) Forest resources: Use and over-exploitation, deforestation, 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, dam's benefits and problems.

c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources.

d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer pesticide problems.

e) Energy resources: Growing energy needs, renewable and non- renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy.

f) Land resources: Solar energy, Biomass energy, Nuclear energy, Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

3) Ecosystems (10)

a) Concept of an ecosystem.

b) Structure and function of an ecosystem

c) Energy flow in the ecosystem

d) Ecological succession

e) Food chains, food webs and ecological pyramids.

f) Introduction, types, characteristics features, structure and function of the Forest ecosystem, Grassland ecosystem, Desert ecosystem.

g) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

4) Environmental Issues (4)

a) Water conservation, rain water harvesting, watershed management

b) Carbon footprint and carbon credit.

5) Field Visit (10)

1) **Nature of Environmental Studies**

Visit to a local area to document environmental assets/ school and colleges to awareness about environmental issues/ Literacy and environmental awareness, environmental impact of pilgrims, festival.

2) **Natural Resources and Associated Problems**

1) Visit to a local area to document environmental natural resources and their uses.

2) Visit to a local area to document environmental assets such as Water resources.

3) Visit to a local area to document environmental assets such as Forest and forest resources/ Mineral resources/ Food resources/ Energy resources/ Land resources.

4) Visit to a local area to documentation Renewable and Non-Renewable resources.

5) Conservation of renewable and non- renewable energy resources for Local area.

6) Energy budgeting of factory, office premises, domestic unit.

7) Local sources of water stream / river/ tank / well /bore well / dam.

3) Ecosystems

1) Visit to a local area to document Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

2) Visit to a local area to document Forest ecosystem. (Grassland Ecosystem, Desert ecosystem).

3) Visit to a local area for document or conservation of ecosystem.

4) To study of different types of local ecosystem like Kass, Mahabaleshwer, Thoseghar, chalkevadi, Koyna back water, Koyna wildlife etc.

4) Environmental Issues

1) Water audit of college campus, energy audit of college campus.

2) Water sources of college campus.

3) Rain water harvesting methods in college campus.

4) Water conservation methods in college campus.

5) Carbon footprint and carbon credit in college campus. (Green audit)

Learning outcomes:

- Students will think critically in relation to environmental affairs
- Students will able create awareness, knowledge, and appreciation of the intrinsic values of ecological processes and communities.
- The ability of the students to write effectively about complex environmental problems will be increased.
- Students will describe and analyze the current national and global environmental problems/ causes of rarity of plants and animals/ biodiversity loss/pollution etc.

References

1) Environmental Science and Engineering – Dr. A. Ravikrishnan – Anna University of technology, Tindivanam.(Unit 1to 4)
2) Environmental Studies – Dr. Jay S. Samant – Shivaji University Kolhapur.(Unit 1 to 4)
3) Environmental Studies – Erach Bharucha - University Grants Commission New Delhi, and Bharati Vidyapeeth Institute of Environment Education &Research, Pune.(Unit 1to 4)
4) Agarwal, K.C.2001, Environmental Biology, Nidi Pub. Ltd., Bikaner.
5) Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380013, India, Email:mapin@icenet.net (R). .(Unit 1to 4)
6) Brunner R.C.,1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p. .(Unit 1to 4)
7) Clank R.S. Marine Pollution, Clanderson Press Oxford (TB). .(Unit 1to 4)
8) Cunningham, W.P. Cooper, T.H.Gorhani, E. & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Pub. Mumbai, 1196p. .(Unit 1to 4)
9) De A.K., Environmental Chemistry, Wiley Wastern Ltd. (Unit 1to 4)

Bachelor of Science (B. Sc.) Part – II: Environmental studies

B. Sc. II Semester II (IV)

Total Lectures 45

6) Biodiversity and its conservation (9)

a) Introduction - Definition: genetic, species and ecosystem diversity Bio-geographical classification of India.

b) Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.

c) India as a mega- diversity nation. Western Ghat as a biodiversity region. Hot-spot of biodiversity

d) Threats to biodiversity habitat loss, poaching of wildlife, man-wildlife conflicts.

e) Endangered and endemic species of India.

g) Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

7) Environmental Pollution (9)

a) Definition: Causes, effects and control measures of: Air pollution, Water pollution, soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards.

b) Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.

8) Social Issues and the Environment (9)

a) Disaster management: floods, earthquake, cyclone, tsunami and landslides.

b) Urban problems related to energy.

c) Resettlement and rehabilitation of people; its problems and concerns.

d) Environmental ethics: Issue and possible solutions.

e) Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

F) Wasteland reclamation. Consumerism and waste products.

9) Environmental Protection (9)

a) Unsustainable to Sustainable development.

b) Environmental Protection Act.

c) Air (Prevention and Control of Pollution) Act.

d) Water (Prevention and control of Pollution) Act.

e) Wildlife Protection Act.

f) Forest Conservation Act.

g) Population Growth and Human Health, Human Rights.

10) Project on Field Visit Submission (10)

1) Biodiversity and its conservation

1) Visit to a local area to document or survey of Biodiversity Western Ghats (Mahableshwer, Kas, Bamnoli, Koyna back water etc.)

2) Planning for sustainable development of Biodiversity conservation.

3) Local visit biodiversity hotspots/ heritage sites

4) Raising awareness of biodiversity issues in Historical places of conservation point of view.

5) Documentation/Awareness about rare, endangered and threatened (RET) species (plants/animals) of particular area.

2) Environmental Pollution

1) Field visit related to air pollution like sugar industry / stone crasher / vehicle pollution / ethanol production industry.

2) Periodic monitoring of pollution parameter in surface water, ground water, air, noise, solid waste.

3) Survey of traffic and transportation vehicle, industry, and servicing centers in the towns and city.

3) Social Issues and the Environment

1) Survey of biogas plants, ETP, CETP, Windmills.

2) Environmental impact of brisk kilns, gurhal, cottage or small scale industries.

3) Traditional and modern agricultures practices such as shifting cultivation methods, burning of agriculture's wastes, composting and vermin-culture.

4) Effect of anthropogenic activities viz. mining, quarrying, dam, construction etc on human beings.

5) Ganesh Idol immersion, Plastic waste management, solid waste management, bird watching, Celebration of World Environment Day, Ozone day, Vermicompost plant, Green Audit.

4) Environmental Protection

1. To study the cases on the illegal collection of plants and animals.
2. To study the cases on waste water and solid waste disposal in industries.
3. Case study on air pollution, water pollution, soil pollution, noise pollution etc.

Learning outcomes:

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References:

1. Environmental Science and Engineering – Dr. A. Ravikrishnan – Anna University of technology, Tindivanam. (Unit 6 to 9)
2. Environmental Studies – Dr. Jay S. Samant – Shivaji University Kolhapur(Unit 6 to 9)
3. Environmental Studies – Erach Bharucha - University Grants Commission New Delhi,and Bharati Vidyapeeth Institute of Environment Education &Research, Pune(Unit 6 to 9)
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10. Down to Earth , Centre for Science and Environment , New Delhi.(R)
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16. Miller T.G. Jr., Environmental Science. Wadsworth Publications Co. (TB).
17. Rao M.N.andDatta, A.K.1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd., 345p
18. Sharma B.K., 2001, Environmental Chemistry, Gokel Publ. Hkouse, Meerut
19. Survey of the Environment, The Hindu (M)
20. Townsend C., Harper, J. and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
21. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, vol. I and II, Environmental Media (R)
22. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno- Science Publications (TB)
23. Wagner K.D.,1998, Environmental management, W.B. Saunders Co. Philadelphia, USA 499p.

(M) Magazine
(R) Reference
(TB) Textbook

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