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## VALUE EDUCATION COURSE (VEC): ENVIRONMENTAL SCIENCE

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Open for First Year Graduate Student w.e.f. 2023-24

**RECOMMENDED BY THE BOARD OF STUDIES IN BOTANY  
AND**

**APPROVED BY THE ACADEMIC COUNCIL**

Devrukh Shikshan Prasarak Mandal's

Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and  
Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.  
Tal.Sangmeshwar, Dist. Ratnagiri-415804, Maharashtra, India

Academic Council Item No: 3 dated 08/07/2023

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangmeshwar, Dist. Ratnagiri-415804,
Name of the Parent University	:	University of Mumbai
Name of the Programme	:	Bachelor of Science
Name of the Class to Which the course is Open	:	First Year, Semester First
No. of Credits	:	02
Title of the Course	:	Environmental Science
Course Code	:	BTVE101
Passing Marks	:	40%
Nature of Course	:	Value Education Course (VEC)
Level	:	UG
Pattern	:	60:40
Status	:	Multidisciplinary- Open to all in the First Year
To be implemented from Academic Year	:	2023-2024

**Syllabus for Value Education Course (VEC): Environmental Science  
(With effect from the academic year 2023-2024)**

**SEMESTER-I**

**Paper No.– I**

**Course Title: Environmental Science**

**No. of Credits - 02**

**Type of Vertical: VEC**

**C. CODE: BTVE101**

**Learning Outcomes Based on BLOOM's Taxonomy:**

After completing the course, the learner will be able to...		
Course Learning Outcome No.	Blooms Taxonomy	Course Learning Outcome
CLO-01	Remember	Recall the environment, ecosystem, biodiversity conservation, sustainability and various types of pollutions case studies.
CLO-02	Understand	Explain the role and importance of environment, ecosystems and biodiversity conservations.
CLO-03	Apply	Demonstrate the case study knowledge for environment conservation.
CLO-04	Analyse	Differentiate the changing patterns of environment in India.
CLO-05	Evaluate	Justify significance of environment and biodiversity.

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<b>Module No.</b>	<b>Content</b>	<b>Credit</b>	<b>Lectures (1 Hr.)</b>
1	<p><b>Environmental Science</b> Definition, scope and importance. Multidisciplinary nature of environmental science Need for public awareness.</p> <p><b>Sustainable Development</b> Introduction to sustainable development: Concept of sustainability. Sustainable Development Goals (SDGs)- targets and indicators, challenges and strategies for SDGs. Sustainable development and its goals with Indian context.</p> <p><b>Conservation of Biodiversity and Ecosystems</b> Biodiversity and its distribution: Biodiversity as a natural resource; Levels and types of biodiversity; Biodiversity in India and the world; Biodiversity hotspots; Threats to biodiversity and ecosystems: Major conservation policies: in-situ and ex-situ conservation approaches; Community-based conservation</p>	01	15
2	<p><b>Climate Change: Impacts, Adaptation and Mitigation</b> Understanding climate change, Difference between climate and weather, Anthropogenic climate change from greenhouse gas emissions– past, present and future; Projections of global climate change with special reference to temperature, rainfall, climate variability and extreme events; Climate change projections for the Indian sub-continent. Impacts, vulnerability and adaptation to climate change: Observed impacts of climate change on ocean and land systems, biodiversity, agriculture, health, Indigenous knowledge for adaptation to climate change. Mitigation measures to climate change</p>	01	15

	<p><b>Case Studies and Field Work</b></p> <p>The students are expected to be engaged in some of the following or similar identified activities:</p> <ul style="list-style-type: none"> <li>• Discussion on one national and one international case study related to the environment and sustainable development.</li> <li>• Field visits to identify local/regional environmental issues, make observations including data collection and prepare a brief report.</li> <li>• Participation in plantation drive and nature camps.</li> <li>• Documentation of campus biodiversity.</li> <li>• Campus environmental management activities such as solid waste disposal, water Management and sanitation, and sewage treatment.</li> </ul>		
<b>Total</b>	<b>02</b>	<b>30</b>	

### Required Previous Knowledge

Basic Knowledge about components of environment, ecosystem, and environment problems is necessary before starting to learn the course

### Access to the Course

The course is available for all the students admitted for Bachelor Degree as Open elective. The students seeking admission to this course considering the terms and conditions laid down by the University of Mumbai, the Government of Maharashtra, and the college, from time to time.

### Forms of Assessment

The assessment of the course will be of Diagnostic, Formative and Summative type. At the beginning of the course diagnostic assessment will be carried out. The formative assessment will be used for the Continuous Internal Evaluation whereas the summative assessment will be conducted at the end of the term. The weightage for formative and summative assessment will be 60:40. The pattern will be followed as approved by Academic Council of the college

### Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade on the grading scale, and grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

### Reference Books:

1. Fisher, Michael H. (2018) An Environmental History of India- From Earliest Times to the Twenty-First Century, Cambridge University Press.
2. Headrick, Daniel R. (2020) Humans versus Nature- A Global Environmental History, Oxford University Press.
3. Hughes, J. Donald (2009) An Environmental History of the World- Humankind's Changing Role in the Community of Life, 2nd Edition. Routledge.

4. Simmons, I. G. (2008). *Global Environmental History: 10,000 BC to AD 2000*. Edinburgh University Press
5. William P. Cunningham and Mary A. (2015) *Cunningham Environmental Science: A Global Concern*, Publisher (Mc-Graw Hill, USA)
6. Bawa, K.S., Oomen, M.A. and Primack, R. (2011) *Conservation Biology: A Primer for South Asia*. Universities Press.
7. Varghese, Anita, Oommen, Meera Anna, Paul, Mridula Mary, Nath, Snehlata (Editors) (2022) *Conservation through Sustainable Use: Lessons from India*. Routledge.
8. Bhagwat, Shonil (Editor) (2018) *Conservation and Development in India: Reimagining Wilderness*, Earthscan Conservation and Development, Routledge.
9. Krishnamurthy, K.V. (2003) *Textbook of Biodiversity*, Science Publishers, Plymouth, UK
10. Jackson, A. R., & Jackson, J. M. (2000). *Environmental Science: The Natural Environment and Human Impact*. Pearson Education.
11. Miller, G. T., and Spoolman, S. (2015) *Environmental Science*. Cengage Learning.
12. Pittock, Barrie (2009) *Climate Change: The Science, Impacts and Solutions*. 2nd Edition. Routledge.
13. Adenle A., Azadi H., Arbiol J. (2015). Global assessment of technological innovation for climate change adaptation and mitigation in developing world, *Journal of Environmental Management*, 161 (15): 261-275.

<https://sdgs.un.org/goals>

[www.ipcc.org](http://www.ipcc.org); <https://www.ipcc.ch/report/sixth-assessment-report-cycle/>.