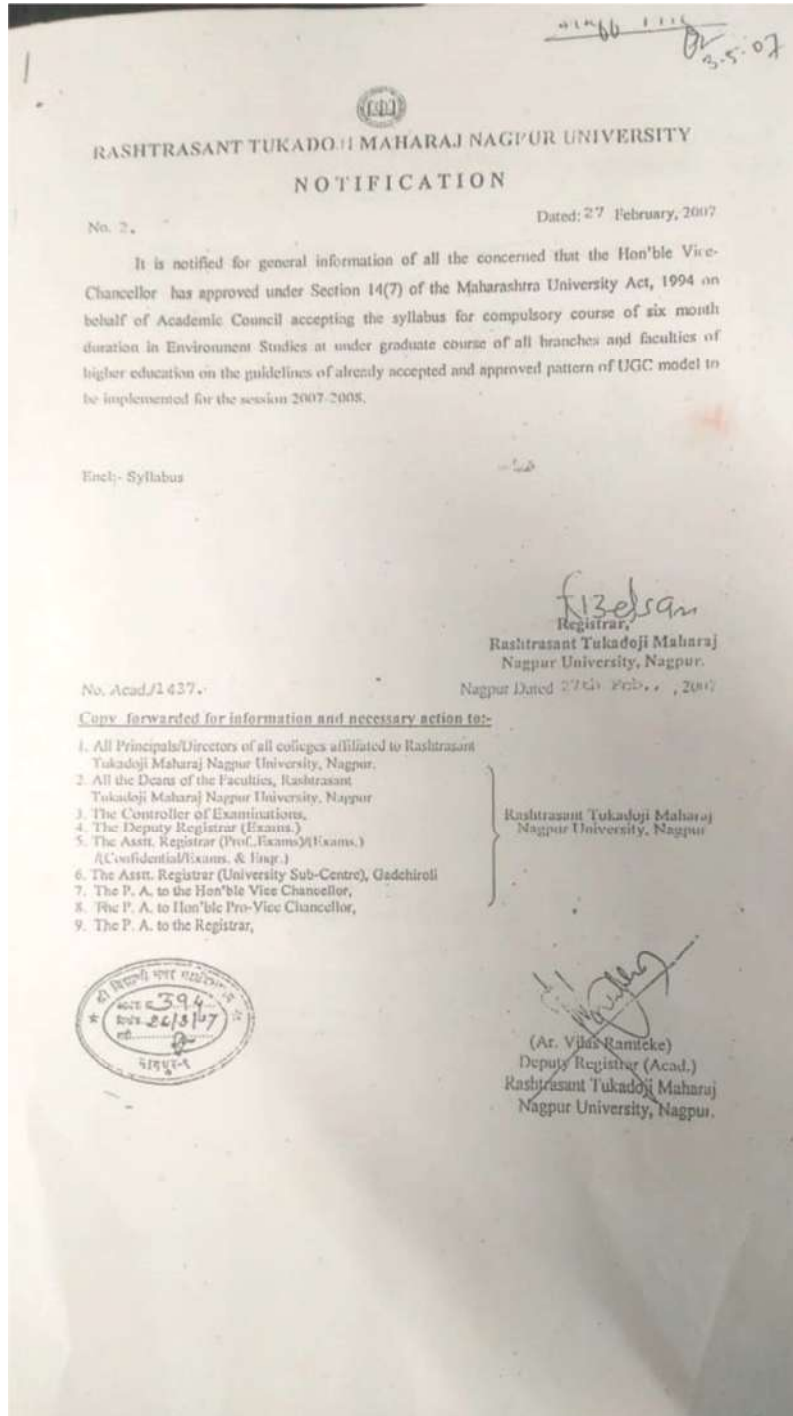


**1.3.1. Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum**

List of courses addressing Environment and Sustainability into the Curriculum:

1. B.Sc. Semester III and IV

The RTMNU direction, guidelines and syllabus is given below.



**Guidelines for Implementation :**

- i. The theory question paper would carry 75 marks - 50 for objective type questions covering various aspects of the syllabus (50 questions, each of one mark) and 25 marks for one essay type question.

At the end of the course the student would be evaluated for 100 marks with distribution as below -

Field note book	-	25
Objective Questions	-	50
Essay type question	-	25
Passing marks	-	40

The result would be declared in grades -

Grade O : above 75; A : 61-75; B : 51-60; C : 40-50

- ii. A fee of Rs.100/- per student be charged and its utilization is as Rs.20/- will be sent to the university and Rs.16/- to Principal to be utilized for infrastructure and administrative expenses pertinent to the course. However the final fee structure may be decided by the appropriate authority of the University.
- iii. The Principal would appoint Coordinator and Assistant Coordinator as per need to coordinate the teaching of the course, appoint contributory teachers, if necessary. At the end of the course, the college would conduct the examination. It will appoint paper setters and examiners. The final grades of candidates should be informed to the university. The expenditure for all the required manpower be met from the remaining amount of fees.
- iv. Qualifications of a Teacher : A teacher in any subject possessing knowledge to teach the "Course on Environmental Studies" shall be eligible.
- v. The course should be taught in second year and can be cleared in third year in case the student remains absent or fails to clear the course.
- vi. The candidate will have to pass in the examination of this course in order to obtain degree certificate from the University.

OR

In view of entire course the student may be assigned a project work Encompassing Community Biodiversity Register (CBR) of any Gram-Panchyat as per format of National Biodiversity Authority of India under the guidance of a teacher. This CBR should be evaluated for 100 marks.

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# Core Module Syllabus for Environmental Studies for Undergraduate Courses of all branches of Higher Education

## Unit 1: The Multidisciplinary nature of environmental studies

- Definition, scope and importance
- Need for public awareness

(2 lectures)

## 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, flood, 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

(8 lectures)

## Unit 3: Ecosystems

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

- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) (6 lectures)

#### Unit 4: Biodiversity and its conservation

- Introduction: Definition: genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, national and local levels
- India as a mega-diversity nation
- Hotspots 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 (8 lectures)

#### Unit 5: Environmental Pollution

- Definition
- Causes, effects and control measures of:
  - a. Air pollution
  - b. Water pollution
  - c. Soil pollution
  - d. Marine pollution
  - e. Noise pollution
  - f. Thermal pollution
  - g. Nuclear hazards
- 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, earthquakes, cyclones 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
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

(7 lectures)

#### Unit 7: Human Population and the Environment

- Population growth, variation among nations
- Population explosion – Family Welfare Programme
- Environment and human health
- Human Rights
- Value Education
- 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
- Visit to a local polluted site—Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems—pond, river, hill slopes, etc.

(Fieldwork Equal to 5 lecture hours)

#### Teaching Methodologies

The Core Module Syllabus for Environmental Studies includes classroom teaching and fieldwork. The syllabus is divided into 8 units, covering 50 lectures. The first 7 units, which cover 45 lectures, are classroom-teaching based and intended to enhance knowledge skills and attitude to environment. Unit 8 is based on field activities, to be covered over five lecture hours, and would provide students with first-hand knowledge on various local environmental aspects. Field experience is one of the most effective learning tools for environmental concerns. This moves education out of the scope of the



textbook mode of teaching and into the realm of hands-on learning in the field, where the teacher 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 a unique synergistic tool in the entire learning process.

The course material provided by UGC for classroom teaching and field activities should be effectively utilized.

The Universities/colleges can draw upon the expertise of outside resource persons for teaching purposes.

The Environmental Core Module will be integrated into the teaching programs of all undergraduate courses.

**Annual System:** The duration of the course will be 50 lectures. The exam will be conducted along with the Annual Examination.

**Semester System:** The Environment Course of 50 lectures will be conducted in the second semester and the examinations 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 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 built-in choice—50 marks

Part C: Field work—25 marks



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