

Re-Accredited 'B++' 2.86 CGPA by NAAC

VEER NARMAD SOUTH GUJARAT UNIVERSITY

University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.

વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી

યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.

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--: પરિપત્ર :-

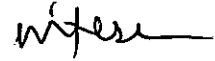
યુનિવર્સિટી સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓ, ડિપાર્ટમેન્ટનાં વડાશ્રીઓ તથા યુનિવર્સિટી કેમ્પસમાં ચાલતા સ્વનિર્ભર અભ્યાસક્રમનાં કો-ઓર્ડિનેટરશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૫-૨૬ થી NEP-2020 અંતર્ગત F.Y. Sem-1 માં Environment (MDC)ના અભ્યાસક્રમને તમામ વિદ્યાશાખાનાં સ્નાતક કક્ષાના તમામ અભ્યાસક્રમોમાં (એપેક્ષ બોડી સિવાયના) MDC હેઠળ બાસ્કેટમાં સમાવેશ કરવા એકેડેમિક કાઉન્સિલની તા.૦૫/૦૫/૨૦૨૫ની સભાનાં ઠરાવ ક્રમાંક:૭૮ થી મંજૂર કરવામાં આવેલ છે. જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

વધુમાં, Environment ૨ ક્રેડિટનાં અભ્યાસક્રમને તમામ વિદ્યાશાખાનાં સ્નાતક કક્ષાનાં અભ્યાસક્રમોમાં (એપેક્ષ બોડી સિવાયનાં) VAC હેઠળ બાસ્કેટમાં સમાવેશ કરવા એકેડેમિક કાઉન્સિલની તા.૦૫/૦૫/૨૦૨૫ની સભાનાં ઠરાવ ક્રમાંક:૭૪ થી મંજૂર કરવામાં આવેલ છે. જે અંગે યુનિવર્સિટી કાર્યાલયનાં તા.૨૮/૦૫/૨૦૨૫, ક્રમાંક:ઓથો/પરિપત્ર/૧૩૪૬૬/૨૦૨૫ થી પરિપત્રિત કરવામાં આવેલ છે. તદ્દનુસાર અમલ કરવા આથી જાણ કરવામાં આવે છે.

(બિડાણ : ઉપર મુજબ)

ક્રમાંક : ઓથો./પરિપત્ર/૧૩૮૮૨/૨૦૨૫

તા.૦૬-૦૬-૨૦૨૫


કુલસચિવ

પ્રતિ,

- ૧) યુનિવર્સિટી સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓ,
- ૨) યુનિવર્સિટી ડિપાર્ટમેન્ટના વડાશ્રીઓ અને યુનિવર્સિટી કેમ્પસમાં ચાલતા સ્વનિર્ભર અભ્યાસક્રમનાં કો-ઓર્ડિનેટરશ્રીઓ.
- ૩) ડીનશ્રીઓ- તમામ વિદ્યાશાખા.
- ૪) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી, સુરત.

..... જાણ તથા ઘટતું થવા.

**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**



**Undergraduate Programme
In
Zoology**

[3 Years (Degree) & 4 Years (Honours/Honours with Research)]

Undergraduate Programme in Zoology as per NEP 2020[3 Years (Degree) & 4 Years (Honours/Honours with Research)]

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

Undergraduate Programme in Zoology

Multidisciplinary Course

Teaching & Evaluation Scheme Semester- I

[Academic Year of Implementation 2025-2026]

Semester-1

Course Code	Course Title	Teaching Schedule Hours/Week	Exam Duration & Marks			Total Theory/Practical Marks	Credit
			Duration (Hours)	(CCE) Internal Marks	(SEE) External Marks		
ZO - MDC ENV - 103	ENVIRONMENT	4	2:00	50	50	100	4
			Total	50	50	100	4

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

Undergraduate Program in Zoology (B. Sc.)

(3 Years Degree; 4 Years Honours/Honours with Research)

SEMESTER – 1 Course: ZO – MDC – ENV – 103, ENVIRONMENT

Name of Program	Bachelor in Science
Objective of Program	The Environmental Science program aims to equip students with an understanding of ecosystems, human-environment interactions, and current environmental challenges. It emphasizes critical thinking, sustainable solutions, and the application of scientific methods to address issues like climate change and resource management. Students are also encouraged to engage in environmental advocacy and promote ethical responsibility toward sustainability.
Program Outcome	<p>PO-01: Scientific Knowledge & Conceptual Understanding: Develop a strong foundation in scientific principles, theories and concepts across disciplines, fostering interdisciplinary learning, advance knowledge and problem-solving abilities.</p> <p>PO-02: Analytical & Critical Thinking: Apply critical thinking and analytical reasoning to evaluate scientific data, hypotheses and real-world problems, leading to evidence-based conclusions.</p> <p>PO-03: Research & Inquiry-based Learning: Develop investigative skills through experimentation, data analysis and scientific inquiry to contribute to research and innovation.</p> <p>PO-04: Laboratory & Technical Skills: Gain hands-on experience with laboratory techniques, instrumentation and computational tools relevant to scientific research and industry applications.</p> <p>PO-05: Digital & Computational Literacy: Utilize digital tools, computational techniques and emerging technologies such as AI, bioinformatics and statistical modelling to enhance scientific learning and problem-solving.</p> <p>PO-06: Environmental & Societal Responsibility: Understand the role of science in addressing environmental, health and societal challenges, promoting sustainability and ethical responsibility.</p> <p>PO-07: Effective Communication & Collaboration: Develop proficiency in scientific communication, both written and oral, for effective dissemination of knowledge while collaborating in multidisciplinary teams.</p> <p>PO-08: Innovation & Entrepreneurship: Foster an entrepreneurial mind-set by applying scientific knowledge for innovation, technology development, and industry-oriented applications. Develop sustainable solutions to address real-world challenges in research and environmental management.</p> <p>PO-09: Lifelong Learning & Professional Growth: Cultivate curiosity and adaptability for continuous learning, equipping students for higher</p>

	education, research, and professional careers. PO-10: Ethical Leadership & Value-based Education: Develop leadership qualities, ethical values, and a sense of responsibility in applying science for societal progress, aligning with Indian knowledge systems and global perspectives.
Program Specific Outcomes	<p>1. Remembering (Knowledge) PSO1: Recall fundamental concepts of environmental science, including ecosystems, biodiversity, and conservation. Identify key environmental issues, such as climate change, pollution, and deforestation.</p> <p>2. Understanding (Comprehension) PSO2: Explain the relationships between human activities and environmental impacts. Interpret environmental data, including graphs, charts, and maps.</p> <p>3. Applying (Application) PSO3: Apply environmental principles to real-world scenarios, such as sustainable development and environmental policy. Use environmental concepts to analyze case studies and propose solutions.</p> <p>4. Analyzing (Analysis) PSO4: Break down complex environmental issues into component parts and evaluate the relationships between them. Critique environmental policies and management strategies.</p> <p>5. Evaluating (Synthesis) PSO5: Design and propose environmental solutions, including sustainable practices and conservation strategies. Evaluate the effectiveness of environmental policies and programs.</p> <p>6. Creating (Evaluation) PSO6: Develop innovative approaches to environmental problem-solving, including the use of technology and interdisciplinary collaboration. Communicate environmental information effectively to diverse audiences.</p>

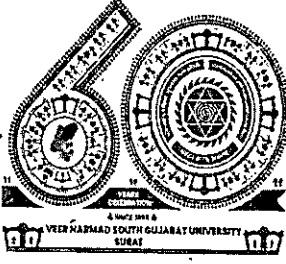
Course code	ZO – MDC –ENV – 103
Course title	ENVIRONMENT
Course level	100-199
Credit	04
Total engagement	4 Credits X 15 hrs. = 60 hrs
Teaching per week	04hrs.
Minimum weeks per semester	15 weeks
Effective from	2025-26
Purpose of course	The course aims to provide students with a comprehensive understanding of environmental systems, challenges, and the impact of human activities on the environment.
Course objective	<ul style="list-style-type: none"> Examine ecological principles and the relationships between

Undergraduate Programme in Zoology as per NEP 2020[3 Years (Degree) & 4 Years (Honours/Honours with Research)]

	<p>organisms and their environments.</p> <ul style="list-style-type: none"> Analyze current environmental issues such as climate change, pollution, and resource depletion. Promote sustainable practices and solutions for environmental preservation and conservation. 																																			
Course outcomes	<p>CO1: Program Outcome of learning environment studies aims to enlighten the students to realize our prime social responsibility to conserve our environment in the face of increasing human population and anthropogenic activities which is the major cause of depletion of environmental resources and ecological balance.</p> <p>CO2: An Environmental Studies major will be able to apply lessons from various courses through field experiences. These experiences will allow students to develop a better sense of not only individual organisms, but of the systems in which these organisms live. Students will also see how natural systems and human-designed systems work together, as well as in conflict with each other.</p> <p>CO3: An Environmental Studies major will be able to do independent research on human interactions with the environment.</p> <p>CO4: Developing values and attitudes towards comprehending intricate environmental economic-social issues and actively taking part in resolving present environmental issues and averting those that arise in the future.</p>																																			
Mapping between COs with PSOs	<table border="1"> <thead> <tr> <th></th> <th>PSO1</th> <th>PSO2</th> <th>PSO3</th> <th>PSO4</th> <th>PSO5</th> <th>PSO6</th> </tr> </thead> <tbody> <tr> <td>CO1</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CO2</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CO3</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> </tr> <tr> <td>CO4</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> </tbody> </table>		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	CO1	✓						CO2	✓	✓					CO3	✓	✓	✓				CO4	✓	✓	✓	✓	✓	✓
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6																														
CO1	✓																																			
CO2	✓	✓																																		
CO3	✓	✓	✓																																	
CO4	✓	✓	✓	✓	✓	✓																														
Pre-requisite	Biology																																			
Course content	<p>UNIT: 1 - Introduction to Environment and Environmental Studies</p> <p>1.1.1 Definition and Components of Environment</p> <p>1.1.2 Relationship between the different components of Environment</p> <p>1.1.3 Man and Environment relationship</p> <p>1.1.4 Impact of technology on Environment</p> <p>1.1.5 Environmental Degradation</p> <p>1.1.6 Multidisciplinary nature of the Environment studies</p> <p>1.1.7 Its scope and importance in the present day Education System</p> <p>UNIT: 2 - Natural Resources</p> <p>2.1.1 Renewable and Non-renewable resources, exploitation and conservation, Role of individual in conservation of natural resources.</p> <p>2.1.2 Water resources: Water sources Surface and Ground water sources, Indian and Global Scenario.</p> <p>2.1.3 Land as a resource, social issues</p>																																			

	<p>2.1.4 Forest resources: Definition and Classification of Forests Ecological and Economic importance and benefits of forest, Indian scenario, Deforestation: causes and effects remedial measures.</p> <p>2.1.5 Food resources: Sources of food, Global and Indian food demand scenario, Limits of food production, Environmental effect of Agriculture.</p> <p>UNIT: 3 - Types of Environmental Pollution</p> <p>3.1.1 Water pollution: Introduction Water Quality Standards, Sources of Water Pollution: Industrial Agricultural, Municipal; Classification of water pollutants, Effects of water pollutants, Eutrophication.</p> <p>3.1.2 Marine Pollution</p> <p>3.1.3 Air pollution: Composition of air; Structure of atmosphere, Ambient Air Quality Standards.</p> <p>3.1.4 Classification of air pollutants, Sources of common air pollutants like PM, SO₂NO_x, Natural & Anthropogenic Sources, Effects of common air pollutants.</p> <p>3.1.5 Land Pollution: Land uses, Land degradation; causes, effects and control, soil erosion.</p> <p>3.1.6 Noise Pollution: Introduction, Sound and Noise, Noise measurements, Causes and Effects</p> <p>3.1.7 Thermal Pollution: Causes and effects</p> <p>3.1.8 Role of individual in the prevention of pollution</p> <p>UNIT: 4 - Energy Resources and Global Environmental Issues</p> <p>4.1.1 Energy resources: Global and Indian energy demand scenario, future Projections, Conventional and Non-conventional sources of energy, Advantages and Limitations, Utilization, Exploitation and related Environmental problems, Environmental implications of Non conventional Energy Sources.</p> <p>4.1.2 Global Environmental Issues: Climate change, Global Warming and Green House Effect, Acid Rain, Depletion of Ozone layer.</p>
Reference books	<ul style="list-style-type: none"> • Agarwal, K.C.: 2001 Environmental Biology. Nidi publication Ltd., Bikaner. (TB) • Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt.Ltd. Ahmedabad -380013. India. • Brunner R.C., 1989, Hazardous Waste incineration, McGraw Hill Inc.480p. (R) • Clark R.S. Marine Pollution, Clarendon Press Oxford (TB) • Cunningham, W.P. Cooper, T.H. Grohani, E. & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Pub. House, Mumbai, 1196p. (R)

	<ul style="list-style-type: none"> • De A.K., Environmental Chemistry. Wiley Eastern Ltd. (R) • Down to Earth, Centre for Science and Environment (R) • Gleick, H.P., 1993. Water in criss. pacific. Institute for Studies in Dev. Environment & Security. • Stockholm Env. Institute: Oxford Univ. Press. 473p. (R) • Hawkins, R.E., Encyclopedia of Indian Natural History. Bombai Natural History Society, • Heywood, V.H. &Waston R.T. 1995, Global Biodiversity Assessment. Cambridge Univ. Press.1140p. (R) • Jadhav, H &Bhonsale, V.M. 1995. Environmental Protection and Laws: Himalaya Pub. House,Delhi. 284p. (R) • Mckinne, M.L. &Schoel R.M. 1996. Environmental Science System & Solutions, Web enhancededition. 639p.(R) • Mhaskar 'A.K. Matter Hazardous, Techno-Science Publication (TB) • Miller T.G. Jr. Environmental Science. Wadsworth Publishing Co., (TB) • Odum, E.P.1971. Fundamentals of Ecology. W.B. Saunders Co. USA. 574p. (R) • Rao M.N &Datta, A.K. 1987. Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p. (R) • Sharma, B.K. 2001. Environmental Chemistry. Goel Publ. House, Meerut. (TB) • Survey of Environmental. The Hindu @ • Townsend C., Harper J, and Michael Begon. Essentials of Ecology. Blackwell Science (TB). • Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances Publications (TB). • Trivedi R.K. and P.K. Goel, Introduction to air pollution. Techno-Science Publications (TB). • Wagner K.D. 1998. Environmental. W.B. Saunders Co. Philadelphia, USA. 499p. (R)
e-learning resources	Sawyam Portal
Teaching methodology	Class work, Discussion, Self Study, Projects, Seminars or / and Assignment



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-: પરિપત્ર :-

યુનિવર્સિટી સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓ, ડિપાર્ટમેન્ટનાં વડાશ્રીઓ તથા યુનિવર્સિટી કેમ્પસમાં ચાલતા સ્વનિર્ભર અભ્યાસક્રમનાં કો-ઓર્ડિનેટરશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૫-૨૬ થી NEP-2020 અંતર્ગત વિવિધ વિદ્યાશાખાનાં સ્નાતક કક્ષાના તમામ અભ્યાસક્રમોમાં (એપેક્ષ બોડી સિવાયના) એકેડેમિક કાઉન્સિલની તા.૦૫/૦૫/૨૦૨૫ની સભાનાં ઠરાવ ક્રમાંક:૭૪ થી નીચે મુજબ ઠરાવેલ છે, જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૦૫/૦૫/૨૦૨૫ની ઠરાવ ક્રમાંક: ૭૪

:: આથી ઠરાવવામાં આવે છે કે, યુનિવર્સિટીના વિભાગ/ સંલગ્ન કોલેજ દ્વારા વિદ્યાર્થીઓને વિવિધ વિદ્યાશાખાનાં સ્નાતક કક્ષાના તમામ અભ્યાસક્રમોમાં (એપેક્ષ બોડી સિવાયના) સેમેસ્ટર-૧ માં VAC હેઠળ ભારતીય જ્ઞાન પરંપરા પરિચય તથા સેમેસ્ટર-૨ માં VAC હેઠળ એન્વાયરમેન્ટ એજ્યુકેશન અભ્યાસક્રમ ફરજીયાત પણે આપવાના રહેશે. તેમજ સેમેસ્ટર-૩ માં VAC-ભારતીય જ્ઞાન પરંપરા(IKS) અને સેમ. ૪ માં VAC માં સંબંધિત અભ્યાસ સમિતિ દ્વારા બાસ્કેટમાં સમાવેશ કરેલ વિવિધ અભ્યાસક્રમો પૈકીના અભ્યાસક્રમો VAC હેઠળ આપવાનાં રહેશે.

વધુમાં, બોર્ડ ઓફ ડી-સની તા.૦૫/૦૪/૨૦૨૫ની સભાનાં ઠરાવ ક્રમાંક: ૨ અનુસાર NEP-2020 અંતર્ગત યુનિવર્સિટીના વિભાગ / સંલગ્ન કોલેજનાં વિદ્યાર્થીઓએ સ્નાતક કક્ષાએ ત્રીજા વર્ષ દરમિયાન ૧૨૦ કલાકની ઈન્ટર્નશીપ પૂર્ણ કરવાની રહેશે.

(બિડાણ : ઉપર મુજબ)

ક્રમાંક : ઓથો./પરિપત્ર/૧૩૪૬૬/૨૦૨૫

તા.૨૮-૦૫-૨૦૨૫

W. J. S.
કુલસચિવ

પ્રતિ,

- ૧) યુનિવર્સિટી સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓ,
- ૨) યુનિવર્સિટી ડિપાર્ટમેન્ટના વડાશ્રીઓ અને યુનિવર્સિટી કેમ્પસમાં ચાલતા સ્વનિર્ભર અભ્યાસક્રમનાં કો-ઓર્ડિનેટરશ્રીઓ.
- ૩) ડીનશ્રીઓ- તમામ વિદ્યાશાખા.
- ૪) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી, સુરત.
- ૫) કો-ઓર્ડિનેટરશ્રી, IKS Centre - Centre for Hindu Studies, વી. ન. દ. ગુ. યુનિ. સુરત.

..... જાણ તથા ઘટતું થવા.

**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**



**Undergraduate Programme
Value Added Course
Environment - I
Semester- II
[3 Years (Degree) &
4 Years (Honours/Honours with Research)]**

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

Undergraduate Programme

B.A./B.Com./B.Sc./BRS/BSW

Value Added Course

Environment - I

Teaching & Evaluation Scheme

Semester- II

[Academic Year of Implementation 2025-2026]

Semester-2

Course Code	Course Title	Teaching Schedule Hours/Week	Exam Duration & Marks			Total Theory/Practical Marks	Credit
			Duration (Hours)	(CCE) Internal Marks	(SEE) External Marks		
ZO – VAC ENV - 201	ENVIRONMENT - I	2	1:00	25	25	50	2
			Total	25	25	50	2

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

Undergraduate Program, Value Added Course

(B.A./B.Com./B.Sc./BRS/BSW)

(3 Years Degree; 4 Years Honours/Honours with Research)

SEMESTER – 2 Course: ZO – VAC – ENV – 201, ENVIRONMENT - I

Name of Program	B.A./B.Com./B.Sc./BRS/BSW
Objective of Program	The Environmental Science program aims to equip students with an understanding of ecosystems, human-environment interactions, and current environmental challenges. It emphasizes critical thinking, sustainable solutions, and the application of scientific methods to address issues like climate change and resource management. Students are also encouraged to engage in environmental advocacy and promote ethical responsibility toward sustainability.
Program Outcome	<p>PO-01: Scientific Knowledge & Conceptual Understanding: Develop a strong foundation in scientific principles, theories and concepts across disciplines, fostering interdisciplinary learning, advance knowledge and problem-solving abilities.</p> <p>PO-02: Analytical & Critical Thinking: Apply critical thinking and analytical reasoning to evaluate scientific data, hypotheses and real-world problems, leading to evidence-based conclusions.</p> <p>PO-03: Research & Inquiry-based Learning: Develop investigative skills through experimentation, data analysis and scientific inquiry to contribute to research and innovation.</p> <p>PO-04: Laboratory & Technical Skills: Gain hands-on experience with laboratory techniques, instrumentation and computational tools relevant to scientific research and industry applications.</p> <p>PO-05: Digital & Computational Literacy: Utilize digital tools, computational techniques and emerging technologies such as AI, bioinformatics and statistical modelling to enhance scientific learning and problem-solving.</p> <p>PO-06: Environmental & Societal Responsibility: Understand the role of science in addressing environmental, health and societal challenges, promoting sustainability and ethical responsibility.</p> <p>PO-07: Effective Communication & Collaboration: Develop proficiency in scientific communication, both written and oral, for effective dissemination of knowledge while collaborating in multidisciplinary teams.</p> <p>PO-08: Innovation & Entrepreneurship: Foster an entrepreneurial mind-set by applying scientific knowledge for innovation, technology development, and industry-oriented applications. Develop sustainable solutions to address real-world challenges in research and environmental management.</p> <p>PO-09: Lifelong Learning & Professional Growth: Cultivate curiosity and adaptability for continuous learning, equipping students for higher</p>

	<p>education, research, and professional careers.</p> <p>PO-10: Ethical Leadership & Value-based Education: Develop leadership qualities, ethical values, and a sense of responsibility in applying science for societal progress, aligning with Indian knowledge systems and global perspectives.</p>
Program Specific Outcomes	<p>1. Remembering (Knowledge) PSO1: Recall fundamental concepts of environmental science, including ecosystems, biodiversity, and conservation. Identify key environmental issues, such as climate change, pollution, and deforestation.</p> <p>2. Understanding (Comprehension) PSO2: Explain the relationships between human activities and environmental impacts. Interpret environmental data, including graphs, charts, and maps.</p> <p>3. Applying (Application) PSO3: Apply environmental principles to real-world scenarios, such as sustainable development and environmental policy. Use environmental concepts to analyze case studies and propose solutions.</p> <p>4. Analyzing (Analysis) PSO4: Break down complex environmental issues into component parts and evaluate the relationships between them. Critique environmental policies and management strategies.</p> <p>5. Evaluating (Synthesis) PSO5: Design and propose environmental solutions, including sustainable practices and conservation strategies. Evaluate the effectiveness of environmental policies and programs.</p> <p>6. Creating (Evaluation) PSO6: Develop innovative approaches to environmental problem-solving, including the use of technology and interdisciplinary collaboration. Communicate environmental information effectively to diverse audiences.</p>

Course code	ZO – VAC – ENV – 201
Course title	ENVIRONMENT - I
Course level	100-199
Credit	02
Total engagement	2 Credits X 15 hrs. = 30 hrs
Teaching per week	02 hrs.
Minimum weeks per semester	15 weeks
Effective from	2025-26

Purpose of course	The course aims to provide students with a comprehensive understanding of environmental systems, challenges, and the impact of human activities on the environment.						
Course objective	<ul style="list-style-type: none"> • Examine ecological principles and the relationships between organisms and their environments. • Analyze current environmental issues such as climate change, pollution, and resource depletion. • Promote sustainable practices and solutions for environmental preservation and conservation. 						
Course outcomes	<p>CO1: Program Outcome of learning environment studies aims to enlighten the students to realize our prime social responsibility to conserve our environment in the face of increasing human population and anthropogenic activities which is the major cause of depletion of environmental resources and ecological balance.</p> <p>CO2: An Environmental Studies major will be able to apply lessons from various courses through field experiences. These experiences will allow students to develop a better sense of not only individual organisms, but of the systems in which these organisms live. Students will also see how natural systems and human-designed systems work together, as well as in conflict with each other.</p> <p>CO3: An Environmental Studies major will be able to do independent research on human interactions with the environment.</p> <p>CO4: Developing values and attitudes towards comprehending intricate environmental economic-social issues and actively taking part in resolving present environmental issues and averting those that arise in the future.</p>						
Mapping between COs with PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
	CO1	✓					
	CO2	✓	✓				
	CO3	✓	✓	✓			
	CO4	✓	✓	✓	✓	✓	✓
Pre-requisite	Biology						
Course content	<p>UNIT: 1 Introduction to Environment and Environmental Studies</p> <p>1.1.1 Definition and Components of Environment</p> <p>1.1.2 Relationship between the different components of Environment</p> <p>1.1.3 Man and Environment relationship</p> <p>1.1.4 Impact of technology on Environment</p> <p>1.1.5 Environmental Degradation</p> <p>1.1.6 Multidisciplinary nature of the Environment studies</p> <p>1.1.7 Its scope and importance in the present day Education System</p> <p>UNIT: 2 Natural Resources</p> <p>2.1.1 Renewable and Non-renewable resources, exploitation and</p>						

	<p>conservation, Role of individual in conservation of natural resources.</p> <p>2.1.2 Water resources: Water sources Surface and Ground water sources, Indian and Global Scenario.</p> <p>2.1.3 Land as a resource, social issues</p> <p>2.1.4 Forest resources: Definition and Classification of Forests Ecological and Economic importance and benefits of forest, Indian scenario, Deforestation: causes and effects remedial measures.</p> <p>2.1.5 Food resources: Sources of food, Global and Indian food demand scenario, Limits of food production, Environmental effect of Agriculture.</p>
Reference books	<ul style="list-style-type: none"> • Agarwal, K.C.: 2001 Environmental Biology. Nidi publication Ltd., Bikaner. (TB) • Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt.Ltd. Ahmedabad -380013. India. • Brunner R.C., 1989, Hazardous Waste incineration, McGraw Hill Inc.480p. (R) • Clark R.S. Marine Pollution, Clarendon Press Oxford (TB) • Cunningham, W.P. Cooper, T.H. Grohani, E. & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Pub. House, Mumbai, 1196p. (R) • De A.K., Environmental Chemistry. Wiley Eastern Ltd. (R) • Down to Earth, Centre for Science and Environment (R) • Gleick, H.P., 1993. Water in crisis. Pacific Institute for Studies in Dev. Environment & Security. • Stockholm Env. Institute. Oxford Univ. Press. 473p. (R) • Hawkins, R.E., Encyclopedia of Indian Natural History. Bombay Natural History Society, • Heywood, V.H. & Waston R.T. 1995, Global Biodiversity Assessment. Cambridge Univ. Press. 1140p. (R) • Jadhav, H & Bhonsale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi. 284p. (R) • Mckinne, M.L. & Schoel R.M. 1996. Environmental Science System & Solutions, Web enhanced edition. 639p. (R) • Mhaskar A.K. Matter Hazardous, Techno-Science Publication (TB) • Miller T.G. Jr. Environmental Science. Wadsworth Publishing Co., (TB) • Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA. 574p. (R) • Rao M.N & Datta, A.K. 1987. Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p. (R)

	<ul style="list-style-type: none"> • Sharma, B.K. 2001. Environmental Chemistry. Goel Publ. House, Meerut. (TB) • Survey of Environmental. The Hindu @ • Townsend C., Harper J, and Michael Begon. Essentials of Ecology. Blackwell Science (TB). • Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances Publications (TB). • Trivedi R.K. and P.K. Goel, Introduction to air pollution. Techno-Science Publications (TB). • Wagner K.D. 1998. Environmental. W.B. Saunders Co. Philadelphia, USA. 499p. (R)
e-learning resources	Sawyam Portal
Teaching methodology	Class work, Discussion, Self Study, Projects, Seminars or / and Assignment

**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**



**Undergraduate Programme
Value Added Course
Environment - II
Semester- IV
[3 Years (Degree) &
4 Years (Honours/Honours with Research)**

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

Undergraduate Programme
B.A./B.Com./B.Sc./BRS/BSW
Value Added Course

Environment - II

Teaching & Evaluation Scheme
Semester- IV

[Academic Year of Implementation 2025-2026]

Semester - 4

Course Code	Course Title	Teaching Schedule Hours/Week	Exam Duration & Marks			Total Theory/Practical Marks	Credit
			Duration (Hours)	(CCE) Internal Marks	(SEE) External Marks		
ZO – VAC ENV - 401	ENVIRONMENT - II	2	1:00	25	25	50	2
			Total	25	25	50	2

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

Undergraduate Program, Value Added Course

(B.A./B.Com./B.Sc./BRS/BSW)

(3 Years Degree; 4 Years Honours/Honours with Research)

SEMESTER – 4 Course: ZO – VAC – ENV – 401, ENVIRONMENT - II

Name of Program	B.A./B.Com./B.Sc./BRS/BSW
Objective of Program	The Environmental Science program aims to equip students with an understanding of ecosystems, human-environment interactions, and current environmental challenges. It emphasizes critical thinking, sustainable solutions, and the application of scientific methods to address issues like climate change and resource management. Students are also encouraged to engage in environmental advocacy and promote ethical responsibility toward sustainability.
Program Outcome	<p>PO-01: Scientific Knowledge & Conceptual Understanding: Develop a strong foundation in scientific principles, theories and concepts across disciplines, fostering interdisciplinary learning, advance knowledge and problem-solving abilities.</p> <p>PO-02: Analytical & Critical Thinking: Apply critical thinking and analytical reasoning to evaluate scientific data, hypotheses and real-world problems, leading to evidence-based conclusions.</p> <p>PO-03: Research & Inquiry-based Learning: Develop investigative skills through experimentation, data analysis and scientific inquiry to contribute to research and innovation.</p> <p>PO-04: Laboratory & Technical Skills: Gain hands-on experience with laboratory techniques, instrumentation and computational tools relevant to scientific research and industry applications.</p> <p>PO-05: Digital & Computational Literacy: Utilize digital tools, computational techniques and emerging technologies such as AI, bioinformatics and statistical modelling to enhance scientific learning and problem-solving.</p> <p>PO-06: Environmental & Societal Responsibility: Understand the role of science in addressing environmental, health and societal challenges, promoting sustainability and ethical responsibility.</p> <p>PO-07: Effective Communication & Collaboration: Develop proficiency in scientific communication, both written and oral, for effective dissemination of knowledge while collaborating in multidisciplinary teams.</p> <p>PO-08: Innovation & Entrepreneurship: Foster an entrepreneurial mind-set by applying scientific knowledge for innovation, technology development, and industry-oriented applications. Develop sustainable solutions to address real-world challenges in research and environmental management.</p> <p>PO-09: Lifelong Learning & Professional Growth: Cultivate curiosity and adaptability for continuous learning, equipping students for higher</p>

	<p>education, research, and professional careers.</p> <p>PO-10: Ethical Leadership & Value-based Education: Develop leadership qualities, ethical values, and a sense of responsibility in applying science for societal progress, aligning with Indian knowledge systems and global perspectives.</p>
Program Specific Outcomes	<p>1. Remembering (Knowledge) PSO1: Recall fundamental concepts of environmental science, including ecosystems, biodiversity, and conservation. Identify key environmental issues, such as climate change, pollution, and deforestation.</p> <p>2. Understanding (Comprehension) PSO2: Explain the relationships between human activities and environmental impacts. Interpret environmental data, including graphs, charts, and maps.</p> <p>3. Applying (Application) PSO3: Apply environmental principles to real-world scenarios, such as sustainable development and environmental policy. Use environmental concepts to analyze case studies and propose solutions.</p> <p>4. Analyzing (Analysis) PSO4: Break down complex environmental issues into component parts and evaluate the relationships between them. Critique environmental policies and management strategies.</p> <p>5. Evaluating (Synthesis) PSO5: Design and propose environmental solutions, including sustainable practices and conservation strategies. Evaluate the effectiveness of environmental policies and programs.</p> <p>6. Creating (Evaluation) PSO6: Develop innovative approaches to environmental problem-solving, including the use of technology and interdisciplinary collaboration. Communicate environmental information effectively to diverse audiences.</p>

Course code	ZO – VAC – ENV – 401
Course title	ENVIRONMENT - II
Course level	200-299
Credit	02
Total engagement	2Credits X 15 hrs. = 30 hrs
Teaching per week	02 hrs.
Minimum weeks per semester	15 weeks
Effective from	2025-26

Purpose of course	The course aims to provide students with a comprehensive understanding of environmental systems, challenges, and the impact of human activities on the environment.						
Course objective	<ul style="list-style-type: none"> Analyze current environmental issues such as climate change, pollution, and resource depletion. Promote sustainable practices and solutions for environmental preservation and conservation. 						
Course outcomes	<p>CO1: Program Outcome of learning environment studies aims to enlighten the students to realize our prime social responsibility to conserve our environment in the face of increasing human population and anthropogenic activities which is the major cause of depletion of environmental resources and ecological balance.</p> <p>CO2: An Environmental Studies major will be able to apply lessons from various courses through field experiences. These experiences will allow students to develop a better sense of not only individual organisms, but of the systems in which these organisms live. Students will also see how natural systems and human-designed systems work together, as well as in conflict with each other.</p> <p>CO3: An Environmental Studies major will be able to do independent research on human interactions with the environment.</p> <p>CO4: Developing values and attitudes towards comprehending intricate environmental economic-social issues and actively taking part in resolving present environmental issues and averting those that arise in the future.</p>						
Mapping between COs with PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
	CO1	✓					
	CO2	✓	✓				
	CO3	✓	✓	✓			
	CO4	✓	✓	✓	✓	✓	✓
Pre-requisite	Biology						
Course content	<p>UNIT: 1 Types of Environmental Pollution</p> <p>1.1.1 Water pollution: Introduction Water Quality Standards, Sources of Water Pollution: Industrial Agricultural, Municipal; Classification of water pollutants, Effects of water pollutants, Eutrophication.</p> <p>1.1.2 Marine Pollution</p> <p>1.1.3 Air pollution: Composition of air, Structure of atmosphere, Ambient Air Quality Standards. Classification of air pollutants, Sources of common air pollutants like PM, SO₂, NO_x, Natural & Anthropogenic Sources, Effects of common air pollutants.</p> <p>1.1.4 Land Pollution: Land uses, Land degradation; causes, effects and</p>						

	<p>control, soil erosion.</p> <p>1.1.5 Noise Pollution: Introduction, Sound and Noise, Noise measurements, Causes and Effects</p> <p>1.1.6 Thermal Pollution: Causes and effects Role of individual in the prevention of pollution</p> <p>UNIT: 2 Energy Resources and Global Environmental Issues</p> <p>2.1.1 Energy resources: Global and Indian energy demand scenario, future Projections, Conventional and Non-conventional sources of energy, Advantages and Limitations, Utilization, Exploitation and related Environmental problems, Environmental implications of Non-conventional Energy Sources.</p> <p>2.1.2 Global Environmental Issues: Climate change, Global Warming and Green House Effect, Acid Rain, Depletion of Ozone layer.</p>
Reference books	<ul style="list-style-type: none"> • Agarwal, K.C.: 2001 Environmental Biology. Nidi publication Ltd., Bikaner. (TB) • Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt.Ltd. Ahmedabad -380013. India. • Brunner R.C., 1989, Hazardous Waste incineration, McGraw Hill Inc.480p. (R) • Clark R.S. Marine Pollution, Clarendon Press Oxford (TB) • Cunningham, W.P. Cooper, T.H. Grohani, E. & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Pub. House, Mumbai, 1196p. (R) • De A.K., Environmental Chemistry. Wiley Eastern Ltd. (R) • Down to Earth, Centre for Science and Environment. (R) • Gleick, H.P., 1993. Water in crisis. Pacific Institute for Studies in Dev. Environment & Security: • Stockholm Env. Institute. Oxford Univ. Press. 473p. (R) • Hawkins, R.E., Encyclopedia of Indian Natural History. Bombay Natural History Society, • Heywood, V.H. & Weston R.T. 1995, Global Biodiversity Assessment. Cambridge Univ. Press. 1140p. (R) • Jadhav, H & Bhonsale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi. 284p. (R) • McKinne, M.L. & Schoel R.M. 1996. Environmental Science System & Solutions, Web enhanced edition. 639p. (R) • Mhaskar A.K. Matter Hazardous, Techno-Science Publication (TB) • Miller T.G. Jr. Environmental Science. Wadsworth Publishing

	<p>Co., (TB)</p> <ul style="list-style-type: none"> • Odum, E.P.1971. Fundamentals-of Ecology. W.B. Saunders Co. USA. 574p. (R) • Rao M.N &Datta, A.K. 1987. Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p. (R) • Sharma, B.K. 2001. Environmental Chemistry. Goel Publ. House, Meerut. (TB) • Survey of Environmental. The Hindu @ • Townsend C., Harper J, and Michael Begoñ. Essentials of Ecology. Blackwell Science (TB). • Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances Publications (TB). • Trivedi R.K. and P.K. Goel, Introduction to air pollution. Techno-Science Publications (TB). • Wagner K.D. 1998. Environmental. W.B. Saunders Co. Philadelphia, USA. 499p. (R)
e-learning resources	Sawyam Portal
Teaching methodology	Class work, Discussion, Self Study, Projects, Seminars or / and Assignment