Re-Accredited 'B++' 2.86 CGPA by NAAC
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ક્રમાંકઃઓથો./BRS(SD)/પરિપત્ર/૧૯૯૩૩/૨૦૨૫
તા.૨૮/૦૭/૨૦૨૫

પ્રતિ,
વિભાગીય વડાશ્રી,
ડિપાર્ટમેન્ટ ઓફ રૂરલ સ્ટડીઝ,
મહાત્મા ગાંધી ગ્રામઅભ્યાસ બિલ્ડીંગ,
વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી,
સુરત.

વિષય :– B.R.S.(SD) Sem.-1 & 2 ના અભ્યાસક્રમ બાબત.

સુજ્ઞશ્રી,

સવિનય જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૫–૨૬ થી અમલમાં આવનાર BRS(SD)સેમેસ્ટર–૧ માં મેજર કોર્ષઃ Introduction of Sustainability અને General Principle of Ecology and Environment અને સેમેસ્ટર–૨ માં મેજર કોર્ષ : Need of Sustainability અને Agricultural Technologies for Sustainable Development માં ભારતીય જ્ઞાન પરંપરાનો સમાવેશ કરી પેટાસમિતિ દ્વારા તૈયાર કરેલ અભ્યાસક્રમ ગ્રામ અભ્યાસ વિષયની અભ્યાસ સમિતિની તા.૨૦/૦૬/૨૦૨૫ની સભાના ઠરાવ ક્રમાંકઃ૩.૧ થી મંજૂર કરી ગ્રામઅભ્યાસ વિદ્યાશાખાને કરેલ ભલામણ ગ્રામ અભ્યાસ વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખાવતી ડીનશ્રીએ મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલની તા.૨૪/૧૨/૨૦૨૪ ની સભાના ઠરાવ ક્રમાંકઃઉપ૩ અન્વયે માન.કુલપતિશ્રીને આપેલ સત્તા અંતર્ગત માનનીય કુલપતિશ્રી દ્વારા મંજૂર કરેલ છે.જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

બિડાણઃ ઉપર મુજબ

કુલસચિવ

પ્રતિ,
૧) ડીનશ્રી, ગ્રામઅભ્યાસ વિદ્યાશાખા,
૨) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.

[Subject code-2309001101010001]

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

BRS (SD) 4 YEAR HONORS

SEMESTER–1

COURSE CODE: MJ:101

COURSE TITLE: Introduction of Sustainability **[EFFECTIVE FROM 2025-26]**

Objectives of the course:

This interdisciplinary course introduces sustainable development by integrating modern scientific research with traditional Indian knowledge systems. Students explore the dynamic interactions between ecological systems and economic development, examining how environmental factors (climate, resources, geography) shape economic patterns while human activities (agriculture, resource use, population growth) transform natural environments. The course provides rigorous analysis of sustainability challenges and solutions, drawing from both contemporary frameworks and indigenous wisdom to develop comprehensive understanding of sustainable development pathways.

CO1 - Students will understand the concept of sustainability and its three pillars (environmental, economic, social), including ancient Indian concepts like Panchamahabhuta theory, and analyze their relevance to addressing contemporary development challenges and climate change.

CO2 - Students will explore the meaning and evolution of sustainable development, compare global frameworks with Indian traditional wisdom, and examine the major issues and problems in implementing sustainable development practices.

CO3 - Students will evaluate environmental ethics principles and their application to Sustainable Development Goals, including the design of comprehensive strategies for achieving sustainability targets through integrated approaches.

CO4 - Students will assess sustainable development indicators across environmental, economic, and social dimensions, and develop solutions for emerging challenges and opportunities in the future of sustainable development.

Unit – I

- Concept and challenges to development
- Concept of sustainability : Defining sustainability and its three pillars (environmental, economic, social), Ancient Indian concepts of balance and harmony (Panchamahabhuta theory), Traditional understanding of interdependence in nature
- Need for Sustainability :Climate change and resource depletion, Indigenous wisdom on living within planetary boundaries.
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Unit – II

- Meaning and concept of sustainable development
- Brief history of sustainable development, Parallel evolution of sustainability concepts in Indian traditions
- issues and problems of sustainable development

Unit – III

- Environmental ethics
- sustainable development goals
- strategies of sustainable development

Unit – IV

- **Sustainable Development Indicators:**Environmental indicators (carbon footprint, biodiversity indices), Economic indicators (green GDP, natural capital accounting), Social indicators (human development index, equity measures)
- Future of sustainable development : Emerging challenges and opportunities

Reading material:

1. Reyazzuddin and R P Singh (2010) Challenges to Sustainable development in India. Deep and Deep Publications, New Delhi.
2. Sakarama Somayaji Environmental concern and Sustainable Development. TERI Publication,
3. Sachs, Jeffrey D. (2015). *The Age of Sustainable Development*. Columbia University Press.
4. Pearce, David W. & Turner, R. Kerry (1990). *Economics of Natural Resources and the Environment*. Johns Hopkins University Press.
5. Shiva, Vandana (2016). *Staying Alive: Women, Ecology and Development*. Zed Books.
6. World Commission on Environment and Development (1987). *Our Common Future* (Brundtland Report). Oxford University Press. (Chapters 1-3)
7. Gadgil, Madhav & Guha, Ramachandra (1995). *Ecology and Equity: The Use and Abuse of Nature in Contemporary India*. Routledge. (Chapters 1-2)
8. Sharma, Arvind (2000). "Hinduism and Environmental Ethics" in *Classical Indian Philosophy*. Oxford University Press.
9. Gadgil, Madhav & Berkes, Fikret (1991). "Traditional Resource Management Systems" in *Resource Management and Optimization*. Vol. 8, pp. 127-141.
10. Agarwal, Anil & Narain, Sunita (1997). *Dying Wisdom: Rise, Fall and Potential of India's Traditional Water Harvesting Systems*. Centre for Science and Environment.
11. Shastri, Hiranmay (2007). *Environmental Ethics in Indian Tradition*. D.K. Printworld.
12. Dwivedi, O.P. (2000). "Dharmic Ecology" in *Hinduism and Ecology*. Harvard University Press.
13. Rolston III, Holmes (1988). *Environmental Ethics*. Temple University Press. (Chapters 4-5)
14. Callicott, J. Baird (1989). *Thinking Like a Mountain: Towards a Council of All Beings*. New Society Publishers.
15. Guha, Ramachandra (2000). *Environmentalism: A Global History*. Longman. (Chapters 6-8)
16. Ministry of Environment and Forests, India (2006). *National Environment Policy*. Government of India.

17. Meadows, Donella H. et al. (2004). *Limits to Growth: The 30-Year Update*. Chelsea Green Publishing.
18. Stiglitz, Joseph E. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*. CMEPSP.
19. UNDP (2020). *Human Development Report 2020: The Next Frontier - Human Development and the Anthropocene*. United Nations Development Programme.
20. Daly, Herman E. (1996). *Beyond Growth: The Economics of Sustainable Development*. Beacon Press. .

[Subject code-2509001101020001]

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

BRS (SD) FOUR YEAR HONORS

SEMESTER – 1

COURSE CODE: MJ - 102

COURSE TITLE: GENERAL PRINCIPLES OF ECOLOGY AND ENVIRONMENT

[EFFECTIVE FROM 2025-26]

BRS(SD) HONORS 1.3: General Principles of Ecology and Environment

Objectives

This course aims to introduce undergraduate students to the fundamental concepts of ecology by integrating scientific knowledge with Indian philosophical and cultural perspectives. It explores the idea of *Shristi* (Universe), environmental components in ancient texts, and the role of traditional wisdom in biodiversity conservation. Students will learn about ecosystem structures, energy flow, ecological degradation, and succession. The course also highlights the value, threats, and conservation of biodiversity at both national and international levels. Emphasis is placed on sustainable local practices and festivals that celebrate biodiversity, fostering environmental awareness rooted in both modern science and Indian knowledge systems.

Course Outcomes:

By the end of this course, students will be able to understand and explain ecological concepts through both scientific and Indian philosophical frameworks. They will gain knowledge of ecosystem structure, functions, and processes such as energy flow and succession. Students will be able to analyze the importance and threats to biodiversity and evaluate national and international conservation strategies. They will appreciate the role of traditional Indian knowledge in sustainable practices and biodiversity conservation. The course will also enable students to recognize the ecological significance of Indian festivals and promote the use of local, eco-friendly products rooted in cultural wisdom.

Unit - I

Concept of Shristi in Indian Philosophy, Components of Environment in Upanishads, Role of Traditional Indian Wisdom in biodiversity Conservation, Sustainable Local products, Celebrating Biodiversity through Indian festivals.

Unit – II

History of Ecology in India, Concept and Need of Ecology, Ecosystem-Types, structure and function, Energy flow in Ecosystem, Degradation of Ecosystem.

Unit – III

Concept and Value of Biodiversity, Importance of Biodiversity, Threats to Biodiversity, Biodiversity conservation strategies at National and International level.

Unit - IV

Ecological Pyramids, Ecological succession-Concept, causes and types,

Characteristics of Succession, Hydrosere succession, Lithosere succession

REFERENCES

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2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad - 380 013, India, Email:mapin@icenet.net (R)
3. Brunner 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, Mumabai, 1196p
6. Sharma, P. D. (2020). *Ecology and environment* (12th ed.). Rastogi Publications.
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. 473p
9. Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H & Waston, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub.

    House, Delhi 284 p.
12. Mckinney, M.L. & School, R.M. 1996. Environmental Science Systems & Solutions, Web enhanced edition. 639p.

13. Mhaskar A.K., Matter Hazardous, Techno-Science Publication (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. Geol Publ. House, Meerut.
18. Survey of the Environment, The Hindu (M)
19. Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science.
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 Publication (TB)
22. Wanger K.D., 1998 Environmental Management. W.B. Saunders Co. Philadelphia, USA 499p (M) Magazine (R) Reference (TB) Textbook
23. Ministry of Environment, Forest and Climate Change. (2023). *Parampara: India's culture of climate-friendly sustainable practices*. Government of India.
24. Gadgil, M., Berkes, F., & Folke, C. (1993). Indigenous knowledge for biodiversity conservation. *Ambio*, *22*(2/3), 151–156.
25. Berkes, F. (2008). Sacred ecology and traditional ecological knowledge. In G. Pretty, H. Seligman, & R. Rapport (Eds.), *Handbook of sustainable development planning* (pp. 273–286). Earthscan.
26. Rath, S. K. (2014). Indigenous knowledge on weather prediction: A case study among farmers in Eastern India. *Indian Journal of Traditional Knowledge, 13*(2), 390–397.
27. Ghosh, S. (2011). Sustainable rural livelihoods through local resource-based enterprises: A study of select tribal regions in Odisha, India. *Indian Journal of Traditional Knowledge, 10*(1), 130–138.
28. Sharma, U., & Rijal, K. (2013). Cultural festivals and biodiversity conservation: A case from India. *Indian Journal of Traditional Knowledge, 12*(2), 251–257.

[Subject code-2409001102010001]

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

BRS(SD) 4 YEAR HONORS

SEMESTER - 2

COURSE CODE : MJ 103

COURSE TITLE: NEED OF SUSTAINABILITY

Credits : 4 Effective from Academic Year :2025-26

Course Objective:

This course aims to develop understanding of contemporary environmental challenges including pollution, resource depletion, and biodiversity loss while exploring the interconnections between human activities and natural systems. Students will examine sustainable development as a framework for balancing economic growth with environmental protection, analyzing traditional and modern approaches to agriculture, energy, and resource management. The course emphasizes the transition from linear to circular economic models, exploring green technologies, renewable energy systems, and sustainable consumption patterns. Upon completion, learners will be equipped to critically evaluate global environmental issues and contribute to sustainable solutions that integrate ecological wisdom with contemporary development needs.

CO1 -Students will understand major environmental problems including air pollution, water pollution, soil degradation, waste problems, and loss of forest and wildlife, and analyze human dependence on natural resources while exploring indigenous knowledge about weather, seasons, farming practices, and environmental traditions connected to festivals.

CO2 -Students will explore sustainable development as a path to survival, examine the importance of agriculture in human lives, compare problems with modern farming against traditional farming and food systems, and evaluate sustainable food choices for long-term agricultural sustainability.

CO3 -Students will evaluate the economics of sustainability by analyzing consumption and production patterns' impact on environment, compare green economy and circular economy models, assess energy consumption patterns and conservation strategies, and examine renewable energy sources, technologies, and sustainable transportation systems.

CO4 -Students will assess sustainable development in relation to global environmental issues, analyze international frameworks and agreements, and develop comprehensive understanding of how local environmental challenges connect to worldwide sustainability concerns and solutions.

Unit – I

- Environmental problems that we face today – air pollution, water pollution, soil degradation and waste problems loss of forest and wildlife.
- Human dependence on natural resources, indigenous knowledge about weather, seasons and farming, festival and traditions connected to environment

Unit – II

- Sustainable development: A path to survival.
- Agriculture and sustainable development – importance of agriculture in our lives, problems with modern farming, traditional farming and food systems, sustainable food choice

Unit – III

- Economics of Sustainability:consumption and production patterns impact on environment, Green economy and circular economy models
- energy consumption pattern and its conservation, Renewable energy sources and technologies, Sustainable transportation systems

Unit – IV

Sustainable development and environment: some global issues.

References:

1. Riyazuddin and R P Singh (2010) Challenges to sustainable development in India, Deep and Deep Publishers, New Delhi.
2. Kumar Das, Sustainable Development, Reference Press, New Delhi
3. Rajagopalan R. (2020) Environmental Studies: From Crisis to Cure, Oxford University Press, New Delhi.
4. Joseph Benny (2018) Environmental Studies, Tata McGraw Hill Education, New Delhi.
5. Rajagopalan R. (2019) Environmental Studies, Oxford University Press, New Delhi.
6. Husain Majid (2021) Environment and Ecology, McGraw Hill Education, New Delhi.
7. Botkin Daniel B. and Keller Edward A. (2017) Environmental Science: Earth as a Living Planet, John Wiley & Sons, New York.
8. Rashid Salim (2019) Green Economy and Sustainable Development, Academic Press, London.
9. Boyle Godfrey (2012) Renewable Energy: Power for a Sustainable Future, Oxford University Press, Oxford.
10. Murray Alan and Skene Keith (2017) Circular Economy: An Introduction, Springer Publications, Berlin.
11. Brundtland Commission (1987) Our Common Future, Oxford University Press, Oxford.
12. Cunningham William P. and Cunningham Mary Ann (2018) Environmental Science, McGraw Hill Education, New York.
13. Bharucha Erach (2013) Environmental Studies, Universities Press, Hyderabad.
14. Kaushik Anubha and Kaushik C.P. (2016) Environmental Studies, New Age International Publishers, New Delhi.

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Veer Narmad South Gujarat University – Surat
Mahtma Gandhi Department of Rural Studies
Syllabus for B.R.S.(Sustainable Development) (Honors)
Semester:2

MJ-104:AGRICULTURAL TECHNOLOGIES FOR SUSTAINABLE DEVELOPMENT

Course Outcomes (CO):

Sustainable agriculture offers a much-needed alternative to conventional input-intensive agriculture, the long-term impacts of which include degrading topsoil, declining groundwater levels and reduced biodiversity. It is vital to ensure India's nutrition security in a climate-constrained world. On successful completion of this course, the students will be able to develop critical understanding on various aspects of sustainable agriculture practices in ancient and modern era of the "BHARAT" and its practical implementation to mitigate the effects of climate change on agriculture.

Unit-I: Sustainable Agriculturethrough the Eye of Bhartiya Gyan

- Agriculture as Dharma
- Panchmahabhuta based Agriculture
- Cow-Centric Economy
- Ahinsa and Satvik Farming
- Vedas, Shashtra and Granth Knowledges contribution
- Traditional Eco-technologies
- Biodiversity and Seed Sovereignty
- Spiritual Ecological Integration
- Definition, meaning, concept and goals of sustainable agriculture in India
- Measurement of sustainability in agriculture,

Unit-II: Sustainable agricultural systems

- Agroforestry
- Precision Farming
- Integrated Pest management
- System of Rice Intensification (SRI Technology)
- Organic Farming
- Conservation (Partial) Agriculture
- Natural Farming
- Integrated Farming Systems
- Biodynamic Agriculture
- Permaculture

Unit-III: Sustainable agricultural practices

- Crop Rotation and Intercropping
- Rain Water Harvesting – Artificial Recharge of Ground Water
- Mulching
- Vermicomposting
- Contour Farming
- Cover Crops
- Intercropping
- Floating Farming

Unit-IV: Key Government Policies and Initiatives

- Pradhan MantriKrishiSinchayeeYojana (PMKSY),
- ParamparagatKrishiVikasYojana (PKVY),
- RashtriyaKrishiVikasYojana (RKVY),
- Soil Health Card Scheme,
- National Mission for Sustainable Agriculture (NMSA),
- Pradhan MantriFasalBimaYojana (PMFBY),
- E-NAM (Electronic National Agriculture Market),
- Kisan Credit Card (KCC) Scheme,
- Krishi Vigyan Kendras (KVKs),
- Agriculture Export Policy,
- Sustainable Farming Practices and Organic Certification Incentives,
- Pradhan MantriKisanSammanNidhi (PM-KISAN),
- Promotion of Agro-Processing Industries,
- National Mission on Oilseeds and Oil Palm (NMOOP),
- Animal Husbandry Infrastructure Development Fund (AHIDF),
- Use of Information Communication Technologies in Sustainable Agriculture,

Suggested Readings

1. Arun K. Sharma. 2002. A Hand book of organic farming. Agrobios, India.

2. Palaniappan, S.P and Annadurai, K.1999. Organic farming-Theory and Practice. Scientific publishers, Jodhpur,India.

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9. https://eos.com/blog/sustainable-agriculture/

10. https://www.sriramsias.com/upsc-daily-current-affairs/sustainable-agriculture-and-government/#:~:text=Key%20Government%20Policies%20and%20Initiatives,leading%20to%20higher%20crop%20productivity.

11. Dr. YadVir Singh, 2022. Organic Farming Practices and Sustainable Agriculture (Volume-7), AkiNik Publications, India