Maharshi Dayanand University, Rohtak
Value Added Courses under NEP 2020 w.e.f. 2023-24 session

Understanding India with a historical perspective; knowledge of India's environment in its totality; yoga education; fitness and sports; and digital learning; are among the common "value added courses" suggested by the University Grants Commission (UGC) in its new guidelines for Curriculum and Credit Framework for Undergraduate Programmes. In this line, the Maharshi Dayanand University, Rohtak offers the following value added courses as per NEP-2020 in Four Year Undergraduate Programmes and Five Year Integrated Programmes for the session 2023-24.

Course code	**Name of the value added course**	**Coordinating Department**	**Mode**
23CSAX01VA01	Digital and Technological Solutions	Department of Computer Science and Applications	Online/Offline/Blended
23EVSX01AC01	Environmental Science	Department of Environmental Sciences	Online/Offline/Blended

Syllabus for Value Added Courses under NEP 2020

Name of the Program	Common for all Four year UG/Five Year Integrated Programs	**Program Code**	-----
Name of the Course	Digital and Technological Solutions	**Course Code**	23CSAX01VA01
Hours/Week	2	**Credits**	2
Max. Marks.	50	**Time of end term examination**	3 Hours

Note: The examiner has to set a total of nine questions (two from each unit and one compulsory question consisting with short answer from all the units. The candidate has to attempt one question each from each unit alongwith the compulsory question (5 x 7 = 35 marks)

Course Objectives:

1. To gain familiarity with digital paradigms
2. To sensitize about role & significance of digital technology
3. To provide know how of communications &networks
4. To bring awareness about the e-governance and Digital India initiatives
5. To provide a flavour of emerging technologies - Cloud, Big Data, AI,ML, Blockchain, Robotics, 3D printing.

Course Outcomes:

On successful completion of this course, the student will be able to have a knowledge regarding

1. Knowledge about digital paradigm.
2. Realization of importance of digital technology, digital financial tools, e-commerce.
3. Know-how of communication and networks.
4. Familiarity with the e-governance and Digital India initiatives
5. An understanding of use & applications of digital technology.
6. Basic knowledge of all machine learning and big data

Unit - I

Introduction & Evolution of Digital Systems: Role & Significance of Digital Technology; Information and Communication Technology (ICT) & Tools; Computer System &its working, Software and its types. *Operating Systems:* Types and Functions. *Problem Solving:* Algorithms and Flowcharts

Unit – II

Communication Systems: Principles, Model & Transmission Media.
Computer Networks & Internet: Concepts & Applications, WWW, Web Browsers, Search Engines, Messaging, Email, Social Networking. *Computer Based Information System:* Significance & Types.
E-commerce & Digital Marketing: Basic Concepts, Benefits & Challenges

Unit – III

*Emerging Technologiesand their applications:*Overview of Artificial Intelligence, Machine Learning, Deep Learning; Big Data, Data Science and Big Data Analytics; Internet of Things (IoT) and Industrial Internet of Things (IIoT), Robotics and 3D Printing; Blockchain Technology; Quantum Computing; Cloud computing and its service models.

Unit – IV

Digital India & e-Governance: Initiatives, Infrastructure, Services and Empowerment.
Digital Financial Tools: Unified Payment Interface, AadharEnabled Payment System, USSD, Credit / Debit Cards, e-Wallets, Internet Banking, NEFT/RTGS and IMPS, Online Bill Payment and POS.
Cyber Security: Threats, Significance, Challenges, Precautions, Safety Measures and Tools.

Suggested Readings:

1. P. Kumar, A. Tomar, R. Sharmila: Emerging Technologies in Computing: Theory, Practice, and Advances, CRC/Chapman & Hall, eBook.
2. Nasib Singh Gill: Handbook of Computer Fundamentals, Khanna Book Publishing Company(P) Limited, New Delhi.
3. Behrouz A. Forouzan:Data Communications and Networking, McGraw Hill.
4. E Balagurusamy: Fundamentals of Computers, Tata McGraw Hill.
5. Buvya, Broberg, and Gosciniski: Cloud Computing- Principals and Paradigms, Wiley.

6. Nasib Singh Gill: Computing Fundamentals and Programming in C, Khanna Book Publishing Company(P) Limited, New Delhi.
7. LaudonKennethC.Carol Guercio Traver: E-commerce (Business, Technology, Society), Pearson.
8. Russel and Norving: Artificial lntelligence- A Modern Approach, Pearson Education.
9. Samuel Greengard: lnternet of Things, MIT press.
10. Peter Norton: lntroduction to Computers, Tata McGraw Hill.
11. C.S.V. Murthy: E-Commerce Concepts, Models, Strategies.
12. Dheeraj Mehrotra: Basics of Artificial lntelligence and Machine Learning, Notion press.
13. Hurwith, Nugent,Halper, Kaufman: Big Data for dummies, Wiley & Sons - Wiley.
14. David Dietrich, Barry Heller, Beibei Yang: Data Science and Big Data Analytics, EMC.

Name of the Program	Common for all Four year UG/Five Year Integrated Programs	**Program Code**	-----
Name of the Course	Environmental Science	**Course Code**	23EVSX01AC01
Hours/Week	2	**Credits**	2
Max. Marks.	50	**Time of end term examination**	3 Hours

Note: The examiner has to set a total of nine questions (two from each unit and one compulsory question consisting of short answer from all units. The candidate has to attempt one question each from each unit along the compulsory question (5 x 7 = 35 marks)

Course Objectives:

To create pro-environment attitude and a behavioural pattern in student community and society that attaches importance and priority to create sustainable life style and awareness on various environmental issues

Course Outcomes:

On successful completion of this course, the student will be able to have a critical thinking on various dimensions of environment problems such as water and air pollution, depletion of natural resources, biodiversity and destruction of ecosystem vis-a vis global climate change and think of solution.

Unit - I

Introduction to Environmental Studies: Multidisciplinary nature of environmental studies. Scope and importance; Concept of sustainability and sustainable development.

Ecosystems: Introduction, types, characteristic features, structure and function of the following ecosystem:- a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit - II

Renewable and non-renewable resources: Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. 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. 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.

Unit - III

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. Hot-sports 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.

Unit - IV

Environmental Pollution: Definition, Cause, 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 h. Solid waste. Role of an individual in prevention of pollution. Disastermanagement : floods, earthquake, cyclone and landslides. Water Conservation and its strategies. Climate change – green house gases, acid rain and global warming.

Suggested Readings:

1. Asthana, D. K. Text Book of Environmental Studies. S. Chand Publishing.
2. Basu, M.,Xavier, S.Fundamentals Of Environmental Studies, Cambridge University Press,
3. Basu, R. N. (Ed.) Environment. University of Calcutta, Kolkata.
4. Bharucha, E. Textbook of Environmental Studies for Undergraduate Courses. Universities Press
5. Miller T.O. Jr., Environmental Science, Wadsworth Publishing Co. Wagner K.D. Environmental Management. W.B. Saunders Co. Philadelphia, USA 499p
6. Rajesh Dhankhar, Environmental Studies, Daya Publishing House, New Delhi
7. Santra, Environmental Sciences, New Central Book Agency, Kolkata
8. V.K. Ahluwalia, Sunita Mahlotra, Environmental Sciences, Ane Books Pvt. Ltd., New Delhi