HS 2001: Environmental Studies			
Teaching Scheme		**Examination Scheme**	
Lectures	: 4 Hrs/Week	Class Test I	: 15Marks
Tutorial	: --	Class Test II	: 15 Marks
Total Credits	: 4	Teachers' Assessment	: 10 Marks
		End -Semester Exam	: 60 Marks

Pre-requisites: Nil

Course objectives:

1. To become aware about the various types of pollution, its sources, effects and control measures
2. To become aware about present environmental issues
3. To become aware of the importance of natural resources and environmental legislation
4. To become aware about environmental biotechnology and bio monitoring
5. To become aware of the biodiversity, conservation methods and factors for the loss of biodiversity

Unit wise Course Outcomes expected:

After completion of this course students will be able to-

CO1. Learn about the basics of environment
CO2. Understand the harmful effects of human activities on environment and their solutions
CO3. Understand the use of biotechnology and bio monitoring for the treatment of environment
CO4. Understand the concept of climate change, global warming, acid rain, various disasters and its mitigation measures

Detailed syllabus:

UNIT-I	***A) Concepts of Environmental Sciences*** Environment, Levels of organizations in environment, Structure and functions in an ecosystem; Biosphere, its Origin and distribution of land, in water and in air, Broad nature of chemical composition of plants and animals ***B) Natural Resources*** Renewable and Non-renewable Resources, Forests, water, minerals, Food and land (with example of one case study); Energy, Growing energy needs, energy sources (conventional and alternative)
UNIT-II	***A) Biodiversity and its conservation***

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	Biodiversity at global, national and local levels; India as a mega-diversity nation; Threats to biodiversity (biotic, abiotic stresses),and strategies for conservation ***B)Environmental Pollution*** Types of pollution- Air, water (including urban, rural, marine), soil, noise, thermal, nuclear; Pollution prevention; Management of pollution- Rural/Urban/Industrial waste management [with case study of any one type, e.g., power (thermal/nuclear), fertilizer, tannin, leather, chemical, sugar], Solid/Liquid waste management, disaster management ***C) Environmental Biotechnology*** Biotechnology for environmental protection- Biological indicators, bio-sensors; Remedial measures- Bio-remediation, phyto remediation, biopesticides, bio-fertilizers; Bio-reactors- Design and application
UNIT-III	***A) Social Issues and Environment*** Problems relating to urban environment- Population pressure, water scarcity, industrialization; remedial measures; Climate change-Reasons, effects (global warming, ozone layer depletion, acid rain) with one case study; Legal issues-Environmental legislation (Acts and issues involved), Environmental ethics ***Environmental Monitoring*** Monitoring- Identification of environmental problem, tools for monitoring (remote sensing, GIS); Sampling strategies- Air, water, soil sampling techniques
UNIT-IV	***Laboratory Work including Practical and Field Work*** covering, of biogeographical zones and expanse of territorial waters on the map of India; Identification of biological resources (plants, animals, birds) ata specific location; Determination of (i) pH value, (ii) water holding capacity and (iii) electrical conductivity of different types of soils; Determination of energy content of plants by bomb calorimeter; Measurement and classification of noise pollution; Determination of particulate matter from an industrial area by high volume sampler; Determination of ico-chemical parameters (pH, alkalinity, acidity, salinity, COD, BOD) of tap water, well water, rural water supply industrial effluent and sea water &potability issues; Demonstration of Remote Sensing and GIS methods; Industrial visit for environmental biotechnology processes (e.g., any one of the fermentation, tissue culture, pharmaceutical industries)

Text books & Reference Books:

1. A Text Book of Environmental Studies by Bharucha E, University Press (India) Pvt. Ltd, 2005
2. A Text Book of Environmental Studies by Nadaf F. M., Pawaskar V. R., Intellectual Book Bureau, Bhopal,2006
3. Fundamental of Ecology by Odum E. P, Natraj Publishers, Dehradun, 1996
4. Inroduction to Environmental Engineering and science by Gilbert M and Wendell P., Pearson Education India, 2015
5. Environmental Science by S.C Santra, New Central Book Agency, 2011
6. Environmental Education by Sharma R. A, 1998

Mapping of Course outcome with program outcomes (Mechanical Engineering)

Corse outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	1		3							
CO2	1		3							
CO3	1		3							
CO4	1		3							
CO5	1		3							

1-HIGH 2- MEDIUM 3- LOW

Teaching Strategies:

The teaching strategy is planed through the lectures, tutorials and team based home works. Exercises are assigned weekly to stimulate the students to actively use and revise the learned concepts which also help the students to express their way of solving the problems fluently in written form. Most critical concepts and mistakes are emphasized.

Teacher's Assessment: Teacher's Assessment of 20 marks is based on one of the /or combination of the few of the following.

1) Home Assignments
2) Tutorials
3) Surprise written Test with multiple choice questions

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HS3006 : Sociology & Indian History for Engineers			
Teaching Scheme		**Examination Scheme**	
Lectures	:2 Hrs/Week	Class Test I	: 15Marks
Tutorial	: -	Class Test II	: 15 Marks
Total Credits	: 2	Teachers' Assessment	: 10 Marks
		End -Semester Exam	: 60 Marks

Pre-requisites:

NIL

Course description: - This course gives an introduction of Indian history, sociological concepts and Indian history & periodization. It also covers modernity and struggle for independence, political economy of Indian society and social change in contemporary India.

Course objectives: - The objectives of the course is to give exposure to the student of

1. Elements of Indian History, sociological concepts
2. Indian History and periodization, social structure and social processes
3. Modernity and struggle of independence and political economy of Indian society
4. Issues and concern in post-colonial India and social changes.

Course Outcomes:

After completion of this course students will be able to

CO1. Understand importance of history in sociological concepts
CO2. Understand evolution of urbanization process, social structure & social process
CO3. Describe modernity & struggle for independence & political economy of Indian society
CO4. Discuss social change in contemporary India through various processes

Detailed Syllabus:

UNIT-I	***A)****:* Introduction to Elements of Indian History: What is history? ; History Sources- Archaeology, Numismatics, Epigraphy & Archival research; Methods used in History; History & historiography; ***B)****:* Introduction to sociological concepts-structure, system, organization, social institutions, Culture social stratification (caste, class, gender, power).State & civil society; *(7Lectures)*
UNIT-II	***A)****:* Indian history & periodization; evolution of urbanization process: first, second &third phase of urbanization; Evolution of polity; early states to empires; Understanding social structures feudalism debate ***B)****:* Understanding social structure and social processes: Perspectives of Marx, Weber &

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	Durkheim
UNIT-III	***A):*** From Feudalism to colonialism-the coming of British; Modernity & struggle for independence ***B):*** Political economy of Indian society. Industrial, Urban, Agrarian and Tribal society; Caste, Class, Ethnicity and Gender; Ecology and Environment;
UNIT-IV	***A):*** Issues & concerns in post-colonial India (up to 1991); Issues & concerns in postcolonial India 2nd phase (LPG decade post 1991) *(3 Lectures)* ***B):*** Social change in contemporary India: Modernization and globalization, Secularism and communalism, Nature of development, Processes of social exclusion and inclusion, Changing nature of work and organization

TEXT BOOKS:

(a) History

1. Desai, A.R. (2005), *Social Background of Indian Nationalism,* Popular Prakashan
2. Guha, Ramachandra (2007), *India After Gandhi,* Pan Macmillan
3. Thapar, Romila (2002), *Early India,* Penguin
4. Sharma R.S.(1965), *Indian Feudalism,* Macmillan
5. Deshpande, Satish (2002), *Contemporary India: A Sociological View,* Viking
6. Gadgil, Madhav & Ramachandra Guha(1993), *This Fissured Land: An Ecological History of India,* OU Press

(b) Sociology:

7. Giddens, A (2009), *Sociology*, Polity, 6th edn.
8. Haralambos M, RM Heald, M Holborn (2000), *Sociology*, Collins
9. Xaxa, V (2008), *State, Society and Tribes* Pearson
10. Chandoke, Neera & Praveen Priyadarshi (2009), *Contemporary India: Economy, Society and Politics*, Pearson
11. Oommen,T.K.(ed.) (1997), *Citizenship and National Identity: From Colonialism to Globalization,* Sage.
12. Mohanty, M (ed.) (2004), *Class, Caste & Gender- Volume 5,* Sage
13. Dhanagare, D.N. , *Themes and Perspectives in Indian Sociology,* Rawat
14. Ramaswamy, E.A. and Ramaswamy,U.(1981), *Industry and Labour,* OU Press
15. Bhowmik, S (ed.) (2010), *Street Vendors in the Global Urban Economy,* Routledge
16. Rao, M.S.A. (ed.) (1974), *Urban Sociology,* Orient Longmans

Mapping of Course outcome with program outcomes (Electrical Engineering)

Course outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13	PO 14
CO1						1		2	2	2		1	3	
CO2						1		2	2	2		1	3	
CO3						1		2	2	2		1	3	

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CO4						1		2	2	2		1	3	
CO5						1		2	2	2		1	3	

1.H IGH 2. MEDIUM 3. LOW

Teacher's Assessment:

Teacher assessment will be based on **any ONE** of the following:

1. Multiple Choice Objective Test : 10 Marks
2. Assignments/PPT presentation on allotted topics : 10 Marks
3. Written Test : 10 Marks
4. Quiz : 10 Marks

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Council, dated 22/07/2018