PERIYAR MANIAMMAI INSTITUTE OF SCIENCE & TECHNOLOGY

PERIYAR MANIAMMAI
INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University)
Established Under Sec. 3 of UGC Act, 1956 • NAAC Accredited
think • innovate • transform

Criterion 1 – Curricular Aspects

Key Indicator	1.3	Curriculum Enrichment
Metric	1.3.1	***Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum***

List and description of the courses which address the Gender, Environment and Sustainability, Human Values and Professional Ethics into the Curriculum

2020-21 ACADEMIC YEAR

Index

S.No.	Title	Page No
I	**List of Courses – Department wise Consolidated list**	**5**
II	**Description of courses - Course Syllabus**	**8**
1.	XAROE1C Non-conventional energy resources	8
2.	XAR501Contemporary Architecture	9
3.	XAR502Environmental Sciences	10
4.	XAR503Culture and Architecture	12
5.	XAR504Site planning and Surveying	13
6.	XAR601Human Settlement Planning	14
7.	XAR602Vernacular Architecture	15
8.	XAR604 Energy Efficient Architecture	16
9.	XAR701 Urban Economics and Sociology	17
10.	XAR901Professional Practice and Ethics	18
11.	XAR903A Architectural Conservation	20
12.	XAR904B Landscape Architecture	21
13.	XID501Introduction to Landscape	22
14.	XID601Professional Practice	23
15.	YAR102Appropriate Materials and Technology for Sustainable	24
16.	YAR103Advanced Studies in Regional and Vernacular Architecture	25
17.	YAR301Sustainable Urban Landscape	26
18.	YAR302Heritage Conservation Planning	28

19.	YAR304B Energy Simulation and Modelling	29
20.	704B Disaster Resistance in Architecture	30
21.	XAR904C Behavioral studies in Built Environment	32
22.	XES202 Environmental Sciences	33
23.	XUM403 Human Ethics, Values, Rights and Gender Equality	35
24.	XUM507 Essence of Indian Traditional Knowledge	37
25.	XUM607 Constitution of India	38
26.	XUM706 Cyber Security	39
27.	XCE509 HSMProfessional Practice, Law & Ethics	41
28.	UMAN-II MC Universal Human Values 2: Understanding Harmony and Gender	44
29.	XUM305 Entrepreneurship Development	47
30.	XUM601 Economics for Engineers	49
31.	XMEOE2 Renewable Energy Sources	50
32.	XMEE17 Industrial Safety	52
33.	XMEE19 Total Quality Management	53
34.	YRE101 Solar Energy Systems	55
35.	YRE102 Wind energy, Tidal energy and OTEC	56
36.	YRM107 Research Methodology and IPR	57
37.	YEGOE1 English for Research Paper Writing	58
38.	YRE104C Fuels and Combustion Technology	59
39.	YRE105A Environmental Engineering	61
40.	YRE105B Carbon Sequestration And Trading	63
41.	YRE105C Waste Management and Energy Recovery	64

42.	YRE201 Bio Energy Systems	65
43.	YRE204C Sustainable Development	66
44.	YRE205B Hydrogen and Nuclear energy	67
45.	XUM606 Disaster Management	70
46.	XES 202 Environmental Studies	72
47.	XBE403 Social Engineering	74
48.	XBE601 Indian Constitution and Human Rights	75
49.	YSW101- Introduction to Society and Social Work	77
50.	YSW102-Social Work with Individuals	79
51.	YSW103- Social Work with Groups	80
52.	YSW104-Social Work with Communities	82
53.	YSW202-Social Work Research and Statistics	84
54.	YSW204-Corporate Social Responsibility	85
55.	YSWNE1-Disaster Management and Mitigation	87

I. LIST OF COURSES - DEPARTMENT WISE CONSOLIDATED LIST

Note: Repeated courses are given **in red color** and syllabus is given only once

1.	Architecture	1. XAROE1C Non conventional energy resources 2. XAR503Culture and Architecture 3. XAR504Site planning and Surveying 4. XAR601Human Settlement Planning 5. XAR602Vernacular Architecture 6. XAR604Energy Efficient Architecture 7. XAR701Urban Economics and Sociology 8. XAR901Professional Practice and Ethics 9. XAR903A Architectural Conservation 10. XAR904B Landscape Architecture 11. XID501Introduction to Landscape 12. XID601Professional Practice 13. YAR102Appropriate Materials and Technology for Sustainable Architecture 14. YAR103Advanced Studies in Regional and Vernacular Architecture 15. YAR301Sustainable Urban Landscape 16. YAR302Heritage Conservation Planning 17. YAR304B Energy Simulation and Modelling 18. XAR501Contemporary Architecture 19. XAR502Environmental Sciences 20. 704B Disaster Resistance in Architecture 21. XAR 904C Behavioral studies in Built Environment
2.	Aerospace Engineering	1. XES202 Environmental Sciences 2. XUM403 Human Ethics, Values, Rights and Gender Equality 3. XUM507 Essence of Indian Traditional Knowledge 4. XUM607 Constitution of India 5. XUM706 Cyber Security
3.	Biotechnology	
4.	Civil Engineering	1. XES102 MAN Environmental Sciences 2. XCE509 HSM Professional Practice, Law & Ethics 3. UMAN-II MC Universal Human Values 2: 4. Understanding Harmony and Gender
5.	Mechanical Engineering	1. XES202 Environmental Sciences 2. XUM305 Entrepreneurship Development 3. XUM403 Human Ethics, Values, Rights and Gender Equality 4. XUM601 Economics for Engineers 5. XUM706 Cyber Security 6. XMEOE2 Renewable Energy Sources 7. XMEE06 Energy Conservation and Management 8. XMEE17 Industrial Safety 9. XMEE19 Total Quality Management 10. YRE101 Solar Energy Systems 11. YRE102 Wind energy, Tidal energy and OTEC 12. YRM107 Research Methodology and IPR 13. YEGOE1 English for Research Paper Writing

		14. YRE201 Bio Energy Systems 15. YPSOE1 Constitution of India 16. YRE104C Fuels and Combustion Technology 17. YRE105A Environmental Engineering 18. YRE105B Carbon Sequestration And Trading 19. YRE105C Waste Management and Energy Recovery 20. YRE204A Optimum Utilization of Heat and Power 21. YRE204C Sustainable Development 22. YRE205B Hydrogen and Nuclear energy 23. YRE302A Energy Audit and Management 24. YREOE1 Hydro Power Technology 25. PYRE101 Solar Energy Systems 26. PYRE102 Wind Energy, Tidal Energy and OTEC 27. PYRE201 Bio Energy Systems 28. PYRE202 Research Methodology and IPR 29. PYRE103A Fuels and combustion technology 30. PYRE103B Waste Management and Energy Recovery 31. PYRE203A Hydro Power Technology 32. PYRE203B Optimum Utilization of heat and power 33. PYRE203C Environmental Engineering 34. PYRE303C Sustainable Development 35. PYRE401A Hydrogen and Nuclear Energy 36. PYREOE1A Energy Audit and Management 37. PYREOE1B Carbon Sequestration and Trading
6.	Electrical and Electronics Engineering	1. Constitution of India 2. Human Ethics, Values, Rights and Gender Equality 3. Disaster Management 4. Economics For Engineers
7.	Electronics and Communication Engineering/ Division of Nanotechnology	1. XES202 Environmental Sciences 2. XUM403 Human ethics, values, rights and gender equality
8.	Computer Science and Engineering	1. XES202Environmental Science
9.	Computer Science and Application	1. XUMA106 Human Ethics, Values, Rights and Gender Equality
10.	Software Engineering	1. XUM 106 - Human Ethics, Values, Rights, and Gender Equality 2. XUM 306 - Disaster Management 3. XES 202 - Environmental Studies 4. XUM206 - Disaster Management 5. XUM 106 - Human Ethics, Values, Rights, and Gender Equality 6. XUM 306 - Disaster Management
11.	Physics	1. XUM106Human Ethics, Values, Rights and Gender Equality 2. XUM306Disaster Management 3. XES202Environmental studies
12.	Chemistry	1. XUM 106 Human ethics, values, rights and gender equality 2. XES 202 Environmental Studies 3. XUM306 Disaster Management

13.	Mathematics	1. XUM106Human Ethics, Values, Rights and Gender Equality 2. XUM306Disaster Management 3. XES202Environmental Studies 4. XUM106Human Ethics, Values, Rights and Gender Equality 5. XUM306Disaster Management
14.	Education	1. XBE403 Social Engineering 2. XBE601 Indian Constitution and Human Rights
15.	Management Studies	1. XUM106 Human Ethics, Values, Rights, and Gender Equality 2. XUM306 Disaster Management 3. YBA107 – Business Ethics and corporate Social Responsibilities
16.	English	1. XUM106 Human Ethics, Values, Rights and Gender Equality 2. XES202 Environmental Studies 3. XUM306 Disaster Management
17.	Commerce	1. XUM106 Human Ethics, Values, Rights, and Gender Equality 2. XUM306 Disaster Management 3. XES202 Environmental studies
18.	Political Science	
19.	Social Work	1. YSW101- Introduction to Society and Social Work 2. YSW102-Social Work with Individuals 3. YSW103- Social Work with Groups 4. YSW104-Social Work with Communities 5. YSW202-Social Work Research and Statistics 6. YSW204-Corporate Social Responsibility 7. YSWNE1-Disaster Management and Mitigation

II. DESCRIPTION OF COURSES - COURSE SYLLABUS

SUBCODE			XAROE1C	L	T	P	C
SUB NAME			NON CONVENTIONAL ENERGY RESOURCES	3	0	0	3
C	P	A					
				L	T	P	H
				3	0	0	3

Week 1 : Scale of quantities, Impact of current energy usage, Conventional sources of energy

Week 2 : Overview of non-conventional energy resources, Consumption by sector.

Week 3 : Solar energy incident on earth, solar spectrum.

Week 4 : Overview of solar energy technologies, Solar Thermal devices.

Week 5 : Solar Photovoltaic devices, Performance and durability of solar devices.

Week 6 : Wind energy, technology and geographical aspects.

Week 7 : Geothermal and Biomass.

Week 8 : Battery basics, types.

Week 9 : Testing, performance of batteries.

Week 10 : Fuel cell types, Fuel processing, concept to product.

Week 11 : Characterization and durability of fuel cells.

Week 12 : Flywheels and super capacitors.

Assignment, Test

SUBCODE			XAR501	L	T	P	C
SUB NAME			CONTEMPORARY ARCHITECTURE -I	3	0	0	3
C	P	A		L	T	P	H
1.5	0	1.5		3	0	0	3

UNIT I CRITIQUING MODERNISM	**6**
Writings of Venturi - Jane Jacobs -- Christopher Alexander.	
UNIT II AFTER MODERNISM	**12**
Post-Modernist Architecture - Historic Revivalism – Critical Regionalism - Deconstructive Theory and Practice.works of zahaHadid, Peter Eissenmen, Daniel Libiskind, Coop Himmelblau.	
UNIT III ALTERNATIVE PRACTICES	**12**
Ideas and selected Works of - Fathy - Baker - Ando - Soleri - Bawa.	
UNIT IV ARCHITECTURE IN COLONIAL INDIA	**6**
Colonialism and its impact - Early British Neo-classical Architecture - Indo-Sarcenic rchitecture and the Works of Chisholm - P.W.D. and the Institutionalization of Architecture – architecture and planning of New Delhi	
UNIT V. POST-INDEPENDENT ARCHITECTURE IN INDIA	**9**
Influence of Corbusier and Louis khan on Indian architects, Housing and the issues of Appropriate Technology-Architecture in the Horizon. Adaptations of modern architecture in Indian context, Chandigarh, le corb, and khan, works in India Works and ideas: Nari Gandhi - Doshi - Kanvinde– Correa	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. Bill Risebero, Modern Architecture and Design.
2. Kenneth Frampton, Modern Architecture: A Critical History, Tahmes and Hudson, London, 1994.
3. Leonardo Benevolo, “History of Modern Architecture”, 2 Vols., reprint, MIT Press, 1977.

REFERENCES

1. Thomas Metcalf, An Imperial Vision, Faber and Faber, London, 1989.
2. ManfredoTaferi / Franceso dal co., Modern Architecture, Faber and Faber/Electa,1980.
3. SigfriedGiedion, Space Time and Architecture: The Growth of a New Tradition, Havard University Press, 1978.

SUB CODE			XAR502	L	T	P	C
SUB NAME			ENVIRONMENTAL SCIENCES	3	0	0	3
C	P	A		L	T	P	H
				3	0	0	3

UNIT - I : THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES	2
Definition, Scope and importance - Need for public awareness.	
UNIT - II : RENEWABLE AND NON-RENWABLE RESOURCES	**7**
Natural resources and associated problems - Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal peoples. - Water resources: Use and over-utilization of surface and ground water, dams-benefits and problems. - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies. - Land resources: Land as a resource, land degradation, man included landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. - Equitable use of resources for sustainable lifestyles.	
UNIT - III : ECOSYSTEMS	**5**
Concept of ecosystem. - Structure and function of an ecosystem. - Procedures, 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 ecosystem: - Forest ecosystem - Grassland ecosystem - Desert ecosystem - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	
UNIT – IV: BIODIVERSITY AND ITS CONSERVATION	**7**
Introduction - Definition: Genetic, species and ecosystem diversity. - Biogeographical classification of India. - Value of biodiversity: Consumptive use, productive use, social, ethical, and aesthetic and option values. - Biodiversity at global, National and local levels. - India as a mega-diversity nation. - Hot spots 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 – V: ENVIRONMENTAL POLLUTION	**7**
Definition - Causes, effects and control measures of: - Air pollution - Water pollution - Soil pollution - Marine pollution - Noise pollution - Thermal pollution - Nuclear Pollution - Soil waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Diaster management: Floods, earthquake, cyclone and landslides.	
UNIT - VI : SOCIAL ISSUES AND THE ENVIRONMENT	**6**
From unsustainable to sustainable development. - Urban problems related to energy. Water conservation, rain water harvesting, watershed management. - Resettlement and re habilitation of people; its problem and concerns. Case studies. - Environmental ethics: - Issues and possible solutions. - Climate changes, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. - Wasteland reclamation. - Consumerism and waste products. - Environmental 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.	

UNIT - VII : HUMAN POPULATION AND THE ENVIRONMENT	5
Visit to a local area to document environmental asserts-river/ forest/ grassland/ hill/ mountain. - Visit to a local polluted site - Urban/ Rural/ Industrial/ Agricultural. Study of common plants, insects, birds. - Study of simple ecosystem-pond, river, hill slopes, etc. (Field work Equal to 5 lecture hours).	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. Miller T.G. Jr., Environmental Sciences, Wadsworth Publishing Co. (TB)
2. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.

REFERENCES

1. Hawkins.R.E, Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R).
2. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assesment. Cambridge Univ. Press 1140p.
3. McKinney, M.L & Schoch, R.M. 1996. Environmental Science System & Solutions, Web enhanced edition.639p.
4. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).

SUBCODE			XAR 503	L	T	P	C
SUB NAME			CULTURE AND ARCHITECTURE	2	0	0	2
C	P	A					
2	0	0		L	T	P	H
				2	0	0	2

UNIT – I INTRODUCTION	**4**
History of civilizations - Evolution of first societies - Relationship between man, nature and built forms - Built forms as expressions of culture.	
UNIT II RELATIONSHIP BETWEEN MAN, NATURE AND SOCIETY	**5**
Introduction to Sociology, an overview of Social Institutions Underlying values of relationships between Man, Nature and Society. Role of Family structure, privacy, religion and occupation, status of women etc. Settlements and its locations- river banks, valleys, fertile soils.	
UNIT III ROLE OF CULTURE IN ARCHITECTURE	**6**
Introduction to culture and architecture. Relationship between culture and climate. Effect of socio – cultural factors in architecture. Impact of tangible and non-tangible elements on spatial design.	
UNIT IV ANTHROPOLOGY OF TRADITIONAL ARCHITECTURE	**7**
Architecture as a Process – kinship and house societies – perceptions of built form – conceptions of space – symbolism and technology – study of the above through case study of traditional architecture in India	
UNIT V ALTERNATE THEORIES OF HOUSE FORM	**8**
Evolution of built forms - influencing factors. Constraining and determining factors – Climate, material resources, construction and technology, site, defense, economics, religion, symbols and meanings.	

LECTURE	TUTORIAL	PRACTICAL	TOTAL
30	0	0	30

TEXT

1. Amos Rapoport, " House Form and Culture", 1969.
2. Amos Rapoport, "Culture, Architecture and Design", 2005

REFERENCES

1. Amos Rapoport, "The meaning of the Built Environment", 1982.
2. Paul Oliver, Encyclopedia of Vernacular Architecture of the world, Cambridge University Press, 1997.
3. Paul Oliver's "Built to meet needs - Cultural Issues in Vernacular Architecture", 2006

SUBCODE			XAR 504	L	T	P	C
SUB NAME			SITE PLANNING AND SURVEYING	1	0	1	2
C	P	A		L	T	P	H
0.8	0.4	0.8		1	0	2	3

UNIT – I INTRODUCTION TO SURVEY AND SURVEYING TECHNIQUES	9
Definition of plot, site, land and region, units of measurements, reconnaissance, and need for surveying. Chain survey and compass survey - Plane Table and Theodolite, total station surveys - various equipments used – simple field surveys.	
UNIT II SITE ANALYSIS	**10**
Importance of site analysis - factors involved – On site and off site factors; Analysis of natural, cultural and aesthetic factors – topography, hydrology, soils, vegetation, climate, surface drainage, accessibility, size and shape, infrastructures available - sources of water supply and means of disposal system, visual aspects;	
UNIT III SITE ANALYSIS TECHNIQUES	**10**
Preparation of site analysis diagram. Study of microclimate:- vegetation, landforms and water as modifiers of microclimate. Study of land form;- contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations – Architectural and visual aspects	
UNIT IV SITE PLANNING AND LAYOUT PRICIPLES	**10**
Context of the site. Preparation of site plan drawing – incorporation of site analysis factors, Organization of vehicular and pedestrian circulation, types of roads, hierarchy of roads, networks, road widths and parking, regulations. Turning radii & street intersections	
UNIT V ENVIRONMENTAL FACTORS	**6**
Man-made structures, sensuous qualities, cultural data, images and data correlation - vegetation – plant associations, types and distribution - preparation of ecological profile for an area, basic understanding of agencies related to environmental regulations.	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	15	0	30	45

TEXT

1. W.M. Marsh - Landscape Planning, John Wilay & Sons, USA 1983.
2. B.C.Punmia - Surveying Vol.I - Standard Book House, New Delhi - 1983.

REFERENCES

1. Kevin Lynch - Site planning - MIT Press, Cambridge, MA - 1967.
2. Edward. T. Q., “Site Analysis”, Architectural Media, 1983.
3. P.B.Shahani - Text of surveying Vol. I, Oxford and IBH Publishing Co - 1980
4. Joseph De.Chiarra and Lee Coppleman - Planning Design Criteria - Van Nostrand Reinhold Co.,New York - 1968.
5. Beer R, Environmental Planning for Site development, Turner, Landscape Planning and environmental impact design.

SUBCODE			XAR601	L	T	P	C
SUB NAME			HUMAN SETTLEMENTS PLANNING	3	0	0	3
C	P	A		L	T	P	H
2.4	0	0.6		3	0	0	3

UNIT – I INTRODUCTION TO HUMAN SETTLEMENTS **8**

Elements of human settlement. Forms of human settlement, Growth factors of human settlement – functions, linkages, networks. Anatomy & classification of human settlements. Characteristics of human settlement at various phases of its growth stage.

UNIT-II INTRODUCTION TO PLANNING AND PLANNING CONCEPTS **10**

Evolution of planning profession, role and scope of a planner, planning in history – town planning in ancient India, Greek, roman and medieval. Urban forms and pattern. Planning concepts proposed by Ebenezer Howard, Patric Geddes, Lewis Mumford, CA Perry, le Corbusier. Writings of Jane Jacobs

UNIT - III COMPONENTS OF PLANNING **12**

Various aspects of planning - Land use planning, transportation planning, environmental planning, infrastructure planning. The fundamentals of the land use planning, Zoning principles and basis for formation of zoning laws. Growth management system, infrastructure (Infrastructure, Road, Water supply, Sanitation, Solid Waste Disposal) development and maintenance - Forecasting infrastructure needs of the town based on set of parameters such as population and size of the city, growth trend.Development Control Regulations and bye-laws, standards, CZR in India. Critical analysis of standards. ICT in city management.

UNIT - IV URBAN PLANNING AND URBAN RENEWAL **10**

Tools and techniques utilized at the local, regional, and state level –master plan, structure plan, and zonal plan. Local Governance and Administration: Objectives, Functions, Responsibilities and Organizational structure of: (i) Village Panchayats (ii) Municipalities (iii) Corporations and (iv) Urban Development Authorities.Urban Renewal Plan – Meaning, Redevelopment, Rehabilitation and Conservation – Govt. schemes – case studies.

UNIT - V CITIES -PARADIGM OF SOCIO POLITICAL EXPRESSION 5

Self sustained communities – SEZ – transit development – integrated townships – case studies.Cities as symbolic expressions of power – Chandigarh, Delhi, Bhubaneshwar, Brasilia, Regulations and standards in India. Critical analysis of standards.

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT BOOKS:

1. Gallion Arthur B &Eisna Simon, The Urban Pattern: City Planning and Housing.
2. UDPFI guidelines
3. ***Town and Country Planning Act 1971with amendments***
4. John Radcliffe, An Introduction to Town and Country Planning.

REFERENCES

1. C.L.Doxiadis, Ekistics, “An Introduction to the Science of Human Settlements”, Hutchinson, London, 1968.
2. Government of India, “Report of the National Commission on Urbanisation”, 1988.
3. AndroD.Thomas, “Housing and Urban Renewal”, George Allen and Unwin, Sydney, 1986.
4. Rodwin, Lloyd, ed., 1987. Shelter, Settlements and Development (Hemel Hempstead, United Kingdom, Unwin Hyman Ltd.)
5. Town and country planning Act 1971 with amendments

SUBCODE			XAR 602	L	T	P	C
SUB NAME			VERNACULAR ARCHITECTURE	3	0	0	3
C	P	A		L	T	P	H
2.5	0.5	0		3	0	0	3

UNIT – I INTRODUCTION	6
Definition and classification of Vernacular architecture – Vernacular architecture as a process – Survey and study of vernacular architecture: methodology- Cultural and contextual responsiveness of vernacular architecture: an overview	
UNIT – II APPROACHES AND CONCEPTS	**9**
Different approaches and concepts to the study of vernacular architecture: an over view – Aesthetic, Architectural and anthropological studies in detail.	
UNIT – III VERNACULAR ARCHITECTURE OF THE WESTERN AND NORTHERN REGIONS OF INDIA	**12**
Forms spatial planning, cultural aspects, symbolism, colour, art, materials of construction and construction technique of the vernacular architecture of the following: - Deserts of Kutch and Rajasthan; Havelis of Rajasthan - Rural and urban Gujarat; wooden mansions (havelis); Havelis of the Bohra Muslims - Geographical regions of Kashmir; house boats.	
UNIT – IV VERNACULAR ARCHITECTURE OF SOUTH INDIA	**8**
Forms, spatial planning, cultural aspects, symbolism, art, colour, materials of construction and construction technique, proportioning systems, religious beliefs and practices in the vernacular architecture of the following: - Kerala: Houses of the Nair & Namboothri community; Koothambalam, Padmanabhapuram palace. - Tamil Nadu: Houses and palaces of the Chettinad region; Agraharams.	
UNIT – V WESTERN INFLUENCES ON VERNACULAR ARCHITECTURE OF INDIA	**10**
Colonial influences on the Tradition Goan house - Evolution of the Bungalow from the traditional bangla, Victoria Villas – Planning principles and materials and methods of construction. Settlement pattern and house typologies in Pondicherry and Cochin.	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	30	0	15	45

TEXT

1. Paul Oliver, Encyclopedia of Vernacular Architecture of the World, Cambridge University Press, 1997.
2. Amos Rapoport, House, Form & Culture, Prentice Hall Inc. 1969.
3. R W Brunskill: Illustrated Handbook on Vernacular Architecture, 1987.

REFERENCES

1. V.S. Pramar, Haveli – Wooden Houses and Mansions of Gujarat, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
2. Kulbushanshan Jain and Minakshi Jain – Mud Architecture of the Indian Desert, Aadi Centre, Ahmedabad 1992. 63
3. G.H.R. Tillotsum – The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989.
4. Carmen Kagal, VISTARA – TheArchitecture of India, Pub: The Festival of India, 1986.
5. S. Muthiah and others: The Chettiar Heritage; Chettiar Heritage 2000

SUBCODE			XAR 604	L	T	P	C
SUB NAME			ENERGY EFFICIENT ARCHITECTURE	1	0	1	2
C	P	A		L	T	P	H
1.33	0.66	0		1	0	2	3

UNIT – I PASSIVE DESIGN	**10**
Significance of Energy Efficiency in the contemporary context, Simple passive design considerations involving Site Conditions, Building Orientation, Plan form and Building Envelope - Heat transfer and Thermal Performance of Walls and Roofs.	
UNIT – II ADVANCED PASSIVE ARCHITECTURE- PASSIVE HEATING	**10**
Direct Gain Thermal Storage of Wall and Roof - Roof Radiation Trap - Solarium - Isolated Gain.	
UNIT – III PASSIVE COOLING	**10**
Evaporative Cooling - Nocturnal Radiation cooling - Passive Desiccant Cooling – Induced Ventilation - Earth Sheltering - Wind Tower - Earth Air Tunnels	
UNIT – IV DAY LIGHTING AND NATURAL VENTILATION	**8**
Daylight Factor - Daylight Analysis - Daylight and Shading Devices - Types of Ventilation - Ventilation and Building Design.	
UNIT – V CONTEMPORARY AND FUTURE TRENDS	**7**
Areas for innovation in improving energy efficiency such as Photo Voltaic Cells, Battery Technology, Thermal Energy Storage, Recycled and Reusable Building materials, Nanotechnology, smart materials and the future of built environment, Energy Conservation Building code.	

30	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	15	0	30	45

TEXT

1. Manual on Solar Passive Architecture, IIT Mumbai and Mines New Delhi, 1999
2. Arvind Krishnan & Others, " Climate Responsive Architecture", A Design Handbook for Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001
3. Majumdar M, "Energy-efficient Building in India", TERI Press, 2000.
4. Givoni .B, "Passive and Low Energy Cooling of Buildings", Van Nostrand Reinhold, New York, 1994

REFERENCES

1. Fuller Moore, "Environmental Control Systems", McGraw Hill INC, New Delhi - 1993
2. Sophia and Stefan Behling, Solpower, "The Evolution of Solar Architecture", Prestel, New York, 1996
3. Patrick Waterfield, "The Energy Efficient Home: A Complete Guide", Crowood press ltd, 2011.
4. Dean Hawkes, "Energy Efficient Buildings: Architecture, Engineering and Environment", W.W. Norton & Company, 2002 5. David Johnson, Scott Gibson, "Green from the Ground Up: Sustainable, Healthy and Energy efficient home construction", Taunton Press, 2008

SUBCODE			XAR 701	L	T	P	C
SUB NAME			URBAN ECONOMICS & SOCIOLOGY	2	0	0	2
C	P	A		L	T	P	H
1	1	3		2	0	0	2

UNIT – I ROLE OF URBAN ECONOMICS &SOCIOLOGY	**5**
Subject matter of Economics and Sociology as related to built environment.	
UNIT – II URBAN ECONOMICS	**6**
Principles of consumption, production and distribution and their relevance's; market demand and supply and price changes, laws of returns and urban land values, built environment and municipal taxes.	
UNIT - III COMPONENTS OF PLANNING	**8**
Various aspects of planning - Land use planning, transportation planning, environmental planning, infrastructure planning. The fundamentals of the land use planning, Zoning principles and basis for formation of zoning laws. Growth management system, infrastructure (Infrastructure, Road, Water supply, Sanitation, Solid Waste Disposal) development and maintenance - Forecasting infrastructure needs of the town based on set of parameters such as population and size of the city, growth trend.Development Control Regulations and bye-laws, standards, CZR in India. Critical analysis of standards. ICT in city management.	
UNIT - IV URBAN PLANNING AND URBAN RENEWAL	**6**
Tools and techniques utilized at the local, regional, and state level –master plan, structure plan, and zonal plan. Local Governance and Administration: Objectives, Functions, Responsibilities and Organizational structure of: (i) Village Panchayats (ii) Municipalities (iii) Corporations and (iv) Urban Development Authorities.Urban Renewal Plan – Meaning, Redevelopment, Rehabilitation and Conservation – Govt.schemes – case studies.	
UNIT - V CITIES -PARADIGM OF SOCIO POLITICAL EXPRESSION	**5**
Self sustained communities – SEZ – transit development – integrated townships – case studies.Cities as symbolic expressions of power – Chandigarh, Delhi, Bhubaneshwar, Brasilia, Regulations and standards in India. Critical analysis of standards.	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	30	0	0	30

TEXT

1. Gallion Arthur B &Eisna Simon, The Urban Pattern: City Planning and Housing.
2. UDPFI guidelines
3. Town and Country Planning Act 1971with amendments
4. John Radcliffe, An Introduction to Town and Country Planning.

REFERENCES

1. C.L.Doxiadis, Ekistics, "An Introduction to the Science of Human Settlements", Hutchinson, London, 1968.
2. Government of India, "Report of the National Commission on Urbanisation", 1988.
3. AndroD.Thomas, "'Housing and Urban Renewal", George Allen and Unwin, Sydney, 1986.
4. Rodwin, Lloyd, ed., 1987. Shelter, Settlements and Development (Hemel Hempstead, United Kingdom, Unwin Hyman Ltd.)
5. Town and country planning Act 1971 with amendments

SUB CODE			XAR901	L	T	P	C
SUB NAME			PROFESSIONAL PRACTICE & ETHICS	3	0	0	3
C	P	A		L	T	P	H
				3	0	0	3

UNIT – I ARCHITECT AND PROFESSION **9**

Role of architect in society - role of IIA and COA– Salient features of Architects' Act 1972 - code of conduct, Partial/ Comprehensive Architectural service, Conditions of engagement of an architect - normal additional, special and partial services – scale of fees for various services - claiming of fees - relationship with client and contractor – management of an architect's office - elementary accountancy.

UNIT – II ARCHITECTURAL COMPETITIONS **8**

Types of competitions - appointment of assessors - duties of assessors - instructions to participants - rejection of entries - award of premium - guidelines prescribed by COA & IIA for promotion and conduct of competitions

UNIT – III EASEMENTS and ARBITRATION **8**

Easements -Definition - types of easement – acquisition extinction and protection of easements - Arbitration in disputes - arbitration agreement - sole arbitration - umpire - accepted matters and – award

UNIT – IV TENDER and CONTRACT **8**

Calling for tenders - tender documents - open and closed tenders - item rate, lump sum, labour and demolition tender - conditions of tender - submission of tender - scrutiny and recommendations. Conditions of contract - Form of contract articles of agreement - Contractor's bill certification

UNIT – V BUILDING RULES and LEGISLATION **12**

The Building Rules and By laws - Panchayat , Municipal, Corporation. Role of Local Authorities and Local Planning Authorities Development Control Rules – Chennai Metropolitan Development Authority. Environmental Acts and Laws, Fire Safety Rules – Role of EIA Committee Need for special rules on architectural control and development -Special Rules governing Hill Area Development - coastal area development - Heritage Act of India - Role of urban Arts Commission, Tamil Nadu Factory Rules.

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. Publications of COA IIA Hand book on Professional Practice, The Architects publishing Corporation of India, and Bombay 1987
2. Roshan Namavathi, Professional Practice, Lakhsmi Book Depot, Mumbai1984

REFERENCES

1. J.J. Scott, Architect's Practice, Butterworth, London 1985
2 D.C. Rules for Chennai Metropolitan Area 1990
3. T.N.D.M. Building Rules, 1972
4. T.N.P. Building Rules 1942
5. Chennai City Corporation Building Rules 1972
6. Derek Sharp, The Business of Architectural Practice William Collins Sons &Co. Ltd., Erafton St., London W1 1986
7. The Tamil Nadu Hill Areas Special Building Rules - 1981
8. Environmental Laws of India - by Kishore Vanguri, C.P.R. Environmental Education Centre, Chennai

SUBCODE			XAR903A	L	T	P	C
SUB NAME			ARCHITECTURAL CONSERVATION	3	0	0	3
C	P	A		L	T	P	H
				3	0	0	3

UNIT - I : INTRODUCTION TO ARCHITECTURAL CONSERVATION	6
Introduction to Architectural conservation and preservation of heritage buildings, Environmental Conservation, - purpose and scope of conservation projects in Indian Context - Role of architect in such programmes. values and ethics of Conservation programme– Involvement of Community & Social Organisations – public participation – Conflict and compatibility between Conservation and development.	
UNIT – II PROCEDURE FOR CONSERVATION	**10**
Procedure for listing of structures for conservation. Inventories, inspection, documentation; degree of intervention for prevention of deterioration, prevention of existing state, consolidation of the fabric, restoration, rehabilitation, reproduction, reconstruction, etc. – To study the structural elements of buildings such as beams, arches and domes; walls, piers and columns, foundation etc. - Causes of decay in buildings by natural and human factors, The role of conservation Architect and his team.	
UNIT – III STRUCTURAL CONSERVATION	**10**
Behavioral properties of traditional construction materials . Various methods and techniques involved in structural conservation. case studies and examples.	
UNIT – IV LEGISLATION AND INSTITUTIONS	**11**
Special legislation – central and state. New Concepts and emerging trends in Conservation. Methods and procedures adopted by agencies such as UNDP, UNESCO, ICOMOS, ICCROM, ASI, INTACH.	
UNIT – V CASE – STUDIES	**8**
Case studies of Conservation projects in Indian and International context. Appraisal of conservation project in view of the above issues - Success and failure – reasons for it.	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

REFERENCES

1. Conservation and Development in Historic Towns and Cities. - Pamela Ward - Orid Press. Ltd.
2. Planning for Conservation - Kain Roger, - St.Martin N-Y 1981
3. Recycling Cities – Cutler and Cutter – Canni, Massachussets, 1976
4. Character of Towns an Approach to Conservation - Worskett Roy, Architectural Press – London.
5. Guidelines for Conservation by INTACH
6. Conservation of Historic buildings, Sir Bernard M Feilden , - Architectural Press, 1982.
7. Gerald Glenn, "Presentation & Rehabilitation", (1996), ASTM International.
8. A History of Architectural Conservation, (1'st Pub.1999, Reprint 2005) – Elservier Butterworth, Oxford, UK.

SUBCODE			XAR 904B	L	T	P	C
SUB NAME			LANDSCAPE ARCHITECTURE	3	0	0	3
C	P	A					
1.2	1.8	0		L	T	P	H
				3	0	0	3

UNIT – I INTRODUCTION	6
Introduction to ecology, ecosystem, biosphere – components and working mechanism of ecosystem – types and courses of disturbance in ecosystem – man-made and natural e.g.Dereliction of land – reclamation, conservation and landscaping of derelict land.	
UNIT – IIPLANTING DESIGN	**9**
Plants as design elements- classification – structural characteristic of plants – visual characteristics of plant viz. line, form, texture, colour, etc. – basic data for plant selection.	
UNIT – IIIELEMENTS IN LANDSCAPE DESIGN	**10**
of Landscape design - Landscape character – Landscape Composition – Plant Association– Landscape effects-Organisation of spaces- circulation, built form and open spaces- exercises on planning for neighbourhood parks and campus developments.**Design Assignment:** Plant selection and composition for given situation.	
UNIT – IV HISTORY OF GARDEN DESIGN	**10**
Study of principles and design – historic styles – Mugal gardens of India: Shalimar Bagh and TajMahal, Japanese gardens: Saihoji, Ryoanji&Katsura imperial palace, Italian Renaissance gardens: Villa Lante at Bagania.	
Landscaping for residential layout – recreational facilities, like parks, play fields- water front areas – hill areas – urban centers like squares, plazas , Consideration and key factors to landscaping of above context. Design Assignment : Landscape proposal and Drawing preparation for assigned project	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. Landscape Architecture – John Omsbeesimonds .
2. Planting Design – Theodore D Walker.

REFERENCES

1. Introduction to landscape design – John L.Motloch.
2. Planting design Handbook – Nick Robinson.
3. Site planning Standards – Joseph dechiara Lee E. Koppelman.
4. Hand Book of Urban Landscape, The Architectural Press, London, 1973, Cliff Tandy.
5. T S S for Landscape Architecture, McGraw Hill, Inc, 1995
6. Landscape planning and Environmental Impact Design , Turner
7. Landscape detailing , Little woods
8. Landscape design , Park C.

SUBCODE			XID501	L	T	P	C
SUB NAME			INTRODUCTION TO LANDSCAPE	3	0	0	3
C	P	A		L	T	P	H
1.3	6	1.3		3	0	0	3

UNIT – I INTERIOR LANDSCAPING	**8**
Introduction to landscape architecture. And role of landscaping design in the built environment, classification of plants, indoor plants and their functions, layout & components, Floriculture – commercial, ornamental, Selection of plants.	
UNIT – II PHYSICAL REQUIREMENTS OF PLANTS	**8**
Physical requirements of plants – light, temperature, water, planting medium, soil separator, weight of plants, acclimatization, maintenance, pests and diseases. Indoor plants in Indian context. Market survey and costs.	
UNIT – III INTERIOR LANDSCAPING ELEMENTS & PRINCIPLES	**8**
Various interior landscaping elements – Plants, rocks, water bodies - pools, fountains, cascades, artefacts, paving & lighting, Design guidelines- plant texture & colour, plant height, plant spacing. Automatic irrigation costing and installation of micro irrigation systems.	
UNIT – IV ROOF AND DECK LANDSCAPE	**10**
Protection of the integrity of the roof and structure, provisions for drainage, light weight planting medium, irrigation, selection of materials, water proofing, provision for utilities and maintenance.	
UNIT – V INTERIOR LANDSCAPE DESIGNS	**11**
Landscaping design parameters for various types of built forms- indoor and outdoor linkage to spaces. Landscaping of courtyards- residential and commercial forms. Indoor plants and their visual characteristics- Colour, texture, foliage. Science of maintaining and growing greenery. Flowers- its Colours, texture and its visual perception in various indoor spaces and science of flower arrangement.	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. Time saver standards for landscape architecture.
2. Planting design by Theodore D.Walker, VNR Publications New York.
3. Landscaping Principles and Practices by Jack E.Ingels, Delmar Publishers.

REFERENCES

1. Designs for 20th century Interiors – Fiona Leolie, VH Publications, London.
2. Ross, R. (1999), Colorful gardening – climbers, Ryland peters and small, London.
3. Scott – James, A. (1995), perfect plant perfect garden, corner octopus limited, London
4. Too good, A. (1995), Designing with house plants, Grange Books publication, London.
5. Trivedi. P.Prathiba. Beautiful Shrubs. Indian council of Agricultural Research. New Delhi, 1990.

SUBCODE			XID601	L	T	P	C
SUB NAME			PROFESSIONAL PRACTICE	3	0	0	3
C	P	A		L	T	P	H
3	1	2		3	0	0	3

UNIT – I INTRODUCTION TO INTERIOR DESIGN PROFESSION **9**

Role of Interior Designer in society: Interior Design Profession as compared to other professions. Difference between profession and business. IIID and other organizations related to interior design profession. Interior Designers approach to works, ways of getting works

UNIT – II ISSUES OF PROFESSIONAL PRACTICE **9**

Issues of professional practice: Professional behaviour, Ethics, Types of clients, Contracts, Tenders, Arbitration etc. Career opportunities, styles of interior design practice, relationship between client and professional, type of fees, process of fees negotiations, billing methods, tax liabilities, contracts – types of contracts – item rate, labor, lump sum, cost plus percentage etc.

UNIT – III DUTIES AND CODE OF CONDUCT **9**

Interior Designer's duties: Drawings to be prepared: Interior Designer's relation with other parties connected with works such as client, contractor, sub-contractors, consultants and authorities. IIID Code of professional conduct: scale of charges: units and mode of measurements, clerk of work and his duties, inspection of work, certificate of payment to contractor, bill of quantities, schedule of rates, tenders, public, limited and negotiated tender documents and allied formalities.

UNIT – IV OFFICE PRACTICES **9**

Types of offices for interior design practice: staff structure, filing of records, correspondence and drawings, maintenance of accounts, presentations in meetings, recording minutes of meeting.

UNIT – V ROLE OF INTERIOR CONSULTANTS 9

A report to be prepared by each student after visiting an interior designer's office. Knowledge of role of consultants and coordination between different consultants on a big project.

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
HOURS	45	0	0	45

REFERENCES

1. Indian Institute of Architects. H.B. Professional Practice' The Architects pub. Bombay.
2. Namavati. H. Roshan. Professional Practice. 8th ed, Lakshani Book Depot, Bombay, 2001.
3. Christine.M. Piotrowski' Professional practice for Interior Designers, 3rd edition, Wiley and sons, 2001.
4. Cindy Coleman,Interior Design Handbook practice, Mc Graw Hill professional, isted, 2001
5. Ronald Veitch, Professional practice for Interior Designers, Peguis Publishers, Limited, 1987.

SUBCODE			YAR102	L	T	P	C
SUB NAME			APPROPRIATE TECHNOLOGIES AND SUSTAINABLE ARCHITECUTRE	3	0	0	3
C	P	A		L	T	P	H
				3	0	0	3

UNIT - I : INTRODUCTION	6
Architecture and the survival of the planet- Assessing patterns of consumption and their alternatives- Profit and politics- Natural building movement – new context for codes and regulations	
UNIT - II : DESIGN PRINCIPLES	**12**
Principle 1: Conserving energy; Principle 2: Working with Climate; Principle 3: minimizing new resources; Principle 4: respect for users; Principle 5: respect for site; Principle 6: holism- Illustrated with examples	
UNIT - III : SUSTAINABLE CONSTRUCTION	**6**
Design issues relating to sustainable development including site and ecology, community and culture, health, materials, energy, and water- Domestic and Community buildings using self help techniques of construction; adaptation, repair and management - portable architecture.	
UNIT - IV : SYSTEMS MATERIALS AND APPLICATIONS	**12**
Adobe- Cob- Rammed Earth- Modular contained earth- light clay- Straw bale- bamboo- earthen finishes, etc.- their sustainability; adaptability to climate; engineering considerations, and construction methods; Waste as a resource Portable architecture to Applications through specific case studies.	
UNIT- V: CASE STUDIES FROM THE CONTEMPORARY SCENARIO	**9**
Ranging from small dwellings to large commercial buildings, drawn from a range of countries to demonstrate best current practice.	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

REFERENCES

1. Brenda and Robert Vale; Green Architecture: Design for a sustainable future; Thames and Hudsson;1996
2. Lynne Elizabeth and Cassandra Adams; Alternative Construction: Contemporary Natural Building Methods
3. Victor Papanek; The Green Imperative; Thames and Hudson; 1995
4. Steven Harris and Deborah Berke; Architecture of the Everyday; Princeton Architectural Press; 1997
5. Pilar Echavarria; Portable Architecture- and unpredictable surroundings; Page One Publishing Pvt. Ltd.; 2005

SUBCODE			YAR103	L	T	P	C
SUB NAME			ADVANCED STUDIES IN REGIONAL AND VERNACULAR ARCHITECTURE	3	0	0	3
C	P	A		L	T	P	H
				3	0	0	3

UNIT - I : INTRODUCTION	5
Brief introduction to vernacular architecture in global context – concepts and approaches in the study of vernacular architecture	
UNIT – II : VERNACULAR ARCHITECTURE IN INDIAN CONTEXT	**8**
The different vernacular architectural styles in India with examples. Northern region – Kashmir Architecture , Eastern region – Bengal Architecture, Western Region – Gujarat and kutch architecture, Rajasthan havelis, Southern Region – Kerala and Chettinadu Architecture.	
UNIT - III : CONCEPTS AND PRINCIPLES IN VERNACULAR STYLE	**12**
Study and understand the concepts and principles of Indian vernacular styles in terms of climate response, materials and indigenous construction techniques followed.	
UNIT - IV : CASE STUDY OF AN IDENTIFIED SETTLEMENT	**15**
Detailed study of a traditional settlement and analyzing in terms of the above discussed concepts and principles.	
UNIT – V: SUITABILITY IN PRESENT CONTEXT	**5**
Discussion on the Suitability of the vernacular concepts in present context with examples.	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

REFERENCES

1. Paul Oliver, Encyclopedia of Vernacular Architecture of the World, Cambridge University Press, 1997.
2. Amos Rappoport, House, Form & Culture, Prentice Hall Inc. 1969.
3. V.S.Praman, Havali- Wooden Houses & Mansions of Gujarat, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
4. Kullrishan Jain &Minakshi Jain - Mud Architecture of the Indian Desert, Aadi Centre, Ahmedabad, 1992.
5. G.H.R. Tillotsum- The tradition of Indian Architecture Continuity, Controversy - Change since 1850, Oxford University Press, Delhi, 1989.
6. Carmen Kagal, VISTARA - The Architecture of India, Pub: The Festival of India, 1986.

SUBCODE			YAR301	L	T	P	C
SUB NAME			SUSTAINABLE URBAN LANDSCAPE	3	0	0	3
C	P	A		L	T	P	H
				3	0	0	3

UNIT - I : ECOLOGY AND LANDSCAPE	6
Concept of Ecosystem: General Structure and Function - Energy flow, Primary & Secondary Production - Types of Biogeochemical cycles; Carbon cycle, Global water cycles, nitrogen cycle bioaccumulation and biomagnifications and - Analysis and evaluation. Concept of ecosystem services.- Types of Ecosystems Environmental Impact Assessment and the Environmental Impact Statement: Theory and Practice. Illustrative examples from India to demonstrate the degree of effectiveness. The role of Environmental Legislation and the Ministry of Environment and Forests.	
UNIT - II : PLANTS AND DESIGN	**10**
Planting as a design element for structuring the landscape. Structural and visual characteristics of plants. Principles of visual composition. Plant association. The role of plant material in environmental improvement, (e.g. soil conservation, modification of microclimate). Ecological and Botanical considerations in landscape design. Plant data sheet. Planting for wildlife, land rehabilitation, the role of planting in water shed management.	
UNIT - III : CULTURAL AND HISTORIC LANDSCAPE	**10**
Early traditions and beliefs about landscape and environment in east. Ancient Indian traditions – Vedic, Jainism, Buddhism and later Hindu movements. Symbolic meanings and sacred value of natural landscapes.Transfer of concepts through Buddhism to China –Chinese landscape development – gardens of China – Pre Buddhist Japanese landscapes – impact of China on Japanese gardens – Japanese gardens.Nomadic culture of central Asia – advent of Islam – concept of Paradise as a garden – spread of Islamic traditions to the West and East. Eastern expression of Islam – Samarkhand and Mughal India – Tomb and pleasure garden – Mughal concepts of site planning. Western expression of Islam – Spain Alhambra and General life, Granada.	
UNIT- IV : CONTEMPORARY LANDSCAPE	**10**
Industrialization and urbanization – impacts and development of the concept of public open spaces, open space development in new towns, parks movement. Study of selected works of modern landscape architects. Frederick Law Olmsted, *Martha Schwartz*, Burle Marx, *Ravindra Bhan* and other pioneers.	
UNIT - V : CASE STUDY	**9**
Analysis and understanding of philosophies of Contemporary landscape architect works in India and abroad.eco tourism projects, landscape in civic spaces, landscape projects at urban level.	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

REFERENCES

1. Geoffrey and Susan Jellico, The landscape of Man, Thames & Hudson Publication, 1995
2. Robert Holden, New landscape Design, Lawrence king publishing, UK, 2003
3. Penelope Hill, Contemporary history of garden design, Birkhauser publishers, 2004
4. Elizabeth Barlow Rogers, Landscape Design – A Cultural &Architectural History, Hary& Abram inc. publishers, 2001.
5. Phillip Pregill& Nancy Volkman, Landscapes in History, Van Nostrand publishers, 1993.
6. Jonas Lehrman, Earthly Paradise- Garden and courtyard in Islam, Thames and Hudson,1980.
7. G.B.Tobey, A history of American Landscape architecture, American Elsevier Publishing Co.,NY, 1973.
8. PieluigiNicholin, Francesco Repishti, Dictionary of today's landscape designers, SkiraEditores P.A, 2003.

SUBCODE			YAR302	L	T	P	C
SUB NAME			HERITAGE CONSERVATION PLANNING	3	0	0	3
C	P	A		L	T	P	H
				3	0	0	3

UNIT – I INTRODUCTION TO ARCHITECTURAL CONSERVATION	6
Introduction to architectural conservation of heritage buildings, environmental conservation, purpose & scope of conservation projects in Indian context – Role of architect in such programmes, values & ethics of conservation programme- involvement of community & social organisations – public participation – conflict and compatibility between conservation and development	
UNIT – II PROCEDURE FOR CONSERVATION	**10**
Procedure for listing of structures for conservation. Inventories, inspection, documentation, degree of intervention for prevention of deterioration, prevention of existing state, consolidation of the fabric, restoration, rehabilitation, reproduction, reconstruction , etc. – to study the structural elements of buildings such as beams, arches, and domes, walls, piers & columns, foundation etc, causes of decay in buildings by natural and human factors, The role of conservation architect & his team.	
UNIT – III STRUCTURAL CONSERVATION	**10**
Behavioral properties of traditional construction materials- various methods and techniques involved in structural conservation, case studies and examples.	
UNIT – IV LEGISLATION AND INSTITUTIONS	**11**
Special legislation – Central and State.New concepts and emerging trends in conservation. Methods and procedures adopted by agencies such as UNDP, UNESCO, ICOMOS, ICCROM, ASI, INTACH	
UNIT- V CASESTUDIES	**8**
Case studies of conservation projects in Indian and International context. Appraisal of conservation project in view of the above issues- success & failure – reasons for it.	
	Total: 45 Hours

REFERENCES

1. Conservation and development in historic towns & cities – Pamela Ward Press Ltd.
2. Planning for conservation – Kain Roger – St.Martin N-Y 1981.
3. Character of towns – An approach to conservation – Worskett Roy, Arch. Press – London.
4. Guidelines for conservation by INTACH.
5. Conservation of Historic Buildings, Sir Bernard M. Felidan, - Arch Press, 1982.
6. Gerald Glenn, “Presentation & Rehabilitation” (1996), ASTM International.
7. History of Architectural conservation, (1st Pub 1999, Reprint 2005) – Butterworth, Oxford, UK.

SUBCODE			YAR304B	L	T	P	C
SUB NAME			ENERGY SIMULATION AND MODELLING	2	2	0	3
C	P	A		L	T	P	H
				2	2	0	3

UNIT I - INTRODUCTION TO ENERGY	**10**
Definition and units of energy, power, Forms of energy, Conservation of energy, second law of thermodynamics, Energy flow diagram to the earth. Origin of fossil fuels, time scale of fossil fuels, Renewable Energy Resources, Role of energy in economic development and social transformation.	
UNIT II - INTRODUCTION TO SOLAR ENERGY	**10**
Solar Spectrum, Solar Time and angles, day length, angle of incidence on tilted surface; Sunpath diagram; Shadow angle protractor; Solar Radiation: Extraterrestrial Radiation; Effect of earth atmosphere; Estimation of solar radiation on horizontal and tilted surfaces; Measurement of Solar radiation, Analysis of Indian solar radiation data and applications.	
UNIT III - INTRODUCTION TO ENERGY MODELING	**10**
Definition of energy modeling, Answers that energy modeling provide, Building modeling tools: Daylighting/ lighting modeling, Computational fluid dynamics(CFD), Building component analysis, HVAC analysis, Building thermal analysis, Whole building energy simulation programs.	
UNIT IV - INTERFACES AND SOFTWARE PACKAGES	**15**
Introduction to interfaces of energy modeling software packages, DOE2, ENERGY PLUS, ECOTECT, CLIMATE CONSULTANT, HEED, BERS, GREEN BUILDING STUDIO.	
UNIT - V CASE STUDY	**15**
Literature case study and live case study, Energy modeling of a residential building.	
	Total: 60 Hours

REFERENCES

1. Eddy Krygiel., Bradley Nies, Green BIM Wily publishing, Canada, 2008.
2. Advanced Energy Design Guide For Small Office Buildings, American Society of Heating Refrigerating and Airconditioning, USA 2004.
3. Davies, Morris Grenfell, Building Heat Transfer, Wiley, 2008.
4. Underwood, Chris, Modelling Methods For Energy In Buildings, WileyBlackwell, 2008.
5. International Energy Conservation Code 2003, International Code Council.
6. Baker, Nick, Energy And Environment In Architecture, Taylor & Francis, 2000.
7. Dobbelsteen, Andy van den, Smart Building In A Changing Climate, Island Press, 2009.

SUBCODE			XAR704B	L	T	P	C
SUB NAME			DISASTER RESISTANCE ARCHITECTURE	3	0	0	3
C	P	A		L	T	P	H
2	0	0		3	0	0	3

UNIT – I	NATURAL HAZARDS AND MAN MADE HAZARDS	5

Introduction to Disaster Management – Contemporary, Natural and Man-made Disasters- Natural Hazards – Fundamentals of Disasters, Causal Factors of Disasters, Poverty, Population Growth, Rapid Urbanization, Transitions in Cultural Practices, Environmental Degradation, War and Civil Strife - brief description on cause and formation of flood, cyclone, earthquake, Tsunami and Landslides. Zoning and classification by center/ state government organizations. Geologic Hazards and Natural disasters – how to recongnize and avoid them – hazards of faulting – hazards of geologic foundations. Man made hazards – fire, gas and chemical leakages, pollution and health hazards, manmade disasters – vulnerability analysis and risk assessment

UNIT – II	CONCEPTS FOR DISASTER RESISTANT DESIGN	5

Vernacular and historical experiences – case studies. Site selection and site development – building forms – Effects of cyclone, tsunami, hurricanes and seismic forces related to building configuration – spatial aspects – contemporary/ international approaches for low rise, mid-rise and high rise buildings. Innovations and selection of appropriate materials – IS code provisions for buildings – disaster resistant construction details.

UNIT – III	FUNDAMENTALS OF EARTHQUAKE AND BUILDING CONFIGURATION	5

Fundamentals of earthquakes - Earths structure, seismic waves, plate tectonics theory, origin of continents, seismic zones in India- Predictability, intensity and measurement of earthquake - Basic terms- fault line, focus, epicentre, focal depth etc. Site planning, performance of ground and buildings - Historical experience, site selection and development - Earthquake effects on ground, soil rupture, liquefaction, landslides- Behaviour of various types of building structures, equipments, lifelines, collapse patterns - Behaviour of non-structural elements like services, fixtures in earthquake - prone zones Seismic design codes and building configuration - Seismic design code provisions – Introduction to Indian codes- Building configuration- scale of building, size and horizontal and vertical plane, building proportions, symmetry of building- torsion, re-entrant corners, irregularities in buildings- like short stories, short columns etc

UNIT – IV	EARTHQUAKE RESISTANT DESIGN	10

Various types of construction details a) Seismic design and detailing of non-engineered construction- masonry structures, wood structures, earthen structures. b) Seismic design and detailing of RC and steel buildings c) Design of non-structural elements- Architectural elements, water supply, drainage, electrical and mechanical components

UNIT – V	POST OPERATIVE MEASURES FOR DISASTER MANAGEMANT	5

Methods to minimize damage to utilities – plaster / wall boards / furnishings/ swimming pools / antennas / free standing retaining masonry walls other remedies and post operative measures – cyclone and earthquake insurance – training for before and after natural hazards and ways to protect family, property

and oneself from natural calamities. Role of international, national and state bodies – CBRI, NBO and NGOs in disaster mitigation and community participation

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. Guidelines for earthquake resistant non-engineered construction, National Information centre of earthquake engineering (NICEE, IIT Kanpur, India), 2004.
2. C.V.R Murthy, Andrew Charlson. "Earthquake design concepts", NICEE, IIT Kanpur, 2006.
3. Agarwal.P, Earthquake Resistant Design, Prentice Hall of India, 2006.

REFERENCES

1. Ian Davis, "Safe shelter within unsafe cities: Disaster vulnerability and rapid urbanization", Open House International, UK, 1987
2. Socio-economic developmental record- Vol.12, No.1, 2005
3. 3. Mary C. Comerio, Luigia Binda, "Learning from Practice- A review of Architectural design and construction experience after recent earthquakes" - Joint USA-Italy workshop, Oct.18-23, 1992, Orvieto, Italy.

SUBCODE			XAR 904C	L	T	P	C
SUB NAME			BEHAVIORAL STUDIES IN BUILT ENVIRONMENT	3	0	0	3
C	P	A					
1.2	1.2	0.6		L	T	P	H
				3	0	0	3

UNIT – I CONCEPTS AND CONCERNS OF PERCEPTION	**7**
Definition - Visual perception - perceptual constancy, objective and spatial vision, attention and awareness, methods of vision perception and science.	
UNIT – II DEVELOPING SENSIVITY TO THE NEEDS OF USERS AND CLIENTS	**8**
Architectural assumptions and Environmental Designs, Designs and social practices, involvement of clients and user in Designs and built environment, realities of clients and public their impact projects and designs.	
UNIT – III DESIGNING AND PLANNING FOR URBAN QUALITY	**10**
Quality of urban environment and living - past, present and futuretrends, role of urban design in urban environment, planning for quality living in urban areas,	
UNIT – IV MICRO AND MACRO BUILT ENVIRONMENT AND BEHAVIORALASPECTS	**5**
Relationship of built environment to society, spatial relationship within built - environment, influence of physical environment on human behavior, influences of built environment on human behaviour.	
UNIT – V BUILT - ENVIRONMENT AND PERCEPTION	**5**
Case studies of tall buildings, low raise neighborhoods, interior and exterior elegance of built environment, local and regional level landscape.	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. Parfeet M and Power G, Planning for urban quality, Rent ledge, London 1977.
2. JohathanBatnett - Urban Design as public polody - Haxper and row Publications New York, 983

REFERENCES

1. Yantis .S (2001), Visual perception, Psychology Press, Philadelphia.
2. Nicol D and Pilling S (2000), changing Architectural education - Towards new proper simalism, Spon Press, London.
3. Frey H, (1999), Eand FN Spon, London.
4. Dovey K, (1999) Framing Places, meditiating power in built form, Rent ledge, London.

SUB CODE			XES202	L	T	P	C
SUB NAME			ENVIRONMENTAL SCIENCES	3	0	0	0
PREREQUISITE			Nil				
C	P	A		L	T	P	H
1.4	0.3	0.3		3	0	0	3

Learning Objectives:

Upon completion of this course, the students

- Would have learn about natural energy resources.
- Would have learn about the pollution sources and control.

Course Outcomes		Domain	Level
After the completion of the course, students will be able to			
CO1	***Describe*** the significance of natural resources and ***explain*** anthropogenic impacts.	Cognitive	Remember Understand
CO2	***Illustrate*** the significance of ecosystem, biodiversity and natural geo bio chemical cycles for maintaining ecological balance.	Cognitive	Understand
CO3	***Identify*** the facts, consequences, preventive measures of major pollutions and ***recognize*** the disaster phenomenon	Cognitive Affective	Remember Receive
CO4	***Explain*** the socio-economic, policy dynamics and ***practice*** the control measures of global issues for sustainable development.	Cognitive	Understand Apply
CO5	***Recognize*** the impact of population and the concept of various welfare programs, and ***apply*** the modern technology towards environmental protection.	Cognitive	Understand Analysis

UNIT - I : INTRODUCTION TO ENVIRONMENTAL STUDIES AND ENERGY **12**

Definition, Scope And Importance – Need For Public Awareness – Forest Resources: Use, Deforestation, Case Studies. – Water Resources: Use And Over-Utilization Of Surface And Ground Water, Dams-Benefits And Problems – Mineral Resources: Uses, Environmental Effects Of Mining, Case Studies-Iron Mining(Goa), Bauxite Mining(Odisha) – Food Resources: Effects Of Modern Agriculture, Fertilizer-Pesticide Problems, Water Logging, Salinity, Case Studies – Energy Resources: Growing Energy Needs, Renewable And Non-Renewable Energy Sources, Use Of Alternate Energy Sources, Case Studies – Land Resources: Land As A Resource, Land Degradation – Role Of An Individual In Conservation Of Natural Resources – Equitable Use Of Resources For Sustainable Lifestyles.

UNIT - II : ECOSYSTEMS AND BIODIVERSITY **7**

Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Biogeochemical cycles – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to Biodiversity – Definition: genetic, species and ecosystem diversity - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT - III : ENVIRONMENTAL POLLUTION **10**

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– Role of an individual in prevention of pollution – Pollution case studies – Disaster management: flood, earthquake, cyclone and landslide.

UNIT - IV : SOCIAL ISSUES AND THE ENVIRONMENT **10**

Rain water harvesting – Resettlement and rehabilitation of people; its problems and concerns, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents – 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 – Public awareness.

UNIT -V : HUMAN POPULATION AND THE ENVIRONMENT **6**

Population growth, variation among nations – Population explosion– Environment and human health – HIV / AIDS– Role of Information Technology in Environment and human health.

	Lecture	Tutorial	Practical	Total
	45	0	0	45

Text Books:

1. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co, USA, 2000.
2. Townsend C., Harper J and Michael Begon, Essentials of Ecology, Blackwell Science, UK, 2003
3. Trivedi R.K and P.K.Goel, Introduction to Air pollution, Techno Science Publications, India, 2003.
4. Disaster mitigation, Preparedness, Recovery and Response, SBS Publishers & Distributors Pvt. Ltd, New Delhi, 2006.
5. Introduction to International disaster management, Butterworth Heinemann, 2006.
6. Gilbert M.Masters, Introduction to Environmental Engineering and Science, Pearson Education Pvt., Ltd., Second Edition, New Delhi, 2004.

Reference Books:

1. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media, India, 2009.
2. Cunningham, W.P.Cooper, T.H.Gorhani, Environmental Encyclopedia, Jaico Publ., House, Mumbai, 2001.
3. S.K.Dhameja, Environmental Engineering and Management, S.K.Kataria and Sons, New Delhi, 2012.
4. Sahni, Disaster Risk Reduction in South Asia, PHI Learning, New Delhi, 2003.
5. Sundar, Disaster Management, Sarup& Sons, New Delhi, 2007.
6. G.K.Ghosh, Disaster Management, A.P.H.Publishers, New Delhi, 2006.

E-References:

1. http://www.e-booksdirectory.com/details.php?ebook=10526
2. https://www.free-ebooks.net/ebook/Introduction-to-Environmental-Science
3. https://www.free-ebooks.net/ebook/What-is-Biodiversity
4. https://www.learner.org/courses/envsci/unit/unit_vis.php?unit=4
5. http://bookboon.com/en/pollution-prevention-and-control-ebook
6. http://www.e-booksdirectory.com/details.php?ebook=8557
7. http://www.e-booksdirectory.com/details.php?ebook=6804
8. http://bookboon.com/en/atmospheric-pollution-ebook
9. http://www.e-booksdirectory.com/details.php?ebook=3749
10. http://www.e-booksdirectory.com/details.php?ebook=2604
11. http://www.e-booksdirectory.com/details.php?ebook=2116

SUB CODE			XUM403	L	SS	T	P	C
SUB NAME			HUMAN ETHICS, VALUES, RIGHTS AND GENDER EQUALITY	1		0	0	1
C	P	A		L		T	P	H
1.8	0	0.2		1+2		0	0	3

Course Outcome		Domain
CO1	Relate and Interpret the human ethics and human relationships	C (Remember & Understand)
CO2	Explain and Apply gender issues, equality and violence against women	C (Understand &Apply)
CO3	Classify and Develop the identify of human rights and their violations	C(Analyse) A(Receive)
CO4	Classify and Dissect necessity of human rights and report on violations.	C(Understand &Analyse)
CO5	List and respond to family values, universal brotherhood, fight against corruption by common man and good governance.	C(Remember) A(Response)

UNIT – I : HUMAN ETHICS AND VALUES	**7**
Human Ethics and values - Understanding of oneself and others- motives and needs- Social service, Social Justice, Dignity and worth, Harmony in human relationship: Family and Society, Integrity and Competence, Caring and Sharing, Honesty and Courage, Valuing Time, Co-operation, Commitment, Sympathy and Empathy, Self respect, Self-Confidence and Personality- Living in harmony at various levels.	
UNIT – II : GENDER EQUALITY	**9**
Gender Equality - Gender Vs Sex -, Concepts, definition, Gender equity, equality, empowerment. Status of Women in India Social, Economical, Education, Health, Employment, HDI, GDI, GEM. Contributions of Dr.B.R.Ambedkar, Thanthai Periyar and Phule to Women Empowerment.	
UNIT-III : WOMEN ISSUES AND CHALLENGES	**9**
Women Issues and Challenges- Female Infanticide, Female feticide, Violence against women, Domestic violence, Sexual Harassment, Trafficking, Access to education, Marriage. Remedial Measures – Acts related to women: Political Right, Property Rights, Right to Education, Medical Termination of Pregnancy Act, and Dowry Prohibition Act.	
UNIT – IV : HUMAN RIGHTS	**9**
Human Rights Movement in India – The preamble to the Constitution of India, Human Rights and Duties, Universal Declaration of Human Rights (UDHR), Civil, Political, Economical, Social and Cultural Rights, Rights against torture, Discrimination and forced Labour, Rights of Children. National Human Rights Commission and other statutory Commissions, Creation of Human Rights Literacy and Awareness. - Intellectual Property Rights (IPR). National Policy on occupational safety, occupational health and working environment.	
UNIT – V : GOOD GOVERNANCE AND ADDRESSING SOCIAL ISSUES	**11**
Good Governance - Democracy, People's Participation, Open and Transparence governance, Corruption, Impact of corruption on society, on how and whom to make corruption complaints, fight against corruption and related issues and character building, Fairness in criminal justice administration,	

Government system of Redressal. Issues and intervention in situations of family violence, substance abuse and corruption. Creation of People friendly environment and universal brotherhood.

	LECTURE	SS	PRACTICAL	TOTAL
	15	30	0	60

TEXT BOOKS

1. Aftab A, (Ed.), Human Rights in India: Issues and Challenges, (New Delhi: Raj Publications, 2012).
2. Bajwa, G.S. and Bajwa, D.K. Human Rights in India: Implementation and Violations (New Delhi: D.K. Publications, 1996).
3. Chatrath, K. J. S., (ed.), Education for Human Rights and Democracy (Shimala: Indian Institute of Advanced Studies, 1998).
4. Jagadeesan. P. Marriage and Social legislations in Tamil Nadu, Chennai: Elachiapen Publications, 1990).

REFERENCES

1. Kaushal, Rachna, Women and Human Rights in India (New Delhi: Kaveri Books, 2000)
2. Mani. V. S., Human Rights in India: An Overview (New Delhi: Institute for the World Congress on Human Rights, 1998).
3. Singh, B. P. Sehgal, (ed) Human Rights in India: Problems and Perspectives (New Delhi: Deep and Deep, 1999).
4. Veeramani, K. (ed) Periyar on Women Right, (Chennai: Emerald Publishers, 1996)

5 . Veeramani, K. (ed) Periyar Feminism, (PeriyarManiammai University, Vallam, Thanjavur: 2010).

E-REFERENCES

1. Planning Commission report on Occupational Health and Safety
2. http://planningcommission.nic.in/about/committee/wrkgrp12/wg_occup_safety.p
2. Central Vigilance Commission (Gov. of India) website: http://cvc.nic.in/welcome.html

SUB CODE			XUM507	L	T	P	C
SUB NAME			ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE	0	0	0	0
PREREQUISITE			Nil				
C	P	A		L	T	P	H

Course objective

The course aims at imparting basic principles of thought process, reasoning and inferencing. Sustainability is at the core of Indian Traditional knowledge Systems connecting society and nature. Holistic life style of yogic science and wisdom capsules in Sanskrit literature are also important in modern society with rapid technological advancements and societal disruptions. Part-I focuses on introduction to Indian Knowledge Systems, Indian perspective of modern scientific world-view, and basic principles of Yoga and holistic health care system.

Course Contents

1. Basic structure of Indian Knowledge System
2. Modern Science and Indian Knowledge System
3. Yoga and Holistic Health care
4. Case studies

References

Knowledge traditions and practices of India, CBSE Publication

1. V. Sivaramakrishnan (Ed.), *Cultural Heritage of India-course material*, Bharatiya Vidya Bhavan, Mumbai. 5th Edition, 2014
2. Swami Jitatmanand, *Modern Physics and Vedant*haratiya Vidya Bhavan
3. Swami Jitatmanand, *Holistic Science and Vedant*haratiya Vidya Bhavan
4. Fritzof Capra, *Tao of Physics*
5. Fritzof Capra, *The Wave of life*
6. VN Jha (Eng. Trans.), *Tarkasangraha of Annam Bhatta*, International Chinmay Foundation, Velliarnad, Arnakulam
7. *Yoga Sutra of Patanjali*, Ramakrishna Mission, Kolkata
8. GN Jha (Eng. Trans.), Ed. RN Jha, *Yoga-darshanam with Vyasa Bhashya*, VidyanidhiPrakashan, Delhi 2016
9. RN Jha, *Science of Consciousness Psychotherapyand Yoga Practices*, VidyanidhiPrakashan, Delhi 2016
10. P B Sharma (English translation), *ShodashangHridayan*

Pedagogy : Problem based learning, group discussions, collaborative mini projects.

Outcome : Ability to understand, conn

COURSE CODE	XUM607	L	T	P	C
COURSE NAME	CONSTITUTION OF INDIA	3	0	0	0
PREREQUISITE:	NIL	L	T	P	H
C:P:A	0:0:0	3	0	0	3

COURSE OUTCOMES		Domain	Level
CO1	Understand the salient features of Indian Constitution	Cognitive	Understanding
CO2	Gather the information on the contours of Constitutional Rights and Duties	Cognitive	Understanding
CO3	know the functions and powers of Governance	Cognitive	Understanding
CO4	Summarise the Responsibilities of Local administration	Cognitive	Understanding
CO5	Able to understand the Function of Election Commission	Cognitive	Understanding

UNIT - I HISTORY AND PHIOLOSOPHY	9
History of Making of the Indian Constitution: History-Drafting Committee, (Composition& Working)Philosophy of the Indian Constitution: Preamble-Salient Features	
UNIT - II CONTOURS OF CONSTITUTIONAL RIGHTS & DUTIES	**9**
Fundamental Rights -Right to Equality-Right to Freedom-Right against Exploitation- Right to Freedom of Religion-Cultural and Educational Rights-Right to Constitutional Remedies-Directive Principles of State Policy-Fundamental Duties.	
UNIT - III ORGANS OF GOVERNANCE	**7**
Parliament-Composition-Qualifications and Disqualifications-Powers and Functions- Executive-President-Governor-Council of Ministers-Judiciary, Appointment and Transfer of Judges, Qualifications-Powers and Functions	
UNIT - IV LOCAL ADMINISTRATION	**11**
District‟s Administration head: Role and Importance, -Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. Pachayati raj: Introduction, PRI: ZilaPachayat. Elected officials and their roles, CEO Zila Pachayat: Position and role. Block level: Organizational Hierarchy (Different departments),Village level: Role of Elected and Appointed officials, Importance of grass root democracy	
UNIT – V ELECTION COMMISSION	**9**
Election Commission: Role and Functioning. -Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.

REFERENCES

1. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
2. The Constitution of India, 1950 (Bare Act), Government Publication.

SUB CODE			XUM706	L	T	P	C
SUB NAME			CYBER SECURITY	3	0	0	3
C	P	A		L	T	P	H
				3	0	0	3

OBJECTIVES

- To study about Cyber-attacks like viruses, worms, Trojan horses, phishing, DOS Attacks, Unauthorized access and control system Attacks.
- To protect system from Cyber-attacks.
- To enforce security for organization against Cyber-attacks.

UNIT – I : INTRODUCTION	**9**

History of Information Systems and its Importance, basics, Changing Nature of Information Systems, Need of Distributed Information Systems, Role of Internet and Web Services, Information System Threats and attacks, Classification of Threats and Assessing Damages Security in Mobile and Wireless Computing- Security Challenges in Mobile Devices ,authentication Service Security, Security Implication for organizations, Laptops Security Concepts in Internet and World Wide Web: Brief review of Internet Protocols-TCP/IP, IPV4, IPV6.Functions of various networking components-routers, bridges, switches, hub, gateway and Modulation Techniques.

UNIT – II : CYBER SECURITY OBJECTIVES AND GUIDANCE	**9**

Basic Principles of Information Security, Confidentiality, Integrity Availability and other terms in Information Security, Information Classification and their Roles. 11 Security Threats to E Commerce, Virtual Organization, Business Transactions on Web, E Governance and EDI, Concepts in Electronics payment systems, E Cash, Credit/Debit Cards

UNIT-III : CYBER SECURITY POLICY CATALOG	**9**

Physical Security- Needs, Disaster and Controls, Basic Tenets of Physical Security and Physical Entry Controls, Access Control- Biometrics, Factors in Biometrics Systems, Benefits, Criteria for selection of biometrics, Design Issues in Biometric Systems, Interoperability Issues, Economic and Social Aspects, Legal Challenges Framework for Information Security, ISO 27001, SEE-CMM, Security Metrics, Information Security Vs Privacy.

UNIT – IV : SECURITY SYSTEMS	**9**

Model of Cryptographic Systems, Issues in Documents Security, System of Keys, Public Key Cryptography, Digital Signature, Requirement of Digital Signature System, Finger Prints, Firewalls, Design and Implementation Issues, Policies Network Security- Basic Concepts, Dimensions, Perimeter for Network Protection, Network Attacks, Need of Intrusion Monitoring and Detection, Intrusion Detection Virtual Private Networks- Need, Use of Tunneling with VPN, Authentication Mechanisms, Types of VPNs and their Usage, Security Concerns in VPN.

UNIT – V : LEGAL ETHICS	**9**

Laws, Investigation and Ethics: Cyber Crime, Information Security and Law, Types & overview of Cyber Crimes, Cyber Law Issues in E-Business Management Overview of Indian IT Act, Ethical Issues

in Intellectual property rights, Copy Right, Patents, Data privacy and protection, Domain Name, Software piracy, Plagiarism, Issues in ethical hacking.				
	LECTURE	**TUTORIAL**	**PRACTICAL**	**TOTAL**
	45	**0**	**0**	**45**

TEXT BOOKS

1. Nina S.Godbole, "Information Systems Security", John wiley& sons India Private Limited, 2008.
2. Mark Merkow, Jim Breithaupt, "Information Security", Pearson Education.
3. D S Yadav, "Foundations of Information Technology", New Age International publisher, Delhi, 2001.

REFERENCES

1. Corey Schou, Daniel Shoemaker, "*Information Assurance for the Enterprise*", Tata McGraw Hill, 2006.
2. Vivek Sood,"Cyber Laws Simplified", Mc Graw Hill Education private Limited in 2001.
3. Steven M. Furnell, "Computer Insecurity", Springer Publisher, 2005 edition.

SUB CODE			XCE509	L	T	P	C
SUB NAME			PROFESSIONAL PRACTICE LAW& ETHICS	3	0	0	3
C	P	A		L	T	P	H
3	0	0		3	0	0	3

Course Objectives

- To make the students understand the types of roles they are expected to play in the society aspractitioners of the civil engineering profession
- To develop some ideas of the legal and practical aspects of their profession.
- To familiarize students with elementary knowledge of laws that would be of utility in their profession, including several new areas of law such as IPR, ADR.

Course Outcome		Domain	Level
CO1	To Understand the various stakeholders roles and ethicsgoverning the profession	Cognitive	Understanding
CO2	To able to contracts management and dispute resolution mechanisms;	Cognitive	Understanding
CO3	To give an understanding of Intellectual Property Rights,Patents.	Cognitive	Understanding
CO4	Able to understand construction related laws	Cognitive	Understanding
CO5	To develop ideas of the legal and practical aspects of theirprofession	Cognitive	Understanding

UNIT – I : PROFESSIONAL PRACTICE AND PROFESSIONAL ETHICS **9**

Respective roles of various stakeholders: Government Agencies (constituting egulatorybodies and standardization organizations, prescribing norms to ensure
safety of the citizens)-Standardization Bodies (ex. BIS, IRC)(formulating standards of practice); professional bodies (ex. Institution of Engineers(India), Indian Roads Congress, IIA/ COA, ECI, Local Bodies/ Planning Authorities) (certifying professionals and offering platforms for interaction); Clients/ owners (role governed by contracts); Developers (role governed by regulations such as RERA); Consultants (rolegoverned by bodies such asCEAI); Contractors (role governed by contracts and regulatory Acts and Standards); Manufacturers/ Vendors/ Service agencies (role governed by contracts and regulatory Actsand Standards)
Definition of Ethics, Professional Ethics, Business Ethics,Corporate Ethics,Engineering Ethics, Personal Ethics; Code of Ethics as defined in thewebsite of Institution of Engineers (India); Profession, Professionalism, ProfessionalResponsibility, Professional Ethics; Conflict of Interest, Gift Vs Bribery, Environmentalbreaches, Negligence, Deficiencies in state-of-the-art; Vigil Mechanism, Whistleblowing,protected disclosures.

UNIT – II : CONTRACTS MANAGEMEN *Indian Contract Act, 1972 and Amendments* covering General principles of contracting; **9**

Contract Formation & Law; Privacy of contract; Various types of contract and their features; Valid & Voidable Contracts; Prime and sub-contracts; Joint Ventures & Consortium; Complex contract

terminology; Tenders, Request For Proposals, Bids & Proposals; Bid Evaluation; Contract Conditions & Specifications; Critical /"Red Flag" conditions; Contract award & Notice To Proceed; Variations & Changes in Contracts; Differing site conditions; Cost escalation; Delays, Suspensions & Terminations; Time extensions & Force Majeure; Delay Analysis; Liquidateddamages& Penalties; Insurance & Taxation; Performance and Excusable Non-performance; Contract documentation; Contract Notices; Wrong practices in contracting (Bid shopping, Bid fixing, Cartels); Reverse auction; Case Studies; Build-Own- Operate & variations; Public- Private Partnerships; International Commercial Terms

UNIT-III : ARBITRATION, CONCILIATION AND ALTERNATIVE DISPUTE RESOLUTION SYSTEM **7**

Arbitration – meaning, scope and types – distinction between laws of 1940 and 1996; UNCITRAL model law – Arbitration and expert determination; Extent of judicial intervention; International commercial arbitration; Arbitration agreements – essential and kinds, validity, reference and interim measures by court; Arbitration tribunal – appointment, challenge, jurisdiction of arbitral tribunal, powers, grounds of challenge, procedure and court assistance; Award including Form and content, Grounds for setting aside an award, Enforcement, Appeal and Revision; Enforcement of foreign awards – New York and Geneva Convention Awards; Distinction between conciliation, negotiation, mediation and arbitration,confidentiality, resort to judicial proceedings, costs; Dispute Resolution Boards; LokAdalats

UNIT – IV : LABOUR AND LABOUR & OTHER CONSTRUCTION-RELATED LAWS **11**

Role of Labour in Civil Engineering; Methods of engaging labour- on rolls, labour sub-contract, piece rate work; Industrial Disputes Act, 1947; Collective bargaining; Industrial Employment (Standing Orders) Act, 1946; Workmen"s Compensation Act, 1923; Building& Other Construction Workers (regulation of employment and conditions of service) Act (1996) and Rules (1998); RERA Act 2017, NBC 2017

UNIT – V : LAW RELATING TO INTELLECTUAL PROPERTY **9**

Introduction – meaning of intellectual property, main forms of IP, Copyright, Trademarks, Patents and Designs, Secrets; Law relating to Copyright in India including Historical evolution of Copy Rights Act, 1957, Meaning of copyright – computer programs, Ownership of copyrights and assignment, Criteria of infringement, Piracy in Internet – Remedies and procedures in India; Law relatingto Patents under Patents Act, 1970 including Concept and historical perspective of patents law in India, Patentable inventions with special reference to biotechnology products, Patent protection for computer programs, Process of obtaining patent
– application, examination, opposition and sealing of patents, Patent cooperation treaty and grounds for opposition, Rights and obligations of patentee, Duration of patents – law and policy considerations, Infringement and related remedies;

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT BOOKS

1. B.S. Patil, Legal Aspects of Building and Engineering Contracts, 1974.
2. Meena Rao (2006), Fundamental concepts in Law of Contract, 3rd Edn. ProfessionalOffset
3. NeelimaChandiramani (2000), The Law of Contract: An Outline, 2nd Edn. AvinashPublicationsMumbai
4. Ethics in Engineering- M.W.Martin&R.Schinzinger, McGraw-Hill
5. Ramappa (2010), Intellectual Property Rights Law in India, Asia Law House
6. Avtarsingh (2002), Law of Contract, Eastern Book Co.
7. Dutt (1994), Indian Contract Act, Eastern Law House

8. Anson W.R. (1979), Law of Contract, Oxford University Press

REFERENCE BOOKS

1. Engineering ethics: concepts and cases – C. E. Harris, M.S. Pritchard, M.J.Rabins
2. Kwatra G.K. (2005), The Arbitration & Conciliation of Law in India with case law on
3. UNCITRAL Model Law on Arbitration, Indian Council of Arbitration
4. Wadhera (2004), Intellectual Property Rights, Universal Law Publishing Co.
5. The National Building Code, BIS, 2017
6. RERA Act, 2017

E-RESOURCES

1. Construction Contracts:http://www.jnormanstark.com/contract.html
2. Contracts Law : http://www.laderapress.com/laderapress/contractslaw1.html
3. Contract&Agreements: http://www.tco.ac.ir/law/English/agreements/General/Contract%20Law/C.htm
4. Contracts: http://206.127.69.152/jgretch/crj
5. Business & Personal Law: http://yucaipahigh.com/schristensen/lawweb/lawch7.ppt
6. Types Of Contracts And Important Provisions: http://www.worldbank.org/ html/ opr/consult/guidetxt/types.html
7. Contract Types/Pricing Arrangements: http://www.sandia.gov/policy

SUB CODE			XUM307	L	T	P	C
SUB NAME			UNIVERSAL HUMAN VALUES 2: UNDERSTANDING HARMONY	2	1	0	3
PREREQUISITE			None. Universal Human Values 1 (desirable)				
C	P	A		L	T	P	H
				2	1	0	3

Course Objective:

- Development of a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.
- Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence
- Strengthening of self-reflection.
- Development of commitment and courage to act.

On the successful completion of the course, students will be able to

COURSE OUTCOMES		DOMAIN	LEVEL
CO1	***Present*** sustainable solutions to the problems in society and nature. They are also able to see that these solutions are practicable and draw roadmaps to achieve them.	Psychomotor Affective	Responding
CO2	***Grasp*** the right utilization of their knowledge in their streams of Technology/Engineering/Management/any other area of study to ensure mutual fulfilment. Ex.mutually enriching production system with rest of nature.	Psychomotor Affective	Responding
CO3	***Evaluate*** the course and share with their friends. They are also able to ***suggest*** measures to make the course more effective and relevant. They are also able to ***make use of*** their understanding in the course for the happy and prosperous family and society.	Psychomotor Affective	Responding

UNIT - I : COURSE INTRODUCTION - NEED, BASIC GUIDELINES, CONTENT AND PROCESS FOR VALUE EDUCATION **6+3**

Purpose and motivation for the course, recapitulation from Universal Human ValuesI - Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' and ExperientialValidation- as the process for self-exploration - Continuous Happiness and Prosperity - A look at basic Human Aspirations - Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment of aspirations of every human being with their correct priority - Understanding Happiness and Prosperity correctly - A critical appraisal of the current scenario - Method to fulfil the above human aspirations: understanding and living in harmony at various levels.

Practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking.

UNIT – II : UNDERSTANDING HARMONY IN THE HUMAN BEING - HARMONY IN MYSELF	6+3

Understanding human being as a co-existence of the sentient 'I' and the material 'Body' - Understanding the needs of Self ('I') and 'Body' - happiness and physical facility - Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer) - Understanding the characteristics and activities of 'I' and harmony in 'I' - Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail - Programs to ensure Sanyam and Health.

Practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

UNIT – III:UNDERSTANDING HARMONY IN THE FAMILY AND SOCIETY- HARMONY IN HUMAN-HUMAN RELATIONSHIP	5+3

Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship - Understanding the meaning of Trust; Difference between intention and competence - Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship - Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals - Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives.

UNIT - IV : UNDERSTANDING HARMONY IN THE NATURE AND EXISTENCE - WHOLE EXISTENCE AS COEXISTENCE	4+2

Understanding the harmony in the Nature 1 - Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and selfregulation in nature - Understanding Existence as Co-existence of mutually interacting units in all-pervasive space - Holistic perception of harmony at all levels of existence.

Practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.

UNIT – V : IMPLICATIONS OF THE ABOVE HOLISTIC UNDERSTANDING OF HARMONY ON PROFESSIONAL ETHICS	7+3

Natural acceptance of human values - Definitiveness of Ethical Human Conduct - Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order - Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems. - Case studies of typical holistic technologies, management models and production systems -Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually

enriching institutions and organizations - Sum up. Practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. to discuss the conduct as an engineer or scientist etc.			
	LECTURE	**TUTORIAL**	**TOTAL**
	28	**14**	**42+3(SS)**
TEXT BOOKS			
1. Human Values and Professional Ethics - R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010.			
REFERENCE BOOKS			
1. Jeevan Vidya Ek- Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.			
2. Human Values - A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.			
3. Leonard, Annie. 2011. The Story of Stuff. New York, NY: Simon & Schuster.			
4. The Story of My Experiments with Truth - Mohandas Karamchand Gandhi AICTE Model Curriculum in Humanities, Social Science and Management Courses (UG Engineering & Technology)			
5. Small is Beautiful - E. F Schumacher.			
6. Slow is Beautiful - Cecile Andrews.			
7. Economy of Permanence - J C Kumarappa.			
8. Bharat Mein Angreji Raj –PanditSunderlal.			
9. Rediscovering India - by Dharampal.			
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi.			
11. India Wins Freedom - Maulana Abdul Kalam Azad			
12. Vivekananda - Romain Rolland (English)			
13. Gandhi - Romain Rolland (English)			

SUB CODE			XUM305	L	T	P	C
SUB NAME			ENTREPRENEURSHIP DEVELOPMENT	3	0	0	3
PREREQUISITE							
C	P	A		L	T	P	H
2.7	0	0.3		3	0	0	3

Course Outcome		Domain/Level C or P or A
CO1	***Recognise*** and ***describe*** the personal traits of an entrepreneur.	C (Understand) A(Receiving)
CO2	***Determine*** the new venture ideas and ***analyse*** the feasibility report.	C(Understand, Analyze)
CO3	***Develop*** the business plan and ***analyse*** the plan as an individual or in team.	C (Analyze) A (Receiving)
CO4	***Describe*** various parameters to be taken into consideration for launching and managing small business.	C (Understand)
CO5	***Explain*** the technological management and Intellectual Property Rights	C (Understand)

COURSE CONTENT

UNIT – I : ENTREPRENEURIAL TRAITS AND FUNCTIONS	**9**
Definition of Entrepreneurship; competencies and traits of an entrepreneur; factors affecting Entrepreneurship Development; Role of Family and Society ; Achievement Motivation; Entrepreneurship as a career and national development;	
UNIT – II : NEW PRODUCT DEVELOPMENT AND VENTURE CREATION	**9**
Ideation to Concept development; Sources and Criteria for Selection of Product; market assessment ; Feasibility Report ;Project Profile; processes involved in starting a new venture; legal formalities; Ownership; Case Study.	
UNIT – III : ENTREPRENEURIAL FINANCE	**9**
Financial forecasting for a new venture; Finance mobilization; Business plan preparation; Sources of Financing, Angel Investors and Venture Capital; Government support in startup promotion.	
UNIT – IV : LAUNCHING OF SMALL BUSINESS AND ITS MANGEMENT	**9**
Operations Planning - Market and Channel Selection - Growth Strategies - Product Launching – Incubation, Monitoring and Evaluation of Business - Preventing Sickness and Rehabilitation of Business Units.	
UNIT – V : TECHNOLOGY MANAGEMENT, IPR PORTFOLIO FOR NEW PRODUCT VENTURE	**9**
Technology management; Impact of technology on society and business; Role of Government in supporting Technology Development and IPR protection; Entrepreneurship Development Training and Other Support Services.	
L = 45 hrs T = 0 hrs P=0hrs Total = 45hrs	
TEXT BOOKS	

1. Hisrich, 2016, *Entrepreneurship*, Tata McGraw Hill, New Delhi.
2. S.S.Khanka, 2013, *Entrepreneurial Development*, S.Chand and Company Limited, New Delhi.

REFERENCES

1. Mathew Manimala, 2005, *Entrepreneurship Theory at the Crossroads, Paradigms & Praxis*, Biztrantra ,2nd Edition.
2. Prasanna Chandra, 2009, *Projects – Planning, Analysis, Selection, Implementation and Reviews*, Tata McGraw-Hill.
3. P.Saravanavel, 1997, *Entrepreneurial Development*, Ess Pee kay Publishing House, Chennai.
4. Arya Kumar,2012, *Entrepreneurship: Creating and Leading an Entrepreneurial Organisation*, Pearson Education India.
5. Donald F Kuratko, T.V Rao, 2012, *Entrepreneurship: A South Asian perspective*, Cengage Learning India.
6. Dinesh Awasthi, Raman Jaggi, V.Padmanand, Suggested Reading / Reference Material for Entrepreneurship Development Programmes (EDP/WEDP/TEDP), EDI Publication, Entrepreneurship Development Institute of India, Ahmedabad. Available from: http://www.ediindia.org/doc/EDP-TEDP.pdf

E-REFERENCES

1. Jeff Hawkins, " Characteristics of a successful entrepreneur", ALISON Online entrepreneurship courses, "https://alison.com/learn/entrepreneurial-skills
2. Jeff Cornwall, "Entrepreneurship -- From Idea to Launch", Udemy online Education, https://www.udemy.com/entrepreneurship-from-idea-to-launch/

Subject Name	Economics for Engineers	
Subject Code	XUM601	
L –T –P –C 3 - 0 – 0– 3	C:P:A 2.64:0.24:0.12	L –T –P –H 3- 0– 0 – 3

Course Outcome		Domain/Level C or P or A
CO1	***Explain*** the concepts of economics in engineering and ***identify*** element of cost to prepare cost sheet	C(Understand) P(Perception)
CO2	***Calculate and Explain*** the Break-even point and marginal costing	C(Apply, Understand) P(Perception)
CO3	***Summarize*** and ***Use*** value engineering procedure for cost analysis	C(Understand) A(Receive)
CO4	***Estimate*** replacement problem	C(Understand)
CO5	***Compute, Explain*** and ***make Use of*** different methods of depreciation	C(Understand, Apply)

COURSE CONTENT

UNIT I	INTRODUCTION TO ECONOMICS	8 hrs

Flow in an economy, Law of supply and demand, Concept of Engineering Economics – Engineering efficiency, Economic efficiency, Scope of engineering economics- types of costing, element of costs, preparation of cost sheet and estimation, Marginal cost, Marginal Revenue, Sunk cost, Opportunity cost

UNIT II	BREAK-EVEN ANALYSIS&SOCIAL COST BENEFIT ANALYSIS	12 hrs

Margin of Safety, Profit, Cost & Quantity analysis-Product Mix decisions and CVP analysis, Profit/Volume Ratio (P/V Ratio), Application of Marginal costing, Limitations

Social Cost Benefit Analysis: compare different project alternatives, Calculate direct, indirect and external effects; Monetizing effects; Result of a social cost benefit analysis.

UNIT III	VALUE ENGINEERING &COST ACCOUNTING	10 hrs

Value engineering – Function, aims, Value engineering procedure - Make or buy decision Business operating costs, Business overhead costs, Equipment operating costs

UNIT IV	REPLACEMENT ANALYSIS	7 hrs

Replacement analysis –Types of replacement problem, determination of economic life of an asset, Replacement of an asset with a new asset.

UNIT V	DEPRECIATION	8 hrs

Depreciation- Introduction, Straight line method of depreciation, declining balance method of depreciation-Sum of the year's digits method of depreciation, sinking fund method of depreciation, Annuity method of depreciation, service output method of depreciation.

L = 45 hrs T = 0 hrs P=0hrs Total = 45 hrs

TEXT BOOKS

1. Sp Gupta, Ajay Sharma &SatishAhuja, "Cost Accounting", V K Global Publications,Faridabad, Haryana, 2012
2. S.P.Jain&Narang, "Cost accounting – Principles and Practice", Kalyani Publishers,Calcutta, 2012
3. PanneerSelvam, R, "Engineering Economics", Prentice Hall of India Ltd, New Delhi, 2001.

4. William G.Sullivan, James A.Bontadelli&ElinM.Wicks, “Engineering Economy”,Prentice Hall International, New York, 2001.

REFERENCES

1. Luke M Froeb / Brian T Mccann, “ Managerial Economics – A problem solving approach” Thomson learning 2007
2. Truett&Truett, “Managerial economics- Analysis, problems & cases “ Wiley India 8th edition 2004.
3. Chan S.Park, “Contemporary Engineering Economics”, Prentice Hall of India, 2002.
4. Donald.G. Newman, Jerome.P.Lavelle, “Engineering Economics and analysis” Engg. Press, Texas, 2002

E-REFERENCES - 1.http://nptel.iitm.ac.in/video.php

Subject Name	**Renewable Energy Sources**	
Subject Code	**XMEOE2**	
L –T –P –C	**3-1– 0–4**	
COURSE CONTENT		
UNIT I	**ENERGY AND ENVIRONMENT**	**10 hrs**
Primary energy sources - world energy resources - Indian energy scenario - energy cycle of the earth –environmental aspects of energy utilization, CO_2 emissions and global warming, Carbon cycle – renewable energy resources and their importance. Potential impacts of harnessing the different renewable energy resources.		
UNIT II	**BIO ENERGY**	**9 hrs**
Energy from bio mass & bio gas plants - various types - design principles of biogas plants - applications. Industrial, municipal and agricultural waste to Energy, Incineration - advantages and limitations – Bio fuels – types, production methods, properties and applications.		
UNIT III	**SOLAR ENERGY**	**10 hrs**
Principles of solar energy collection -.solar radiation - measurements - instruments - types of collectors - characteristics and design principles of different type of collectors - performance of collectors. Solar thermal applications – water heaters and air heaters - performance and applications - simple calculations - solar cooling - solar drying - solar ponds - solar tower - solar furnace.		
UNIT IV	**WIND, TIDAL AND GEO THERMAL ENERGY**	**9 hrs**

Energy from the wind - general theory of windmills - types of windmills - design aspects of horizontal axis windmills - applications. Energy from tides and waves – working principles of tidal plants and ocean thermal energy conversion plants - power from geothermal energy - working principle of geothermal power plants		
UNIT V	**ENERGY CONSERVATION AND AUDIT**	**7 hrs**
Energy Conservation, Energy Audit and Energy Management-Principles and Techniques.		
L = 45 hrs T = 0 hrs P= 0 hrs Total = 45 hrs		
TEXT BOOKS		
1. Rai G.D, "Non conventional Energy sources" (1999) Khanna Publishers, New Delhi 2. Duffie and Beckmann, "Solar Energy Thermal Processes, John Wiley, 1974.		
REFERENCES		
1. Sukhatme, S.P., Solar Energy, 2nd edition, TMH, 2003 2. Sulton, "Direct Energy Conversion", McGraw-Hill, 1966. 3. Garg. H. P and Prakash. J., "Solar Energy - Fundamentals and applications", TMH, New Delhi, 1997. 4. Ashok V Desai, "Non-conventional Energy", Wiley Eastern Ltd, New Delhi, 1990		
E-REFERENCES		
1.http/NPTEL Online /IITM		

SUB CODE	SUB NAME	L	T	P	C
XMEE17	INDUSTRIAL SAFETY	3	0	0	3

C	P	A
3	0	0

L	T	P	H
3	0	0	3

PREREQUISITE:

Course outcomes:		Domain	Level
CO1:	**Evaluate** the safety performance of an organization from accident records	**Cognitive**	Evaluating
CO2:	**Explain** the functions and activities of safety engineering department	**Cognitive**	Understanding, Evaluating
CO3:	**Select** complex man machine systems using human factors engineering tools so as to achieve comfort, worker satisfaction, efficiency, error free and safe workplace environment	**Cognitive**	Remembering, Applying
CO4:	**Choose** the various physiological functions of our body and the test methods for periodical monitoring of health	**Cognitive**	Remembering, Applying, Evaluating, Creating
CO5:	**List** out important legislations related to Health , Safety and Environment	**Cognitive**	Remembering, Analyzing

COURSE CONTENT **Hours**

` UNIT-I ACCIDENT PREVENTION 9

Definitions - history of safety movement - ILO – NSC – BSC – LPA - theories and principles of accident causation - cost of accidents - accident reporting and investigation - safety committee - safety suggestion scheme - safety education and training -safety management techniques

UNIT –II SAFETY MANAGEMENT 9

. Safety systems - safety information system – safety control system - hazard and risk analysis – risk assessment methodologies - Fault Tree Analysis (FTA) and Event Tree Analysis (ETA) - total loss control - risk management.

UNIT-III HUMAN FACTORS ENGINEERING 9

Man machine system- human behaviour- principles of ergonomics- factors impeding safety and personal protective equipment.

UNIT –IV OCCUPATIONAL HEALTH AND HYGIENE 9

Physical hazards - chemical hazards – recognition of hazards – evaluation – control measures - occupational health – concept and spectrum of health – industrial toxicology – definitions – hazard – toxicity local and systemic effect routes ofentry

UNIT V SAFETY REGULATION 9

History of legislations related to safety - factories act and rules - workmen compensation act - OSHA standards.

THEORY 45 PRACTICAL 0 TOTAL HRS 45

TEXT BOOKS

1. John V Grimaldi and Rollin H Simonds, Safety management, All India Travelers book seller, New delhi,1989. 2. Occupational Safety manual, BHEL, 2002.

REFERENCES

1. Accident Prevention Manual for Industrial Operations, NSC, Chicago, 1982.

2. Brown, D.B., System Analysis and Design for Safety, Prentice Hall Inc., New Jersy, 1976.

3. Encyclopedia of Occupational Health and Safety, Vol. I and II, International Labour Organisation, Geneva, 1985.

4. Handbook of Occupational Health and Safety, NSC Chicago, 1982.

5. Heinrich, H.W., Industrial Accident Prevention, McGraw-Hill, 1980.

6. Lees, F.P., Loss Prevention in Process Industries, Butterworths, New Delhi, 1986.

7. McCornick, E.J., and Sanders, M.S., Human Factors in Engineering and Design, Tata McGraw-Hill, 1982.

XMEE19 TOTAL QUALITY MANAGEMENT 3 0 0 3

AIM:

To provide comprehensive knowledge about the principles, practices, tools and techniques of Total quality management.

OBJECTIVES:

- To understand the various principles, practices of TQM to achieve quality.
- To learn the various statistical approaches for Quality control.
- To understand the TQM tools for continuous process improvement.
- To learn the importance of ISO and Quality systems.

Unit – I INTRODUCTION **6**

Definition of Quality, Dimensions of Quality, Quality Planning, Historical Review, Quality Council, Quality Statements, Quality costs - Analysis Techniques for Quality Costs. Customer satisfaction, Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention.

Unit – II TQM PRINCIPLES **9**

Principles of TQM, Leadership – Concepts, Role of Senior Management, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation,–Employee Involvement – Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement.

Unit – III TQM METHODS **6**

Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, Strategy, Performance Measure.

Unit – IV STATISTICAL PROCESS CONTROL (SPC) **9**

The seven tools of quality, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes,

Process capability, Concept of six sigma, New seven Management tools.

Unit – V TQM TOOLS **8**

Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA.

Unit – VI QUALITY SYSTEMS **7**

Need for ISO 9000 and Other Quality Systems, ISO 9000:2008 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, ISO 14000 and OHSAS 20000– Concept, Requirements and Benefits.

TOTAL : 45

TEXT BOOK

Dale H.Besterfiled, et al., “Total Quality Management”, Pearson Education, Inc. 2003. (Indian reprint 2004). ISBN 81-297-0260-6.

REFERENCES

1. James R.Evans & William M.Lidsay, "The Management and Control of Quality", (5th Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).
2. Feigenbaum.A.V. "Total Quality Management", McGraw Hill, 1991.
3. Oakland.J.S. "Total Quality Management", Butterworth – Hcinemann Ltd., Oxford. 1989.
4. Narayana V. and Sreenivasan, N.S. "Quality Management – Concepts and Tasks", New Age International

E-RESOURCES:

1. http://nptel.iitm.ac.in/syllabus/syllabus.php?subjectId=110101010

2. http://www.intechopen.com/books/total-quality-management-and-six-sigma

3.http://www.intechopen.com/books/total-quality-management-and-six-sigma/the-integration-of-tqm-and-six-sigma

YRE101- SOLAR ENERGY SYSTEMS 3 0 0 3

(Use of approved data book permitted in the examination)

UNIT - I SOLAR RADIATION 9

Source of radiation – Sun earth relationship- extra terrestrial radiation.– Atmospheric attenuation – terrestrial radiation-radiation on a horizontal surfaces and inclined planes-relations between horizontal radiation and inclined surfaces – relations between monthly, daily and hourly radiation and components of the radiations– solar charts – Critical radiation-Measurement of global, direct and diffuse solar radiation- pyrohelio meter, pyrano meter, pyro geo meter, net pyradiometer-sunshine recorder – an overview of solar radiation data in India.

UNIT - II SOLAR COLLECTORS – FLAT PLATE COLLECTORS 9

Design considerations – classification- Flat plate collectors- air heating collectors liquid heating – Temperature distributions- Heat removal rate- Useful energy gain – Losses in the collectors-for efficiency of flat plate collectors – selective surfaces – tubular solar energy collectors analysis of concentric tube collector – testing of flat plate collectors. Solar green house. Solar Tracking. Solar kilns

UNIT- III CONCENTRIC SOLAR COLLECTORS ANDTHERMAL APPLICATION 9

Concentric collectors-Limits to concentration – concentrator mounting – tracking mechanism - performance analysis focusing solar concentrators: Heliostats. Solar powered absorption A/C system (Ammonia/water) solar water pump, solar chimney, solar drier, solar dehumidifier, solar still, solar cooker.

UNIT – IV SIMULATION AND ENERGY STORAGE 9

Simulation in Solar Process Design- TRANSYS- Design of active systems- f chart methods for liquid and air heaters- phi bar, of chart method - sensible, latent heat and thermo-chemical storage-pebble bed etc. materials for phase change- Glauber's salt-organic compounds -solar ponds.

UNIT- V SOLAR PV SYSTEM 9

Photovoltaic cell – characteristics -maximum power- tracking-cell arrays-power electric circuits for output of solar panels--inverters-batteries-charge regulators, Construction concepts. Latest trends in PV systems, Life cycle analysis of solar energy system time value of money, evaluation of carbon credit of solar energy system.

A compulsory seminar / assignment on design / case study/analysis /application in any one of the solar thermal energy system **L:45; T:15; Total:60**

TEXT BOOKS:

1. DuffieJ.A and Beckman, W.A., "Solar Engineering of Thermal Processes", 2nd Edition, John Wiley& Sons Inc., Newyork, 1991
2. G.N. Tiwari."Solar Energy ; Fundamentals ,design,modelilg and applications " Third RePrint , Narosa Publishing House, New Delhi,2006

REFERENCES:

1.Edward E.Anderson, "Fundamentals for Solar Energy Conversion", Addison Wesley pubCO.,1983.
2.Fank Kreith,,Jan F.Kreider,:Principles of solar Engg", 1978.
3.Koushika M.D," Solar Energy Principles and Applications", IBT publications and distributors, 1988.
4.Kaushik S.C, Tiwari G.N and Nayak J.K, "Thermal control in passive solar buildings" .IBT Publishers & Distributors, 1988.

YRE102- WIND ENERGY, TIDAL ENERGY AND OTEC 3 0 0 3

UNIT - I MEASUREMENT TECHNIQUES 12

(Use of approved data book permitted in the examination)

Introduction-measurement and instrumentation-Beau fort number Guest parameters-wind type-power law index betz constant Terrain value.Wind speed characterization-site survey and site analysis -Energy in wind-Highest, lowest wind speeds-wind speed for return periods-study of wind applicable Indian standards-steel Tables, Structrual Engineering.

UNIT – II WINDMILL AND WIND TURBINE 10

Wind mill characteristics – types of wind mills- performance analysis -Merits and limitation-variables in wind energy conversion system-wind power density-power in a wind stream-wind turbine efficiency-power of a wind turbine for given in-coming wind velocity - forces on the blades of a propeller-examples of wind farm site-mean wind velocity-wind velocity duration curve-energy pattern factor-wind power duration characteristics - Tip speed ratios - Solidity curves.

Terms-study of all types of turbines (HAWT, VAWT)-typical large capacity wind turbines-sizing-tower design-power duration curves-wind rows diagrams –study of characteristics-actuator theory –analysis of Hourly, daily, monthly, annual, wind behavior-control and instrumentations. syncln & power stabilization synchronization & power stabilization.

UNIT - III POWER GENERATION AND HYBRIDISATION 10

Types of wind energy system-alternatives-Grid-combination of diesel generator, Battery storage-wind turbine circuits-wind map of India-Wind farm-indefinitely developed wind turbine-study of various wind turbines manufactured indigenously - kilowatt rating-retrofits-R&M-OP & FC-speed limitation-fatigue stress.

UNIT - IV WAVE AND TIDAL ENERGY 7

Wave energy -Tidal changes – Ecological changes – Types Tidal Power – Energy from Sea – Tidal Turbines – Tidal Power Generation – Recent Trends and Developments – Problems and solutions – Case Studies.

UNIT - V OTEC 6

The concepts- construction and operational problems – history of OTEC development Alternative energy technology – Ocean thermal energy conversion – Techniques – Problems and solutions – Case Studies-ecological and environmental aspects.

A compulsory seminar / assignment on design / case study/analysis /application in any one of the Wind energy,Tidal and OTEC **L:45; Total:45**

TEXT BOOKS;

1.E.L Wakil ”Power plant technology”, McGrawGill Publishers,New York
2.G. D Rai “Non Conventional Energy sources” Khanna publishers. New Delhi

REFERENCES:

1.S.Rao & B.B.Parulekar,”Energy Technology”, 3rd edition,Khanna publishers,1995.
2.Anna Mani & Dr.Nooley,”wind Energy Data for India”, 1983.

YRM107 – Research Methodology and IPR 2 0 0 2

Unit 1: Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations

Unit 2: Effective literature studies approaches, analysis Plagiarism, Research ethics,

Unit 3: Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee

Unit 4: Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

Unit 5: Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications.

Unit 6: New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.

References:

1. Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science & engineering students'"
2. Wayne Goddard and Stuart Melville, "Research Methodology: An Introduction"
3. Ranjit Kumar, 2 nd Edition, "Research Methodology: A Step by Step Guide for beginners"
4. Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd ,2007. Mayall , "Industrial Design", McGraw Hill, 1992.
5.. Niebel , "Product Design", McGraw Hill, 1974.
6. Model Curriculum of Engineering & Technology PG Courses [Volume -II] 125 Asimov, "Introduction to Design", Prentice Hall, 1962.
7. Robert P. Merges, Peter S. Menell, Mark A. Lemley, " Intellectual Property in New Technological Age", 2016.
8. T. Ramappa, "Intellectual Property Rights Under WTO", S. Chand, 2008

YEGOE1- ENGLISH FOR RESEARCH PAPER WRITING

UNIT 1:- Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity andVagueness **4**

UNIT 2:- Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticising, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts. Introduction **4**

UNIT 3:- Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check. 4

UNIT 4:- key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature. **4**

UNIT 5:- Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions **4**

UNIT 6:- useful phrases, how to ensure paper is as good as it could possibly be the first- time submission **4**

Suggested Studies:

1. Goldbort R (2006) Writing for Science, Yale University Press (available on Google Books)
2. Day R (2006) How to Write and Publish a Scientific Paper, Cambridge University Press
3. Highman N (1998), Handbook of Writing for the Mathematical Sciences, SIAM. Highman'sbook .
4. Adrian Wallwork , English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2011.

YRE104C - FUELS AND COMBUSTION TECHNOLOGY 3 0 0 3

UNIT – I FUELS & FUEL ANALYSIS: 8

Types of fuel-Physical and chemical characteristics of solid, liquid, and gaseous fuels-Non conventional fuel-producer gas, hydrogen, biogas etc- Determination of Calorific values-Ultimate and proximate analysis-problems associated with handlings, storage and combustion

COMBUSTION STOICHIOMETRY 9

Stoichiometry relations – conservation of mass principles – theoretical & actual combustion processes – calculation of air fuel ratio for a fuel of known combustion – calculation of flue gas composition of fuel and excess air supplied from exhaust gas analysis – combustion calculation with sub-stoichiometry air – calculation of atmospheric air moisture – Dew point temperature of the combustion products – Flue gas analysis- Boiler performance analysis

UNIT - II THERMODYNAMICS OF COMBUSTION PROCESSES 10

COMBUSTION KINETICS: Degree of reactions-reactions equilibrium-Laws of mass action-criteria of equilibrium-heat and temperature-Gibbs free energy – equilibrium constant-Vant hoffs isotherm – rate of reaction-factors affecting rate of reaction-calculation of equilibrium constant and composition of reating systems .

UNIT- III FLAME, FLAME STRUCTURE, IGNITION AND IGNITORS 10

Flame – flame structure – flame propagation – deflagaration – detonations – flame front – Ignition – self & forced ignition – Ignition temperature & ignition limits – Factors influencing ignition – SIT – Ignition lag – limits of inflammability & its determination – factors affecting inflammability limits – calculation of inflammability limits – flame blow off, blow out & flash back – flame quenching, Flame structure – flame stability – premixed & diffused flames – velocity of flame propagation – various methods of flame stabilization – swirl number & its significance – Turndown ratio – Ignitors – various types of ignitors – NFPA class I, II & III ignitors – Eddy plate ignitor – plasma ignitor – High energy Arc ignitor – DIPC ignitor.

UNIT- IV BASICS OF FURNACES **10**

Industrial furnaces – process furnaces Steam generating furnaces – Kilns – Batch & continuous furnaces – Advantages of ceramic coating – Heat source – Distributions of head source in furnaces – Blast furnace – open hearth furnace – pot & crucible furnaces – waste heat recovery in furnaces – Recuperator – Regenerators – Furnace atmospheres – Furnace Insulation – Furnace Heat balance calculations, Pipe still Heater.

UNIT - V COAL BURNING EQUIPMENTS **7**

Coal burning methods – over feed & underfeed supply of coal – Mechanical Stokers – Travelling grate & spreader stoker – vibrating grate stoker – Advantages & disadvantages of stoker firing over pulverized systems of firing – problems encountered with burning of high ash coal. Pulverized fuel burners – streamlined burner – turbulent burners – Tangential burner – cyclone burner – special type burners.A compulsory seminar / Assignment on design /case study / Analysis/ Application in any one of the combustion system and accessories (viz Burner,Draught etc)

L:45; Total:45

TEXT BOOKS:

1. Dr. SamirSarkar, "Fuels & Combustion", Orient Longman, Second edition, 1990.
2. Gupta O.P. "Elements of Fuels, Furnaces & Refractories", 3rd edition, Khanna Publishers, 1996.

REFERENCES:

1. S.P. Sharma & Chander Mohan, "Fuels & Combustion", Tata McGraw Hill Publishing Co.Ltd., 1984
2. J.D. Gilchrist, "Fuels, Furnaces & Refractories", Pergamon Press, ISBN-008-029430-9 ----
3. Blokh A.G. "Heat Transmission in Steam Boiler furnaces", Hemisphere Publishing Corpn.ISBN-089-116-626-2

Subject Name **ENVIRONMENTAL STUDIES**
Subject Code **YRE105A**

L –T –P –C	C:P:A	L –T –P –H
3- 0 – 0– 0	2.5:0:0.5	3- 0– 0 – 3

Course Outcome		**Domain/Level C or P or A**
CO1	Describe the significance of natural resources and explain anthropogenic impacts.	C (Remembering and Understanding)
CO2	Illustrate the significance of ecosystem, biodiversity and natural geo bio chemical cycles for maintaining ecological balance.	C (Understanding)
CO3	Identify the facts, consequences, preventive measures of major pollutions and recognize the disaster phenomenon.	C (Remembering) A(Receiving)
CO4	Explain the socio-economic, policy dynamics and practice the control measures of global issues for sustainable development.	C (Understanding and Analyzing)
CO5	Recognize the impact of population and the concept of various welfare programs, and apply the modern technology towards environmental protection.	C (Understanding and Applying)

COURSE CONTENT

UNIT I INTRODUCTION TO ENVIRONMENTAL STUDIES AND ENERGY **9 hrs**

Definition, scope and importance – Need for public awareness – Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, flood, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies – 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 II ECOSYSTEMS AND BIODIVERSITY **9 hrs**

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 (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to Biodiversity – Definition: genetic, species and ecosystem diversity - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT III ENVIRONMENTAL POLLUTION **12 hrs**

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: flood, earthquake, cyclone and landslide.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT **9 hrs**

Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, 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.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT **6 hrs**

Population growth, variation among nations – Population explosion – Family welfare programme – Environment and human health – Human rights – Value education - HIV / AIDS – Women and Child welfare programme– Role of Information Technology in Environment and human health – Case studies.

L = 45 hrs T = 0 hrs P= 0 hrs Total = 45 hrs

TEXT BOOKS

1. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co, USA, 2000.
2. Townsend C., Harper J and Michael Begon, Essentials of Ecology, Blackwell Science, UK, 2003
3. Trivedi R.K and P.K.Goel, Introduction to Air pollution, Techno Science Publications, India, 2003.
4. Disaster mitigation, Preparedness, Recovery and Response, SBS Publishers & Distributors Pvt. Ltd, New Delhi, 2006.
5. Introduction to International disaster management, Butterworth Heinemann, 2006.
6. Gilbert M.Masters, Introduction to Environmental Engineering and Science, Pearson Education Pvt., Ltd., Second Edition, New Delhi, 2004.

REFERENCES

1. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media, India, 2009.
2. Cunningham, W.P.Cooper, T.H.Gorhani, Environmental Encyclopedia, Jaico Publ., House, Mumbai, 2001.
3. S.K.Dhameja, Environmental Engineering and Management, S.K.Kataria and Sons, New Delhi, 2012.
4. Sahni, Disaster Risk Reduction in South Asia, PHI Learning, New Delhi, 2003.
5. Sundar, Disaster Management, Sarup & Sons, New Delhi, 2007.
6. 6.G.K.Ghosh, Disaster Management, A.P.H.Publishers, New Delhi, 2006.

YRE105B - CARBON SEQUESTRATION AND TRADING 3 0 0 3

UNIT - I GREENHOUSE GAS **9**

Stabilization of greenhouse gas concentrations – greenhouse gas risks and reservoirs – green gas mitigation – Carbon di oxide and climate change, acid rain, global warming, impacts of global warming-Kyeto-procal.

UNIT - II CARBON **9**

Practices for sequester carbon - car bon sequestration types – carbon credits – carbon testing – potential for carbon sequestration.

UNIT - III MANAGEMENT **9**

Risk management and risk reduction – carbon economics – Verification of carbon change.

UNIT - IV CASE STUDIES **9**

Carbon trading model – Century Model – Case Studies.

UNIT - V RULES AND REGULATIONS **9**

Implication Methanol and Nitrous Oxide carbon bank – Best Management Practices 0 Publics issues – policies.

L:45; Total:45

TEXT BOOKS

1. Emission Trading:Environmental Policies New approach-Richard F. Kosobud, Douglas L. Schreder, Holly M. Biggs Published 2000 John Wiley and Sons.

REFERENCES:

1 Agricultural Practices and Policies for Carbon Sequestration in Soil By John M. Kimble, Rattan Lal Published 2002CRCPress

2. The Impact of Carbon Dioxide and Other Greenhouse Gases on Forest Ecosystems By David F. Karnosky Published 2001
CABI Publishing

YRE105C - WASTE MANAGEMENT AND ENERGY RECOVERY 3 0 0 3

UNIT – I SOLID WASTE 8

Definitions – Sources, types, Compositions, Properties of Solid Waste – Municipal Solid Waste – Physical, Chemical and Biological Property – Collection – Transfer Stations – Waste Minimization and Recycling of Municipal Waste.

UNIT – II WASTE TREATMENT 8

Size Reduction – Aerobic Composting – Incineration – Furnace Type and Design, Medical/Pharmaceutical Waste Incineration – Environmental Impacts – Measures of Mitigate Environmental Effects due to Incineration.

UNIT – III WASTE DISPOSAL 9

Land Fill Method of Solid Waste Disposal – Land Fill Classification, Types, Methods and Sitting Consideration – Layout and Preliminary Design of Land Fills – Composition, Characteristics, generation, Movement and Control of Landfill Leachate and Gases – Environmental Monitoring System for Land Fill Gases.

UNIT – IV HAZARDOUS WASTE MANAGEMENT 10

Definition and Identification of Hazardous Waste – Sources and Nature of Hazardous Waste – Impact on Environment – Hazardous Waste Control – Minimization and Recycling Assessment of Hazardous Waste – Disposal of Hazardous Waste, Underground Storage Tanks Construction, Installation and Closure.

UNIT – V ENERGY GENERATION FROM WASTE 10

Types – Biochemical Conversion – Sources of Energy Generation – Industrial Waste, Agro Residues – Anaerobic Digestion – Biogas Production - Types of Biogas Plant Thermochemical Conversion – Sources of Energy Generation – Gasification – Types of Gasifiers – Briquetting – Industrial Applications of Gasifiers – Utilization and Advantages of Briquetting – Environment Benefits of Biochemical and Thermochemical Conversion. **L:45; Total:45**

TEXT BOOKS

REFERENCES:

1. Parker, Colin & Roberts, Energy from Waste – An Evaluation of Conversion Technologies, Elsievier Applied Science, London, 1985.
2. Shah, Manoj Datta, Waste Disposal in Engineered Landfills, Narosa Publishing House, 1997.
3. Rich, Gerald et.al., Hazardous Waste Management Technology, Podevan Publishers, 1997.
4. Bhide AD., Sundaresan BB, Solid Waste Management in Developing Countries, INSDOC, New Delhi, 1983.

YRE 201 - BIO ENERGY SYSTEMS 3 0 0 3

UNIT- I BIO FULES **9**

Bio fuels: types, Properties and sources- Bio fuels first, second and third generation production processes and technologies- Bio diesel comparison with diesel - Biofuel applications – Bio diesel and Ethanol as a fuel for I.C. engines - Relevance with Indian Economy - Bio-based Chemicals and Materials - Commercial and Industrial Products - Govt. Policy and Status of Bio-fuel technologies in India.

UNIT - II CHARACTERISATION OF BIOMASS **9**

Biomass: Sources and Classification. – Properties - Energy plantation - Preparation of biomass. Size reduction- Briquetting of loose biomass - Drying, storage and handling of biomass. Conversion of biomass. Biomass processing for liquid and gaseous fuel production. Effect of

particle size, temperature, on products obtained – Processing of various biomass for gas production for Thermal and Electrical application.

UNIT- III BIOGAS TECHNLOGY **10**

Feed stock for biogas production, animal residues, Aqueous wastes containing biodegradable organic matter- Microbial and biochemical aspects- factors and operating parameters for biogas production- Kinetics and mechanism-Dry and wet fermentation. Digesters-types-digesters for rural application – High rate digesters for industrial waste water treatment

UNIT- IV GASIFICATION OF BIOMASS **10**

Thermo chemical Principles: Effect of pressure, temperature and introducing, steam and oxygen. Design and operation of fixed and fluidized bed Gasifier, circulating fluidized bed gasifiers, Safety aspects, operating characteristics of moving bed and fluidized bed gasifier- different types- advantages and disadvantages- performance analysis of gasifiers.

UNIT – V COMBUSTION OF BIOMASS & COGENERATION SYSTEMS **7**

Combustion of woody biomass – theory, calculations and design of equipments, Cogeneration in biomass processing industries. – Economic Case studies: Combustion of rice husk. Use of bagasse for cogeneration.

A compulsory seminar / assignment on design / case study/analysis /application in any one of the Bio Energy systems

L:45; Total:45

TEXT BOOKS;

1. Chakraverthy A, “Biotechnology and Alternative Technologies for Utilisation of Biomass or Agricultural Wastes”, Oxford & IBH publishing Co, 1989.
2. Mittal K.M “ Biogas Systems : “Principles and Applications” New age international publishers (P) Ltd 1996, Nijaguna, B.T Biogas Technology, New age International publishers (P) Ltd

REFERENCES:

1 Venkata Ramana P and Srinivas S.N, "Biomass Energy Systems", ISBN 81-85419- 25-6, Tata Energy Research Institute, 1996.
3. Klass D.L and Emert G.M, "Fuels from Biomass and Wastes", Ann Arbor Since Publ. Inc. Michigan, 1985.
4. O.P.Chawla, "Advances in Bio-gas Technology" I.C.A.R., New Delhi, 1970.

YRE204C – SUSTAINABLE DEVELOPMENT 3 0 0 3

UNIT - I INTRODUCTION 12

Industrial activity and Environment industrialization and sustainable development – Industrial Ecology – Prevention versus control of industrial pollution – Regulations to encourage cleaner production based approached.

UNIT - II CLEANER PRODUCTION CONCEPT 7

Importance – Historical evolution – Benefits – promotion – barriers – Role of Industry, government and Institutional – Resume, recovery, recycle, substitution – Internet information & other CP resources.

UNIT- III CLEANER PRODUCTION PROJECT DEVELOPMENT 10

Overview of CP Assessment steps & skills – preparing for the site – material balance – Technical and Environmental feasibility analysis – Economic Evolution of alternatives – Total cost analysis – CP financing - Established programme – Preparing & programme plan – reset audit – Environmental statement

UNIT - IV LIFE CYCLE ANALYSIS & ENVIRONMENTAL MANAGEMENT SYSTEM 8

Elements of LCA - life cycle costing – ECO labelling - Design for the Environment Environmental standards – ISO 14001 – Environmental audit.

UNIT - V CASE STUDY 8

Industrial application of CP, LCA, EMS & Environmental audit
L:45; Total: 45

REFERENCES:

1. Pollution prevention: Fundamental and Practice, Paul L Bishap, McGrawhill , INC
2. Pollution prevention and abatement Handbook – Towards cleaner production – World bank and UNDP, Washinghton, D.C
3. Cleaner Production Audit, Prasad Modak, Asian Institute of Technology, Bangkok

YRE 205B - HYDROGEN AND NUCLEAR ENERGY 3 0 0 3

UNIT - I HYDROGEN ENERGY **9**

Hydrogen as a renewable energy source - Sources of Hydrogen - Fuel for Vehicles - Hydrogen Production - Direct electrolysis of water - direct thermal decomposition of water - biological and biochemical methods of hydrogen production - Storage of hydrogen - Gaseous, Cryogenic and Metal hydride - Utilization of hydrogen.

UNIT - II BATTERIES & FUEL CELL **12**

Battery – Storage cell Technologies -storage cell fundamentals- characteristics – Emerging trends in batteries-Carbon- Zinc & alkaline cells, Mercury, Zinc –air &Silver oxide button cells, Lead acid, Edison, Ni cad & Ni mg cells and lithium Technology

Fuel cell – Principle of working- construction- Design and performance analysis of fuel cells-The alkaline fuel cell, Acidic fuel cells, PEM Fuel cells, SOFC - Emerging trends in fuel cells, - Applications – Industrial and commercial

UNIT - III NUCLEAR POWER **9**

Nuclear energy conversion - Chemical and nuclear equations - Nuclear reactions -Fission and fusion - Energy from fission and fuel burn-up - Radioactivity – Neutron energies - Fission reactor types - Nuclear power plants - Fast breeder reactor and power plants - Production of nuclear fuels.

UNIT - IV NUCLEAR POWER **10**

Fuel rod design - Steam cycles for nuclear power plants - reactor heat removal – Coolant channel orificing - Core thermal design - Thermal shields - Fins in nuclear plants – Core thermal hydraulics - Safety analysis - LOCA - Time scales of transient flow and heat transfer processes.

UNIT - V NUCLEAR WASTE MANAGEMENT **5**

Segregation and safe disposal of nuclear waste –case studies

L:45; Total:45

TEXT BOOKS'

1. M. M. El-Wakil: Power Plant Technology, McGraw Hill, 1985

2. Hand book of Batteries and Fuel cells ,3rd Edision, Edited by David and Thomas, B. Reddy, McGrawhill Book company,N.Y 2002

3. Fuel cell, Principles and applications ,Viswanathan,B and Scibioh,Aulice M. Universities Press.2006

REFERENCES:

1. A. W. Culp Jr: Principles of Energy Conversion, McGraw Hill, 2001
2. Principles of fuel cells by Xianguo Li, Taylor & francis,2006
3. T. F. Morse: Power Plant Engineering, Affiliated East West Press, 1978
4. R. H. S. Winterton: Thermal Design of Nuclear Reactors, Pergamon Press, 1981
5. R. L. Murray: Introduction to Nuclear Engineering, Prentice Hall, 1961

YRE302A ENERGY AUDIT AND MANAGEMENT **3 0 0 3**

UNIT - I INTRODUCTION **10**

Energy scenario – Principles and imperatives of energy conversion – Energy consumption pattern – Resource availability – Why save energy – reasons to save energy – an over view of energy consumption and its effects – current energy consumption in India – Role of Energy Managers in Industries.

UNIT - II ENERGY CONSERVATION OF THERMAL UTILITIES **10**

Energy Audit–Characteristic Methods Employed in Certain Energy Intensive Industries – Various Energy Conservation Measures in Steam – Losses in Boiler. Methodology of Upgrading Boiler Performance – Boiler Blow Down Control – Excess Air control – Pressure Reducing Stations. Energy Conservation in Steam Systems – Importance of correct Pressure, Temperature, & Quality of Steam – Condensate Recovery – Condensate Pumping – Thermo Compressors – Recovery of Flash Steam – Air Removal & Venting – Moisture Removal. Steam Traps – Types, Function, Necessity – Section and application. Co-generation – in-plant power generation systems –
co-generation Schemes and configuration – Design Considerations – Heat Rate Improvement. Case Studies.

UNIT - III ENERGY CONSERVATION OF UTILITIES **10**

Centrifugal pumps – energy consumption & energy saving potentials – Design consideration minimizing over design – case studies – Fans & Blowers – Specification – Safety margin – choice of fans controls – design considerations. Air compressor & compressed air systems – selection of compressed air layout – Encon aspects to be considered at design – Design consideration. Refrigeration & Air conditioning – Heat load estimation – methods of minimizing heat loads – optimum selections of equipments – case studies. Energy conservation in cooling towers & spray ponds – Case studies.

UNIT - IV ENERGY AUDITING **8**

Potential areas for Electrical Energy Conservation in various Industries – Conservation methods – Energy Management Opportunities in Electrical Heating, Lighting System, Cable Selection – Energy Efficient Motors – Factors Involved in Determination of Motor Efficiency Adjustable AC Drivers, Application & its Uses – Variable speed Drivers / Belt Drives Energy Efficiency in Electrical Systems – HT Power Distribution – Control system in HT/LT side, Harmonics – Energy Efficiency in Lighting – Case studies.

UNIT - V ENERGY MANAGEMENT **7**

Organizational background desired for energy management persuation / motivation / publicity role, tariff analysis, detailed process of M&T Energy monitoring, auditing & targeting – Economics of various Energy conservation schemes, instrumentation and calibrationElectronics Control and Industrial Energy Management Systems. Thermostats, Boiler controls; proportional, differential and integral control, optimizers; compensators.

L:45; T:15; Total:60

TEXT BOOKS

1. Eastop T.D & Croft D.R, Energy Efficiency for Engineers and Technologists,. Longman Scientific & Technical, ISBN – 0-582 – 03184, 1990.

REFERENCES:

1. Reay D.A, Industrial Energy Conservation, 1st edition, Pergamon Press, 1977.
2. Larry C whitetal, Industrial Energy Management & Utilization.

DISASTER MANAGEMENT

Course Outcomes:		Domain	Level
CO1	Understanding the concepts of application of types of disaster preparedness	Cognitive	Application
CO2	On completion of this course the students will be able to understand planning essentials of disaster.	Cognitive	Analyze
CO3	Have a good understanding of importance of seismic waves occurring globally	Cognitive	Analyze
CO4	On completion of this course, the students will be able to perform drill essential for disaster mitigation	Cognitive	Application
CO5	Have a keen knowledge on essentials of risk reduction	Cognitive	Application

COURSE CODE	COURSE NAME	L	T	P	C
XUM 606	**DISASTER MANAGEMENT**	**3**	**0**	**0**	**3**
C:P: A		**L**	**T**	**P**	**H**
3:0:0		**3**	**0**	**0**	**3**
UNIT- I: INTRODUCTION					**9**
Introduction – Disaster preparedness – Goals and objectives of ISDR Programme- Risk identification – Risk sharing – Disaster and development: Development plans and disaster management –Alternative to dominant approach– disaster-development linkages -Principle of risk partnership					
UNIT- II: APPLICATION OF TECHNOLOGY IN DISASTER RISK REDUCTION					**9**
Application of various technologies: Data bases – RDBMS – Management Information systems – Decision support system and other systems – Geographic information systems – Intranets and extranets – video teleconferencing. Trigger mechanism – Remote sensing-an insight – contribution of remote sensing and GIS - Case study					
UNIT- III: AWARENESS OF RISK REDUCTION					**9**
Trigger mechanism – constitution of trigger mechanism – risk reduction by education – disaster information network – risk reduction by public awareness					
UNIT- IV: DEVELOPMENT PLANNING ON DISASTER					**9**
Implication of development planning – Financial arrangements – Areas of improvement – Disaster preparedness – Community based disaster management– Emergency response.					
UNIT- V: SEISMICITY					**9**

Seismic waves – Earthquakes and faults – measures of an earthquake, magnitude and intensity – ground damage – Tsunamis and earthquakes

	LECTURE	TUTORIAL	TOTAL
	45	0	45

TEXTBOOKS

1. Siddhartha Gautam and K Leelakrishna Rao, "Disaster Management Programmes and Policies", Vista International Pub House, 2012,
2. Arun Kumar, "Global Disaster Management", SBS Publishers, 2008

REFERENCES

1. Encyclopaedia of Disaster Management, Neha Publishers & Distributors, 2008
2. Pradeep Sahni, Madhavi Malalgoda and Ariyabandu, "Disaster risk reduction in South Asia", PHI, 2002
3. Amita Sinvhal, "Understanding earthquake disasters" TMH, 2010.
4. Pardeep Sahni, Alka Dhameja and Uma Medury, "Disaster mitigation: Experiences and reflections", PHI, 2000

XES202			ENVIRONMENTAL STUDIES	L	T	SS	C
				2	0	1	2
C	P	A		L	T	SS	H
1.5	0	0.5		2	0	1	3

PREREQUISITE: Nil

	COURSE OUTCOMES	DOMAIN	LEVEL
On the successful completion of this course students would be able to			
CO1	***Describe***the significance of natural resources and ***explain*** anthropogenic impacts.	Cognitive	Remember Understand
CO2	***Illustrate*** the significance of ecosystem, biodiversity and natural geo bio chemical cycles for maintaining ecological balance.	Cognitive	Understand
CO3	***identify*** the facts, consequences, preventive measures of major pollutionsand ***recognize*** the disaster phenomenon	Cognitive Affective	Reasoning Receiving
CO4	***Explain*** the socio-economic, policy dynamics and***practice*** the control measures of global issues for sustainable development.	Cognitive	Understand Analyze
CO5	***Recognize*** the impact of population and the concept of various welfare programs, and ***apply***themodern technology towards environmental protection.	Cognitive	Understand Apply

UNIT I	**INTRODUCTION TO ENVIRONMENTAL STUDIES AND ENERGY**	**6**

Definition, scope and importance – Need for public awareness – Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, flood, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World

food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies – 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 II	ECOSYSTEMS AND BIODIVERSITY	6

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 (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to Biodiversity – Definition: genetic, species and ecosystem diversity - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT III	ENVIRONMENTAL POLLUTION	6

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: flood, earthquake, cyclone and landslide.

UNIT IV	ENERGY AND WATER CONSERVATION	6

Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, 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

UNIT V	HUMAN POPULATION AND THE ENVIRONMENT	6

Population growth, variation among nations – Population explosion – Family welfare programme – Environment and human health – Human rights – Value education - HIV / AIDS – Women and Child welfare programme– Role of Information Technology in Environment and human health – Case studies.

LECTURE	SS	PRACTICAL	TOTAL
30	15	-	45

TEXT BOOKS

1. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co, USA, 2000.
2. Townsend C., Harper J and Michael Begon, Essentials of Ecology, Blackwell Science, UK, 2003

3. Trivedi R.K and P.K.Goel, Introduction to Air pollution, Techno Science Publications, India, 2003.

REFERENCES:

1. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media, India, 2009.
2. Cunningham, W.P.Cooper, T.H.Gorhani, Environmental Encyclopedia, Jaico Publ., House, Mumbai, 2001.
3. S.K.Dhameja, Environmental Engineering and Management, S.K.Kataria and Sons, New Delhi, 2012.
4. Sahni, Disaster Risk Reduction in South Asia, PHI Learning, New Delhi, 2003.
5. Sundar, Disaster Management, Sarup& Sons, New Delhi, 2007.
6. G.K.Ghosh, Disaster Management, A.P.H.Publishers, New Delhi, 2006.

E RESOURCES

1. http://www.e-booksdirectory.com/details.php?ebook=10526
2. https://www.free-ebooks.net/ebook/Introduction-to-Environmental-Science
3. https://www.free-ebooks.net/ebook/What-is-Biodiversity
4. https://www.learner.org/courses/envsci/unit/unit_vis.php?unit=4
5. http://bookboon.com/en/pollution-prevention-and-control-ebook
6. http://www.e-booksdirectory.com/details.php?ebook=8557

Semester	**IV**
Subject Name	**SOCIAL ENGINEERING**
Subject Code	**XBE403**

L –T –P –C	**C:P:A**	**L –T –P –H**
2- 0 –0- 2	**1:0.5:0.5**	**2- 0 -0- 2**

Course Outcome:		**Domain C or P or A**
CO1	***Identify*** the origin of caste and race	Cognitive
CO2	***Listen*** the anti caste struggles in modern India and ***react*** with modern Indian movement.	Affective/ Psychomotor
CO3	***Distinguishes*** the gender inequalities	Cognitive

COURSE CONTENT

UNIT-I **Origins of Caste and Race** **12hrs**

India: A Nation of caste and class
Caste and Race: Dravidian and Aryan conflict – An historical Overview

UNIT –II	Anti-caste and race movement in Modern India	12hrs

Anti-Caste struggles in Modern India: Mahatma Gandhi and Phule's contribution
Thanthai Periyar Contribution in eradicating social injustice
Ambedhkar's approach to eradication of untouchablity and annihilation of caste in the context of dalit movement in India

UNIT-III	Gender inequality

Dignity of Labour and Caste: Kancha llaiah's Scientific Method
Women and Caste: Issues of gender of inequality. Empowerment of women

Sessional work :

a) Collection of news papers cutting connected with social issues, caste discrimination, women inequality
b) Conducting social survey in Villages
c) Visiting NGO's activities for women empowerment.

TEXT BOOKS

1 Dr B.R. Ambedhkar and Untouchablity – Fighting the Indian Caste system – Christophe Jattrelot, Columbia University Press, May 2005
2 Collected works of Periyar EVR, Compiled by Dr K. Veeramani, The Periyar Self-Respect Propaganda Institution Periyar Thidal, 50, EVK Sampath Salai, Chennai – 600 007
3 Mahatma Jothipha Phule Life History
4 Dignity of Labour in our time, Prof. Kanch Illaiah, Hyderabad

L-60 hrs P-15hrs Total – 75 hrs

Semester	**VI**
Subject Name	**INDIAN CONSTITUTION AND HUMAN RIGHTS**
Subject Code	**XBE601**

L –T –P –C	C:P:A	L –T –P –H
2- 0– 0- 2	2:0:0	2- 0 – 0- 2

Course Outcome: **Domain**

C or P or A

CO1	Know the importance, preamble and salient features of Indian constitution	Cognitive
CO2	Appreciate the significance of fundamental rights, duties and directive principles of state policy	Cognitive
CO3	Develop an understanding of the strength of the union government	Cognitive
CO4	Know the meaning, significance, the growing advocacy of human rights.	Cognitive

COURSE CONTENT

UNIT I INTRODUCTION TO THE CONSTITUTION OF INDIA

Preamble – constitution assembly of India – philosophical foundations of the Indian constitution – fundamental rights – fundamentals duties and the directive principles of the state policy of the Indian constitution – Union Government: structure and functions, State Government: structure and functions – Indian federal system – Parliament – President, Prime Minister – constitutional amendments – constitutional functionaries – assessment of working of the panchayat raj.

UNIT II HUMAN RIGHTS

Meaning, concept – notion and classification of rights: natural, moral and legal rights. Three generations of human rights civil and political rights: economic, social and cultural rights: collective / solidarity rights. Theories of human rights. Rights of the disadvantages groups (SC, ST, OBC, Minorities children and women). Mechanisms for the protection of the rights of disadvantaged groups. Social justice and human rights

L- 30 hrs T-15 hrs Total -45 hrs

TEXT BOOKS

1. Durga Das Basu, “Introduction to the constitution of India”, prentice Hall of India, New Delhi.
2. Jansuez Symonides(ed), 2005. Human Rights, Rawat Publications, Jaipur.
3. Subash C Kashyap, the working of Indian constitution, NBT, New Delhi.
4. Human rights in India: theory and practice. National Book Trust, 2001.

SEMESTER -I					
Subject Code	**Subject Title**	**Category**			
		L	**T**	**P**	**CREDITS**
YSW101	**INTRODUCTION TO SOCIETY AND SOCIAL WORK**	**4**	**0**	**0**	**4**

PREAMBLE

This course will familiarize students with the various roles, functions, and tasks which social workers perform in a variety of settings and acquaint them with the primary skills and practices of generalist social work. Students will be introduced to social work practice as a multi-level and multi-method approach, influencing change in problem situations. Students will also be introduced to the core values and Code of Ethics of social work and be exposed to issues of diversity, oppression, and social justice.

COURSE OBJECTIVES

- To acquire basic knowledge on professional Social Work.
- To understand historical development of the profession, its concepts and different methods.
- To develop skills and techniques in dealing with social issues and problems
- To apply oneself as an instrument of change.

COURSE OUTCOME

The student will be able to

CO1	**Illustrate** the Social Work concept , methods and explain about Social Work Education.	Cognitive	Understanding
CO2	**Recall** Social Work professional values, code of ethics and **invent** skills required for Social Worker	Cognitive	Remembering Creating
CO3	**Distinguish** the concepts of Society, Community, Cultural process and its elements	Cognitive	Analyzing
CO4	**Explain** the constitution of India and Social Welfare	Cognitive	Understanding Evaluating
CO5	**Identify** various Social Problems prevalent in India	Cognitive	Applying

COURSE CONTENTS

UNIT – I **12**

Social Work: Introduction to Social Work as practiced today in India, Concept, Definition, Social Service, Social Welfare, Social Security, Social Reforms, Social Defense, Social Justice, Social Legislation and Social Education. Contribution of Indian Social reformers to Social movements and Social Welfare. Historical development of Social Work in UK, USA and India.

UNIT – II **12**

Social Work as a Profession: Nature and its scope; Principles and its Methods - Professional Values, Code of ethics, Fields of Social Work, Skills for Social Worker. Social Work education and its growth, Objectives of Field work, new developments in Social Work literature, Professional organizations for Social Work in India and abroad. Status and Problems of Social Work professionals in India.

UNIT – III **12**

Individual and Society: Concepts: Society, Community, Association, Institution, Cultural Process and it's Elements, Social Stratification; Factors of Social Change; Institutional and Social groups-types and functions; Cultural lag and cultural change, Social control and Social deviance.

UNIT IV **12**

Constitution of India and Social Welfare: Indian Constitution and its implication of Social Welfare: Fundamental Rights Part-III, Fundamental Duties Part-IV A, Directive principles of State Policy Part-IV, Human Rights According to U.N Charter and Indian Constitution.

UNIT – V **12**

Social Problems in India: Poverty; Unemployment; Population; Social Disorganization, Issues relatedto weaker section, marginalized and excluded groups. Cyber-crimes, Technological addiction; Corruption; dowry and suicides. Specific social issues in Tamil Nadu.

Total Hours- 60

REFERENCES :

1. Stanley. S. Social Problems in India, Allied Publishers, New Delhi – 2005.
2. Jacob K.K. Social Work Education in India, Himanshu Pub., New Delhi, 2002
3. Chowdry P. Introduction to Social Work, New Atmaram & Sons. New Delhi, 1998
4. Wadia A.R. History and Philosophy of Social Work in India, Allied Publication, NewDelhi, 2001.
5. Memoria C.B. Social Problems and Social disorganization in India. Kitab Mahal,New Delhi.

SEMESTER -I					
Subject Code	Subject Title	Category			
		L	T	P	CREDITS
YSW102	SOCIAL WORK WITH INDIVIDUALS	4	0	0	4

PREAMBLE

This course aims to develop simple to complex skills of working with individuals in various situations like crisis, preventive, facilitative and developmental. This course also aims at introducing the graduates to understand, develop abilities, critically analyze the problems of individuals, intervene and enhance better living.

COURSE OBJECTIVES

- To understand social case work as a method of Social Work and appreciate its place in Social Work practice.
- To develop abilities to critically analyze problems of individuals factors affecting them.
- To enhance understanding of the basic values, principles concepts, tools techniques skills and process.
- To develop appropriate skills and attitudes to work with individuals.

COURSE OUTCOME

CO1	**Illustrate** the concept of Social Case Work practice in the fields of Social Work.	Cognitive	Understanding
CO2	**Discuss** the theories and approaches of Social Case Work and **extend** these approaches in the field work.	Cognitive	Creating Understanding
CO3	**Relate and how** the Case work tools and techniques helped for a Social Worker working with individuals and families	Cognitive	Remembering
CO4	**Apply** the process of Social Case Work in order to solve the problems of individuals	Cognitive	Applying
CO5	**Evaluate** the working relationship with the client and prioritize the emerging trends in Social Work with Individuals.	Cognitive	Evaluating

COURSE CONTENTS

UNIT I **12**

Social Case work: Definitions, scope, historical development -Concepts of adjustment and maladjustment - Philosophical assumptions and casework values. Principles of casework; Components of Social Case Work: Person, Problem, Place and Process.

UNIT II **12**

Process in casework: Study, assessment, intervention, evaluation, follow-up, and termination. Theories and approaches: Psycho-social approach, Functional approach, Problem solving approach, Crisis Theory, Family intervention, Behavioural modification, Transactional analysis and Holistic approach.

UNIT III **12**

Tools for Help: Case work tools: Interview, home visit, observation, listening, communication skills, rapport building. Records: Nature, purpose and principles of recording. Techniques of casework: Supportive, resource enhancement and counseling. Self as a professional: Professionalself - Conflicts and dilemmas in working with individuals and families.

UNIT IV **12**

Application of Method: Primary and secondary settings - Application of methods in family, women, and child welfare settings, marriage counseling centers, schools settings, medical and psychiatric settings, correctional institutions, and industry.

UNIT V **12**

Emerging trends in Social Work with Individuals: Short Term Case Work, Preventive Case Work intervention, multiple interviewing, psychotherapy, similarities and difference between case work, counseling and psychotherapy. Referrals, psychiatric consultation and psychological tests.

Total Hours -60

REFERENCES

1. Banerjee, G. R. 1971 "Some Thoughts on Professional Self in Social Work", IndianJournal of Social Work, Mumbai: Tata Institute of Social Sciences.
2. Biestek, F. P. 1957 The Case Work Relationship, London, George Allen and Unwin.
3. Hamilton, G. 1950 Theory and Practice in Social Case Work, New York, Columbia

SEMESTER -I					
Subject Code	**Subject Title**	**Category**			
		L	**T**	**P**	**CREDITS**
YSW103	**SOCIAL WORK WITH GROUPS**	**4**	**0**	**0**	**4**

PREAMBLE

This course aims at developing the understanding of Group Work as a method of Social Work. It is also helping the learners to understand and develop abilities to critically analyze the problems of groups in various settings. This paper indeed enlightens the graduates of Social Work profession to work with various groups and achieve better coping towards working in a team.

COURSE OBJECTIVES

- To develop understanding of group work as a method of Social Work.
- To gain knowledge about group formation and use of a variety of group approaches.
- To develop knowledge, skills and techniques to be used by the Social Worker in groups.
- To understanding group as an instrument of change.

COURSE OUTCOME

CO1	**Demonstrate** the concept of Social Group Work practice in the fields of Social Work.	Cognitive	Understanding
CO2	**Create and construct** different types of social groups in the community and develop the group process in different stages.	Cognitive	Creating Understanding
CO3	**Plan** the group activity for the intervention of Group work Process	Cognitive	Remembering
CO4	**Apply** the approaches and theory of group work practice in order to solve the problems of groups	Cognitive	Applying
CO5	**Evaluate** the working relationship with the groups in different settings and record the glimpses.	Cognitive	Evaluating

COURSE CONTENTS

UNIT – I **12**

Social Group Work: Definition, objectives and scope - Models of Group Work- Historical Development of Group Work, Principles of Group Work, Values, Significance, Principles and Skills - Group Work Process - Limitation of social group work practice in India.

UNIT – II **12**

Social Groups and Development: Definition, Characteristics, Types of Groups and Functionsof a Group - Stages of Group Development, Basic Human Needs met by Groups at Different Stages of Group Development - Group Process : Bond, Acceptance, Isolation, Rejection, Sub- Group Formation, Withdrawal, Behaviour Contagion, Conflict and Control.

UNIT – III **12**

Programme Planning: Meaning and Definition of Programme, Principles and Process of Programme Planning and the place of Agency in Programme Planning - Programme Laboratory: Values and Techniques (Games, Singing, Dancing, Dramatics, Street play, Puppetry, Group Discussions, Excursion, Psychodrama, Socio drama, Role play, and Brain Storming) - Rural Camp: Planning, Organizing, Executing, Evaluating and Reporting.

UNIT – IV **12**

Approaches and Practices of Social Work with Groups**:** Group Therapy, Group Psychotherapy, Use of Home Visits and Collateral Contacts. Leadership: Concepts, Definition, Characteristics, Functions, Qualities of Leader, Types and Theories of Leadership, Training for Leadership - Sociometry and Sociogram - Group Work Supervision: Meaning, Purpose and Functions.

UNIT – V **12**

Group Work Recording: Meaning, Purpose, Principles, Process and Summary Records - Group Work Evaluation: Meaning and its Place in Group Work, Steps in Group Work Evaluation and Criteria for Good Group Work. Application of Group Work Methods in Different Settings: Community Settings, Medical and Psychiatric Settings, De-Addiction Centres, CorrectionalInstitutions, Schools, Industries, Special Schools and Aged Homes.

Total Hours -60

REFERENCES:

1. Allan Brown, 2005; Group Work: Third edition, Rawat Book Sellers, Jaipur
2. Balgopal, P.R.& Vassil, T.V. 1983 Groupsin Social Work: An Ecological Perspective. New York: Macmillan
3. Brown, Allan 1994 Group Work. Hamphshire: Ashgate.
4. Dirverdi, 2005 Group Work with Children and Adolescent, Rawat Book Sellers, Jaipur
5. P.D.Misra, Penna Misra, Social Work Practice, 2001
6. Garrin, 2006, Handbook of Social Work with Groups, Rawat Book Sellers, Jaipur
7. Geoffrey, L.G. & Ephross, P.H.1997 Group Work with Population at Risk. New York:
8. Oxford University Press.
9. Toseland, R.W. & Rivas, R.1984 An Introduction to Group Work Practice. New York:MacMillian.

SEMESTER -I					
Subject Code	**Subject Title**	**Category**			
		L	**T**	**P**	**CREDITS**
YSW104	**SOCIAL WORK WITH COMMUNITIES AND RADICAL SOCIAL WORK**	**4**	**0**	**0**	**4**

COURSE OBJECTIVES

- To understand the elements of community organization practice.
- To enhance knowledge on Historical development of the community organization and strategies for social action.
- To develop skills and techniques in dealing with the micro-macro connections between the range of complex issues in practice.
- To express attitudes conducive to participatory activities for civil society.

COURSE OUTCOME

The Student will be able to

CO1	**Explain** the types of community, its structure and **classify** Community organization and Community Development	Understanding
CO2	**List** the Method of Community organization and **Apply** the skills for Community organization	Applying and Analyzing
CO3	**Summarize** the phases of Community organization and **relate** the role of social worker	Understanding
CO4	**Plan** programme addressing issues in the community and **decide** suitable programme laboratory techniques.	Creating and Evaluating
CO5	**Demonstrate** the models and strategies of Social action and Social reforms	Understanding

COURSE CONTENTS

UNIT – I **12**

Community: Meaning, Types and Characteristics; Community Power Structure. Community Dynamics: Integrative and Disintegrative Processes in the Community. **Community Organization**: Concept, Definition, Objectives, Philosophy, Approaches and Principles; Community Organizations as a Method of Social Work; Community Welfare Councils and Community Chests. Community Organization and Community Development: Similarities and Differences.

UNIT – II **12**

Methods of Community Organization: Planning, Education, Communication, Community Participation, Collective Decision Making, Involvement of Groups and Organizations, Resource Mobilization, Community Action, Legislative and Non-Legislative Promotion, Co-Ordination; Skills in Community Organization; Community Organization as an Approach to Community Development.

UNIT – III **12**

Phases of Community Organization: Study, Assessment, Discussion, Organization, Action, Evaluation, Modification, Continuation; Community Study; Community Organization in Emergencies (Fire, Flood, Famine, Drought, Earthquake, Tsunami, and War); Role of Social Workers in Community Organization.

UNIT – IV **12**

Programme Planning: Meaning and Definition of Programme, Principles and Process of Programme Planning and the place of Agency in Programme Planning; Programme Laboratory - Values and Techniques: (Games, Singing, Dancing, Dramatics, Street play, Puppetry, Group Discussions, Excursion, Psychodrama, Socio drama, Role play, and Brain Storming) - Rural Camp: Planning, Organizing, Executing, Evaluating and Reporting.

UNIT – V **12**

Radical Social Work: Aims and criticism of Traditional Social Work; Social Action: Definition, Strategies of Social Action and Social Reform; Saul Alinsky's and Paulo Freire's Methods; Process of Social Action. Models and Strategies of Community Organization: Locality Development Model - Social Planning Model - Social Action Model - Select methods of public interest mobilization, litigation, protests and demonstrations, Dealing with authorities, Public Relations, Planning, Monitoring and Evaluation

Total Hours -60

REFERENCES

1. Shivappa R. 2009 STREAMS IN THE RIVER- A Journey Into Inclusive Concerns,Dhatri Pustaka, Bangalore
2. Biklen, Bouglas.P, *Community Organizing - Theory & Practice*, New Jersey Prentice.
3. Beher A and Samuel J (2006) Social Watch in India: Citizens Report on Governance andDevelopment, Pune : NCAS
4. Kettner, P and Moroney, Robert (2007) Designing and Managing Programs: AnEffectiveness-Based Approach, University ofFlorida
5. Ledwith Margaret (2005) Community Development: A Critical Approach, Policy Press
6. Somesh Kumar (2002) Methods for Community Participation: A

complete guide forpractitioners, New Delhi : Sage Publication Vista
7. Donna Hardina (2013) *Innovative Approaches for Teaching Community OrganizationSkills* published by Routledge, New York.
8. Christopher A.J & Willium Thomas.A (2006*) Community Organization & SocialAction,* Himalaya, Mumbai

SEMESTER -II					
Subject Code	**Subject Title**	**Category**			
		L	**T**	**P**	**CREDITS**
YSW 202	**SOCIAL WORK RESEARCH AND STATISTICS**	**4**	**0**	**0**	**4**

COURSE OBJECTIVES

- To understand the scientific approach to human inquiry in comparison to the native or common sense approach in various aspects, of Social Work research process.
- To develop an ability to see the linkages between practice, research, theory and their role in enriching one another. conceptualize, formulate and conduct simple research
- To enhance knowledge conceptualization of a research strategy and problem; writing a research proposal; developing tools for col1ecting data; use of sampling, strategies for data collection, processing, presentation, analysis and interpretation; and writing research report etc.
- To develop attitudes conducive to participatory activities for civil society.

COURSE OUTCOME

The Student will be able to

CO1	**Define** the Social research and Social work research, **outline** the steps in research	Remembering and Understanding
CO2	**Explain** the Research design and Sampling techniques	Understanding
CO3	**List** the Sources of Data collection and **recall** the tools to be **chosen**	Remembering and applying
CO4	**Analyze** the data collected **Interpret** and **discuss**	Analysis, Evaluate and Create
CO5	**Illustrate** the statistical design for data analysis and **compile** data using computer applications	Understand and Create

UNIT – I **12 Hours**

Social Work Research: Meaning, definition, ethics, purpose of research, Social research and Social Work research. Scientific Method: Nature. Characteristics, purpose and steps in research process; Formulation of Research problems, Review of Literature.

UNIT – II **12 Hours**

Research Design and Sampling: Types: Exploratory, Descriptive, Diagnostic and Experimental. Mixed Methods in research. Hypothesis: Sources, Formulation, Attributes of

hypotheses and types. Sampling: Definition Principles, Types and procedures; population and Universe, measurement: Meaning, levels of measurement: Nominal ordinal, interval and ratio; validity and reliability: meaning and types.

UNIT – III **12 Hours**

Sources and Methods of Data Collection: Sources: Primary and Secondary; Research tools : Observation and Survey methods, Interview guide, Interview schedule, questionnaire, FGD, Case Study. Pre-test and pilot study.

UNIT –IV **12 Hours**

Preparation of Research Proposal: Format processing of Data, Code book, Transcription, tabulation, Diagrammatic representation of data. Interpretation and analysis, Discussion; Report writing and Referencing; Applications and Limitations of Research in Social Work.

UNIT – V **12 Hours**

Social Statistics: Statistics: Meaning, use and its limitations in Social Work Research. Measures of Central' Tendency: Arithmetic Mean, Median and Mode Dispersion: Range, Quartile deviation, Standard deviation and Co-efficient of Variation. Tests of significance: "t" test and chi-square and Correlation; Meaning, types and uses: Karl Pearson's Coefficient of Correlation and Spearman's Rank Correlation. Computer applications: Special reference to Statistical Package for Social Science (SPSS)

Total Hours -60

REFERENCES

1. Crabtres, B. F. and Miller, Doing Qualitative Research, New Delhi: W. L. (Eds.) 2000Sage Publications.
2. Denzin, Norman, K. & Handbook of Qualitative Research (II ed.), Lincoln, Y. S. (Eds.) 2000 New Delhi: Sage Publications.
3. Field, Andy. 2000 Discovering Statistics Using SPSS for Windows: Advanced Techniques for Beginning, New Delhi:Sage Publications.
4. Foster, J. J. 1998 Data Analysis Using SPSS for Windows:A Beginner's Guide, New Delhi: Sage Publications.

SEMESTER -II					
Subject Code	**Subject Title**	**Category**			
		L	**T**	**P**	**CREDITS**
YSW204	**CORPORATE SOCIAL RESPONSIBILITY**	**4**	**0**	**0**	**4**

Course Objectives

- To equip individuals with knowledge and skills undertaking Corporate Social Responsibility.
- To develop competencies for effective field interventions, research and management of CSR interventions.
- To develop an insight into present CSR strategies of model business organization.
- To enable students with conceptual clarity on need, purpose and relevance of research applicability in CSR practice.

COURSE OUTCOME

CO1	**Illustrate** the concept and its Importance of CSR towards society	Cognitive	Understanding
CO2	**Summarize** the guidelines for CSR Reporting and Analyze the practices adopted by the companies with respect to CSR	Cognitive	Understanding Analyzing
CO3	**Make the use of** CSR towards stakeholders	Cognitive	Applying
CO4	**Criticize** the role of Social Worker, NGO's and HR Professional in implementing CSR towards Corporate, Civil and Public Governance.	Cognitive	Evaluating
CO5	**Elaborate** the recent trends in CSR and train the students to develop effective CSR strategy for community upliftment.	Cognitive	Creating Applying

COURSE CONTENTS

UNIT-I **12 Hours**

Corporate Social Responsibility – Concept, importance of CSR, Caroll"s pyramid of CSR, methods and scope of CSR – History of CSR, Developmental Phases of CSR, Business Ethics & Corporate Social Responsibility, CSR in Emerging Economies of the world.

UNIT-II **12 Hours**

Corporate Transitions and CSR-SEBI Guidelines for Corporate Social Responsibility Reporting, Provisions for CSR in Companies Act 2013: Definition, CSR Activities, CSR Committees, CSR Policy, CSR Expenditure, CSR Reporting, Display of CSR activities on its website. Understanding the thrust areas mentioned in schedule IV of the Companies Act 2013, Understanding the practices adopted by companies with respect to CSR Committees, activities and policy.

UNIT-III **12 Hours**

CSR towards Stakeholders- Shareholders, Creditors and Financial Institutions, Government, Consumers, Employees and Workers, Local Community and Society, CSR and environmental Concerns -Designing CSR Policy- Factors influencing CSR Policy, Stake holders and Social Preferences: Customer, Employees, Communities, Investors.

UNIT- IV **12 Hours**

CSR governance and CSR roles: Public Governance; Corporate Governance; and Civic Governance. Role of Government and NGOs in CSR, Role of NGO"s and International Agenciesin CSR, Integrating CSR into Business, Role of HR Professionals in CSR, Role of Social workers in CSR, CSR Programmes in India and Abroad, Future of CSR.

UNIT – V **12 Hours**

Recent trends in CSR; Transparency, Trust, community engagement, accessing new markets responsibly, initiatives to engage companies, standing Up for Social Injustices, Cross-Company Collaboration, Activism Spurs Results, Industries Leading on Key Issues,

Companies Leverage Unique Assets for Disaster Relief, Solid and Liquid Waste Management, Smart villages, digital learning etc.,

Total Hours 60

References

1. Balachandran & Chandrasekaran, *Corporate Governance & Social Responsibility*, Prentice Hall, 2010.
2. Baxi C.V. and Prasad Ajit (2005): Corporate Social Responsibility, Excel Books.
3. Case study on Corporate Social Responsibility. – Vol. – I [ICFAI Business School Case Development Centre.] Vara Vasanthi ICFAI Books, Hyderabad.
4. Johnson, H.H. Business in contemporary society-framework & issues, WadsmortuPublishing Co Ltd
5. Madhumita Chatterji, Corporate Social Responsibility, Oxford University Press
6. Philip Kotler and Nancy Lee, Corporate social responsibility: Doing the most good for company and your cause, Wiley, 2005.

SEMESTER III					
Course Code	**Course Title**	**Category**			
		L	**T**	**P**	**CREDITS**
YSWNME	**DISASTER MANAGEMENT AND MITIGATION**	**1 (2)SS**	**0**	**0**	**2**

COURSE CONTENT

Unit – I **3 Hours**

Disaster : Definition, Concept, Classification of disaster: Nature and man-made – Disasters in India and Abroad.

Unit – II **3 Hours**

Disaster Management : Definition, Phases of Disaster: Relief, Rehabilitation and Development

– Impact of Disaster on survivors: Family life, Livelihood, Education etc.,

Unit – III **3 Hours**

Disaster Policy and Programme : State and National**,** International policies, for Disaster Management.

Unit – IV **3 Hours**

NGOs, INGOs and Government Intervention in Disaster Management: Survey – Assessment – Reports – Developing specific Materials and Manuals for Various groups (Children, Women, Adults and Aged) Training Professionals / Para Professionals in Trauma Counselling, skills andLivelihood education. Working with Groups – Communities on Sustainable development and Rehabilitation.

Unit – V **3 Hours**

Disaster Preparedness : Models of Disaster Preparedness – Role of Social Workers in Disaster Mitigation Programmes for various groups: Family, Individual and Community levels.

REFERENCES

1. Juan jose lopez-Ibor,george Christodoulou,Mario maj, Norman sartorius, and ahmed Okasha(2005): Disaster and Mental Health, John Wiley and Sons, England.
2. Parthasarathy R, Bharat,S, Kumar KVK, Sekar K, Girimaji,S and Murthy RS, (2001) Information Manual 3.Psychosocial care for Children –A Manual for Teachers action Aid India Bangalore.
3. Antara Sen Dave, Beena, Jadav, K Sekar,Subashis Bhadra,G.p Rajashekhar,Kishore Kumar K.V. and Srinivasamurthy R (2003): Riots; Psychosocial care for children Books for Change, Action Aid,Karnataka,Bangalore.
4. Rashmi Lakshminarayan (2004): Disaster mental health in India, Indian Redcross, New Delhi.
5. Sekar K, Pan S, Babu SKP, Kumar KVK (2004): National Disasters Psychosocial care bycommunity level workers, Books for change, Bangalore.