

Name of programme : CE/ EE/ET/ME/MT/CM/IT/DDGM
 Programme Code : 01/02/03/04/05/08/21/22/23/24/15/16/17/18/19
 Name of course : Environmental Science
 Course code : AU481

Teaching Scheme:

	Hours/Week	Total Hours
Theory	--	--
Term work / Practical	2	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term Work
Duration	--	--	--	--	--
Marks	--	--	--	--	50

Sr. No	Topic/Subtopic	Hours	Weight age	Practical
1.	Introduction 1.1 Need of the study of environmental science, definition scope and importance of environmental studies. 1.2 Environment & its component need of public awareness, effect of human activities on technological environment. 1.3 Depleting Nature of environmental sources such as soil, water, minerals & forests. Need of conserving natural resources preserving the environment.	04		
2.	Sustainable Development: 2.1 Concept of sustainable development. 2.2 Social, Economical & Environmental aspect of sustainable development. 2.3 Control measure: 3 R (Reuse, Recovery, and Recycle). Appropriate Technology, Environmental education.	04		

3	Environmental Pollution: 3.1 Introduction. 3.2 Water Pollution: Sources of water pollution-Sewage, Industrial waste, Agriculture chemicals, Thermal & radioactive waste, Heavy metals. Effects of water pollution. Control of water pollution. 3.3 Air pollution: Introduction, sources of air pollution, types of air pollution, effects of air pollution, control measures of air pollution. 3.4 Concept of Global Warming, Ozone Layer Depletion, Acid rain, Greenhouse effects. 3.5 Noise Pollution: Definition, Classification of noise pollution, effects of noise pollution, control of noise pollution. 3.6 Land Pollution: Causes, effects and remedies. 3.7 E-Pollution: Definition, Causes and effects and remedies measures. 3.8 Introduction to solid waste management. 3.9 Water Conservation: Rainwater harvesting, Watershed Management	16		
4	Renewable sources of Energy: Biomass, Biogas, Solar Energy, Nuclear Power, Hydropower, Wind Energy, Ocean (Tidal Energy), Geothermal Energy.	04		
5	Environmental Legislation: 5.1 Introduction 5.2 Ministry of Environment and Forest. (MOEF) Organizational Structure of MOEF. 5.3. Functions & Powers of Control Pollution Control Board. 5.4 Functions & Powers of State Pollution Control Board. 5.5 Environment Protection Act.	04		

Assignments:

1. Study of air quality of Pune city.
2. Study of noise pollution in Pune city.
3. Study of solid waste management of Pune city.
4. Study of E-waste management of Pune city.
5. Study of Environmental Status Report of Pune city prepared by Pune Municipal Corporation.


Text Books:

Sr. No	Author	Title	Publication
1	S.P. Nisture, D. A. Joshi, G.S.Chhawsaria	Basic Civil and Environmental Engineering	Pearson
2	Anindita Basak, D.L. Manjunath	Basics of Environmental Studies	Pearson
3	L.D. Danny Harvey	Global Warming The Hard Science	Pearson
4	Benny Joseph	Environmental Studies	TataMcGraw Hill
5	Godfrey Boyle	Renewable Energy	Oxford Publications
6	R. Rajagopalan	Environmental studies	Oxford University Press

Websites:

1. <http://www.mpcb.gov.in/>
2. <http://www.cpcb.nic.in/>
3. <http://www.envfor.nic.in/>
4. <http://www.neeri.res.in/>

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Programme : Diploma in CE/EE/ ET/ ME/MT/ CM/ IT
 Programme Code : 01/02/03/04/05/06/07/21/24/26/15/16/17/18/19
 Name of Course : Community Development
 Course Code : AU482

Teaching Scheme:

	Hours /Week	Total Hours
Theory	02	32
Practical		

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests of 60 min Duration	3 Hrs	---	---	---
Marks	20	80	---	---	---

Course Rationale:

The course has been introduced to make young Engineers especially aware of the present status of Villages & to motivate them to make improvement in villages when they start their Engineering carrier.

Course Objectives:

After studying this course, the student will be able to

- Able to understand present situation in villages and realize the gravity of the village development.
- Able to make survey of villages, collect the data, analyze it and identify the area of development.
- Able to identify the available natural resources and how they can be utilized for betterment of villages.
- Able to collect the useful information for starting probable new industries in villages.
- Able to guide villagers in building low cost durable houses taking in to considerations weather conditions of that area.
- Able to guide villagers for development good habits regarding health and hygiene.
- Motivated to bring about all round development of villages.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weight age
1.	Introduction			
	1.1	Present status of rural and urban community.	02	04
	1.2	Necessity of community development.		
	1.3	Identifying needs of community, Ways to develop community.		
2.	Human Power Development			
	2.1	Present scenario of Human power in India,	04	08
	2.2	Socioeconomic survey to ascertain requirement of human requirements.		

	2.3	Methodology for training the human power		
	2.4	Wage employment and self employment,		
	2.5	Support from financial institutions for self employment.		
3.	Appropriate Technology and Technology Transfer			
	3.1	Technological development of India, Additional needs of community due to technology development,	04	12
	3.2	Classification of rural industries,		
	3.3	Areas of appropriate technology,		
	3.4	Use of locally available materials,		
	3.5	Methods of transfer of technology, Project reports preparation.		
4.	Industrialization			
	4.1	Present status of rural traditional industries,	04	12
	4.2	Renewal of old industries in villages- Manufacturing new commodities such as plastic utensils, nylon ropes, ceramics Repairing – agricultural implements, tractors, automobiles, electrical or diesel pump sets, domestic appliances Food processing – Papad, jam, jelly, pickles, preservation, spices, syrups, ketchups Utilization of waste product – Gobar gas, fuel cake, Construction – Brick clamp, stone quarry, sand supply, and crusher. Miscellaneous – Handlooms, power looms, Ginning mills, Jaggery making Service Industry –House keeping Public facility centre (suvidha Kendra-setu) Net café, Bachat Gat concept and working. Housing support to industrialization.		
5.	Non Conventional Energy Sources			
	5.1	Availability of energy sources in India,	06	20
	5.2	Needs of use of non conventional energy sources.		
	5.3	Availability of such sources in India.		
	5.4	Various types of non conventional energy sources. Solar energy – Solar water heater and solar cooker, wind energy, wind mill and wind turbines, bio-gas-generation.		
6.	Community Services			
	6.1	Health and Hygiene awareness,	04	08
	6.2	Health services,		
	6.3	Educating the community for good habits of health and hygiene, Potable drinking water, purifying well water, low cost latrines, drainage system and soak pits Tree plantation programmes, roads and communications.		
7.	Waste Management			
	7.1	Generation of waste, causes	04	08
	7.2	Types of waste – domestic, commercial, industrial, E-waste, hazardous waste.		
	7.3	Waste separation of domestic waste e.g. wet, dry, reusable, recyclable,		
	7.4	Waste disposal – methods, treatments, etc.		
	7.5	Reduce, Reuse, and Recycle, 3Rs in Waste Management.		

8.	Developments			
	8.1	Programmes for all round development of	04	08
	8.2	Community, Various government schemes, IRDP – Integrated Rural Development Programme.		
	8.3	Active participation of community in development programmes		
	8.4	Motivation for participation.		
	Total		32	80

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Introduction	Class rooms teaching
2.	Man power developments	Class rooms teaching, data collection
3.	Appropriate technology & technology transfer	Class rooms teaching
4.	Industrialization	Class rooms teaching
5.	Non-conventional energy sources	Class rooms teaching
6.	Community services	Class rooms teaching
7.	Waste Management	Class rooms teaching
8.	Developments	Class rooms teaching

Text Books:

Sr. No	Author	Title	Publication
1.	Katav Sing	Rural Development Principles, Policies and management.	---
2.	S.P. Sukhatme	Solar Energy	---
3.	G.P. Rai	Non-Conventional Sources of Energy	---
4.	Debendra K. Das	Dynamics of rural development, perspectives	Deep & Deep Publications Delhi

Reference Books:

Sr. No	Author	Title	Publication
1.	T.T.T.I. Madras	Environmental Engg.	Tata McGraw Hill Publishing Co. Ltd. New Delhi.

Learning Resources: Internet, Daily News papers

Specification Table;

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Introduction	04	--	--	04
2.	Man-power development	04	04	--	08
3.	Appropriate technology & its transfer	04	04	04	12
4.	Industrialization	04	04	04	12
5.	Non-conventional Energy Sources	08	06	06	20
6.	Community Services	04	04	--	08
7.	Waste Management	--	04	04	08
8.	Developments	04	04	--	08
	Total	32	30	18	80

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Programme : Diploma in CE/EE/ET/ME/MT/CM/IT
 Programme Code : @1/02/03/04/05/06/07/15/16/17/18/19/24
 Name of Course : Renewable & Sustainable Energy Management
 Course Code : AU483

Teaching Scheme:

	Hours /Week	Total Hours
Theory	02	32
Practical	--	--

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes	3 Hrs	---	---	---
Marks	20	80	---	---	---

Course Rationale:

Energy is an important aspect in all sectors of country's economy. The energy crisis is mainly caused due to increased population and enhanced standard of living and life style of people. The conventional sources of energy are insufficient to meet these demands. Hence alternative energy sources are utilized for power production. The use of alternative energy source is increasing day by day. Diploma Engineers are to develop, operate and maintain these systems therefore essential to know basics of energy conversion, conservation, energy audit and waste heat recovery techniques.

Course Objectives:

After studying this course, the student will be able to

- Know the National scene of energy production, utilization, consumption and reserves.
- Appreciate the need for non-conventional energy sources.
- Understand relative advantages and disadvantages of various non-conventional energy sources.
- Develop awareness for effective utilization of alternative energy sources.
- Identify different components of solar energy and wind energy sources.
- Identify and analyze biomass plant.
- Identify and apply energy conservation techniques for commonly used Power absorbing and generating devices.
- Apply principles of energy conservation and energy management techniques.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
1.	Review of conventional sources of energy		
	1.1 Types of conventional energy sources, availability and important power plants in India	04	06

	1.2	India's production and reserves for fossil fuels, waterpower, nuclear power.		
	1.3	Need for non-conventional energy sources.		
	1.4	Environmental impact of various energy sources. Green building, sustainable development. Carbon credits and its significance		
2.	Solar Energy			
	2.1	Principle of conversion of solar energy into heat and electricity Solar radiation. Solar radiations at earth's surface	06	16
	2.2	Solar radiation geometry- declination, hour Angle, altitude angle, incident angle, zenith angle, solar azimuth angle.		
	2.3	Solar collectors and their types ,applications, advantages and limitations		
	2.4	Applications of Solar energy		
		Solar electric power generation: solar photovoltaic cell, solar cell principle and working, its applications, advantages and disadvantages.		
		Solar water heating, Solar distillation, Solar cooking and furnace,		
		Solar pumping and Green house, Agriculture and industrial process heat.		
		Space heating, space cooling,		
3.	Wind Energy			
	3.1	Basic principles of wind energy conversion, power in wind, available wind power formulation, power coefficient, and maximum power	05	16
	3.2	Main considerations in selecting a site for wind mills, advantages and limitations of wind energy conversion		
	3.3	Classification of windmills, construction and working of horizontal And vertical axis wind mills, their comparison.		
	3.4	Main applications of wind energy for power generation and pumping.		
4.	Energy From Biomass			
	4.1	Common species recommended for biomass, methods for obtaining energy from biomass.	06	16
	4.2	Classification of biomass- gasified, fixed bed and fluidized		
	4.3	Application of gasifier		
	4.4	Biodiesel production and application		
	4.5	Agricultural waste as biomass, biomass digester, comparison of biomass with conventional fuels.		
5.	Geothermal Energy and Tidal Energy			
	5.1	Availability, forms of geothermal energy- Dry steam, wet steam, hot dry rock, magnetic chamber system	06	16
	5.2	Different power plants available.		
	5.3	Tidal power, factors for selection of tidal power plant		
	5.4	Classification-Single basin, double basin type		

	5.5	Tidal power plants in world, ocean thermal plants.		
6	Energy Conservation and management			
	7.1	Energy conservation and management, need and importance of energy conservation and management	05	10
	7.2	Concept of payback period, return on investment, life cycle cost, Sankey diagrams, specific energy consumption, Distribution of energy consumption		
	7.3	Energy audit, types of audit, methods of energy conservation		
	7.4	Cogeneration and its application.		
	7.6	Concept of energy management, study of different energy Management techniques like- analysis of input, reuse and recycling of waste, energy education, conservative technique and energy audit.		
		Total	32	80

List of Assignments:

Sr. No.	Name of Assignment
1.	To collect information about global and Indian energy market
2.	One field visit to be conducted to demonstrate application of Solar Energy
3.	One field visit to be conducted to Wind Mill
4.	To visit a biomass/ biogas plant of municipal waste or elsewhere.
5.	Perform energy audit for workshop/Office/Home/SSI unit.

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Review of conventional sources of energy	Classroom teaching and Internet browsing
2.	Solar Energy	Classroom teaching and field visits, use of charts
3.	Wind Energy	Classroom teaching, field visit & use of charts
4.	Energy From Biomass	Classroom teaching, field visit & use of charts
5.	Geothermal Energy	Classroom teaching and Internet browsing
6.	Tidal Energy	Classroom teaching and Internet browsing
7.	Energy Conservation	Classroom teaching
8.	Energy Conservation Techniques	Classroom teaching and case study

Text Books:

Sr. No	Author	Title	Publication
1.	Non conventional energy resources	Dr B.H.Khan	Tata McGraw Hill
2.	Non conventional energy	G. D. Rai	Khanna publication

	Resources		
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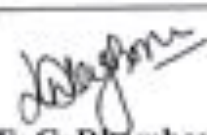
Sr. No	Author	Title	Publication
1.	Solar energy	S. P. Sukhatme	Tata McGraw Hill
2.	Solar energy	H. P. Garg	Tata McGraw Hill
3.	Power plant engineering	Arora Domkundwar	Dhanpat Rai & co.
4.	India- The energy sector	P.H. Henderson	Oxford University Press
5.	Industrial energy conservation	D. A. Ray	Pergaman Press
6.	Non-conventional energy source	K. M. Mittal	---
7.	Energy resource management	Krupal Singh Jogi	---
8.	Website for Akshay Urja News Bulletin, (www.mnes.nic.in)	---	---

Reference Books:

Learning Resources: Charts of solar water heater and cooker, Models of solar water heater and cooker, Photovoltaic cells etc., video cassette no.131, 365 of G.P.P. library

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Review of conventional sources of energy	06	--	--	06
2.	Solar Energy	02	06	08	16
3.	Wind Energy	04	04	08	16
4.	Energy From Biomass	04	04	08	16
5.	Geothermal Energy	04	--	06	10
6.	Tidal Energy	08	--	--	08
7.	Energy Conservation	--	04	--	04
8.	Energy Conservation Techniques	--	04	--	04
	Total	28	22	30	80


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Programme : Diploma in CE/EE/ET/ME/MT/CM/IT
Programme Code : 01/02/03/04/05/06/07/15/16/17/18/19
Name of Course : Engineering Economics
Course Code : AU484

Teaching Scheme:

	Hours /Week	Total Hours
Theory	02	32
Practical	--	--

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Three class tests of 60 min Duration	3 Hrs	--	--	--
Marks	20	80	--	--	--

Course Rationale:

Diploma Engineers working in middle level management are no longer confined to the role of professional technicians. They often have to take business decisions, for which they are required to apply economic concepts, logic, tools of analysis and economic theories as they advance in their carrier. It is for this reason that diploma students are required to posses some working knowledge of economic concepts, economic policy of our country, also the effects of globalization, GATT, WTO etc.

Course Objectives:

After studying this course, the student will be able to

- Various concepts, applications, contribution of Micro Economics and macro economics to engineering business decisions.
- Consumer demand, market demand, supply and production.
- Prices and cost - Break even analysis, price decisions.
- Concept of National income.
- Inflation, Deflation and unemployment.
- Money and Banking, New economic environment.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Weightage
1	Introduction to Economics		
	1.1 Definitions of economics, Objectives, Importance, concept of engineering economics.	04	10
	1.2 General concepts on micro & macro economics- Market economy, Command economy, Mixed economy.		
2	Demand Analysis		
	2.1 Utility related demand- total and marginal utility, law of diminishing marginal utility, cardinal and ordinal utility.	07	20
	2.2 Law of demand, Determinants of demand, Elasticity of demand, Factors governing the elasticity of demand.		
	2.3 Techniques and methods for forecasting of demand.		
3	Supply, Production and Cost analysis		
	3.1 Law of supply, Determinants of supply, Elasticity of supply and factors governing elasticity.	06	14
	3.2 Theory of production, Laws of production.		
	3.3 Cost concepts, Elements of costs, Preparation of cost sheet, Segregation of costs into fixed and variable costs. Break-even analysis-Linear approach. (Simple numerical problems to be solved)		
4	Time value of money		
	4.1 Simple and compound interest.	08	16
	4.2 Principle of economic equivalence. Evaluation of engineering projects, Cost-benefit analysis in public projects.		
	4.3 Depreciation- Causes of depreciation, Methods of calculating depreciation- Straight line method and declining balance method.		
5	National Income and Inflation		
	5.1 Concepts and measurement of national income, Gross domestic and national production (GNP, GDP).	03	08
	5.2 Inflation and deflation, measures, kinds and effects.		
	5.3 Unemployment causes, kinds, effects and remedies.		
6	Finance, Money and Banking and New Economic Environment		
	6.1 Financial statements i.e. Profit & Loss (Income) Statement, Balance sheet, Book – Keeping, Financial reporting.	04	12

	6.2	Money- Kinds and functions, significance.		
	6.3	Banking- Meaning and functions of commercial banks and Reserve Bank of India.		
	6.4	Liberalization- merits and demerits, GATT and W.T.O.		
Total			32	80

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Introduction to Economics	Lecture method, discussion
2	Demand Analysis	Lecture method, Assignment, surveys, case study, discussion
3	Supply Production and cost analysis	Lecture method, Assignment, surveys, case study, discussion
4	Time value of money	Lecture method, Assignment, surveys, case study, discussion
5	National income and inflation	Lecture method, Literature survey, discussion.
6	Finance, money and banking and New economic environment	Lecture method, visits journals review, discussion.

Text Books:

Sr. No	Author	Title	Publication
1	D.N. Dwivedi and Abhishek Dwivedi	Engineering Economics	Vikas publishing House Pvt. Ltd., New Delhi,
2	Maheshwari	Managerial Economics (2nd ed)	Prentice Hall of India Pvt. Ltd. New Delhi

Reference Books:

Sr. No	Author	Title	Publication
1	Pannerselvam	Engineering Economics	Prentice Hall of India Pvt. Ltd. New Delhi
2	Sasmita Mishra	Engineering economics & Costing	Prentice Hall of India Pvt. Ltd. New Delhi
3	Newnan, Eschenbach, and Lavelle,	Engineering Economic Analysis, 9th Edition,	Oxford University Press, 2004.
4	Eschenbach, Ted G.	Engineering Economy -	Irwin, 1995

		Applying Theory to Practice	
5	Newnan and Wheeler,	Study Guide for Engineering Economic Analysis, 9th Edition,	Oxford University Press, 2004.
6	Anthony J. Tarquin	Engineering Economy	McGraw-Hill, 1989

Learning Resources: Books, Journals, and Reports etc.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction to Economics	04	06	--	10
2	Demand Analysis	06	08	06	20
3	Supply Production and cost analysis	06	04	04	14
4	Time value of money	06	06	04	16
5	National Income and Inflation	04	04	--	08
6	Finance, Money and Banking and New economic environment	06	04	02	12
Total		32	32	16	80

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