BECVE 303 TENVIRONMENTAL ENGINEERING – I

Objectives:

1. To prepare students to apply basic knowledge of environmental engineering in conventional civil engineering practice involving water supply engineering in particular.
2. The course will provide students knowledge regarding the sources, of water demands, population forecasting, and conveyance of water.
3. To prepare students to analyze, plan, and design of various phases of water supply systems.
4. To provide the students the knowledge regarding the various characteristics of water, estimation of the quantity of water.
5. The course will provide students with fundamentals of solid waste management

Outcomes:

a. The students would be able to understand the importance and necessity of water supply.
b. The students would be able to determine the capacity of water supply scheme.
c. The students would have the basic knowledge related to the conveyance systems and the appurtenances used.
d. The students would have knowledge of characteristics of water, drinking water standards and necessity of treatment.
e. The students would be able to design various units of conventional water treatment plant.
f. The students would be equipped with the basic knowledge related to design of water supply system.
g. The students should be able to understand of necessity of treatment, types of treatment processes and disposal methods for solid waste.

Syllabus :

Unit – I

Introduction: Importance and necessity of water supply scheme.

Water Demand: All types of water demand, empirical formulae, factors affecting per capita demand, variation in demand, design period, population forecasting methods and examples.

Sources of water: Rain water, Ground water-springs, infiltration galleries, Dug wells, tube wells, Surface water-stream, lake, river, impounding reservoirs, ponds & sea.

Intake structures: Location, types river, lake, canal, reservoir etc.

Unit – II

Conveyance of water: Types of pipes, joints, fittings, valves & appurtenances.

Hydraulic design aspects: Friction, Manning's, DarcyWeishbach& Hazen Williams equationand problem.

Rising main and pumps: Concept of rising main. Classification, working, merits and demerits, selection of pumps.

Unit – III

Water quality: Physical, Chemical and bacteriological characteristics of water, Health effects of various water characteristics, Standards of drinking water. (WHO 2011, CPHEOO, IS 10500). Water born diseases

Water treatment: Objective of treatment, unit operations and processes, house hold & community based rural water treatment, decentralized water treatment, flow sheet of conventional water treatment plant.

Aeration: Purpose, types of aerators, design of cascade aerator.

Coagulation and Flocculation: Definition, Principles, types of coagulants and reactions, coagulant doses, types of mixing and flocculation devices.

Unit – IV

Sedimentation: Principles, types of setting basins, inlet and outlet arrangements, simple design of sedimentation tank.

Clariflocculators: Principles and operation.

Filtration: Mechanism of filtration, types of filters-RSF, SSF, Pressure filters, elements of filters sand specification, operational problems in filtration, Design of SSF and RSF, Membrane filtration technique of water treatment.

Unit – V

Disinfection: Purpose, Mechanism, criteria for good disinfectant, various disinfectants, their characteristics, disinfection by chlorination using different forms of chlorine. Types of chlorination.

Distribution systems: Requirements of a good distribution system, methods of distribution systems and layouts, Leakage and leak detector, Study of fire hydrants.

Storage reservoirs for treated water: Types, capacity of reservoir, mass curve.

Unit – VI

Municipal solid waste management : Generation sources, composition, Methods of Collection, transportation, disposal, Recycle, Reuse.

Examples on simple hydraulic design of pipes, estimation of population and water quality, plain sedimentation tanks, cascade aerators, filters, pumps, dose of chlorine). Visit to Water treatment plant (compulsory).

BEIT306T **ENVIRONMENTAL ENGINEERING**

(Total Credits: Nil)

Teaching Scheme:
Lecture: 2 Hours/week

Examination Scheme:
Theory: (Audit Course)

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UNIT I: Introduction:

Definition, scope and importance; Need for public awareness institution in environment, people in environment

UNIT II: Natural Resources:

Renewable and non-renewable and associated problem; Role of an individual in conservation of natural resources; equitable use of resources for sustainable lifestyles

UNIT III: Ecosystems:

Concept of an ecosystem – understanding ecosystrem, ecosystem degradation, resource utilization Structure and function of an ecosystem- producers, consumers and decomposers, Energy flow in the ecosystem – water, carbon, oxygen, nitrogen, and energy cycle, integration of cycles in nature Ecological Succession; Food chains ,food webs and ecological pyramids ;Ecosystem types- Characteristic features structure and function of forest ,grassland ,desert and aquatic ecosystems.

UNIT IV: Bio-diversity:

Introduction – biodiversity at genetic, species and ecosystem levels Bio-geographic classification of India Value of biodiversity- consumptive use value, productive use value, social, ethical, moral, aesthetic and optional value of biodiversity. India as a mega – diversity nation; hotspots of biodiversity Threats to bio-diversity –habitat loss, poaching of wildlife, man-wild life conflicts. Common endangered and endemic plant and animal species of india. Insitu and Exsitu conservation of biodiversity.

UNIT V: Pollution:

Definition; causes effects and control measures of air, water, soil, marine, noise and thermal pollution and nuclear hazards Solid water management – causes, effects and control measures of urban and industrial waste Role of individual and institution in prevention of pollution Disaster management – floods, earthquake, cyclone, landslides

UNIT VI: Social Issues and the Environment:

Unsustainable to sustainable development; urban problems related to energy; Water conservation, rainwater harvesting, watershed management; problems and concerns of resettlement and rehabilitation of affected people. Environmental ethics - issues and possible solutions – Resource Consumption patterns and need for equitable utilization; Equity disparity in Western and Eastern countries; Urban and rural equity issues; need for Gender equity. Preserving resources for future generations The rights of animals; Ethical basis of environment education and awareness; Conservation ethics and traditional value systems of India Climate change, global warming, acid rain, Ozone layer depletion, Nuclear accidents and holocausts. Wasteland Reclamation; Consumerism and Waste products Environment legislations - The Environment (protection) Act ; The Water (prevention and control of pollution) Act ; The Wildlife Protection Act; Forest Conservation Act ; Issues involved in enforcement of environmental Legislations – environment impact assessment (EIA), Citizens actions and Action groups. Public awareness – using an environmental calendar of activities self Initiation

UNIT VII: Human Population and the Environment:

Global population growth, variation among nations Population Explosion; Family welfare programmes - methods of stetrilization; Urbanization Environment and human health – Climate and health, infectious Diseases, water –related diseases, risk due to chemical in food, cancer and environment. Human Rights – Equity, nutrition and health rights, intellectual property rights(IPRS), Community Biodiversity registration(CBRs).Value education – environment value, valuing nature, valuing culture, social justice, human heritage, equitable use of resources , common property resources , ecological degradation. HIV/AIDS; Women and child welfare; Information technology in environment and human health.

Text Books:

1. UGC publication "a text book of environment studies for undergraduate courses by Erach bharucha", published by university Press (india) Pvt. Ltd., Hyderabad-500029.
2. Text Book of Environmental Studies, Second Edition by Deeksha Dave and S. S. Katewa, Cengage Learning

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BEME406T: ENVIRONMENTAL STUDIES (Theory)

CREDITS: Nil (College Assessment in Grades)

Teaching Scheme
Lectures: 3 Hours/Week

Examination Scheme
College Assessment: Grades
(Grades: O, A, B, C)

Course Objectives and Expected Outcomes: This course provides an integrated and interdisciplinary approach to the study of environment and solutions to environmental problems. This course will spread awareness among the students about environmental issues and shall alert them to find solutions for sustainable development.

UNIT – I **[6 Hrs.]**

Introduction:
Definition, scope and importance; Need for public awareness -Institutions in environment, people in environment.

Natural Resources:
Renewable and non-renewable and associated problems; Role of an individual in conservation of natural resources; equitable use of resources for sustainable lifestyles.

UNIT – II **[6 Hrs.]**

Ecosystems:
Concept of an ecosystem - understanding ecosysterns, ecosystem degradation, resource utilization, Structure and functions of an ecosystem- producers, consumers) and decomposers.

Energy flow in the ecosystem - water, carbon, oxygen, nitrogen; and energy cycles, integration of cycles in nature.

Ecological succession; Food chains, food webs and ecological pyramids; Ecosystem types - characteristic features, structure:, and functions of forest, grassland, desert and aquatic ecosystems.

UNIT – III **[6 Hrs.]**

Bio-diversity:

Introduction - biodiversity; at genetic, species and ecosystem levels Bio-geographic classification of India

Value of biodiversity - Consumptive use value, productive use .value, social, ethical, moral, aesthetic and optional value of biodiversity.

India as a mega-diversity nation; hotspots of biodiversity

Threats to bio-diversity - habitat loss, poaching of wildlife, man-wild life conflicts. Common endangered and endemic plant and animal species of India. Insitu and Exsitu conservation of biodiversity

UNIT – IV **[6 Hrs.]**

Pollution :

Definition; Causes, effects and control measures of air, water, soil, marine, noise and thermal pollutions and nuclear hazards.

Solid waste management - Causes, effects and control measures of urban and industrial waste. Role of individual and institutions in prevention of pollution.

Disaster management Floods, Earth quacks, Cyclone and land slides.

UNIT – V **[6 Hrs.]**

Social Issues and the Environment:

Unsustainable to sustainable development; Urban problems, related to energy; Water conservation, rainwater harvesting, watershed management; Problems and concerns of resettlement and rehabilitation of affected people.

Environmental ethics - issues and possible solutions – Resource consumption patterns and need for equitable utilization; Equity disparity in Western and Eastern countries; Urban and rural equity issues; need for gender-equity.

Preserving Resources for future generations. The rights of animals; Ethical basis of environment education and awareness; Conservation ethics and traditional value systems of India.

Climate change, global warming, acid-, rain, Ozone layer depletion, nuclear accidents and holocasts. Wasteland Reclamation; Consumerism and Waste products.

Environment legislations - The Environment (protection) Act; The water (Prevention and Control of Pollution) Act; The. Wildlife Protection Act; Forest Conservation Act; Issues involved in enforcement of environmental legislations - environment impact assessment (EIA), Citizens actions and action groups.

Public awareness — Using an environmental calendar of activities, self initiation.

UNIT – VI **[6 Hrs.]**

Human Population and the Environment:

Global population growth, variation among nations, population explosion; Family Welfare Programmes.- methods of. sterilization; Urbanization.

Environment and human health - Climate and health, Infectious diseases, water-related diseases, risk due to chemicals in food, Cancer and environment.

Human rights — Equity, Nutrition and health rights, intellectual property rights (IPRS), Community Biodiversity registers (CBRs).

Value education - environmental values, valuing nature, valuing cultures, social justice, human heritage, equitable use of resources, common property resources, ecological degradation.

HIY/AIDS; Women and Child Welfare; Information technology in environment and human health.

Syllabus.
RTM Nagpur University Nagpur.

BE. Course.

INDUSTRIAL ECONOMICS AND ENTREPRENEURSHIP DEVELOPMENT.
(Common to all branches of Engineering & Technology.)

Examination Scheme:

Units: 06.

Marks: Internal - 20
External - 80

Objective
Study of this subject provides an understanding of the scope of an industrial economics and entrepreneurship development, key areas of business development, sources of finance, project preparation, methods of taxation and tax benefits, significance of entrepreneurship and economic growth, application of engineering skills in entrepreneurial activities etc.

1.
Industrial economics, Types of Business structures, top and bottom line of the organization, economic analysis of business, economics of operations, economic prudence in business.

2.
Market structures- Monopoly, Oligopoly, and Monopolistic competition. Pricing strategies, business integration- forward backward integration, economies of scale, diseconomies of scale, liberalization, privatization and globalization. Business cycles, optimum size of firm.

3.

The functions of central bank and commercial banks, Foreign Direct Investment, Free trade vs. Protectionism, Capital formation, Inflation, Recession and stagnation, Inclusive growth, Public-Private partnership for development, Multiplier effect, Accelerator effect.

4

Entrepreneurship meaning, Major Motives Influencing an Entrepreneur, Factors Affecting Entrepreneurial Growth. Project Formulation, Product development, Market Survey and Research, Demand forecasting techniques,Techno Economic Feasibility Assessment – Preparation of Preliminary Project Reports – Project Appraisal – Sources of Information – Classification of Needs and Agencies.

5.

Need – Sources of Finance, Term Loans, Capital Structure, venture capital. Angel funding, Financial Institution, management of working Capital, Costing, Break Even Analysis, Network Analysis Techniques of PERT/CPM – Taxation – Direct, Indirect Taxes.

6.

Sickness in small Business, Major problems faced by SSIs, Foreign Direct Investments and threat to SSI, Technical consultancy organizations, safeguard measures against variation in currency value, Government Policy for Small Scale Enterprises, tax holidays, and incentives to SSIs.

TEXT BOOKS

Industrial Economics. By, Ranjana Seth, Ane Book Pvt Ltd.

Modern Economic Theory By, K.K. Dewett. S.Chand.

Industrial Economics. By, Jagdish Sheth, Pearson Publication.

"Entrepreneurial Development" By, S.S.Khanka S.Chand & Co. Ltd. Ram Nagar New Delhi, 1999.
Hisrich R D and Peters M P, "Entrepreneurship" 5th Edition Tata McGraw-Hill, 2002.

Management of Entrepreneurship. By, N.V.R. Naidu, I.K. International Pvt Ltd.

Entrepreneurial Development. By, S.Anil Kumar. New Age International.

Small- Scale Industries and Entrepreneurship, By, Dr. Vasant Desai, Himalaya Publication.

REFERENCE BOOKS:

Business Economics. By, K.Rajgopalchar. Atalantic Publishers.

Microeconomics. By, Robert Pindyk

Business Economics. By, H.L. Ahuja,H. L. Ahuja,Louis Prof. De Broglie. S.Chand.

Rabindra N. Kanungo "Entrepreneurship and innovation", Sage Publications, New Delhi, 1998.

Financing Small Scale Industries in India, By, K.C.Reddy.Himalaya Publication.

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur

Faculty of Engineering and Technology

B.E. (MECHANICAL ENGINEERING): FIFTH SEMESTER

BEME501T: INDUSTRIAL ECONOMICS AND ENTREPRENEURSHIP DEVELOPMENT (Theory)

CREDITS: 04

Teaching Scheme
Lectures: 3 Hours/Week
Tutorial: 1 Hour/Week

Examination Scheme
Duration of Paper: 03 Hours
University Assessment: 80 Marks
College Assessment: 20 Marks

Course Objectives and Expected Outcomes: This course is designed to create awareness about economics terminology and business organization, to understand relationship between business, market and society, to create awareness about entrepreneurship as a career avenue; financial agencies and government support systems for entrepreneurship. This course shall stimulate the potential to develop entrepreneurial orientation through innovation, creativity & students will understand the concept of innovation, invention, creativity and discovery in engineering context and shall also get awareness about IPR and Patents.

UNIT – I **[8 Hrs.]**

Industrial Economics : Economics, classification of economics, Basics concepts, Law of demand, Demand analysis, Types of demand, Determinants of demand, Methods of demand forecasting, Supply, Law of diminishing marginal utility, Elasticity of demand, Types of elasticity of demand.

UNIT – II **[8 Hrs.]**

Factors of production, Production function, Firm and Industry, Law of return, Cost concepts, Fixed variable, Average, Marginal and Total cost, Break even analysis Depreciation and methods for depreciation.

UNIT – III **[8 Hrs.]**

Inflation, effect of inflation, Monetary and fiscal measures to control inflation, deflation, stagflation direct and indirect taxes. Market and market structures, Perfect competition, Monopoly, Monopolistic competition, Oligopoly, Price determination in these Situations. Concept & overview of share market, Effect of share market on economy, Share market terminologies.

UNIT – IV **[8 Hrs.]**

Innovation & Creativity: Concept of creativity, innovation, invention, discovery. Methods for development of creativity, convergent & divergent thinking etc. Introduction to Intellectual Property Rights (IPR), Patent and laws related to patents.

UNIT – V **[8 Hrs.]**

Concept of entrepreneurship, its relations in economic developments, Eventuation of concept of entrepreneur, characteristics of an Entrepreneur, Types of entrepreneurs, Qualities of entrepreneur, Factors affecting growth of entrepreneurship. Theory of achievement, motivation, Medelland's. experiment, Women entrepreneurship, Role of SSI, it's advantages & limitations, policies governing small scale industries, Procedure to set up small scale industrial unit, Advantages and limitations of SSI.

UNIT – VI **[8 Hrs.]**

Preparation of project report: Factors governing project selection, Market survey, Preparation of project report. Financial, technical & market analysis of project. Entrepreneurial support systems, Role of consultancy organization like, District Industrial Centre, State Industrial Development Corporation, Financial institution, Latest SSI schemes of DIC (to be confirmed from DIC from time to time)

Note: Group of students (Min 05 & Max 09) are expected to prepare a project report for business / industry on the knowledge acquired.

TEXT BOOKS:

1. Modern Economics, H. L. Ahuja, S.Chand Publishers
2. Modern Economic Theory, K. K. Dewett., S. Chand Publishers
3. Engineering Economics, D. N. Dwivedi, A. Dwivedi, Vikas Publishing House
4. Entrepreneurship Development, S. S. Khanka, S. Chand Publishers
5. Creativity Innovation & Entrepreneurship, Zechariah James Blanchard, Needle Rat Business Publishers.