JHARKHAND Rai University

DIPLOMA SEM VI CE

Diploma VIth Sem												
			Periods			Evaluation Scheme						
S.No	**Subject Code**	**Name of Subject**	**L**	**T**	**P**	**Assignment**	**TA**	**Total**	**ESE**	**Subject Total**	**Credit**	**Hours**
1	5AD.352	Contracts and Accounts	3	0	0	20	10	30	70	100	3	3
2	5AD.353	Environment Engineering	3	0	0	20	10	30	70	100	3	3
3	5AD.354	Design Of RCC Structures	3	0	0	20	10	30	70	100	3	3
4	40B.451	**Human Values and Ethics	2	0	0	20	10	30	*20	50	0	2
5	**ELECTIVE II (Choose any one from the followings)**											
	7D.351	Principles of Management	3	0	0	20	10	30	70	100	3	3
	5AD.381	GIS	3	0	0	20	10	30	70	100	3	3
	5AD.382	Green Building	3	0	0	20	10	30	70	100	3	3
	5AD.383	Watershed Management	3	0	0	20	10	30	70	100	3	3
PRACTICAL/DESIGN/DRAWING/SESSIONAL												
1	5ADP.353	Environment Engineering Lab	0	0	2		30	30	20	50	1	2
3	5AD.395	Project	0	0	10		75	75	75	150	5	10
										600	**18**	**26**

***Note: Only Viva voce is Conducted**

****Note: Non Credit Course**

*****Note: Intoduced MOOCS online course Upto 20% of credit to be earned by moocs swayam portal of UGC**

Program: Diploma
Semester: Six
Course: Principle of Management
Course Code: 7D.351

L	T	P	C
3	0	0	3

Course Objective:

- Explain strategic management in business operations.
- Define management, quality management, and project management.
- Identify relevant issues in human resource management

Unit-I

Overview of Business**-** Types of Business- Service, Manufacturing, Trade, Industrial sectors- Introduction to, Engineering Industry, Process Industry, Textile Industry, Chemical Industry, Agro Industry Globalization-Introduction, Advantages & disadvantages w.r.t India Intellectual Property Rights (IPR), Concept, Types of IPR

Management Process**-**What is Management, Evolution, and Various Definitions, concept of Management, Levels of Management, Administration and Management, Scientific Management by FWTAYLOR? Principles of Management (14 principles of Henry Fayol), Functions of Management-Planning, Organizing, Coordinating, Directing, Controlling, Decision Making

Unit-II

Organizational Management Organization-Definition, Steps informing organization Types of Organization-Line, Line & staff, Functional, Project type Departmentation- Centralized & Decentralized, Authority & Responsibility, Span of Control (Management) Forms of ownerships-Proprietorship, Partnership, Joint Stock Company, Co-operative society, Govt. Sector

Unit-III

Human Resource Management Personnel Management-Introduction, Definition, Function Staffing-Introduction to HR, Introduction to HR Planning, Recruitment procedure Personnel–Training & Development, Types of training, Induction, Skill enhancement Leadership & Motivation-Leadership-Styles & types, Motivation–Definition, Intrinsic & Extrinsic, Moslow's theory of Motivation and its significance Safety Management- Causes of Accidents, Safety Procedures. Introduction, Objectives & feature of Industrial Legislation such as, Factory Act, ES Act, Workman Compensation Act, Industrial Dispute Act.

Financial Management**-** Financial Management-Objectives & Functions, Capital Generation & Management-Types of capitals, Sources of finance, Budgets and Accounts-Types of Budgets, Production Budget (including Variance Report) Labor Budget, Introduction to Profit & Loss Account (Only concept) Balance sheet etc., Introduction to Various Taxes, Excise Service Tax, Income Tax, VAT, Custom Duty.

Unit-IV

Materials Management- Inventory Management-Meaning & Objectives, ABC Analysis Economic Order Quantity-Introduction& Graphical Representation Purchase Procedure-Objectives of Purchasing,

Functions of Purchasing Department, and Steps in Purchasing, Modern Techniques of Material Management, and Introductory treatment to just in Time (JIT)/System Applications & Products (SAP)/Enterprise Resource Planning (ERP).
Project Management (Simple/Elementary Numerical)-Project Management-Introduction & Meaning, Introduction to CPM/PERT Techniques (simple network problems), Concept of Break Even Analysis and its significance; Quality Management- Definition of Quality, Concept of Quality, Quality, Circle, Quality Assurance, Introduction to TQM, Kaizen, 5'S'&SixSigma.

Suggested Readings:

1. *Industrial Engg &Management, Dr. O.P. Khanna, Dhanpat Rai& sons NewDelhi*
2. *Business Administration &Management, Dr. S.C. Saxsena, SahityaBhavanAgra*
3. *The process of Management, W.H. Newman, E. Kirby Warren, Prentice-Hall of India Pvt. Ltd.NewDelhi-110001*

Program: Diploma
Semester: Six
Course: Contracts and Accounts
Course Code: 5AD.352

L	T	P	C
3	0	0	3

Course Objective:

- Able to know about the types of contractor
- To know about tender & bidding process
- To know the legal aspects of contracts
- Able to release payment to a contractor

Unit-I

Procedure of execution of work by P.W.D- Organizational structure of P.W.D., functions of their personnel, P.W.D. Procedure of initiating the work, administrative approval, technical sanction, budget provision, Methods used in P.W.D., For carrying out works contract, method and departmental method, rate list method, piece work method, day's work method, department method (NMR and Casual Muster Roll.)

Unit-II

Contract-Definition of contract, Objects of contract, requirements of valid contract, Types of engineering contract with advantages and disadvantages their suitability- Lump sum contract, item rate contract, percentage rate contract, cost plus percentage, cost plus fixed fee, cost plus variable percentage and cost plus variable fee contract, labor contract, demolition contract, target contract, negotiated contract, Class of contractor, Registration of contractor, BOT Project: objectives, scope, advantages, disadvantages, examples.

Tender &Tender Documents**-** Definition of tender, necessity of tender, types-local and global, tender notice, points to be included while drafting tender notice, drafting of tender notice, Meaning of terms: earnest money, security deposit, validity period, right to reject one or all tenders, corrigendum to tender notice and its necessity, Tender documents–list, schedule-a, schedule-b ,schedule-C, Terms related to tender documents–contract conditions: time limit, time extension, penalty, defective material and workmanship, termination of contract, suspension of work, subletting of contract, extra items ,escalation ,arbitration, price variation clause, defect liability period, liquidated and un liquidated damages, Filling the tender by contractor and points to be observed by him, Procedure of submitting filled in tender document, procedure of opening tender , comparative statement , scrutiny of tenders, award of contract, acceptance letter and work order, Unbalanced tender, ring formation.

Unit-III

Accounts in P.W.D**-** Various account forms and their uses- measurement books, nominal muster roll, imp rest cash, indent, invoice, bills, vouchers, cash book, temporary advance.

Payment to Contractors**-** Mode of payment to the contractor- interim payment and its necessity, advance payment, secured advance, on account payment, final payment, first and final payment, retention money, reduced rate payment, petty advance, mobilization advances.

Unit-IV

Specification-Necessity and importance of specifications of items, points to be observed in framing specifications of an item, types of specification –brief and detailed, and standard and manufacturer's specification, preparing detailed specifications of items in civil engineering works. from each of following: building construction system, irrigation engineering system, transportation engineering system, environmental engineering system, legal aspects of specification, definition, necessity of valuation. Definitions–cost, price, value, characteristics of value, factors affecting value, types of value: book value, scrap value, salvage value, speculative value, distress value, market value, monopoly value, sentimental value, factors affecting value. depreciation, obsolescence, sinking fund, methods of calculation of depreciation– straight line method, sinking fund method, constant percentage method quantity survey method, computation of capitalized value, gross income, outgoing, net income, years purchase. Types of outgoing, and their percentages, fixation of rent as per P.W.D. Practice

Suggested Readings:

1. *Estimation And Costing, B.N. Datta, UBS Publishers*
2. *Estimating &Costing, S.C. Rangwala, Charotar Publication*
3. *ESTIMATING &COSTING, G. S.Birdie, Dhanpat Rai And Sons*

Program: Diploma
Semester: Six
Course: Environmental Engineering
Course Code: 5AD.353

L	T	P	C
3	0	0	3

Course Objective:

- Be able to analyse an industrial activity and identify the environmental problems
- Be able to plan strategies to control, reduce and monitor pollution.
- Understand key current environmental problems.
- be conversant with basic environmental legislation

Unit I

Water supply engineering; Sources of supply, yields, introduction to intakes and conductors; Estimation of demand; Water quality standards; Control of Water-borne diseases; Primary and secondary treatment, detailing and maintenance of treatment units; Conveyance and distribution systems of treated water, leakages and control; Rural water supply; Institutional and industrial water supply.

Unit II

Waste Water Engineering; Urban rain water disposal; Systems of sewage collection and disposal; introduction to Design of sewers and sewerage systems; pumping; Characteristics of sewage and its treatment, Disposal of products of sewage treatment, stream flow rejuvenation Institutional and industrial sewage management; Plumbing Systems; Rural and semi-urban sanitation.

Unit III

Solid Waste Management; Sources, classification, collection and disposal; introduction and Management of landfills, Hazardous Wastes Introduction, types of hazardous wastes, Characteristics of hazardous wastes, treatment and disposal of hazardous wastes

Unit IV

Air And Noise Pollution and Ecology; Sources and effects of air pollution, monitoring of air pollution; Noise pollution and standards; Ecological chain and balance, Environmental assessment

Suggested Readings:

1. *Environmental Engineering (Volume I&II), S. Garg, Khanna Publishers,*
2. *Environmental Engineering, N.N.Basak, TMH*
3. *Water Supply and Sanitary Engg. Birdie G.S,Birdie J.S.DhanpatRai&Sons*

Program: Diploma
Semester: Six
Course: Environmental Engineering Lab
Course Code: 5ADP.353

L	T	P	C
0	0	2	1

List of experiments:-

1. Determination of turbidity, color and conductivity.
2. Determination pH, Alkalinity and acidity.
3. Determination of hardness and chlorides.
4. Determination of residual chlorine and chlorine demand.
5. Determination of dissolved oxygen.
6. Determination of B.O.D. of sewage
7. Determination of C.O.D. of domestic and industrial waste.
8. Determination of Kjeldal Nitrogen.

Program: Diploma
Semester: Six
Course: Design of RCC Structure
Course Code: 5AD.354

L	T	P	C
3	0	0	3

Course Objective:

- Students will become familiar with the reinforced concrete fabrication and construction process
- Students will be required to design a concrete mix design and form, pour, construct, and test a
- Reinforced concrete beam.
- Students will be required to perform as a group, each with individual assignments, on an industry relevant design project

Unit I

Properties of Concrete and its Ingredients: Types of cement and their characteristics; ingredients of concrete; Aggregates quality and grading – coarse and fine aggregates; (Brief discussion only) Concrete types and their composition: use in different structural units; law of water-cement ratio; compaction requirement; additives and admixtures; Tests on cement and concrete; design of mix proportions by fineness modulus and trial mix methods Reinforcements – types of reinforcement and their properties. Design philosophies to the Working Stress method, Limit state and ultimate strength method
Working Stress method: Introduction, calculation of neutral axis, critical depth, moment of resistance for under-reinforced, over-reinforced and balanced sections

Unit II

Limit state of collapse, limit state of serviceability, partial safety factors, Neutral axis determination, Analysis & Design Problems. Under-reinforced, over-reinforced and balanced sections, singly, doubly reinforced sections
Limit state design for Shear, Bond and Torsion: Shear reinforcement in form of vertical stirrups and bent-up bars; shear strength of concrete; minimum shear reinforcement; development length; design for torsion reinforcement

Unit III

Design of beams and Slabs: Rectangular, T beams and one way, two way slabs

Unit IV

Design of Columns: Short axially loaded columns; helical reinforcement; columns with axial load and uniaxial /biaxial bending; interaction charts as per SP – 16. Design of Footings

Suggested Readings:

1. *Limit State Theory &Design of Reinforced Concrete, Dr. V.L. Shah &Late Dr.S.R. Karve, Structures Publications*
2. *Pre-stressed Concrete, N.KrishnaRaju, New Age International*
3. *Reinforced concrete Design, B.C. Punmia, Laxmi Publication*
4. *Reinforced concrete Design, S.U. Pillai&DevdasMenon, TMH*

Program: Diploma
Semester: Six
Course: Human Values and Ethics
Course Code: 40B.451

L	T	P	C
0	2	0	0

Course Objective:

- To provide a critical perspective on the socialization of human beings.
- To introduce students to information about some key aspects of Indian culture and ethics.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.

1. **VALUE CRISIS IN CONTEMPORARY INDIAN SOCIETY**
   - 1.1 Value Crisis at the Individual Level
   - 1.2 Societal Level
   - 1.3 Intellectual Level
   - 1.4 Cultural Level
   - 1.5 Value – What are they?
   - 1.6 The Indian Concept of Values.
   - 1.7 Modern Approach to the Study of Values.
   - 1.8 Aesthetic Sensibilities

2. **MORAL AND ETHICAL HUMAN VALUES**
   - 2.1 Bases for Moral Judgment
   - 2.2 Some Canons of Ethics.
   - 2.3 Virtue Ethics.
   - 2.4 Ethics of Duty.
   - 2.5 Ethics of Responsibility
   - 2.6 Factors to be considered in Making Ethical Judgments.
   - 2.7 Different Meanings of Human Values
   - 2.8 A New Approach to Human Value ,Freedom, Creativity Love &Wisdom

3. **MORAL VALUES IN PROFESSION**
   - 3.1 What is a Profession?
   - 3.2 Professional Ethos
   - 3.3 Code of Professional Ethics
   - 3.4 Practicing the Code
   - 3.5 Corporate Social Responsibility
   - 3.6 The Larger Domain of Human Values
   - 3.7 Institutionalizing Ethics and Human Values

4. **GENDER SENSITIZATION**

4.1 Socialisation of women

4.2 Just Relationships, being together as equals

4.3 Declining sex ratio, demographic consequences

4.4 Women's work, its politics and economics, fact and fiction, unrecognized and unaccounted work

4.5 Domestic violence, eve teasing and harassment. Is home a safe place?

Recommended Texts:

- Dr. Rajan Mishra, Human Values: Laxmi Publications Pvt. Ltd.
- S. Dinesh Babu, Professional Ethics and Human Values; Laxmi Publications Pvt. Ltd.
- P.S. Rathore. Business Ethics And Communication; S.Chand Publishing
- Dr. K.Alex. Managerial Skills; S. Chand Publishing.
- Dr. M. Adithan, Study Skills For Professional Students For Higher Education , S.Chand Publishing
- Govindarajan M "Professional Ethics and Human Values."
- R.R. Gaur and R. Sangal " A Foundation Course in Human Values and Professional Ethics"

Websites:

- www.tatamcgrawhill.com/digital Solutions/ monopoly
- www.schandedutech.com
- www.laxmipublications.com

Program: Diploma
Semester: Six
Course: Watershed Management (Elective II)
Course Code: 5AD.383

L	T	P	C
3	0	0	3

Course Objective:

- The ability to understand and analyse watersheds and river basins for wholesome sustainable development, protection of source water.
- Students will be able to determine the causes of stress in different river basins and work towards remediation techniques for restoration of river and ecosystem health.

Unit I
Introduction: concept OF watershed development, objectives of watershed
Development, need for watershed development in India, integrated and multidisciplinary
Approach for watershed management.

Unit ii
Characteristics of watershed: size, shape, physiographic, slope, climate,
Drainage, land use, vegetation, geology of soils, hydrology and hydrogeology, socio-economic
Characteristics, basic data on watersheds.

Unit iii
Water harvesting: rainwater harvesting, catchment harvesting, harvesting
Structures, soil moisture conservation, check dams, artificial recharge, farm ponds,
Percolation tanks.
Land management: land use and land capability classification, management of
Forest, agricultural, grassland and wild land, reclamation of saline and alkaline soils.

Unit iv
Ecosystem management: role of ecosystem, crop husbandry, soil enrichment,
Inter, mixed and strip cropping, cropping pattern, sustainable agriculture, bio-mass
Management, dry land agriculture, silvi pasture, horticulture, soil forestry AND afforestation.
Planning of watershed management activities, peoples participation, preparation of
Action plan, administrative requirements.

Suggested Reading:

1. *Watershed Management by JVS Murthy – New Age International Publishers.*
2. *Water Resource Engineering by R.Awurbs and WP James – Prentice Hall Publishers.*
3. *Watershed Management by VVN Murthy – Kalyani Publications.*
4. *Irrigation and Water Management by D.K. Majumdar – Prentice Hall of India.*

Program: Diploma
Semester: Six
Course: Geo-informatics (Elective II)
Course Code: 5AD.381

L	T	P	C
3	0	0	3

Course Objective:

- Preparation of geospatial features in computing environment
- Analyze spatial and attribute data for solving spatial problems
- Create GIS and cartographic outputs for presentation
- Understand the software/hardware requirements for implementing a GIS Project

Unit I

Aerial Photographs- Basic terms & Definitions, scales, relief displacements, Flight Planning, Stereoscopy, Characteristics of photographic images, Fundamentals of aerial photo-interpretation

Unit II

Physics of remote sensing, Ideal remote sensing system, Remote sensing satellites and their data products, Sensors and orbital characteristics, Spectral reflectance curves, resolution and multi-concept, FCC

Unit III

Satellite Image - Characteristics and formats, Image histogram, Introduction to Image rectification, Image Enhancement, Land use and land cover classification system, Supervised Classification, Applications of remote sensing

Unit IV

Basic concepts of geographic data, GIS and its components, Data acquisition, Raster and Vector formats, topology and Data models, Spatial modeling, Data output, GIS Applications
Introduction Satellite navigation System, GPS- Space segment, Control segment, User segment, GPS satellite signals, Receivers, Static, Kinematic and Differential GPS

Suggested Reading:

1. *Introduction to Remote Sensing, Campbell, J.B., Guilford Press*
2. *Principles of Remote Sensing, Curran, P.J., Longman, London*
3. *Elements of Photogrammetry, Wolf P.R., TMH*
4. *Surveying Vol-III, B.C. Punamia, Khanna Publishers*

Program: Diploma
Semester: Six
Course: Green Building (Elective II)
Course Code: 5AD.382

L	T	P	C
3	0	0	3

Course Objective:

- Ability to understand the principles and choices in home design and construction.
- Ability to know innovative materials, systems, and construction methods.
- Ability to learn about energy-efficient systems including onsite power generation.
- Ability to distinguish cost-benefits of retrofitting, remodeling, or renovating existing homes

Unit I

Green Building Process and Ecological Design Fundamental Principles of Green Building, Introduction to high-performance green buildings, Conventional versus green building delivery systems - Design and construction relationships - Green building project execution - the integrated design process - green building documentation requirements - design versus ecological design - historical perspective - contemporary ecological design - future ecological design - green design to regenerative design.

Unit II

Green Building Systems

Sustainable sites Design and landscaping – selection of green materials - products and practices - passive design strategy – internal load reduction – indoor environment quality strategies - Building energy system strategies – Water cycle strategies- building water and waste management IGBC standards.

Unit III

Green Building Implementation

Site protection planning - health and safety planning - construction and demolition waste management - reducing the footprint of construction operations - maximizing the value of building commissioning in HVAC System, lighting and non mechanical Systems - costs and benefits relevance to IGBC standards.

Unit IV

Assessment and Economics

Methods and tools for building assessment. Future directions in green high performance building technologies-Carbon accounting-Green Building specifications. Business case for high-performance green buildings - the economics of green building - benefits - managing initial costs - cost barrier in project management – long term environment benefits.

Suggested Reading:

1. *Jerry Yudelson, Green Building A To Z, Understanding The Buildings, 2008.*
2. Green Building Guidelines: Meeting The Demand For Low-Energy, Resource Efficient Homes. Washington, D.C.: Sustainable Buildings Industry Council, 2004.

1. Jerry Yudelson, Green Building Through Integrated Design, Mcgraw Hill, 2008
2. Alex Wilson And Mark Peipkorn., Green Building Products: The Green Spec Guide To Residential Building Materials, 2nd Edition, Gabriola Island, BC:
3. Jane Anderson, David E. Shiers, And Mike Sinclair. The Green Guide To Specification: An Environmental Profiling System For Building Materials And Components, 3rd Edition, Oxford; Malden, MA: Blackwell Science, 2002.
4. Charles J. Kibert, Sustainable Construction: Green Building Design And Delivery, 2nd Edition, Wiley, 2007.
5. ECBC 2007 Manual, Bureau Of Energy Efficiency, New Delhi