



St. Xavier's College, Ranchi

(NAAC Accredited 'A' Grade College)

(An Autonomous College of Ranchi University)

Syllabus

Department of Vocational

&

Management Studies

Honours Programme:

- ***B.Voc. (Building Construction Management) w.e.f. Academic year 2014-15***



प्रो. (डॉ.) जसपाल एस. सन्धू
सचिव

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Secretary



विश्वविद्यालय अनुदान आयोग
University Grants Commission

(मानव संसाधन विकास मंत्रालय, भारत सरकार)
(Ministry of Human Resource Development, Govt. of India)

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D.O.No.F.2-7/2014(CC/NVEQF)/Misc.

3rd August, 2016

Dear Sir/Madam,

1-4 AUG 2016

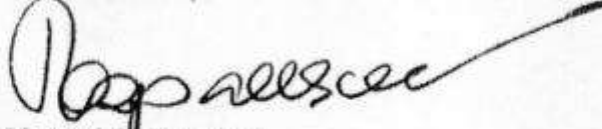
The University Grants Commission (UGC) has launched a scheme on skill development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) Degree with multiple exit options such as Diploma/Advanced Diploma under the NSQF. The B.Voc. programme is focussed on universities and colleges providing undergraduate studies which would also incorporate specific job roles and their National Occupational Standards (NOSs) alongwith broad based general education.

In order to, look into new developments and consider the candidates passing out of B.Voc. Degree Programme as per eligibility requirements, it is requested to implement the following:

- (i) Bachelor of Vocation (B.Voc.), a Bachelor level degree specified by UGC under section 22(3) of UGC Act, 1956 and notified in official Gazette of India dated 19th January, 2013 be recognised at par with the other Bachelor level degrees for competitive exams conducted by Union/State Public Service Commission, Staff Selection Commission or other such bodies where the eligibility criteria is "Bachelor Degree in any discipline".
- (ii) Students with B.Voc. Degree should be considered eligible for the trans disciplinary vertical mobility into such courses where entry qualification is a Bachelor Degree without specific requirement in a particular discipline.

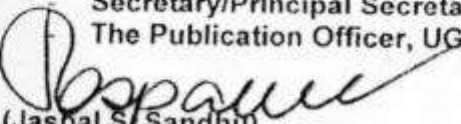
With kind regards,

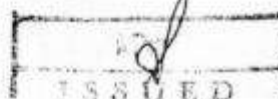
Yours sincerely,


(Jaspal S. Sandhu)

The Vice-Chancellor of all Universities.

Copy to :

Secretary/Principal Secretary (Higher Education), All States and UTs
The Publication Officer, UGC, New Delhi for uploading on UGC website.

(Jaspal S. Sandhu)



Course Curriculum

<u>Sem</u>	<u>Honours Course</u>	<u>Title of the Course</u>	<u>Marks</u>	<u>Credit (CRT+GA)</u>	<u>Exit Status</u>
I	I	Management Theory & Organization Behaviour	100	3+1	D I P L O M A
I	II	Construction Materials & Applications-I	100	3+1	
I	III	Basics of Civil Construction	100	3+1	
I	IV	Construction Economics	100	3+1	
I	V	Project & Viva voce	100	2+12	
II	VI	Civil AutoCAD-I	100	3+1	
II	VII	Basic Mathematics	100	3+1	
II	VIII	Structure	100	3+1	
II	IX	Construction Material & Applications-II	100	3+1	
II	X	Project & Viva voce	100	2+12	
III	XI	Construction Marketing Management	100	3+1	A D V A N C E
III	XII	Construction Safety Management	100	3+1	
III	XIII	Civil AutoCAD-II	100	3+1	
III	XIV	Construction Personnel Management	100	3+1	
III	XV	Project & Viva voce	100	2+12	
IV	XVI	Building Management System	100	3+1	D I P L O M A
IV	XVII	Civil Survey	100	3+1	
IV	XVIII	Construction Financial Accounting	100	3+1	
IV	XIX	Advanced Construction Technology	100	3+1	
IV	XX	Project & Viva voce	100	2+12	
V	XXI	Project Estimation & Cost Analysis	100	3+1	B. V O C.
V	XXII	Material Procurement & Store Management	100	3+1	
V	XXIII	Infrastructure Development & Project Management	100	3+1	
V	XXIV	Construction Quality Management	100	3+1	
VI	XXV	Project & Viva voce	100	2+12	
VI	XXVI	Construction & International Contracting	100	3+1	D E G R E
VI	XXVII	Entrepreneurship Development Programme	100	3+1	
VI	XXVIII	Project Management Technique	100	3+1	
VI	XXIX	Green Technology	100	3+1	
VI	XXX	Project & Viva voce	100	2+12	

- ❖ Marks are based on 30:70 systems. 30 marks are allotted for the Assignment, Attendance, & Mid-Semester Examination and 70 marks are allotted for the End-Semester Examination.
- ❖ Honours Course Number-V, X, XV, XX, XXV & XXX): Marks are divided on 50:50 Marks Systems. 50 Marks are allotted for the Internal Project Assessment & Presentation and 50 Marks are allotted for the External Viva voce.
- ❖ Pass marks for each course is 45 (Total Combined marks of mid semester examination, internal assignment, attendance and End Semester Examination).
- ❖ 1 Credit = 15 Learning Hours
- ❖ CRT= Class Room Teaching, GA=Guided Assignment

Semester-I-B.Voc. (Building Construction Management)
Course-I-Management Theory & Organization Behaviour

Objectives:

- This course is provides knowledge regarding various management theories for the functioning of management and administration. The established theories are to be discussing for better understanding of corporate and non corporate functioning.
 - This course also onlooks different organizational behaviour are discussing for better understanding of different factors of organizational behaviour which are effectively influence the organization or have the power to alternate the organizational functioning.
1. General Management – Comparison between traditional management and modern scientific Management, roles of Taylor, Fayol, Mayo, McGregor, and Management functions, Management styles.
 2. Introduction of organization and organizational behaviour, Perception and attitudes;
 3. Management Processes & Functions: Planning, organizing, staffing, leading & controlling.
 4. Motivation concepts and processes; Group behaviour and teams, communication, authority & leadership. Globalization & structure of the organization.
 5. Power and politics in the organization, organizational change and culture.
 6. Organizational Development.

Recommended Books:

1. Organizational Behaviour-M N Mishra, Vikas Publishing House Pvt. Ltd.
2. Organizational Behaviour-Stephen P. Robbins & Seema Sanghi, Pearson Education
3. Organizational Development-Dr. Vasudeva, Associated Publishers.
4. Principles of Management-P. C. Tripathy P. N. Reddy

Semester-I-B.Voc. (Building Construction Management)

Course-II-Construction Material & Application-I

Objectives: This course provides knowledge regarding various types of civil construction material and its application. Knowledge regarding mother earth materials and its applications are also discussing for better understanding of the students. It is the basic of a civil engineering uses.

1. Introduction-Needs, specifications, performances; materials' properties; quality control and standards.
2. Stones: Appearance, properties; types of stones (igneous, sedimentary, metamorphic); exploitation of quarries; workability of stones; maintenance of stonework (cleaning, preservation, water repellents, restoration, vegetable growth).
3. Timber: Tree structure; tree growth; classification of trees; structure of timber; moisture content of timber; defects of timber; durability of timber; preservation of timber; selection of timber.
4. Soils: The nature of soils; aspects of engineering geology; physical and mechanical properties of soils; index properties; classification of soils, earth as a building material; adobe and rammed earth.
5. Clay products: Classification of clay products; bricks, tiles and pipes.
6. Ferrous metals: Classification of metals; iron alloys and their classification; properties and uses of cast iron; wrought iron; properties and uses of steel; classification of steel products.
7. Cementations materials: Lime, gypsum; types of plaster; source of gypsum plasters; manufacture of plasters; setting of plaster; classification of plasters; mortars.
8. Cement: Sources of raw materials for manufacture of ordinary Portland cement; manufacture of ordinary Portland cement; setting and hardening of cement; constituents of raw materials; constituent of ordinary Portland cement; other types of cement; classification of cement.
9. Aggregates: Sources of aggregates; types of aggregates; properties of aggregates; functions of aggregates; shape and surface area of aggregates; surface texture of aggregates; size of aggregates; grading of aggregates; moisture contents of aggregates.

Recommended Books

1. Mamlouk, M.S. and Zaniewski, J.P.-Materials for Civil, Prentice Hall
2. Shan Somayaji, Civil Engineering Materials, 2nd Edititon, Prentice Hall Inc.
3. Derucher, K.Korfiatis. G. & Ezeldin, S., Materials for Civil and Highway Engineers, 4th Edition, Prentice Hall Inc.
4. Hibbeler, R.C. Mechanics of Materials, Prentice Hall, 2003.
5. Building material "RANGWALA"

Semester-I-B.Voc. (Building Construction Management)

Course-III-Basics of Civil Construction

Objectives: *This course providing basic knowledge regarding civil construction with its different techniques and factors. Infrastructural supports systems and new technology are also discussing for better understanding of the students.*

1. General building requirements, types of building, components, technical terms and parts of building.
2. Foundations: - purpose, types of foundations, deep foundations and structural design.
3. Brick work masonry: - Definition, types of bricks, bonds, tools of brick layer, stability strength and defects.
4. Stone masonry: - Generals, comparison between stone and bricks, dressing, finishing and setting of stone masonry.
5. Basics of different types Arches Lintels, Floor Doors windows and stairs.
6. Basics of Shoring and under pinning scaffoldings works.
7. Introductory ideas of Retaining walls and white wash.
8. Introductory ideas of Trussed beams Iron and wooden, its uses and importance.
9. Batching plant: - Role and importance of Batching plant in construction work.
10. Planning of building by Law.

Recommended books:

1. Concise Hand Book of Civil Engineering-V. N. Vazirani & S P Chandole, S Chand
2. Basic Civil Engineering-Satheesh Gopi, Pearson Education India.
3. Building construction-B.C.Punamia

Semester-I-B.Voc. (Building Construction Management)

Course-IV-Construction Economics

Objectives: *This course provides the knowledge regarding construction economics and its application in the economical environments with various factors.*

1. *Basic economic concepts: Stock and Flow, Static and Dynamic economics, Micro economics and Macroeconomics, National Income concepts.*
2. *Market demand : Demand, meaning and types, Law of demand, exceptions to the law of demand, Elasticity of Demand, Methods of measuring elasticity of demand, Marginal utility Analysis.*
3. *Production analysis: Production functions, law of returns, least cost combination, cost and cost curves, choice of plant size in the long run.*
4. *Supply: Law of supply, elasticity of supply.*
5. *Cost concepts and estimation: Cost elements, economic vs. accounting concepts of costs and Revenues, Standard Cost, Actual Cost, Over head Cost, Cost control, Break-Even-Analysis.*
6. *Economic appraisal techniques: Long- Range and Short range Budgeting, Criteria for Project Appraisal, Social benefit-cost analysis, Depreciation: concepts and Techniques.*
7. *Monetary System: Money and its functions, Functions of the Commercial Bank and Central Bank, Monetary Policy.*
8. *Inflation and business cycles: Causes, effects and methods to Control Inflation, Concepts of Business Cycles.*

Recommended Books:

1. *A Text Book of Economic Theory-Stonier and Hauge.*
2. *Modern Economic Theory-K. K. Dewett*
3. *Engineering Economics-Degrano*
4. *Principles of Macroeconomics-Rangarajan and Dholakia.*

Semester-I-B.Voc. (Building Construction Management)

Course-V-Project & Viva voce

Objectives: This course provides in house testing knowledge and field knowledge for proper development and perfect application of construction material to the students and makes them sufficient to handle real life problems of civil structures. The following experiments are to be performed by the students in the in house lab:

1. Sieve analysis of sand
2. Sieve analysis of coarse aggregate.
3. Sieve analysis of Fly ash and bottom ash
4. Effective size determination.
5. Density of fine sand and coarse aggregate.
6. Determination of specific gravity through picnometer.
7. Analysis of brick.
8. One field visit.
9. One civil lab visit.

In this course students are assigned with the practical topics by the project guide, which is based on the practical aspects within the civil engineering module. This course is also increased the practical skills of the students and enhance their presentation system. Real industrial working knowledge will be understood by the students for enhancing their employability. This course is continuously monitored by the project guide with periodical assessment system with the preparation of the project report. 50 marks are assigned for the internal assessment and another 50 marks evaluation will be taken by the external examiner based on the project report as viva voce.

Semester-II-B.Voc. (Building Construction Management)

Course-VI-Civil AutoCAD- I

Objectives: This course provides knowledge regarding civil related Computer Aided Design with application and systems. It's a pure practical paper and exclusively oriented with the computer software of civil AutoCAD.

1. **Getting Started with AutoCAD:-** Starting AutoCAD, AutoCAD's User Interface, Working with Commands, AutoCAD's Cartesian Workspace, Opening an Existing Drawing File, Viewing and Saving Work
2. **Basic Drawing & Editing Commands:-** Drawing Lines, Erasing Objects, Drawing Lines with Polar Tracking, Drawing Rectangles, Drawing Circles and Undo and Redo Actions
3. **Drawing Precision in AutoCAD:-** Using Running Object Snaps, Using Object Snap Overrides, Polar Tracking at Angles and Object Snap Tracking
4. **Making Changes in Drawing:-** Selecting Objects for Editing, Moving Objects, Copying Objects, Rotating Objects, Scaling Objects, Mirroring Objects and Editing with Grips
5. **Organizing Drawing with Layers:-** Creating New Drawings With Templates, introduction of Layers, Layer States and Changing an Object's Layer
6. **Advanced Object Types:-** Drawing Arcs, Drawing Polylines, Editing Polylines, Drawing Polygons and Drawing Ellipses
7. **Getting Information from Drawing:-** Working with Object Properties and Measuring Objects.
8. **Advanced Editing Commands:-** Trimming and Extending Objects, Stretching Objects, Creating Fillets and Chamfers, Offsetting Objects and Creating Arrays of Objects.
9. **Inserting Blocks:-** introduction of Blocks, Inserting Blocks, Working with Dynamic Blocks, Inserting Blocks with Design Centre and Inserting Blocks with Content Explorer
10. **Setting Up a Layout:-** Printing Concepts, Working in Layouts, Copying Layouts, Creating Viewports and Guidelines for Layouts
11. **Printing of Drawing:-** Printing Layouts and Printing from the Model Tab,
12. **Text:-** Working with Annotations, Adding Text in a Drawing, Modifying Multiline Text, Formatting Multiline Text, Adding Notes with Leaders to Drawing, Creating Tables and Modifying Tables

Recommended Books

1. AutoCad Reference Guide-CADD Center
2. Beginning AutoCAD 2012-Cheryl Shrock
3. Mastering AutoCAD Civil 3D 2012-Richard Graham, Louisa Holland

Semester-II-B.Voc. (Building Construction Management)

Course-VII-Basic Mathematics

Objectives: *This course provides the knowledge regarding fundamentals and applications of mathematics in the different areas especially in the construction area.*

1. Algebra—Linear equation in one variable & two variables, quadratic equations.
2. Trigonometry—Measurement of Angles, Trigonometric, or Circular, Functions, Heights and Distances.
3. Mensuration—Volume and surface area of solids (cube, cuboids, cylinder, cone, sphere, hemisphere and frustum).
4. Differentiation- Using first principle, Product rule, Quotient rule, parametric functions, Implicit functions, logarithmic functions, second order differentiation.
5. Application of derivatives-Derivatives as a rate measure, Maxima and Minima.
6. Integration-Integration by Substitution, using trigonometric identities, Integration by parts, Some special integrals, Partial fractions, Definite Integrals.
7. Application of Integrals-Area of bounded regions

Recommended Books

1. Basic Maths - R.S. Agarwal
2. Basic Maths - R.D. Sharma

Semester-II-B.Voc. (Building Construction Management)

Course-VIII-Structure

Objectives: This course provides the core knowledge regarding civil structure with different responsible factors. The importance of structure in the civil construction is also describing for the full understanding of students.

1. **Structural analysis:** The loading and the structure; important definitions and units; types of loading; types of support; types of structure; types of material; the behaviour of beams and cantilevers; the behaviour of columns; the behaviour of trusses; the behaviour of arches; the behaviour of walls; the behaviour of foundations.
2. **Equilibrium:** The meaning of equilibrium; force, moment and component; Basic idea of resolving forces and taking moments; the resultant of the equilibrant; the centre of gravity; the centroid.
3. **Trusses:** The merit of a truss; determinate and indeterminate trusses; the method of joints; a simplified method of joints for parallel boom trusses; the method of sections; the graphical method.
4. **Basic idea of Stress:** Elasticity; the definition of stress; the stress from a normal force; the stress from a bending moment; the stress from a shear force; normal and bending stresses combined; normal and shear stresses combined; principal stresses; Mohr's circle; the definition of strain; normal stress and strain in steel; normal stress and strain in concrete; normal stresses in members composed of two materials; welded and riveted joints.
5. **Beams and cantilevers:** The support reaction, checking the shear stress; the deflection of a beam; the deflection of a truss.
6. **Shafts:** Torsion moment in circular shafts; angular twist of circular shafts; torsion shearing stress.
7. **Columns:** Short and long columns; factors affecting the buckling load; the slenderness ratio; the permissible load for a short and long column.
8. **Basic idea of Arches, Walls, Foundation engineering and Steel structures**

Recommended Books

1. **Properties of Concrete**-A.M.Neville – Prentice Hall
2. **Concrete Technology**-M.S.Shetty. – S.Chand & Co.
3. **Advanced RCC Design**-Pillai & Mennon Tata MacGraw Hill
4. **Limit State Design**-Ramachandra
5. **Limit State Design**-A.K. Jain
6. **Limit State Design of Reinforced Concrete**-P.C. Vergese
7. **Advanced Design of Structures**-N. Krishna Raju

Semester-II-B.Voc. (Building Construction Management)

Course-IX-Constriction Material & Application—II

Objectives: This course provides the advance stage of knowledge regarding civil construction materials and its applications with ratio of materials mixtures. Others materials and application of different chemicals are also discussing for full scale understanding of the students.

1. Concrete: Constituents of concrete; manufacture of concrete; the concrete mix; types of mix; constituent ratios; workability; strength of concrete; rate of strength development; moisture movement in concrete; defects of concrete; concrete tests.
2. Blocks and precast building elements: Other bricks; building blocks; materials used for making blocks; classification of concrete blocks; physical characteristics of concrete blocks; lightweight concrete blocks; other precast building elements.
3. Non ferrous metals: Classification of non ferrous alloys; properties and available forms of copper, working copper, copper-based alloys and their uses; nickel, tin, cadmium, chromium, zinc, lead and its alloys, aluminum in building.
4. Paints: Paint schemes; basic constituents of paints; functions and properties of constituents; types of paint; film formation of paint; failures of paint films and their causes.
5. Plastics: Sources of substances to make plastics; manufacture of plastics; polymerization; co-polymers; classification of plastics; additives; uses of plastics.
6. Glass: Sources of substances to make glass; manufacture of glass; properties; types of glass; additives; work of glass.
7. Wall and floor coverings: Textile floor and wall coverings, their terminology and classification; paper, metal and plastic wall coverings, their terminology and classification.
8. Bituminous materials and products: Sources of bituminous materials; properties and failures of bituminous materials; classification of bitumen's; cut-back bitumen; air-blown bitumen; bituminous products; mastic asphalt; uses of bituminous products.
9. Sealants and insulating materials: Sealants and their classification; thermal and acoustical insulating materials; characteristics and classification of thermal insulating materials; characteristics and classification of acoustical insulating materials.

Recommended Books

1. Mamlouk, M.S. and Zaniewski, J.P.-Materials for Civil and, Prentice Hall
2. Shan Somayaji-Civil Engineering Materials, 2nd Edititon, Prentice Hall
3. Derucher, K.Korfiatis. G. and Ezeldin, S.-Materials for Civil and Highway Engineers, 4th Edition, Prentice Hall Inc.
4. Hibbeler, R.C.-Mechanics of Materials, Prentice Hall, 2003.

Semester-II-B.Voc. (Building Construction Management)

Course-X-Project & Viva voce

Objectives: This course provides insitu testing knowledge and field knowledge for proper development of the students. The following test is to be performed by the students within the lab:

1. Impact strength of coarse aggregate.
2. Consistency of cement.
3. Initial and final setting time of cement.
4. Apparent porosity.
5. Bulk density.
6. Water absorption.
7. Lime reactivity test of pozolana materials.
8. One field visit.
9. One lab visit.

In this course students are assigned with the practical topics by the project guide, which is based on the practical aspects within the civil engineering module. This course is also increased the practical skills of the students and enhance their presentation system. Real industrial working knowledge will be understood by the students for enhancing their employability. This course is continuously monitored by the project guide with periodical assessment system with the preparation of the project report. 50 marks are assigned for the internal assessment and another 50 marks evaluation will be taken by the external examiner based on the project report as viva voce.

Semester-III-B.Voc. (Building Construction Management)

Course-XI-Construction Marketing Management

Objectives: *This course provides marketing knowledge in the aspects of construction in both ways-core construction marketing and allied construction marketing aspects.*

1. Introduction to Marketing.
2. Nature, Scope and Significance of Marketing.
3. Marketing Process & Planning.
4. Marketing Strategy—Segmentation, Targeting & Positioning.
5. Marketing Strategies and Product Life Cycle.
6. Marketing Mix—Nature & Significance of Marketing Mix.
7. Product Decision.
8. Pricing Decision.
9. Promotional Mix—types of promotional mix, need-utility & Strategies.
10. Place Decision—Supply Chain Management.
11. Different Forms of Marketing.
12. Evaluation & Control of Marketing Functions.

Recommended Books:

1. Marketing Management—Philip Kotler
2. Principles of Marketing—Philip Kotler & Gary Armstrong
3. Marketing Management-Planning, Control—V. S. Ramaswamy & S. Namakumari
4. Modern Marketing Management—Rustom S. Davar
5. Case Study solutions in Marketing—H. Kaushal
6. Marketing Management—S. K. Sarangi

Semester-III-B.Voc. (Building Construction Management)

Course-XII-Construction Safety Management

Objectives: *This course provides knowledge regarding the safety management at the construction site. Precautions and measurement of safety are also analysed for various construction fields for the proper understanding of the students.*

1. *Construction Safety Management – Role of various parties, duties and responsibilities of top management, site managers, supervisors etc. role of safety officers, responsibilities of general employees, safety committee, safety training, incentives and monitoring. Writing safety manuals, preparing safety checklists and inspection reports.*
2. *Safety in construction operations – Safety of accidents on various construction sites such as buildings, dams, tunnels, bridges, roads, etc. safety at various stages of construction. Prevention of accidents. Safety measures.*
3. *Safety in use of construction equipment e.g. vehicles, cranes, hoists and lifts etc.*
4. *Safety of scaffolding and working platforms.*
5. *Safety while using electrical appliances and Explosives.*
6. *Various safety equipment and gear used on site. First aid on site.*
7. *Disaster Management and Rehabilitation*

Recommended Books

1. *Construction safety manual published by National Safety Commission of India.*
2. *Safety Management in Construction Industry–A manual for project managers, NICMAR.*
3. *Construction Safety Handbook – Davies V. S. Thomasin K, Thomas Telford, London.*
4. *ISI for safety in Construction – Bureau of Indian Standards.*
5. *Safety management– Girimaldi and Simonds, AITBS, New Delhi.*

Semester-III-B.Voc. (Building Construction Management)

Course-XIII-Civil AutoCAD-II

Objectives: This course provides knowledge regarding advance Civil Computer Aided Design in the various stages of civil constructions. Various dimensions of design is analysed for the developing perfections of the students.

1. **Hatching:-** Hatching and Editing Hatches,
2. **Adding Dimensions:-** Dimensioning Concepts, Adding Linear Dimensions, Adding Radial and Angular Dimensions and Editing Dimensions
3. **Working Effectively with AutoCAD:-** Creating a Custom Workspace, Using the Keyboard Effectively, Object Creation, Selection and Visibility, Working in Multiple Drawings, Copying and Pasting Between Drawings, Using Grips Effectively and Additional Layer Tools
4. **Accurate Positioning:-** Coordinate Entry, Locating Points with Tracking, Construction Lines, Placing Reference Points
5. **Parametric Drawing:-** Working with Constraints, Geometric Constraints and Dimensional Constraints
6. **Working with Blocks:-** Creating Blocks, Editing Blocks, Removing Unused Elements, Adding Blocks to Tool Palettes, Modifying Tool Properties in Tool Palettes
7. **Creating Templates:-** Use Templates, Controlling Units Display, Creating New Layers, Adding Standard Layouts to Templates and Saving Templates
8. **Annotation Styles:-** Creating Text Styles, Creating Dimension Styles and Creating Multi leader Styles
9. **Advanced Layouts:-** Quick View Layouts, Creating and Using Named Views, Advanced Viewport Options, Layer Overrides in Viewports and Additional Annotative Scale Features
10. **External References :-** Attaching External References, Modifying External References and External Reference Specific Information

Recommended Books

1. AutoCad Reference Guide CADD Center
2. Beginning AutoCAD 2012-Cheryl Shrock
3. Mastering AutoCAD Civil 3D 2012-Richard Graham, Louisa Holland

Semester-III-B.Voc. (Building Construction Management)

Course-XIV-Construction Personnel Management

Objectives: *This course provides through knowledge to the students regarding labour and other personnel management at the site of the construction and in the administrative office also. This course also deals with the labour law and its implications in the construction industry.*

1. *Introduction to HRM in Indian Context*
2. *Strategic Human Resource Management*
3. *HRM trends; Philosophies of values, morals and ethics, societal responsibilities and good citizenry. Good practices and managerial responsibilities.*
4. *Human resource policies & practices;*
5. *Recruitment & Selection.*
6. *Training and Development;*
7. *Performance Appraisal and evaluation system; Participative management;*
8. *Compensation Management*
9. *Collective bargaining & Negotiation Skills*
10. *Employee Relation and Labour Laws*

Recommended Books

1. *Personnel Management and Industrial Relations-Dale Yoder Prentice-Hall*
2. *Human Resource Management-Ashwathappa, McGraw-Hill Education*
3. *Managing Human Resources-V D Dudeja, Gagandeep Publications.*
4. *Human Resource Management, Principles and Practices-P G Aquinas*

Semester-III-B.Voc. (Building Construction Management)

Course-XV-Project & Viva Voce

Objectives: This course provides insitu testing knowledge and field knowledge for proper development of the students. The following test is to be conduct by the students within the lab:

1. Preparation of M15, M20, M25 grade concrete mix
2. Initial and final setting time.
3. Slump test for workability of concrete
4. Compressive strength of concrete.
5. Soil bearing capacity.
6. Durability of concrete samples (M-15, M20, M25)
7. One field visit.
8. One lab visit.

In this course students are assigned with the practical topics by the project guide, which is based on the practical aspects within the civil engineering module. This course is also increased the practical skills of the students and enhance their presentation system. Real industrial working knowledge will be understood by the students for enhancing their employability. This course is continuously monitored by the project guide with periodical assessment system with the preparation of the project report. 50 marks are assigned for the internal assessment and another 50 marks evaluation will be taken by the external examiner based on the project report as viva voce.

Semester-IV-B.Voc. (Building Construction Management)
Course-XVI-Building Management System

Objectives: *This course provides innovative way procedure and work practice in the field of construction management. It deals with each and every aspects of technical procedure to make students self sufficient to facereal problems and managing things more technically.*

1. Disposal systems: Rainwater pipe work and gutters; foul drainage above ground; drainage below ground; sewage pumping; sewage treatment and sterilization; centralized vacuum cleaning; refuse chutes; compactors and macerators.
2. Piped supply systems: Cold and hot water; pressurized water; compressed air; natural and liquid petroleum gas; fuel oil storage and distribution; steam distribution; fire fighting, elementary design of pipe work, materials and fittings.
3. Heating, cooling and ventilating systems: Gas supply, installations and appliances; gas, oil, coal fired and electric boilers; heat pumps; solar collectors; primary heat distribution; hot water, steam and warm air heating; heat recovery; refrigeration plant and cooling distribution; local cooling units; general supply and extract; toilet and kitchen extract; dust collection; air conditioning
4. Electrical supply, power and lighting, security and control systems: LV supply and distribution; LV power; DC supply; UPS; emergency lighting; lighting; electric heating; telephone plants; sound amplification; radio, TV and CCTV; data transmission; access control; security detection and alarm; fire detection and alarm; monitoring; building automation.
5. Transport systems: Lifts and escalators; moving pavements; goods distribution and mechanized warehousing; mechanical and pneumatic document conveying.
6. Building Communication system; Telephone, Broadband and Wi-Fi networking.
7. Building Sustainable Development; Water harvesting, Anti Thundering Device & Greenery

Recommended books

1. Handbook for Building Engineers in Metric systems, NBC, New Delhi, 1968.
2. William T. Mayer-Energy Economics and Build Design, McGraw-Hill Book, Company
3. William H. Severns and Julian R.Fellows, Air-conditioning and Refrigeration, John Wiley & Sons, London, 1988.
4. E.C. Butcher and A.C. Parnell, Designing for Fire Safety, John Wiley and Sons, 1993.

Semester-IV-B.Voc. (Building Construction Management)

Course-XVII-Civil Survey

Objectives: This course provides a full and compact knowledge of survey the 'heart of civil engineering'. It deals with the knowledge involved prior to any construction and planning. This help students to understand better about the pre scenario before construction and make them able to do necessary operation

1. **Introduction to Chain and Compass Surveying:** Introduction, Definition of surveying, primary divisions of surveying, object and classification of surveying, principles of surveying, approximate methods of chine and tape surveying, unfolding and folding of a chain, instruments for chaining and taping, measurement by tape and chain, errors in tape measurements and their corrections, testing and adjusting of a chain, chaining on flat and sloping ground, obstacle in chaining, direct and indirect methods of ranging, methods of traversing, principle basic definitions, bearings and meridians, prismatic compass, surveyors compass, azimuthal and quadrantal bearing systems, true north and magnetic north, magnetic declination, local attraction and its correction.
2. **Leveling and contouring:** Definition of terms, principles of leveling, types of levels, leveling staffs, booking and reduction in field book, balancing of sights, errors curvature and refraction, distance of visible horizon, reciprocal leveling, and its merits, contour, contour interval, horizontal equivalent, contour gradient, factors affecting contour interval, characteristics of contours, direct and indirect methods of contouring, uses of contour maps.
3. **Theodolite:** Vernier and microscopic theodolite, construction, temporary and permanent adjustments, measurements of horizontal and vertical angles, methods of repetitions and reiteration, sources of errors, checks in traversing, omitted measurements.
4. **Plane table surveying:** Principles, merits and demerits, instruments and other accessories, methods used, radiation, traversing, resection, intersection and their uses, two and three point problem.
5. **Tachometry:** General principles of stadia system, fixed and movable hair methods, inclined sights with staff vertical, inclined sight with staff normal to the line of sight, determination of tachometric constants, analytic lens, field work and seconds, tangential system.
6. **Curves:** Types of curves, elements of curve, different methods of setting out-simple circular curves, compound curves, reverse curves, transition curves, types of transition curves, super-elevation, suitability of a circular curve, vertical curves.
7. **Modern Survey Instruments**
8. **Basic idea of Engineering Drawings**

Recommended Books:

1. **Surveying-K. R. Arora**
2. **Surveying Volume – I & II-B. C. Punmia**
3. **Advance Surveying-R. Agor**

Semester-IV-B.Voc. (Building Construction Management)
Course-XVIII-Construction Financial Accounting

Objectives: This course provides specific knowledge regarding financial accounting systems applicable in the construction industry. The standardization of the accounting procedures are also discussing for updated knowledge for the students.

1. Basics financial accounting, cost accounting, management accounting and financial management, Capital and revenue items.
2. Accounting Process: GAPP, double entry system, ten point programmes in book keeping, journal, ledger, cash book, trial balance, final balance, provisions and reserves. Profit and loss account sheets and balance sheets.
3. Depreciation and its common methods.
4. Budgeting: Types of budgets, procedure for master budget, cash flow forecasts. Budgetary control system.
5. Project Account: Preparation of contract accounts for each project. Methods of recording and reporting site accounts to project office, from project office to head office.
6. Cash flow and Fund Flow statement.
7. Uses of Financial ratio analysis of construction business.
8. Cost volume profit Analysis.

Recommended Books

1. Construction Management & Accounts-H. Singh, Tata McGraw Hill
2. Principles of Corporate Finance-A. R. Brealy, Tata McGraw Hill, New Delhi.
3. Foundations of Financial Management-Block Hirt, McGraw Hill.

Semester-IV-B.Voc. (Building Construction Management)

Course-XIX-Advanced Construction Technology

Objectives: *This course provides a proper set of various advance techniques used in civil construction and its mainantance. It makes student more technically strong by dealing each and every advance step in a very enumerate way and provides information to use resources in a very convenient manner*

1. Modern construction technology
2. Construction of multi-storied and high rise buildings.
3. Bridges, special types of bridges, cable stayed bridges, suspension and pressurised bridge.
4. Off shore structure types methods of construction and maintenance.
5. Construction of diaphragm walls, principle and construction of machine foundations.
6. Off shore structure, types, methods of construction and maintenance.

Recommended Books

1. Manuals Brochures Publications from Construction Companies, firms etc.
2. Reports of actual works executed
3. NICMAR Publications on Construction Engineering



Semester-IV-B.Voc. (Building Construction Management)

Course-XX-Project & Viva Voce

Objectives: This course provides insitu testing knowledge and field knowledge for proper development of the students. The following test is to be performed by the students within the lab.

Surveying-I (General survey and basic estimation and knowledge for practical purpose)

1. Chaining
2. Types of survey
3. Measurement of errors determination
4. Field exploration and estimation topographically
5. One field visit
6. One lab visit.

In this course students are assigned with the practical topics by the project guide, which is based on the practical aspects within the civil engineering module. This course is also increased the practical skills of the students and enhance their presentation system. Real industrial working knowledge will be understood by the students for enhancing their employability. This course is continuously monitored by the project guide with periodical assessment system with the preparation of the project report. 50 marks are assigned for the internal assessment and another 50 marks evaluation will be taken by the external examiner based on the project report as viva voce.

Semester-V-B.Voc. (Building Construction Management)

Course-XXI-Project Estimation & Cost Analysis

Objectives: This course is aim to provide knowledge regarding construction estimation and analyzing of cost. Different systems of estimations and its importance at the various stages of construction is analyse for the proper understanding of the students.

1. Procedure of Estimating – method of estimation for main items of works RCC, RB, Flooring Roofing, plaster, doors and windows, wood work, Iron work, white washing, painting. Lump sum items. Rates, Reducing calculation, Degree of accuracy.
2. Types of estimates - Writing technical specifications and tender documents. Types of contracts - terms and conditions conflicts and arbitration - Rate Analysis - schedule of rates Valuation and Rent fixation
3. Method of Building Estimates by method 1 and 2.
4. Estimates of Buildings, different types of Roofs, RCC work, Sanitary and water supply works.
5. Estimation of Quantities of Materials and Transport.
6. Application of Computer software for Estimation & Cost Analysis.

Recommended books

1. Estimating and Costing in Civil Engineering B. N. Dutta UBS Publishers Distributors Pvt. Ltd
2. Estimating in Building Construction Steven Peterson, Frank Dagostino
3. Fundamentals of Construction Estimating-David Pratt
4. Estimates and contracts-B. S. Patil

Semester-V-B.Voc. (Building Construction Management)
Course-XXII-Material Procurement & Store Management

Objectives: This course providing knowledge regarding various civil construction materials procurement systems and its management in the store. Various scientific methods are discussing for understanding complete store management including inventory management and vendor analysis.

1. Importance of material management and its role in construction industry-scope, objectives and functions, integrated approach to materials management, Role of materials manager.
2. Classification and Codification of materials of construction. ABC analysis-Procedure and its use, Standardization in materials and their management, Procurement, identification of sources of procurement, vendor analysis. Vendor analysis concept of (MRKP) Material requirement planning, planning, purchase procedure, legal aspects.
3. Estimating of material requirement, phasing of their procurement. Procurement: identification of sources, vendor analysis, purchases procedure, legal aspects of purchasing, transporting of materials. Transportation modes.
4. Inventory Management – Inventory Control techniques. EOQ, Advantages and limitation of use of EOQ, Periodic ordering, order point control, safety stock, stock outs, application of ABC analysis in inventory control, concept of (JIT)- Just in time management, Indices used for assessment of effectiveness of inventory management.
5. Store Management: Stores organization, stores layout, receipts and inspection, issue of materials. Care and safety in handling. Store records and store accounting.
6. Stores Management: Receipt and inspection, care and safety in handling, loss on storage, wastage, Bulk purchasing, site layout and site organization, scheduling of men, materials and equipment.
7. Quality Control – Conventional methods of quality control of Construction materials. Statistical method of quality control, sampling techniques quality control in process. Quality management and its economics.
8. Use of (MMS) – Materials Management Systems in materials planning, procurement, inventory, control, cost control etc.

Recommended Books

1. Purchasing and Inventory Control- K. S. Menon, Wheeler Publication.
2. Construction planning, equipment and methods-Peurifoy, Tata McGraw Hill publication.

Semester-V-B.Voc. (Building Construction Management)
Course-XXIII-Infrastructure Development & Project Management

Objectives: This course provides knowledge regarding infrastructure development and project management with its importance. Different systems and way of project management is also discussing for complete understanding of the students.

1. Construction Industry – Nature, characteristics, size and structure
2. Role of infrastructure development in employment generation and improving of the National economy.
3. Various Agencies associated with infrastructure development in India as regards various sectors.
4. Status of Infrastructure in India- Indian government policy, Roads and buildings, communication, water supply, irrigation, power energy sectors, ports and aviation, health and educational services, rural development.
5. The basic principles of infrastructure planning, condition assessment, monitoring of the condition of the asset, maintenance strategies, funds requirement, life cycle costing, annual budgeting for maintenance and rehabilitation, and prioritizing maintenance strategies for optimum return on investment.
6. Site mobilization: Site reconnaissance, site layout including sizing and location of infrastructure. Organizing utilities, Mobilizing manpower, materials, equipment, funds etc.
7. Site management: Implementing performance accounting, monitoring systems for waste. Prevention of mal practices, networking with other parties.
8. Health and welfare of workers, women workers: Project and the community.
9. Issues related to infrastructure development – pre – requisites necessary to ensure success for switching over from public sector management to private sector management. Issues in developing, funding and managing infrastructure projects. Role, responsibility of project managers.

Recommended Books

1. India Infrastructure Report–Rakesh Mohan
2. Infrastructure Today - Magazine
3. Document of five year plans, published by Govt. of India.

Semester-V-B.Voc. (Building Construction Management)
Course-XXIV-Construction Quality Management

Objectives: This course provides knowledge regarding management of quality and its requirements for the civil construction. Different parameters of quality measurement is also analyze for proper understanding of the students.

1. *Quality: Necessity for improving Quality in the context of Global Challenges.*
2. *Concept of Quality Control, Quality Assurance, Quality Management and Total Quality Management (TQM)*
3. *Study of various Quality Standards in Construction : Related to building materials and other inputs for construction processes, methods and techniques for construction outputs, products and services, such as BIS, BS, Indian standard, British, American, German & Japanese standards, Managing Quality in various projects stages from concept to completion by building quality into design of structures, Inspection of incoming material and machinery In process quality inspections and tests.*
4. *Designing of quality manuals, checklists and inspection reports, installing the quality assurance system, monitoring and control.*
5. *Quality Assurance Department and quality control responsibilities of the line organization. Quality in foundations and piling work, structural work. Concreting, electrical system building facilities, waste recycling and maintenance.*
6. *Developing quality culture in the organization: Training of people, Bench – marking quality. Quality circles.*
7. *Study of ISO 9000, ISO 14000 and QS 9000 standards and certification procedures.*

Recommended Books

1. *Kwaku A., Tenah and Jose M.Guevera, Fundamental of Construction Management and Organization, Prentice Hall of India, 1995.*
2. *Juran Frank, J.M. and Gryna, F.M.-Quality planning and Analysis, Tata McGraw Hill*
3. *Clarkson H. Oglesby-Productivity Improvement in Construction, McGraw Hill 1989.*

Semester-V-B.Voc. (Building Construction Management)

Course-XXV-Project & Viva Voce

Objectives: This course provides insitu testing knowledge and field knowledge for proper development of the students. The following experiments are to be conduct by the students within the lab.

Surveying-2 (Advance Surveying)

1. Plane table survey
2. Prismatic survey
3. Contour
4. Curve tracing
5. Dumpy level
6. One field visit
7. One lab visit

In this course students are assigned with the practical topics by the project guide, which is based on the practical aspects within the civil engineering module. This course is also increased the practical skills of the students and enhance their presentation system. Real industrial working knowledge will be understood by the students for enhancing their employability. This course is continuously monitored by the project guide with periodical assessment system with the preparation of the project report. 50 marks are assigned for the internal assessment and another 50 marks evaluation will be taken by the external examiner based on the project report as viva voce.

Semester-VI-B.Voc. (Building Construction Management)
Course-XXVI-Construction & International Contracting

Objectives: This course provides knowledge regarding international treaties for the civil construction. Different parameters of construction on international basis is also analyze for proper understanding of the students.

1. International contracting – meaning, scope, nature, present status of the International construction market, role of Asia- Pacific region countries in the present construction development. Impact of WTO/GATS on the Indian Construction Sector as regards domestic market and export sector.
2. Study and application of various conditions of contract under the FIDIC document development of Regulatory framework. Project exports from India.
3. International financing: Various institution such as WB, IMF, ADB. African bank etc. and their role, rules – regulations in funding various projects, forming alliance, bilateral and multilateral funding, trade practices etc.
4. International Projects – Types of BOT systems such as BOT, BOOT, BOO, DBO, BOR, BLT, BRT, BTO & DBGO, MOOT, ROO, ROT, BOLT – Contractual procedures, special features, methods of handling.
5. Selection of personnel to suit socio-economic-environmental culture in other countries, suitable organizational structure.
6. Disputes Resolving – International Courts, formation of DRB's (Dispute resolving boards) functioning and experiences in India and abroad, Advantages of DRB's

Recommended Books

1. FIDIC documents
2. Construction Contracts & Claims – Simon M.S. McGraw Hill, New York
3. International Construction Contracting – K.N.Vaid-NICMAR Publication

Semester-VI-B.Voc. (Building Construction Management)
Course-XXVII-Entrepreneurship Development Programme

Objectives: This course provides students with a solid introduction to the entrepreneurial process of creating new businesses, role of Creativity and innovation in entrepreneurial start-ups, manage family-owned companies, context of social innovation and social entrepreneurship and issues and practices of financing entrepreneurial business.

Unit-1 Entrepreneurial Management

10 Hours

The evolution of the concept of entrepreneurship, John Kao's Model on Entrepreneurship, Idea generation, Identifying opportunities and Evolution, Building the Team/Leadership, Strategic planning for business, Steps in strategic planning, Forms of ownership-Sole proprietorship, partnership, limited liability partnership and corporation form of ownership, advantage/disadvantage, Franchising, advantages/disadvantages of franchising, types of franchise arrangements, franchise contracts, franchise evolution checklist, Financing entrepreneurial ventures, managing growth, Valuation of a new company, Harvesting and Exist strategies, Corporate Entrepreneurship.

Unit-2 Entrepreneurship Creativity and Innovation

5 Hours

Stimulating creativity, Organizational actions that enhance/hinder creativity, Managerial responsibilities, Creative teams, Source of innovation business, managing organizations for innovation and positive creativity

Unit-3 Social Entrepreneurship

10 Hours

Introduction to social entrepreneurship, Characteristics and role of social entrepreneurs, Innovation and Entrepreneurship in a social Context, Start-Up and early stage venture issues in creating and sustaining a Non-profits organization, Financing and Risks, Business Strategies and Scaling up.

Unit-4 Family Business and Entrepreneurship

10 Hours

The entrepreneur, role and personality, family business, concepts, structure and kinds of family firms, culture and innovation of family firm, managing business, family and shareholder relationships, conflict and conflict resolution in family firms, managing leadership, succession and continuity, women's issues in the family business, encouraging change in the family business system.

Unit-5 Financing the Entrepreneurial Business

10 Hours

Arrangements of funds, traditional source of financing, Loan syndicating, Consortium finance, role played by commercial banks, appraisal of loan applications by financial institutions, Venture capital.

Recommended Books

1. Burns, P.-Entrepreneurship and small business. New Jersey
2. Drucker, P. F-Innovation and entrepreneurship: Practice and principles, USA; Elsevier
3. Gersick, K.E., Davis, J.A., Hampton, M. M., & Lansberg, I.-Generation to generation: Life Cycle of the family business: Boston: Harvard Business School Press
4. Hisrich, R., & Peters, M.-Entrepreneurship, New Delhi: Tata McGraw Hill
5. Holt, D. H.-Entrepreneurship new venture creation. New Delhi: PHI
6. John Kao, Creativity & Entrepreneurship
7. Kaplan, J.-Patterns of Entrepreneurship. Wiley
8. Khandwalla, P.-Corporate creativity. New Delhi: Tata McGraw Hill
9. Mullins, J.-New Business Road Test, New Delhi: PHI

Semester-VI-B.Voc. (Building Construction Management)

Course-XXVIII-Project Management Techniques

Objectives: *This course provides knowledge regarding project management and its requirements for the civil construction. Different parameters and role of project management is also analyzed for proper understanding of the students.*

1. *Project Management – Basic forms of organization with emphasis on Project and matrix structures; project life cycle, planning for achieving time, cost, quality, safety requirements of projects, project feasibility reports based on socio-techno-economic-environmental impact analysis, project clearance procedures and necessary documentation for major works like dam, multi-storied structures, ports, tunnel, Qualities. Role, responsibility of projects Manager; Role of PMC (Project Management Consultants) on major projects, Web based project management.*
2. *Construction Scheduling – Work break down structure, activity cost and time estimation in CPM, PERT, RPM (Repetitive Project Modeling) techniques. LOB technique Mass haul diagrams.*
3. *Construction Management – Site mobilization – demobilization aspects, various Resources management based on funds availability, organizing and monitoring of the construction work with respect to cost-time schedules, co-coordinating–communicating–reporting technique Application of MIS to construction, monitoring and control mechanisms, Training of Construction Managers.*
4. *Work Study: Definition. Objective, basic procedure, method study and work measurement work study applications in Civil Engineering.*
5. *Method study – Definition, Objective, Procedure for selecting the work, recording facts, symbols, flow process charts, multiple activity charts, string diagrams.*
6. *Work measurement – Time and motion studies, Concept of standard time and various allowance, time study equipment performance rating. Activity sampling time-tapse photography technique. Analytical production studies.*
7. *Administration of Incentive Schemes – Necessity, Merit rating, job evaluation, installation, modification and maintaining and incentive scheme based on implementation experience.*

Recommended books

1. *Construction Management and Planning-Sengupta and Guha-Tata McGraw Hill*
2. *Project Management – K. Nagrajan, New age International Ltd.*
3. *Professional Construction Management-Barrie Paulson-McGraw Hill, Institute Edition.*
4. *Project Management – Ahuja H.N. & John Wiely, New York.*

Semester-VI-B.Voc. (Building Construction Management)

Course-XXIX-Green Technology

Objectives: *This course provides knowledge regarding sustainable construction and its requirements for the civil construction. Different parameters of sustainability and concept of green building is also analyzed for proper understanding of the students.*

1. Introduction to sustainable design/green building and building performance whole building design process.
2. Community and Site Planning a. land development, b. site planning, c. construction waste management, d. Storm water management, e. pest management
3. Renewable energy design with nature a. passive solar design strategies, b. solar water heating systems, c. solar photovoltaic strategies.
4. Environmental and climate considerations in residential designs and construction.
5. Building enclosure components a. Foundation / walls / floors / roof / exterior claddings/ insulation and air sealing/windows and doors b. Integration of building design, systems engineering, and commissioning building as a system.
6. Green building guidelines a. programs, b. checklists, c. resources. Building codes/ international energy codes.
7. Energy efficiency and performance
 - a) HVAC mechanical systems,
 - b) Lighting,
 - c) Appliances-Fundamentals of heat, air and moisture flow, surface radiant temperatures
8. Efficient water use
 - a) Plumbing fixtures
 - b) Landscaping
 - c) Gray water plumbing
 - d) Rainwater catchment, Indoor environmental quality, Sustainable/green building materials, Building for performance and durability case studies

Recommended Books:

1. Sustainable Construction: Green Building Design and Delivery, Second Edition-Charles J. Kibert, Wiley.
2. The Rough Guide to Climate Change, Second Edition-Robert Henson, Rough Guides L
3. LEED 2009 for New Construction and Major Renovation Rating System (Short Version), US, Green Building Council.

Semester-VI-B.Voc. (Building Construction Management)

Course-XXX-Project & Viva Voce

Objectives: This course provides insitu testing knowledge and field knowledge for proper development of the students. The following tests will be conduct by the students within the lab:

1. Estimation and planning.
2. Plan and plotting.
3. One field visit.
4. One lab visit.

In this course students are assigned with the practical topics by the project guide, which is based on the practical aspects within the civil engineering module. This course is also increased the practical skills of the students and enhance their presentation system. Real industrial working knowledge will be understood by the students for enhancing their employability. This course is continuously monitored by the project guide with periodical assessment system with the preparation of the project report. 50 marks are assigned for the internal assessment and another 50 marks evaluation will be taken by the external examiner based on the project report as viva voce.

End of Syllabi- B. Voc. (Building Construction Management)