

## MANAGEMENT AND ENTREPRENEURSHIP

**Course Code: IM51**  
**L: P: T: S: 4: 0: 0: 0**  
**Exam Hours: 03**  
**Total Hours: 50**

**Credits: 04**  
**CIE Marks: 50**  
**SEE Marks: 50**

### **COURSE OBJECTIVES:**

1. Understand the underlying principles of management.
2. To analyze and identify the functions of entrepreneurial activities and its prerequisites under practical conditions.
3. To develop and enhance one's decision making skills amidst competitive business market.

**Course Outcomes: After completion of the course, the graduates will be able to**

<b>CO1</b>	understand and apply the principles of management
<b>CO2</b>	Use the entrepreneurial qualities and skill under real world practical conditions
<b>CO3</b>	Analyse the functions of management and entrepreneurship and apply them to practical situations.
<b>CO4</b>	Ascertain various channels provided by government of India to initiate business enterprise
<b>CO5</b>	Initiate and develop small scale industries
<b>CO6</b>	Evaluate management and entrepreneurship skills and develop decision making skills and entrepreneurial personality.

### **Mapping of Course outcomes to Program outcomes:**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
<b>CO1</b>	1	1	2	1	3	2	3	3	3	3	3	3
<b>CO2</b>	1	1	2	1	3	2	3	3	3	3	3	3
<b>CO3</b>	1	2	2	1	1	2	3	3	3	2	3	3
<b>CO4</b>	1	2	3	1	2	3	3	3	3	3	3	3
<b>CO5</b>	1	2	3	2	2	3	3	3	3	3	3	3
<b>CO6</b>	2	2	3	2	2	3	3	3	3	3	3	3

Unit	Course Content	Hours	COs
1	<p>MANAGEMENT: Introduction – Meaning – nature and characteristics of Management, Scope and Functional areas of management – Management as a science, art of profession – Management &amp; Administration – Roles of Management, Levels of Management, Development of Management Thought – early management approaches .</p> <p>PLANNING: Nature, importance and purpose of planning process – Objectives – Types of plans (Meaning Only) – Decision making –Importance of planning. (Case studies discussion)</p>	09	CO1 CO2
2	<p>ORGANIZING AND STAFFING: Nature and purpose of organization – Principles of organization – types of organization – Departmentation – Committees- Centralization Vs Decentralization of authority and responsibility – Span of control – MBO and MBE (Meaning Only) Nature and importance of staffing. (Case studies discussion)</p>	10	CO1 CO2
3	<p>DIRECTING &amp; CONTROLLING: Meaning and nature of directing – Leadership styles, Maslow’s theory of motivation, Communication – Meaning and importance – coordination, meaning and importance and Techniques of Co-Ordination. Meaning and steps in controlling – Essentials of a sound control system – Methods of establishing control (in brief). (case studies discussion)</p>	10	CO3 CO4
4	<p>ENTREPRENEUR: Meaning of Entrepreneur; Evolution of the Concept, Functions of an Entrepreneur, Types of Entrepreneur, Entrepreneur – an emerging Class. Concept of Entrepreneurship – Evolution of Entrepreneurship, Development of Entrepreneurship; Stages in entrepreneurial process; Role of entrepreneurs in Economic Development; Entrepreneurship in India; Entrepreneurship – its Barriers. (Case studies discussion, role play / group discussion)</p>	10	CO3 CO4
5	<p>SMALL SCALE INDUSTRY: Definition; Characteristics; Need and rationale: Objectives; Scope; role of SSI in Economic Development. Advantages of SSI, Steps to start an SSI, Impact of Liberalization, Privatization, Globalization on S.S.I, Effect of WTO/GATT.</p> <p>Startup India: Benefits, Policies. Action plan- simplification and Handholding, Funding Support and incentives, Industry-Academia Partnership and Incubation.</p> <p>Salient features of <a href="#">Karnataka Startup Policy 2015-2020</a>, Strategies encouraging entrepreneurship through NAIN. Venture capitalist, SSI funding schemes by banks and financial institutions, Government of India Initiatives on Thrust Areas, overview of detailed project report/profile.</p> <p>(Related case studies, supporting videos and group discussion)</p>	11	CO5 CO6

**SELF-STUDY COMPONENT:****Preparation of Project report/Profile****Note:**

1. At the end of the course students should have cultivated the ability to prepare project profile based on their selected business idea.
2. One Credit is allocated to project profile prepared by students.
3. Project profile/report shall be submitted before the end of the course.

**Contents /Structure of mini project report/profile:**

1. Introduction
2. Market potential
3. Basis and pre assumptions
4. Implementation schedule
5. Technical aspects
6. Financial aspects and analysis
8. Details of machinery and equipment/ service suppliers

**TEXT BOOKS:**

1. Principles of Management – P.C.Tripathi, P.N.Reddy – Tata McGraw Hill.
2. Dynamics of Entrepreneurial Development & Management – Vasant Desai – Himalaya Publishing House.
3. Entrepreneurship Development – Poornima.M.Charantimath – Small Business Enterprises – Pearson Education – 2006 (2 & 4).
4. Management & Entrepreneurship-N V R Naidu, IK International, 2008

**REFERENCE BOOKS:**

- 1 Management Fundamentals – Concepts, Application, Skill Development – Robers Lusier – Thomson.
2. Entrepreneurship Development – S.S.Khanka – S.Chand & Co.
3. Management – Stephen Robbins – Pearson Education/PHI – 17th Edition, 2003.
4. <http://www.startupindia.gov.in/>
5. [http://startup.karnataka.gov.in/docs/Startup\\_Policy\\_Karnataka.pdf](http://startup.karnataka.gov.in/docs/Startup_Policy_Karnataka.pdf)

**Assessment Pattern:****CIE –Continuous Internal Evaluation Theory (50 Marks)**

Bloom's Category	Tests	Preparation of Project Report/ Profile
Marks (Out of 50)	30	20
Remember	--	02
Understand	10	02
Apply	10	04
Analyze	05	04
Evaluate	05	03
Create		05

SEE –Semester End Examination Theory (50 Marks)

Bloom's Category	Marks Theory(50)
Remember	10
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	

## Geotechnical Engineering - I

**Course Code : CV52**  
**L:P:T:S : 3:0:0:0**  
**Exam Hours : 03**  
**Hours/Week : 03**

**Credits : 3**  
**CIE Marks : 50**  
**SEE Marks : 50**  
**Total hours : 40**

### Course Objectives:

1. To enable the students to acquire the knowledge of basics of soil mechanics
2. To understand the origin of soil, classification, basic terms and properties of soil
3. To design of civil engineering sub structures

### Course Outcomes: At the end of the course the students will be able to:

	Course Outcome
CO 1	Identify and classify the soils
CO 2	Determine various index and engineering properties of soil
CO 3	Compute settlements under footings and loaded areas
CO 4	Analyse the soil parameters which are useful in the design of sub-structures
CO 5	Determine the shear strength and consolidation of soil
CO 6	Analyse the compaction properties of soil.

### Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1		2									
CO2	1	1	2									
CO3		2										
CO4		2	3									
CO5				1								
CO6		2										

Unit	Content	Hours	Co's
<b>1</b>	<p>History of soil mechanics, Definition. Phase Diagram, Voids ratio, Porosity, Percentage Air Voids, Air content, Degree of saturation, Water content, Specific Gravity of soil solids and soil mass, Densities and Unit weights - Bulk, Dry, Saturated &amp; Submerged and their inter relationships.</p> <p><b>INDEX PROPERTIES OF SOIL AND THEIR DETERMINATION:</b>  Index Properties of soil- Water content , Specific Gravity, Particle size distribution, Relative Density, Consistency limits and indices, in-situ density,</p> <p>Activity of Clay, Laboratory methods of determination of index properties of soil: Water content (Oven Drying method &amp; Rapid Moisture method), Particle size distribution (Sieve analysis), Liquid Limit- (Casagrande and Cone penetration methods), Plastic limit and shrinkage limit. Particle size distribution (hydrometer)</p>	<b>8</b>	<b>CO1 CO2</b>
<b>2</b>	<p><b>CLASSIFICATION OF SOILS:</b> Purpose of soil classification, Particle size classification – MIT classification and IS classification. IS classification - Plasticity chart and its importance, Field identification of soils.</p> <p><b>CLAY MINERALOGY AND SOIL STRUCTURE:</b> Single grained, honey combed, flocculent and dispersed structures, Valence bonds, Soil-Water system, Electrical diffuse double layer, adsorbed water, base-exchange capacity, Isomorphous substitution. Common clay minerals in soil and their structures- Kaolinite, Illite and Montmorillonite</p>	<b>8</b>	<b>CO1 CO3</b>
<b>3</b>	<p><b>FLOW OF WATER THROUGH SOILS:</b> Darcy's law- assumption and validity, coefficient of permeability and its determination (laboratory and field), factors affecting permeability, permeability of stratified soils, Seepage Velocity, and coefficient of percolation, quick sand phenomena, Capillary Phenomena.</p> <p><b>SHEAR STRENGTH OF SOIL:</b> Concept of shear strength, Mohr-coulomb theory, conventional and modified failure envelopes, Effective stress concept of total stress, Concept of pore pressure, Total and effective shear strength parameters, factors affecting shear strength of soils, Sensitivity and Thixotropy of clay.</p>	<b>8</b>	<b>CO3 CO4</b>
<b>4</b>	<p><b>COMPACTION OF SOIL:</b> Definition, Principle of compaction, Standard and Modified proctor's compaction tests, factors affecting compaction, effect of compaction on soil properties, Field compaction control – compactive effort &amp; method, lift thickness and number of passes, Proctor's needle,</p>	<b>8</b>	<b>CO1 CO5</b>

	<b>CONSOLIDATION OF SOIL:</b> Definition, Mass-spring analogy, Terzaghi's one dimensional consolidation theory-assumption and limitations (no derivation), Normally consolidated, under consolidated and over consolidated soils, pre-consolidation pressure and its determination by Casagrande's method. Consolidation characteristics of soil ( $C_c$ , $a_v$ , $m_v$ and $C_v$ ).		
<b>5</b>	<b>DETERMINATION OF SHEAR STRENGTH AND CONSOLIDATION OF SOIL:</b> Measurement of shear parameters-Direct shear test, unconfined compression test and Triaxial compression test , Test under different drainage conditions. Laboratory one dimensional consolidation test, Determination of consolidation characteristics of soils-compression index and coefficient of consolidation (square root of time fitting method, logarithmic time fitting method).	<b>8</b>	<b>CO1 CO6</b>

NOTE:

1. Questions for CIE and SEE not to be set from self-study component.
2. Assignment Questions should be from self-study component only.

<b>Self Study Component</b>		
<b>Unit</b>	<b>Contents of the unit</b>	<b>CO's</b>
<b>1</b>	INDEX PROPERTIES OF SOIL AND THEIR DETERMINATION: Origin of soil and formation of soil, Specific gravity of soil solids (Pycnometer and density bottle method)	<b>CO1,CO2</b>
<b>2</b>	CLAY MINERALOGY AND SOIL STRUCTURE: Textural classification	<b>CO1,CO3</b>
<b>3</b>	COMPACTION OF SOIL: Superficial velocity, effective stress and Neutral stress	<b>CO3,CO4</b>
<b>4</b>	COMPACTION OF SOIL: Compacting equipment	<b>CO1,CO5</b>
<b>5</b>	DETERMINATION OF SHEAR STRENGTH AND CONSOLIDATION OF SOIL: Vane shear test	<b>CO1,CO6</b>

#### TEXT BOOKS:

1. Soil Mechanics and Foundation Engg.-Punmia B.C. (2005), Laxmi Publications Co. , New Delhi.
2. Principles of Soil Mechanics and Foundation Engineering- Murthy V.N.S. (1996), 4th Edition, UBS Publishers and Distributors, New Delhi.

## REFERENCES BOOKS:

1. Foundation Analysis and Design- Bowles J.E. (1996), 5th Edition, McGraw Hill Pub. Co. New York.
2. Soil Engineering in Theory and Practice- Alam Singh and Chowdhary G.R. (1994), CBS Publishers and Distributors Ltd., New Delhi.
3. Basic and Applied Soil Mechanics- GopalRanjan and Rao A.S.R. (2000), New Age International (P) Ltd., New Delhi.
4. Geotechnical Engineering- Donald P Coduto Phi Learning Private Limited, New Delhi
5. Geotechnical Engineering- Shashi K. Gulathi&ManojDatta. (2009), “ TataMcGraw Hill.
6. Text Book of Geotechnical Engineering- Iqbal H. Khan (2005), 2nd Edition, PHI, India.
7. Numerical Problems, Examples and objective questions in Geotechnical Engineering- NarasimhaRao A. V. &Venkatrahmaiah C. (2000), Universities Press., Hyderabad.

## Assessment Pattern:

CIE: Continuous Internal Evaluation Pattern for theory: (50 Marks)

Blooms Category	Tests	Assignments	AAT 1	AAT 2
Marks (out of 50)	30	10	05	05
Remembrance	10	2	1	1
Understand	5	2	1	1
Apply	5	2	1	1
Analyze	5	2	1	1
Evaluate	5	2	1	1
Create				

\*AAT 1– Alternate Assessment Tool 1

AAT 2 - Alternate Assessment Tool 2

SEE – Sem End Examination Theory (50 Marks)

Blooms Category	Theory Marks (50)
Remembrance	10
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	



## TRANSPORTATION ENGINEERING –I

**Course Code : CV53**  
**L:P:T:S : 3:0:0:0**  
**Exam Hours : 03**  
**Hours/Week : 03**

**Credits : 3**  
**CIE Marks : 50**  
**SEE Marks : 50**  
**Total hours : 40**

### Course Objectives:

1. To understand the basic concepts of Transportation engineering.
2. To classify the need of modes of transportation systems
3. To develop highway drainage system, principles of pavement design

### Course Outcomes: At the end of the course the student will be able to

	Course Outcome
CO 1	Analyse the concept of transportation Engineering and its role in Nation development
CO 2	Classify the need of modes of transportation systems, principles of highway alignment design, realignment, drawings
CO 3	Distinguish the principle of planning, surveys, collection of data and design principles of various highway components
CO 4	Evaluate the concept of construction, equipments, material specifications as per IRC, maintenance of highways, economics and drainage aspects
CO 5	Develop highway drainage system, principles of pavement design
CO 6	Estimate the highway economics by different methods, vehicle operation cost calculation for economics calculation

### Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2											
CO2		1	3									
CO3	1		2									
CO4			3									
CO5			2	1								
CO6		2	3									

Unit	Content	Hours	Co's
<b>1</b>	<p>PRINCIPLES OF TRANSPORTATION ENGINEERING: Importance of transportation, Different modes of transportation and comparison, Characteristics of road transport Jayakar committee recommendations, and its implementation – Central Road Fund, Indian Roads Congress, Central Road Research Institute. HIGHWAY DEVELOPMENT AND PLANNING: Road types and classification, road patterns, planning surveys, master plan – saturation system of road planning, phasing road development in India, problems on best alignment among alternate proposals Salient Features of 3rd and 4th twenty year road development plans and Policies.</p>	<b>8</b>	<b>CO1 CO2 CO3</b>
<b>2</b>	<p>HIGHWAY ALIGNMENT AND SURVEYS: Ideal Alignment, Factors affecting the alignment, Engineering surveys-Map study, Reconnaissance, Preliminary and Final location &amp; detailed survey, Reports and drawings for new and re-aligned projects</p> <p>HIGHWAY GEOMETRIC DESIGN – I: Importance, Terrain classification, Design speed, Factors affecting geometric design, Cross sectional elements-Camber- width of pavement Shoulders- Width of formation- Right of way, typical cross sections</p>	<b>8</b>	<b>CO2 CO3</b>
<b>3</b>	<p>HIGHWAY GEOMETRIC DESIGN – II: Sight Distance Restrictions to sight distance- Stopping sight distance &amp; Overtaking sight distance-overtaking zones- Examples on SSD, OSD and ISD- Sight distance at intersections, Horizontal alignment-Radius of Curve- Superelevation – Extra widening Transition curve and its length, setback distance – Examples, Vertical alignment-Gradient-summit and valley curves with examples.</p> <p>PAVEMENT MATERIALS: Subgrade soil – functions and desirable properties-HRB soil classification-determination of CBR and modulus of subgrade reaction-Examples on CBR and Modulus of subgrade reaction with corrections, Aggregates- Desirable properties and list of tests, Bituminous materials- Desirable properties of bitumen, bitumen, cutback and emulsion-List of tests and its importance</p>	<b>8</b>	<b>CO2 CO3 CO4</b>
<b>4</b>	<p>PAVEMENT DESIGN: Pavement types, component parts of flexible and rigid pavements and their functions, design factors, ESWL for dual wheel assemble and its determination-Examples, Design of flexible pavements as per IRC:37-2012-Examples, Rigid pavement-Westergaard's equations for load and temperature stresses</p>	<b>8</b>	<b>CO5</b>

<b>5</b>	<b>PAVEMENT CONSTRUCTION:</b> Earthwork: cutting-Filling, Preparation of subgrade, Specification and construction of i) Granular Sub base, ii) WBM Base, iii) WMM base, iv) Bituminous Concrete, and PQC v) concrete roads <b>HIGHWAY DRAINAGE:</b> Significance and requirements, Surface drainage system and design-Examples, sub surface drainage system, design of filter materials	<b>8</b>	<b>CO6</b>
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**NOTE: 1. Questions for CIE and SEE not to be set from self-study component.**

**3. Assignment Questions should be from self-study component only.**

<b>Self Study Component</b>		
<b>Unit</b>	<b>Contents of the unit</b>	<b>CO's</b>
<b>1</b>	PRINCIPLES OF TRANSPORTATION ENGINEERING: present development in transportation sector	<b>CO1,CO2,CO3</b>
<b>2</b>	HIGHWAY ALIGNMENT AND SURVEYS: Application of GIS in surveying	<b>CO2,CO3</b>
<b>3</b>	PAVEMENT MATERIALS: Modern methods of construction practice	<b>CO2,CO3,CO4</b>
<b>4</b>	PAVEMENT DESIGN: Design of slab thickness only as per IRC:58-2015	<b>CO5</b>
<b>5</b>	PAVEMENT CONSTRUCTION: modern method of pavement construction and construction equipments used in practice	<b>CO6</b>

**Text Books:**

1. Highway Engineering, S K Khanna and C E G Justo, Nem Chand Bros, Roorkee.
2. Highway Engineering, L R Kadiyali, Khanna Publications, New Delhi

**References:**

1. Transportation Engineering, K P Subramaniam, Scitech Publications, Chennai.
2. Transportation Engineering, James H Banks, Mc.Graw Hill Publications, New Delhi
3. Highway Engineering, R Sreenivasa Kumar, University Press Pvt Ltd, Hyderabad
4. Transportation Engineering, C JotinKhisty, B Kent Lal, PHI Learning Pvt Ltd, New Delhi
5. Indian Road Congress (IRC) 58-2002, IRC 37-2001
6. Specifications for Roads and Bridges – MoRT&H, IRC, New Delhi

## Assessment Pattern:

CIE: Continuous Internal Evaluation Pattern for theory: (50 Marks)

Blooms Category	Tests	Assignments	AAT 1	AAT 2
Marks (out of 50)	30	10	05	05
Remembrance	10	2	1	1
Understand	5	2	1	1
Apply	5	2	1	1
Analyze	5	2	1	1
Evaluate	5	2	1	1
Create				

\*AAT 1– Alternate Assessment Tool 1

AAT 2 - Alternate Assessment Tool 2

SEE – Sem End Examination Theory (50 Marks)

Blooms Category	Theory Marks (50)
Remembrance	10
Understand	10
Apply	10
Analyze	10
Evaluate	10

## STRUCTURAL ANALYSIS – II

**Course Code : CV54**  
**L:P:T:S : 4:0:0:0**  
**Exam Hours : 03**  
**Hours/Week : 04**

**Credits : 4**  
**CIE Marks : 50**  
**SEE Marks : 50**  
**Total hours : 52**

### Course Objectives:

1. To analyze structures for different loading and support conditions.
2. To determine the appropriate method of analysis for structures with increased number of degrees of freedom.
3. To understand the concept of analysis for rolling loads and development of Influence Line Diagrams.

### Course Outcomes: At the end of the course the students will be able to

	Course Outcome
CO 1	Analyze different structural elements both determinate and indeterminate
CO 2	Understand of rolling load and influence lines.
CO 3	Analyse indeterminate beams and frames using Slope Deflection method
CO 4	Analyse indeterminate beams and frames using Moment Distribution method
CO 5	Analyze indeterminate beams and frames using Kani's method
CO 6	Analyze indeterminate beams and frames using flexibility and stiffness matrix method of analysis

### Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	2									
CO2	1	2	3									
CO3	2	1	3									
CO4	1	2	3	2								
CO5	2	1	2									
CO6	1	2	3									

Unit	Content	Hours	Co's
1	SLOPE DEFLECTION METHOD: Introduction, Sign convention, Development of slope deflection equations and Analysis of Beams and Orthogonal Rigid jointed plane frames (non-sway) with kinematic redundancy $\leq 3$ . (Members to be axially rigid) Analysis of rigid jointed plane frames (sway, members assumed to be axially rigid and kinematic redundancy $\leq 3$ )	12	CO1 CO3
2	MOMENT DISTRIBUTION METHOD: Introduction, Definition of terms, Distribution factor, Carry over factor, Development of method and Analysis of beams and orthogonal rigid jointed plane frames (non-sway) with kinematic redundancy less than/equal to three. (Members to be axially rigid) Analysis of rigid jointed plane frames (sway, members assumed to be axially rigid and kinematic redundancy $\leq 3$ )	12	CO1 CO4
3	KANI'S METHOD: Introduction, Basic Concept, Analysis of Continuous beams and Analysis of rigid jointed non-sway plane frames.	10	CO1 CO5
4	MATRIX METHOD OF STRUCTURAL ANALYSIS (System Approach): Introduction, Development of flexibility and stiffness matrix for plane truss elements and axially rigid plane framed structural elements. Analysis of axially rigid plane frames by flexibility and stiffness methods with static indeterminacy $\leq 3$	12	CO1 CO6
5	ROLLING LOAD AND INFLUENCE LINES: Rolling load analysis for simply supported beams for several point loads and UDL. Influence line diagram for reaction, SF and BM at a given section	6	CO2

**NOTE:**

1. Questions for CIE and SEE not to be set from self-study component.
2. Assignment Questions should be from self-study component only.

Self Study Component		
Unit	Contents of the unit	CO's
1	SLOPE DEFLECTION METHOD: Slope deflection method for beams with kinematic redundancy $> 3$	CO1, CO3
2	MOMENT DISTRIBUTION METHOD: Moment distribution method for beams with kinematic redundancy $> 3$	CO1, CO4
3	KANI'S METHOD: Kani's method for sway analysis	CO1, CO5
4	MATRIX METHOD OF STRUCTURAL ANALYSIS: Introduction to Finite Element Analysis.	CO1, CO6

<b>5</b>	<b>ROLLING LOAD AND INFLUENCE LINES:</b> Classification of loads as per IRC	<b>CO2</b>
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### Text Books

1. Theory of Structures, Pandit and Guptha, Vol. – II, Tata McGraw Hill, New Delhi.
2. Basic Structural Analysis, Azmi Ibrahim, K. U. Muthu, M. Vijay Anand, and MagantiJanardhana, I K International Publishing House Pvt. Ltd, 2001

### References

1. Theory of Structures, S P Timoshenko & D H Young, 2<sup>nd</sup> Edition, International Student Edition
2. Elementary Structural Analysis, Norris and Wilbur, International Student Edition. McGraw Hill Book Co: New York
3. Structural Analysis, DevdasMenon, Narosa Publications
4. Analysis of Structures, Thandava Murthy, Oxford University Press, Edition 2005
5. Structural Analysis, Russell C Hibbeler, Maxwell Machmillan International Editions.
6. Basic Structural Analysis, Reddy C. S., Tata McGraw Hill, New Delhi.

### Assessment Pattern:

CIE: Continuous Internal Evaluation Pattern for theory: (50 Marks)

Blooms Category	Tests	Assignments	AAT 1	AAT 2
Marks (out of 50)	30	10	05	05
Remembrance	10	2	1	1
Understand	5	2	1	1
Apply	5	2	1	1
Analyze	5	2	1	1
Evaluate	5	2	1	1
Create				

\*AAT 1– Alternate Assessment Tool 1  
AAT 2 - Alternate Assessment Tool 2

SEE – SEM End Examination Theory (50 Marks)

Blooms Category	Theory Marks (50)
Remembrance	10
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	

## DESIGN OF REINFORCED CONCRETE STRUCTURES

**Course Code : CV55**  
**L:P:T:S : 4:0:0:0**  
**Exam Hours : 03**  
**Hours/Week : 04**  
**Course Objective:**

**Credits : 4**  
**CIE Marks : 50**  
**SEE Marks : 50**  
**Total hours : 52**

1. To understand the basic concepts of behavior of reinforced concrete systems and elements
2. To learn the concept of design procedure of RC elements

	Course Outcome
<b>CO 1</b>	Incorporate the knowledge of different principles for designing RC elements
<b>CO 2</b>	Paraphrase the behaviour of concrete and reinforced steel in combination
<b>CO 3</b>	Interpret and use of relevant Indian Standard codes
<b>CO 4</b>	Differentiate the structural elements with respect to its behaviour under different loading conditions.
<b>CO 5</b>	Discriminate between uniaxial and biaxial moments prior to structural design.
<b>CO 6</b>	Design different structural elements manually with respect to field conditions

### Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>CO1</b>	3	3	3	2	-	2	-	3	3	3	1	3
<b>CO2</b>	3	3	3	3	-	2	-	3	3	3	-	3
<b>CO3</b>	3	3	3	3	-	2	-	3	3	3	1	3
<b>CO4</b>	3	3	3	3	-	2	-	3	3	3	1	3
<b>CO5</b>	3	3	3	3	-	2	-	3	3	3	-	3
<b>CO6</b>	3	3	3	3	-	2	-	3	3	3	2	3





	boundary conditions. Design of simply supported, cantilever and continuous slabs as per IS: 456 – 2000  DESIGN OF STAIRCASES: General features, types of staircase loads on stair cases, effective span as per IS code provisions, distribution of loading on stairs, Design of dog legged and open-well staircases with waist slabs		
<b>4</b>	DESIGN OF COLUMNS: General aspects, effective length of column, loads on columns, slenderness ratio for columns, minimum eccentricity, design of short axially loaded columns, design of column subject to combined axial load and uniaxial moment and biaxial moment using SP – 16charts	<b>10</b>	<b>CO1, CO3, CO4, CO5</b>
<b>5</b>	DESIGN OF FOOTINGS: Introduction, load for footing, Design basis for limit state method, Design of isolated rectangular footing for axial load and uniaxial moment, design of pedestal	<b>08</b>	<b>CO1, CO3, CO4, CO5</b>

**NOTE:**

1. Questions for CIE and SEE not to be set from self-study component.
2. Assignment Questions should be from self-study component only

<b>Self Study Component</b>		
<b>Unit</b>	<b>Contents of the unit</b>	<b>CO's</b>
<b>1</b>	PRINCIPLES OF LIMIT STATE DESIGN AND ULTIMATE STRENGTH OF R.C. SECTION: Concept of WSM and Ultimate load method	<b>CO1,CO3</b>
<b>2</b>	DESIGN OF BEAMS: Detailing according with SP – 34, types of cracks in beams	<b>CO1,CO2,CO3</b>
<b>3</b>	DESIGN OF SLABS: Introduction to flat slab, waffle slabs and its detailing	<b>CO1,CO3,CO4</b>
<b>4</b>	DESIGN OF COLUMNS: Concept of floating columns	<b>CO1,CO3,CO4,CO5</b>
<b>5</b>	DESIGN OF FOOTINGS: Concept of raft, eccentric	<b>CO1,CO3,CO4,CO5</b>

**Text Books:**

1. Reinforced Concrete Design, Pillai and Menon, TMH Education Pvt. Ltd, 3<sup>rd</sup> Edition, 2009
2. Limit State Design of Reinforced Concrete, Krishnaraju, CBS Publications

**References:**

1. Design of reinforced concrete structures, S Ramamrutham
2. Reinforced concrete design, B C Punmia, Jain & Jain
3. Reinforced Concrete Design, W H Mosley and J H Bungey, 4<sup>th</sup> Edition
4. Reinforced Concrete Analysis and Design, S S Ray, Blackwell Science Publications,
5. IS 456-2000, Indian Standard code for Plain and Reinforced Concrete
6. SP-16 & SP -34 Design Aids for Reinforced Concrete

**Assessment Pattern:**

CIE: Continuous Internal Evaluation Pattern for theory: (50 Marks)

Blooms Category	Tests	Assignments	AAT 1	AAT 2
Marks (out of 50)	<b>30</b>	<b>10</b>	<b>05</b>	<b>05</b>
Remembrance	<b>10</b>	<b>2</b>	<b>1</b>	<b>1</b>
Understand	<b>5</b>	<b>2</b>	<b>1</b>	<b>1</b>
Apply	<b>5</b>	<b>2</b>	<b>1</b>	<b>1</b>
Analyze	<b>5</b>	<b>2</b>	<b>1</b>	<b>1</b>
Evaluate	<b>5</b>	<b>2</b>	<b>1</b>	<b>1</b>
Create				

\*AAT 1– Alternate Assessment Tool 1

AAT 2 - Alternate Assessment Tool 2

SEE – SEM End Examination Theory (50 Marks)

Blooms Category	Theory Marks (50)
Remembrance	10
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	

## COMPUTER AIDED DESIGN AND DRAFTING LABORATORY

### CADD LAB

**Course Code : CVL57**

**L:P:T:S : 0:3:0:0**

**Exam Hours : 03**

**Hours/Week : 03**

**Credits : 2**

**CIE Marks : 50**

**SEE Marks : 50**

**Total hours : 40**

#### Course Objectives:

1. To learn the basic building drawing and components of building
2. To give an exposure to the bye laws, orientations, building standards
3. To prepare students for future Engineering positions
4. To make them efficient to use MS Excel when a repetitive work arises

#### Course Outcomes: At the end of the course the students will be able to

	Course Outcome
CO 1	Utilize Auto cad basic tools for building drawing.
CO 2	Model two dimensional drawings with Auto CAD
CO 3	Adapt suitable building standards for planning and designing of buildings.
CO 4	Identify the bye laws and building design as per government norms.
CO 5	Convert sketches into engineered drawings (Structural Drawings).
CO 6	Analyse the behavior of different types of beams using MS Excel.

#### Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2								
CO2	3	3	3	2								
CO3	3	3	3	2								
CO4	3	3	3	1								

<b>CO5</b>	3	3	3	1								
<b>CO6</b>	3	3	3	1								

<b>Unit</b>	<b>Content</b>	<b>Hours</b>	<b>Co's</b>
<b>1</b>	<b>INTRODUCTION TO BUILDING DRAWING:</b> 1.1 Preparing geometrical drawing of component of buildings i) Stepped wall footing and isolated RCC column footing ii) Continuous beam iii) RCC dog legged and open well stairs (Manual) 1.2 Functional design of building (Residential, Public and Industrial), positioning of various components of buildings, orientation of buildings, building standards, bye laws, set back distances and calculation of carpet area, plinth area and floor area ratio.	<b>10</b>	<b>CO3 CO4 CO5</b>
<b>2</b>	<b>Basics of AUTOCAD:</b> 2.1 <u>Drawing tools</u> : Line, Ray, Construction line, Multiline, Polyline, 3D Polyline, Polygon, Rectangle, Helix, Arc, Circle, Donut, Spline, Ellipse, Block, Table, Point, Point, Hatch, Boundary, Region, text. 2.2 <u>Modify tools</u> : Erase, Copy, Mirror, Offset, Array, Move, Rotate, Scale, Stretch, Lengthen, Trim, Extend, Break, Chamfer and Fillet, Using Text: Single line text, Multiline text, Spelling, Edit text, Special Features: View tools, Layers concept, Dimension tools, Hatching, Customizing toolbars, Working with multiple drawings. 2.3 <u>View Commands</u> : Zoom, Pan, Dynamic, Zoom Previous, Zoom real-time, Drawing Settings and Aids, Snap, Grid, OSnap, OTrack. 2.4 <u>Dimension Command</u> : Formatting Dimension Style and Multi-leader Style. 2.5 <u>Drawing Settings and Aids</u> : Layers, Load Line types, Match properties, World UCS and User-defined UCS, Drawing limits and units, Blocks, Attributes. 2.6 <u>Saving and Plotting</u> : Paper space, Layout space and Viewports, Pen assignments and Printer setup.	<b>10</b>	<b>CO1 CO2 CO3 CO4</b>
<b>3</b>	<b>Preparation of AUTOCAD Drawings</b> 3.1 Using Auto Cad Development of plan, elevation, section and schedule of openings from the given line diagram of two bed room residential buildings and to show the C/S of foundation, lintel & chejja. 3.2 Using Auto cad developing the Functional design of building using inter connectivity diagrams (bubble diagram), development of line	<b>20</b>	<b>CO1 CO2 CO3 CO4</b>

	<p>diagram only for following building i) Primary health center, ii) Primary school building, iii) College canteen</p> <p>3.2 Using Auto CAD For a given single line diagram, preparation of water supply, sanitary and electrical layouts</p>		
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### References

1. National Building Code, BIS, New Delhi.
2. IS SP34, BIS New Delhi
3. “Building Drawing”, by Shah M. H. And Kale C. M., Tata McGraw Hill Publishing Co
4. CAD Laboratory - M A Jayaram, D S Rajendraprasad, Sapna Publications.

### Assessment Pattern:

CIE: Continuous Internal Evaluation Pattern for LAB: (50 Marks)

Blooms Category	CIA	Internals
Marks (out of 50)	30	20
Remembrance	5	4
Understand	5	4
Apply	10	4
Analyze	5	4
Evaluate	5	4
Create		

SEE – Sem End Examination LAB (50 Marks)

Blooms Category	LAB Marks (50)
Remembrance	10
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	

## HYDRAULICS AND HYDRAULIC MACHINE LABORATORY

**Course Code : CVL58**

**L:P:T:S : 0:2:0:0**

**Exam Hours : 03**

**Hours/Week : 03**

**Credits : 2**

**CIE Marks : 50**

**SEE Marks : 50**

**Total hours : 40**

### Course Objectives:

1. Students are expected to learn basic experiments of fluid mechanics.
2. Students shall introduce to get exposure with turbines, pumps as practical application.

### Course Outcomes: At the end of the course the students will be able to:

	Course Outcome
CO 1	Analyse application on fluid mechanics.
CO 2	Calibrate of fluidic components.
CO 3	Verify Bernoulli's equations.
CO 4	Verify Darcy's wesibach equations.
CO 5	Evaluate practical application of pumps.
CO 6	Analyse practical application of turbines.

### Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1									
CO2	1	1	2									
CO3	1	1	3									
CO4	1	1	2									
CO5	1	2	1									
CO6	2	1	3									

Unit	Content	Hours	Co's
1	1.Verification of Bernoulli's equation 2. Calibration of 90° V-notch 3.Calibration of Trapezoidal notch	10	CO1
2	1.Calibration of Venturiflume 2. Determination of Hydraulic coefficients of a vertical orifice.	8	CO2 CO3
3	1.Calibration of Venturimeter 2.Determination of Darcy's friction factor for a straight pipe	8	CO4 CO3
4	1.Determination of vane coefficients for a flat vane 2.Performance characteristics of a single stage centrifugal pump	8	CO5
5	1.Performance characteristics of a Kaplan turbine 2. Performance characteristics of a Pelton turbine	6	CO6

#### References:

1. Experiments in fluid mechanics – Sarbjit Singh, PHI Pvt Ltd, New Delhi 2009
2. Hydraulics and Hydraulic Mechines Laboratory Manual – Dr. N. Balasubramanya

#### Assessment Pattern:

CIE: Continuous Internal Evaluation Pattern for LAB: (50 Marks)

Blooms Category	CIA	Internals
Marks (out of 50)	30	20
Remembrance	5	4
Understand	5	4
Apply	10	4
Analyze	5	4
Evaluate	5	4
Create		

\*AAT 1– Alternate Assessment Tool 1

AAT 2 - Alternate Assessment Tool 2

SEE – Sem End Examination Practical (50 Marks)

Blooms Category	lab Marks (50)
Remembrance	



Understand	10
Apply	10
Analyze	30
Evaluate	
Create	