DESIGN OF STEEL STRUCTURES [As per Choice Based Credit System (CBCS) scheme] SEMESTER –VI	
Subject Code 18CV61	CIE:50
Number of Lecture Hours/Week:04	SEE: 50
Total Number of Lecture Hours:50	Exam Hours:03
CREDITS –04	

Course Objectives: This course will enable students to
1. Understand advantages and disadvantages of steel structures, steel code provisions and plastic behaviour of structural steel.
2. Learn Bolted connections and Welded connections.
3. Design of compression members, built-up columns and columns splices.
4. Design of tension members, simple slab base and gusseted base.
5. Design of Design of beams.

Modules	RBT Level/hrs
Module -1 **Introduction:** Advantages and Disadvantages of Steel Structures, Limit state method Limit State of Strength, Structural Stability, Serviceability Limit states, Failure Criteria Design Consideration, Loading and load combinations, IS code provisions, Specification and Section classification.	10 hours L1,L2,L3
Module -2 **Bolted Connections:** Introduction, Types of Bolts, Behaviour of bolted joints, Design of High Strength friction Grip(HSFG) bolts Design of Simple bolted Connections (Lap and Butt joints)- Advantages and Disadvantages Eccentric bolted connection. **Welded Connections:** Introduction, Types and properties of welds, Weld Defects Simple welded joints for truss member, Advantages and Disadvantages.	10 Hours L1,L2,L3
Module -3 **Design of Compression Members:** Introduction, Sections used for compression members, Behaviour& types of failures, Effective length of compression members, Design of compression members. Design of Laced and Battened Systems.	10 Hours L1,L2,L3
Module -4 **Design of Column Bases:** Design of Simple Slab Base and Gusseted Base. **Design of Tension Members:** Introduction, Types of Tension members, Behaviour of Tension members modes of failure, Slenderness ratio, Factors affecting the strength of tension members, Design of Tension members and Lug angles, Splices.	10 Hours L1,L2,L3
Module -5 **Design of Beams:** Types of Rigid steel beam sections-Behaviour of Beams in	10 Hours L1,L2,L3

flexure, Beam types Beam to Beam Connections, Beam to Column Connection and Column Splices [No Numerical Problems]	

Course Outcomes: After studying this course, students will be able to:

1. Possess a knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel
2. Understand the Concept of Bolted and Welded connections.
3. Understand the Concept of Design of compression members, built-up columns and columns splices.
4. Understand the Concept of Design of tension members, simple slab base and gusseted base.
5. Understand the Concept of Design of beams.

Program Objectives:

. Engineering knowledge
. Problem analysis
. Interpretation of data

Question Paper Pattern:

1. The question paper will have ten questions.
2. Each full question consists of 10 marks.
3. There will be 2 full questions (with a maximum of four sub questions) from each module.
4. Each full question will have sub questions covering all the topics under a module.
5. The students will have to answer 5 full questions, selecting one full question from each module.

Text Books:

1. N Subramanian., "Design of Steel Structures" (2016), Oxford University Press, New Delhi.
2. Duggal S K., "Limit State Method of Design of Steel Structures", Tata McGraw Hill, New Delhi
3. Bhavikatti.S.S,"Design of Steel Structures" By Limit State Method as per IS:800-2007.

Reference Books:

1. Dayarathnam P, "Design of Steel Structures", S Chand and Company Ltd., New Delhi.
2. Kazim S M A and Jindal R S, "Design of Steel Structures", Prentice Hall of India, New Delhi.
3. IS 800-2007: General Construction in Steel Code Practice (Third revision), Bureau of Indian Standards, New Delhi.

ADVANCED GEOTECHNICAL ENGINEERING
[As per Choice Based Credit System (CBCS) scheme]
SEMESTER –VI

Subject Code	18CV62	**CIE**	50
Number of Lecture Hours/Week	04	**SEE**	50
Total Number of Lecture Hours	50	**Exam Hours**	03

CREDITS – 04

Course objectives: This course will enable students to

1. Appreciate basic concepts of soil mechanics as an integral part in the knowledge of Civil Engineering. Also to become familiar with foundation engineering terminology and understand how the principles of Geotechnology are applied in the design of foundations
2. Learn introductory concepts of Geotechnical investigations required for civil engineering projects emphasizing in situ investigations
3. Conceptually learn various theories related to bearing capacity of soil and their application in the design of shallow foundations and estimation of load carrying capacity of pile foundation
4. Estimate internal stresses in the soil mass and application of this knowledge in proportioning of shallow and deep foundation fulfilling settlement criteria
5. Study about assessing stability of slopes and earth pressure on rigid retaining structures

Modules	Teaching Hours	RBT Level
Module -1		
Soil Exploration: Introduction, Objectives and Importance, Stages and Methods of exploration- Test pits, Borings, Geophysical methods, stabilization of boreholes, Sampling techniques, Undisturbed, disturbed and representative samples, Geophysical exploration and Bore hole log. Drainage and Dewatering methods, estimation of depth of GWT (Hvorslev's method).	**10**	**L1,L2,L3**
Module -2		
Stress in Soils: Introduction, Boussinesq's and Westergaard's theory concentrated load, circular and rectangular load, equivalent point load method, pressure distribution diagrams and contact pressure, Newmark's chart Foundation Settlement - Approximate method for stress distribution on a horizontal plane, Types of settlements and importance, Computation of immediate and consolidation settlement**.**	**10**	**L2,L3,L4**
Module -3		
Lateral Earth Pressure: Active, Passive and earth pressure at rest, Rankine's theory for cohesionless and cohesive soils, Coulomb's theory, Rebhann's and	**10**	**L2,L4,L5**

Culmann's graphical construction. **Stability of Slopes** : Assumptions, infinite and finite slopes, factor of safety, use of Taylor's stability charts, Swedish slip circle method for C and C-o (Method of slices) soils, Fellineous method for critical slip circle		
Module -4		
Bearing Capacity of Shallow Foundation: Types of foundations, determination of bearing capacity by Terzaghi's and BIS method (IS: 6403), Effect of water table and eccentricity, field methods - plate load test and SPT, settlement of foundation.	**10**	**L2,L4,L5 ,L6**
Module -5		
Pile Foundations: Types and classification of piles, single loaded pile capacity in cohesionless and cohesive soils by static formula, efficiency of file group, group capacity of piles in cohesionless and cohesive soils, negative skin friction, pile load tests, Settlement of piles, under reamed piles (only introductory concepts – no derivation)**,**	**10**	**L1, L2, L3 L4**

Course outcomes: On the completion of this course students are expected to attain the following outcomes;

1. Ability to plan and execute geotechnical site investigation program for different civil engineering projects
2. Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
3. Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
4. Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
5. Capable of estimating load carrying capacity of single and group of piles

Question paper pattern:

1. The question paper will have ten questions.
2. Each full question consists of 10 marks.
3. There will be 2 full questions (with a maximum of four sub questions) from each module.
4. Each full question will have sub questions covering all the topics under a module.
5. The students will have to answer 5 full questions, selecting one full question from each module.

Text Books:

1. Gopal Ranjan and Rao A.S.R., Basic and Applied Soil Mechanics, New Age International (P) Ltd., New Delhi.
2. Punmia B C, Soil Mechanics and Foundation Engineering, Laxmi Publications co.,New Delhi.
3. Murthy V.N.S., Principles of Soil Mechanics and Foundation Engineering, UBS Publishers and Distributors, New Delhi.
4. Braja, M. Das, Geotechnical Engineering; Thomson Business Information India (P) Ltd., India

Reference Books:

1. T.W. Lambe and R.V. Whitman, Soil Mechanics-, John Wiley & Sons
2. Donald P Coduto, Geotechnical Engineering- Phi Learning Private Limited, New Delhi
3. Shashi K. Gulathi& Manoj Datta, Geotechnical Engineering-. , Tata McGraw Hill Publications

4. DebashisMoitra, “Geotechnical Engineering”, Universities Press.,
5. Malcolm D Bolton, “A Guide to soil mechanics”, Universities Press.,
6. Bowles J E , Foundation analysis and design, McGraw- Hill Publications

HIGHWAY ENGINEERING
[As per Choice Based Credit System (CBCS) scheme]
SEMESTER –VI

Subject Code	**18CV631**	**IA Marks**	**50**
Number of Lecture Hours/Week	**03**	**Exam Marks**	**50**
Total Number of Lecture Hours	**40 Hours**	**Exam Hours**	**03**
CREDITS –03		**Total Marks-100**	

Course objectives: This course will enable studentsto;

1. Gain knowledge of different modes of transportation systems, history, development of highways and the organizations associated with research and development of the same inINDIA.
2. Understand Highway planning and development considering the essential criteria's (engineering and financial aspects, regulations and policies, socio economicimpact).
3. Get insight to different aspects of geometric elements and train them to design geometric elements of a highwaynetwork.
4. Understand pavement and its components, pavement construction activities and itsrequirements.
5. GaintheskillsofevaluatingthehighwayeconomicsbyB/C,NPV,IRRmethods and also introduce the students to highway financing concepts.

Module -1

Principles of Transportation Engineering: Importance of transportation, Different modes of transportation and comparison, Characteristics of road transport Jayakar committee recommendations, and 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, problems on best alignment among alternate proposals Salient Features of 3rd and 4thtwenty year road development plans and Policies, Present scenario of road development in India (NHDP & PMGSY) and in Karnataka (KSHIP & KRDCL) Road development plan - vision 2021.**L1,L2**

Module -2

Highway Alignment and Surveys: Ideal Alignment, Factors affecting the alignment, Engineering surveys-Map study, Reconnaissance, Preliminary and Final location & detailed survey, Reports and drawings for new and re-aligned projects
Highway Geometric Design: Cross sectional elements–width, surface, camber, Sight distances–SSD, OSD, ISD, HSD, Design of horizontal and vertical alignment–curves, super-elevation, widening, gradients, summit and valley curves**L2,L3,L4**

Module -3

Pavement Materials: Subgrade soil - desirable properties-HRB soil classification- determination of CBR and modulus of subgrade reaction with Problems Aggregates- Desirable properties and tests, Bituminous materials-Explanation on Tar, bitumen, cutback and emulsion-tests on bituminous material
Pavement Design: Pavement types, component parts of flexible and rigid pavements and their functions, ESWL and its determination (Graphical methodonly)-Examples**L3,L4,L5**

Module -4

Pavement Construction:
Earthwork; cutting and Filling, Preparation of subgrade, Specification and construction of i) Granular Sub base, ii) WBM Base, iii) WMM base, iv) Bituminous Macadam, v)
Dense Bituminous Macadam vi) Bituminous Concrete, vii) Dry Lean Concrete sub base and PQC viii) concrete roads **L2,L3,**

Module -5

Highway Drainage: Significance and requirements, Surface drainage system and design-Examples, sub surface drainage system, design of filter materials, Types of cross drainage structures, their choice and location

Highway Economics: Highway user benefits, VOC using charts only-Examples, Economic analysis - annual cost method-Benefit Cost Ratio method-NPV-IRR methods- Examples, Highway financing-BOT-BOOT concepts

L1,L2,L3

Course outcomes: After studying this course, students will be able to:

1. Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of requireddata.
2. Evaluate the engineering properties of the materials and suggest the suitability of the same for pavementconstruction.
3. Design road geometrics, structural components of pavement anddrainage.
4. Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financingconcepts.

Program Objectives:

- Engineeringknowledge
- Problemanalysis
- Interpretation ofdata

TextBooks:

1. S K Khanna and C E G Justo, " Highway Engineering", Nem Chand Bros,Roorkee
2. L R Kadiyali, "Highway Engineering", Khanna Publishers, NewDelhi.
3. R Srinivasa Kumar, "Highway Engineering", UniversityPress.
4. K.P.subramanium, "Transportation Engineering", SciTech Publications,Chennai.

Reference Books:

1. Relevant IRCCodes
2. Specifications for Roads and Bridges-MoRT&H, IRC, NewDelhi.
3. C. JotinKhisty, B. Kentlal, "Transportation Engineering", PHI Learning Pvt. Ltd.New Delhi.

TAFFIC ENGINEERING
[As per Choice Based Credit System (CBCS) scheme]
SEMESTER –VI

Course Code	**18 CV632**	**CIE Marks**	**40**
Number of Lecture Hours/Week	**03**	**SEE Marks**	**60**
Total Number of Lecture Hours	**40 Hours**	**Exam Hours**	**03**

Credits – 03

Course Objectives: This course will enable students to

1. Understandfundamentalknowledgeoftrafficengineering,scopeandits importance.
2. Describe basic techniques for collecting and analysing traffic data, diagnosingproblems,designingappropriateremedialtreatment,and assessing itseffectiveness.
3. Applyprobabilisticandqueuingtheorytechniquesfortheanalysisoftraffic flow situations and emphasis the interaction of flow efficiency and traffic safety.
4. Understand and analyse traffic issues including safety, planning, design, operation andcontrol.
5. Applyintelligenttransportsystemanditsapplicationsinthepresent traffic scenario.

Module-1

Traffic Planning and Characteristics: Road Characteristics-Road user characteristics, PIEV theory, Vehicle Performance characteristics, Fundamentals of Traffic Flow, Urban Traffic problems in India, Integrated planning of town, country, regional and all urban infrastructures, Sustainable approach- land use & transport and modal integration.

L1,L2,L3

Module-2

Traffic Surveys: Traffic Surveys- Speed, journey time and delay surveys, Vehicles Volume Surveyincludingnon-motorized transports, Methods and interpretation, Origin Destination Survey, Methods and presentation, Parking Survey, Accident analyses-Methods, interpretation and presentation, Statistical applications in traffic studies and traffic forecasting, Level of service- Concept, applications andsignificance.

L1,L2,L3,L4,L5

Module-3

Traffic Design and Visual Aids: Intersection Design- channelization, Rotary intersection design, Signal design, Coordination of signals, Grade separation, Traffic signs including VMS and road markings, Significant roles of traffic control personnel, Networking pedestrian facilities & cycle tracks

L1,L2,L3,L4

Module-4

Traffic Safety and Environment: Road accidents, Causes, effect, prevention, and cost, Street lighting, Traffic and environment hazards, Air and Noise Pollution, causes, abatement measures, Promotion and integration of public transportation, Promotion of non-motorized transport.

L1,L2,L3

Module-5

Traffic Management: Area Traffic Management System, Traffic System Management (TSM) with IRC standards, Traffic Regulatory Measures, Travel Demand Management (TDM), Direct and indirect methods, Congestion and parking pricing, All segregation methods- Coordination among different agencies, Intelligent Transport System for traffic management, enforcement andeducation.

L1,L2,L3,L4

Course outcomes: After studying this course, students will be able to:

1. Understandthehumanfactorsandvehicularfactorsintrafficengineeringdesign.
2. Conductdifferenttypesoftrafficsurveysandanalysisofcollecteddatausing statisticalconcepts.
3. Useanappropriatetrafficflowtheoryandtocomprehendthecapacity&signalized intersectionanalysis.
4. Understand the basic knowledge of Intelligent TransportationSystem.

Text Books:

1. Kadiyali.L.R. “Traffic Engineering and Transport Planning ”, Khanna Publishers, Delhi,2013
2. S K Khanna and CEG Justo and A Veeraragavan, “Highway Engineering”, Nem Chand andBros.
3. Indian Roads Congress (IRC) Specifications: Guidelines and Special Publications onTrafficPlanning andManagement
4. Salter. R.I and Hounsell N.B, “Highway Traffic Analysis and design”, Macmillan PressLtd.1996.

Reference Books:

1. Fred L. Mannering, Scott S. Washburn and Walter P. Kilareski, Principles of HighwayEngineeringandTrafficAnalysis,WileyIndiaPvt.Ltd.,NewDelhi,2011
2. GarberandHoel,“PrinciplesofTrafficandHighwayEngineering”,CENGAGE Learning, New Delhi,2010
3. SP:43-1994, IRC Specification, “Guidelines on Low-cost TrafficManagement Techniques” for Urban Areas,1994
4. John E Tyworth, “Traffic Management Planning, Operations and control”, Addison Wesly Publishing Company,1996
5. Hobbs.F.D.“TrafficPlanningandEngineering”,UniversityofBrimingham, Peragamon Press Ltd, 2005

AIR POLLUTION & CONTROL

[As per Choice Based Credit System (CBCS) scheme]
SEMESTER –VI

Course Code:	**18CV641**	**CIE Marks**	**50**
Number of Lecture Hours/Week	**03**	**SEE Marks**	**50**
Total Number of Lecture Hours	**40**	**Exam Hours**	**03**

CREDITS – 03

Course Objectives: This course will enable students to

1. Study the sources and effects of air pollution
2. Learn the meteorological factors influencing air pollution.
3. Analyze air pollutant dispersion models
4. Illustrate particular and gaseous pollution control methods.

Modules	Teaching Hours	RBT Level
Module -1		
Introduction: Definition, Sources, classification and characterization of air pollutants. Effects of air pollution on health, vegetation & materials. Types of inversion, photochemical smog.	**8Hours**	**L1, L2**
Module -2		
Meteorology: Temperature lapse rate & stability, wind velocity & turbulence, plume behavior, measurement of meteorological variables, wind rose diagrams, Plume Rise, estimation of effective stack height and mixing depths.	**8Hours**	**L1,L2,L3**
Module -3		
Sampling: Sampling of particulate and gaseous pollutants (Stack, Ambient & indoor air pollution), Monitoring and analysis of air pollutants (PM2.5, PM10, SOX, NOX, CO, NH3)	**8Hours**	**L2,L3,L4**
Module -4		

Control Techniques: Particulate matter and gaseous pollutants- settling chambers, cyclone separators, scrubbers, filters & ESP.	**8Hours**	**L3,L4**
Module -5		
Air pollution due to automobiles, standards and control methods. Noise pollution causes, effects and control, noise standards. Environmental issues, global episodes, laws, acts, protocols	**8Hours**	**L3,L4,L5, L6**

Course outcomes: After studying this course, students will be able to:

1. Identify the major sources of air pollution and understand their effects on health and environment.
2. Evaluate the dispersion of air pollutants in the atmosphere and to develop air quality models.
3. Ascertain and evaluate sampling techniques for atmospheric and stack pollutants.
4. Choose and design control techniques for particulate and gaseous emissions

Text Books:

1. M. N. Rao and H V N Rao, "Air pollution", Tata Mc-G raw Hill Publication.
2. H. C. Perkins, "Air pollution". Tata McGraw Hill Publication
3. Mackenzie Davis and David Cornwell, "Introduction t o Environmental Engineering" McGraw-Hill Co.

Reference Books:

1. Noel De Nevers, "Air Pollution Control Engineering" , Waveland Pr Inc.
2. Anjaneyulu Y, "Text book of Air Pollution and Control Technologies", Allied Publishers

Environmental Engineering [As per Choice Based Credit System (CBCS) scheme] SEMESTER –VI			
Subject Code	**18CV642**	**CIE**	**50**
Number of Lecture Hours/Week	**03**	**SEE**	**50**
Total Number of Lecture Hours	**40**	**Exam Hours**	**03**

CREDITS –03

Course objectives: This course will enable studentsto

1. Understand the Environmental pollution Caused by Human Activities
2. Systems of collection of water
3. Quality of water and its permissible standards.
4. Methods to treat the water physical, chemical and biological.
5. Disinfection of water by various methods.

Modules	Teaching Hours	RBT Level
Module -1		
INTRODUCTION: Human activities and environmental pollution. Water for various beneficial uses and quality requirement. Need for protected watersupply. DEMAND OF WATER: Types of water demands- domestic demand in detail, institutional and commercial, public uses, fire demand. Per capita consumption –factors affecting per capita demand, population forecasting, different methods with merits &demerits- variations in demand of water, design periods & factors governing the design periods	**8 Hours**	**L3,L4**
Module -2		
SOURCES: Surface and subsurface sources – suitability with regard to quality andquantity. COLLECTION AND CONVEYANCE OF WATER: Intake structures – different types of intakes; factor of selection and location of intakes. Pumps- Necessity, types – power of pumps; factors for the selection of a pump.	**6 Hours**	**L1, L2,L3**
Module -3		
QUALITY OF WATER: Objectives of water quality management. wholesomeness & palatability, water borne diseases. Water quality parameters – Physical, chemical and Microbiological. Sampling of water for examination. Water quality analysis (IS: 3025 and IS: 1622) using analytical and instrumental techniques. Drinking water standards BIS & WHO guidelines. Health significance of Fluoride, Nitrates and heavy metals like Mercury, Cadmium, Arsenic etc. and toxic / trace organics.	**6 Hour**	**L4,L5**

Module -4		
WATER TREATMENT: Objectives – Treatment flow-chart. Aeration- Principles, types of Aerators. SEDIMENTATION: Theory, settling tanks, types, design. Coagulant aided sedimentation, jar test, chemical feeding, flash mixing, and clari- flocculator. FILTRATION: Mechanism – theory of filtration, types of filters, slow sand, rapid sand and pressure filters including construction, operation, cleaning and their design – excluding under drainage system – back washing of filters. Operational problems in filters.	**10 Hours**	**L5, L6**
Module -5		
DISINFECTION: Theory of disinfection, types of disinfection, Chlorination, chlorine demand, residual chlorine, use of bleaching powder. UV irradiation treatment – treatment of swimming pool water SOFTENING – definition, methods of removal of hardness by lime soda process and zeolite process RO & Membrane technique.	**10 hours**	**L2, L3**
Course Outcomes : After Studying this students will be able to : 1. Design the population forecasting 2. Conveyance of water through pipes and pumps 3. BOS Standard for drinking water 4. Design of filter beds.		
Text Books: 1. Water supply Engineering –S.K.Garg, KhannaPublishers Environmental Engineering I –B C Punima and AshokJain Manual on Water supply and treatment –CPHEEO, Minstry of Urban Development, NewDelhi		

EXTENSIVE SURVEY LAB [As per Choice Based Credit System (CBCS) scheme] SEMESTER –VI			
Subject Code	18CVL65	CIE	50
Number of Practice Hours/Week	03	SEE	50
Total Number of Practice Hours	40	Exam Hours	03
		Total Marks	100

CREDIT – 01

Course objectives: This course will enable students to
1. Understand the practical applications of Surveying.
2. Use Total station and other Measurement Equipment's.
3. Work in teams and learn time management, communication and presentation Skills

• To be conducted between 5th & 6th Semester for a period of 2 weeks including Training on total station.
• Viva voce conducted along with 6th semester exams
• An extensive project preparation training involving investigation, collection of data is to be conducted. Use of Total Station is compulsory for minimum of TWO Projects.
• The student shall submit a project report consisting of designs and drawings.
• Drawings should be done using CAD and survey work using total station
• Students should learn data download from total station, generation of contours, block leveling, longitudinal and cross sectional diagrams, and capacity volume calculation by using relevant software's
• The course coordinators should give exposure and simulate activities to achieve the course outcomes

1**. NEW TANK PROJECTS**: The work shall consist of;
a. Reconnaissance survey for selection of site and conceptualization of project.
b. Alignment of center line of the proposed bund, Longitudinal and cross sections of the center line.
c. Detailed survey required for project execution like Capacity surveys, Details at Waste weir and sluice points, Canal alignment etc. as per requirement
d. Design and preparation of drawing with report.

2. **WATER SUPPLY AND SANITARY PROJECT**: The work shall consist of;
a. Reconnaissance survey for selection of site and conceptualization of project.
b. Examination of sources of water supply, Calculation of quantity of water Required based on existing and projected population.
c. Preparation of village map by using total station.
d. Survey work required for laying of water supply and UGD
e. Location of sites for water tank. Selection of type of water tank to be provided. (ground level, overhead and underground)
f. Design of all elements and preparation of drawing with report.

3**. HIGHWAY PROJECT**: The work shall consist of;
a. Reconnaissance survey for selection of site and conceptualization of project.
b. Preliminary and detailed investigations to align a new road (min. 1 to 1.5 km Stretch) between two obligatory points. The investigations shall consist of topographic surveying of strip of land for considering alternate routes and for Final alignment. Surveying by using total station.
c. Report should justify the selected alignment with details of all geometric Designs for traffic and design speed assumed.
d. Drawing shall include key plan initial alignment, final alignment, longitudinal Section along final alignment, typical cross sections of road.

4. **RESTORATION OF AN EXISTING TANK**: The work shall consist of;
a. Reconnaissance survey for selection of site and conceptualization of project.
b. Alignment of center line of the existing bund, Longitudinal and cross sections Of the center line.
c. Detailed survey required for project execution like Capacity surveys, Details at Waste weir and sluice points, Canal alignment etc. as per requirement
d. Design of all elements and preparation of drawing with report.

5. **TOWN/HOUSING / LAYOUT PLANNING**: The work shall consist of;
a. Reconnaissance survey for selection of site and conceptualization of project.
b. Detailed survey required for project execution like contour surveys
c. Preparation of layout plans as per regulations
e. Centerline marking-transfer of center lines from plan to ground
f. Design of all elements and preparation of drawing with report as per regulations

Course outcomes: After studying this course, students will be able to:
1. Apply Surveying knowledge and tools effectively for the projects
2. Understanding Task environment, Goals, responsibilities, Task focus, working in Teams towards common goals, Organizational performance expectations, Technical and behavioral competencies.
3. Application of individual effectiveness skills in team and organizational context, Goal setting, time management, communication and presentation skills.
4. Professional etiquettes at workplace, meeting and general
5. Establishing trust based relationships in teams & organizational environment
6. Orientation towards conflicts in team and organizational environment, Understanding sources of conflicts, Conflict resolution styles and techniques

Program Objectives:
• Engineering knowledge
• Problem analysis
• Interpretation of data

Reference Books:
Training manuals and User manuals
Relevant course reference books

Software Application Lab [As per Choice Based Credit System (CBCS) scheme] SEMESTER –VI	
Subject Code 18CVL66	**CIE:50**
Number of Lecture Hours/Week:03	**SEE:50**
Total Number of Lecture Hours: 40	**Exam Hours:03**
CREDITS –01	

Course objectives: This course will enable students to
1. Use industry standard software in a professional set up.
2. understand the elements of finite element modeling, specification of loads and boundary condition, performing
analysis and interpretation of results for final design
3. Develop customized automation tools

Modules	**RBT Level/hrs**
Module -1 **Use of civil engineering softwares:** Use of softwares for: 1. Analysis of plane trusses, continuous beams, portal frames 2. 3D analysis of multistoried frame structures	20 hours L1,L2,L3
Module -2 **1. Project Management-** Exercise on Project planning and scheduling of a building project using any project management software: a. Understanding basic features of Project management software b. Constructing Project: create WBS, Activities, and tasks and Computation Time using Excel spread sheet and transferring the same to Project management software. c. Identification of Predecessor and Successor activities with constrain d. Constructing Network diagram (AON Diagram) and analyzing for Critical path, Critical activities and Other non Critical paths, Project duration, Floats. e. Basic understanding about Resource Creation and allocation f. Understanding about Splitting the activity, Linking multiple activity, assigning Constrains, Merging Multiple projects, Creating Baseline Project **1. GIS applications using open source software:** a. To create shape files for point, line and polygon features with a map as reference. b. To create decision maps for specific purpose.	18 hours L1,L2,L3
Module -3 **Use of EXCEL spread sheets:** Design of singly reinforced and doubly reinforced rectangular beams, design of one way and two way slabs, computation of earthwork, Design of horizontal curve by offset method, Design of super elevation	12 Hours L1,L2,L3

Course Outcomes: After studying this course, students will be able to: use software skills in a professional set up to automate the work and thereby reduce cycle time for completion of the work

Program Objectives

- · Engineering knowledge
- · Problem analysis
- · Interpretation of data

Question paper pattern:

- The question paper will have 3 modules comprising of 6 questions.
- There will be two full questions (with a maximum of three subdivisions, if necessary) from each module.
- Each full question shall cover the topics as a module
- Module-1: 20 Marks, Module-2: 15 Marks, Module-3: 15 Marks
- The students shall answer three full questions, selecting one full question from each module. If more than one question is answered in modules, best answer will be considered for the award of marks limiting one full question answer in each module.

Reference Books: Training manuals and User manuals and Relevant course reference books

FIELD TRAINING LAB

[As per Choice Based Credit System (CBCS)scheme]

SEMESTER – VI

Subject Code	18CVL67	**CIE**	50
Number of Lecture Hours/Week	03	**SEE**	50
Total Number of Lecture Hours	40	**Exam Hours**	03

CREDITS-01

Course Objectives: This course will enable students to

1. Work properly in the construction field
2. initiate the work at construction field

Experiments

1 Safety measures taken in Construction field
2 Tools used in Construction field
3 Field test on Cement
4 Field test on Sand (FA)
5 Field test on CA
6 Field Reinforcement checking
7 Field test on Bricks
8 Field test on Fresh Concrete**L1,L2,L3**

Course outcomes: After studying this course, students will be able to:

1. Initiate the work at site.
2. Take safety measures at construction site.
3. Do material test on field

SOFT SKILLS [As per Choice Based Credit System (CBCS) scheme] SEMESTER –VI	
Subject Code 18HSM69A	**CIE:50**
Number of Lecture Hours/Week:03	**SEE:50**
Total Number of Lecture Hours: 40	**Exam Hours:03**
CREDITS –01	

Course Objectives :

To enable the students to obtain the basic knowledge about Communication Skills - Iin the following topics:-

- The Meaning, definition, importance, purpose, process, types, barriers and Essential of communication.
- Develop reading and understanding ability
- Learn effective writing
- Learn how to write different types of letter.
- Case method of learning

Modules	RBT Level/hrs
Module - I INTRODUCTION TO COMMUNICATION: Meaning, Definition, Importance & Purpose of Communication, Process of Communication, Types of Communication, Communication network in an organization, 7c's of communication, Barriers to Communication and Essential of good Communication.	6 HOURS
Module – II READING AND UNDERSTANDING – Reading Comprehension – Reading rate and reading comprehension, Paraphrasing, Interpretations of graphical information, Book reading and summarizing it.	6 hours
Module -III EFFECTIVE WRITING. Purpose of Writing, Clarity in Writing, Principle of Effective Writing. Better writing using personal Experiences – Describing a person, situation, memorable events etc….	5 Hours

Module -IV DRAFTING OF LETTERS: Writing different types of letters – writing for employment, joining letter, complaints & follows up , Enquiries, representation etc. Official Communication – e-mail & Social Media.	6 Hours
Module - V CASE METHOD OF LEARNING: Understand Case method of learning, different type of cases, overcoming the difficulties of the case method, analyzing the case. Do's & Don'ts for case preparation.	5 HOURS

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

CO 1	Explain about basic of Communication C 2
CO 2	Develop reading and understanding ability.,C 2
CO 3	Learn effective writing. C 2
CO 4	Learn how to write different types of letter C 2
CO 5	Analyze a Case study and solve C 2

Pattern of question paper

Solve all five full questions selecting atleast one question from each module .

Text Books :

1. Scot ofer, contemporary business communication, Biztantra
2. Chaturvedi P D & Mukesh chaturvedi - Business communication:Concepts, cases & applications- 2/e, pearson education.
3. Essential of Business communication – Rajendra Pal and J.S Korlhall – Sultan Chand & Sons, New Delhi.