

Subject Name	L	T	P	Credit
Entrepreneurship(CVE260)	4	-	-	4

Course Objective:

- 1) To understand and gain the skills that are needed to implement ideas in today's society
- 2) To understand Entrepreneurship part in process that includes idea generation and Implementation.
- 3) To understand the concept of Entrepreneurship and its place in today's society

UNIT-I

INTRODUCTION TO ENTREPRENEURSHIP: Definition of Entrepreneur / Entrepreneur, Difference between Entrepreneurship / Entrepreneurship Need for Entrepreneurship ,qualities of successful entrepreneur ,Myths about Entrepreneurship, Classification of entrepreneurs on the basis of different, criteria, Reasons for the failure of entrepreneurs

UNIT-II

INDUSTRIES AND BUSINESS ORGANIZATIONS:-Concept of Industry or Enterprise Classification of Industries:- On the basis of capital investment -Tiny (Micro) Industry, Small Scale, Medium Scale, Large Scale, Rural Industry, Cottage Industry ,Forms of Business Organization :-Proprietorship, Board & Co-operative, Partnership, Public Ltd. Private Ltd. IT Sector, Government Co-operative / Undertakings, Tiny small scale Industry- Definition, Its significance in National Development, Govt. policies for SSI promotions

UNIT-III

INSTITUTIONAL ASSISTANCE:- Types of Institutional assistance- Infra - structural assistance- Technical Assistance- Financial assistance- Marketing Assistance, Information / guidance & Training - SISI – ASK - MPCON – CSIR - CED- MA – NRDC, Infrastructure - D/C - AVN/AKVN, Finance- SIDBI – KVIB, MPFC - NABARD – MPWDC NSIC, M.P.A.V.V.N., Marketing - MP- AGRO – NSIC - PM.LUN - EXPORT COPPORATION – KVIP – MPHSVN MPLDC, Quality Control – BIS - FPO - MPLUN F.D.A. - AG. MKT. Board

UNIT-IV

INCENTIVES / CONCESSION / FACILTITIES AVAILABLE:-Seed money, Incentive / subsidies Others (Phones, Lands etc)

UNIT-V

PLANNING OF AN INDUSTRIAL UNIT (SSI):-Pre- Planning Stage - Scanning the environment - Market survey - Seeking information - product / project selection, Implementation Stage - PPR Preparation - DIC registration - Arrangement of Land - Arrangement of Power - Obtaining NOC / Licenses from various departments - DPR Preparation - Seeking financial assistance - Commercial Production , Post Implementation stage - Permanent registration from D.I.C. - Availing Subsidies - Diversification / Modification - Setting up of marketing channel / Distribution.

UNIT-VI

ACHIVEMENT MOTIVATION:-Historical perspective, Concept of achievement motivation
Significance of achievement motivation, Development of achievement motivation

UNIT-I

FINANCIAL MANAGEMENT OF AN INDUSTRIAL UNIT (SSI):-Tools of financial analysis,
Ratio analysis, Fund Flow / Cash flow analysis, Working capital and concepts, Financial
accounting

Course Outcomes:

1. Student would be able to recognize various techniques of Entrepreneurship and their needs, opportunities, products and services, creation of new industries.
2. Students will understand the use of tools for generating entrepreneurial ideas and problem solving.
3. Students will understand the process of selection of ideas.

Reference Books:

1. *Entreprenerial Development Vol. I,II,III ,By Vasant desai Himalaya Publicaton*
2. *CEDMAP (Center of Entrepreneurial development Madhya Pradesh*
3. *Udyamita Vikas By Anand Prakashan*

Subject Name	L	T	P	Credit
Geo technical Engineering (CVE270)	2	1	2	4

COURSE OBJECTIVE:

The objectives of geotechnical engineering are to introduce the student to the principles that govern the use and application of soil as an engineering material in civil engineering projects, for the student to gain proficiency in the classification and quantitative evaluation of soil engineering properties, and for the selection and application of design parameters constructed facility.

Unit I

Properties of soil: Soil as a three phase system. water content, determination of water content , void ratio, porosity and degree of saturation, density index. different Unit weight of soil mass .determination of bulk unit weight and dry unit weight by core cutter method and sand replacement method as per IS code. specific gravity, determination of specific gravity by pycnometer field identification tests of fine grained soil, IS. classification chart. consistency of soil, stages of consistency, atterberg's. limits of consistency . determination of liquid limit, plastic limit and shrinkage limit as per IS code. Classification of fine grained soil by using plasticity chart. Seive analysis of soil and sedimentation of soil, log, scale of particle size. Stokes law, Consistency limit diagram. Particle size distribution, mechanical sieve analysis as per. IS code particle size distribution curve, effective diameter of soil, Uniformity coefficient and coefficient of curvature, well graded and uniformly graded soils. Particle size classification of soils & IS classification of soil

Unit II

Permeability of soil & seepage analysis: Definition of permeability. laminar and turbulent flow. importance of permeability. darcy's law of permeability, coefficient of permeability, typical values of coefficient of permeability for different soil, factors affecting permeability. determination of coefficient of permeability by constant head and falling head permeability tests, simple problems to determine coefficient of permeability. seepage through earthen structures, seepage velocity, seepage pressure, phreatic line, flow lines and equipotential lines, flow net, characteristics of flow net, application of flow net.

Unit III

Shear strength and bearing capacity of soil: Shear failure of soil, field situation of shear failure. concept of shear strength of soil. components of shearing resistance of soil, cohesion, internal friction. Mohr-coulomb, failure theory (Coulomb's Law), strength envelope, strength Equation, Purely cohesive and cohesion less soils. laboratory determination of shear strength of soil, Direct shear test, Box shear test and tri-axial test, unconfined compression test & vane shear test, plotting strength envelope, determining shear strength parameters of soil.

Unit IV

Bearing capacity of soil and earth pressure :Concept of bearing capacity, ultimate bearing capacity, safe bearing capacity and allowable bearing pressure, terzaghi's analysis and assumptions made. effect of water table on bearing capacity, field methods for

determination of bearing capacity ,Plate load test and standard penetration test, typical values of bearing capacity from building code IS:1904. Definition of active earth pressure and passive earth pressure, structures subjected to earth pressure in the field,earth pressure, effective pressure, neutral pressure, and total pressure magnitude of earth pressure, rankines theory, assumptions made in the Rankine's theory, earth retaining structures, earth pressure on earth retaining structures, bearing capacity of soil during earthquake.

Unit V

Compaction of soil &Stabilization : Concept of compaction, purpose of compaction field situations where compaction is required.,standard proctor test, Compaction curve, optimum moisture content, maximum dry density, Zero air voids line. Modified proctor test. Factors affecting compaction. Field methods of compaction – rolling, ramming & vibration and suitability of various compaction equipments, california bearing ratio, CBR test, significance of CBR value. Difference between compaction and consolidation. Concept of soil stabilization, necessity of soil stabilization, different methods of soil stabilization, mechanical soil stabilization, lime stabilization, cement stabilization, bitumen stabilization, fly-ash stabilization.

Unit VI

Site investigation and sub soil exploration : Necessity of site investigation & sub-soil exploration. Types of exploration – general , detailed. Method of site exploration open excavation & boring. Criteria for deciding the location and number of test pits and bores. Trial pits types of Augers. Auger boring, wash boring and percussion drilling. Disturbed & undisturbed soil samples for lab testing. Field identification of soil – dry strength test, dilatancy test & toughness test. Empirical correlation between soil properties and SPT values. Record of boring Bore hole log.

COURSE OUTCOME:

- Knowledge of the basic concepts and principles of soil properties.
- Ability to analyze safe bearing capacity with the application of terzaghi's equations.
- Ability to distinguish between compaction and consolidation and their relevant equipments .
- Knowledge of various methods of soil exploration at site.
- Analysis of various types of soil test.

REFERENCES

Soil Mechanics & Foundation Engineering, -Dr. B. C. Punmia, - Standard Book house,New Delhi.
Soil Mechanics & Foundation Engineering- V.N.S. Murthi - Tata McGraw Hill , New Delhi.
Geo-technical Engineering, - Gulhati & Dutta -Tata McGraw Hill ,New Delhi

LIST OF EXPERIMENTS

1. Determination of water content of given soil sample by oven drying method as per IS Code.
2. Determination of bulk unit weight dry unit weight of soil in field by core cutter method as per IS Code.

3. Determination of Liquid limit & Plastic limit of given soil sample as per IS Code.
4. Determination of grain size distribution of given soil sample by mechanical sieve analysis as per IS Code
5. Determination of coefficient of permeability by constant head test.
6. Determination of coefficient of permeability by falling head test Practical
7. Determination of shear strength of soil using direct shear test.
8. Determination of MDD & OMC by standard proctor test on given soil sample as per IS Code.
9. Determination of CBR value of given soil sample.
10. Determination of shear strength of soil using Laboratory Vane shear test.

Subject Name	L	T	P	Credit
Mechanics of Structure(CVE280)	2	1	2	4

COURSE OBJECTIVES: This course introduce student to show how to determine the stress, strain and deflection suffered by bi-dimensional structural elements when subjected to different loads, understanding the adequacy of mechanical and structural elements under different loads is essential for the design and safe evaluation of any kind of structure, calculate and represent the stress diagrams in bars and simple structures.

UNIT-I

STRESS & STRAIN : Definition of rigid body, plastic body, mechanical properties of metal such as elasticity & elastic limit . Definition of stress, strain, modulus of elasticity, Classification of stress, strain, Sign convention. Stress-strain curve for mild steel and HYSD bar, yield stress/ proof stress, Ultimate stress, breaking stress and percentage elongation. Deformation of body due to axial load. Deformation of a Body subjected to axial forces. Deformation of body of stepped c/s due to axial load, max. stress and min. stress induced. Stresses in bars of composite section & deformation. Shear stress, shear strain & modulus of rigidity, complementary shear stress, state of simple shear, punching shear.

UNIT-II

ELASTIC CONSTANTS & PRINCIPAL STRESSES : Definition of lateral strain, Poisson's ratio, Change in lateral dimensions. Definition of bulk modulus, volumetric strain ,Volumetric strain due to uni- axial , biaxial and tri-axial stresses. Relation between modulus of elasticity, modulus of rigidity and bulk modulus. Definition of principal planes & principal stresses. Principal planes & stress due to bi-axial stress system & due to state of simple shear (Analytical method only). Strain Energy : Definition of strain energy, modulus of resilience and proof resilience ,Types of loading – gradually, suddenly applied load & Impact load. Comparison of stresses due to gradual load, sudden load and impact load.

UNIT-III

SHEAR FORCE AND BENDING MOMENT : Types of beams - cantilever, simply supported, fixed and continuous beams, types of loading- point load, uniformly distributed load, support reactions for determinate structures. Concept of shear force and bending moment, sign convention. Relation between bending moment, shear force and rate of loading. Shear force and bending moment diagrams for simply supported beams, overhanging beams and cantilever subjected to point loads, UDL and couples, point of contra flexure.

UNIT-IV

MOMENT OF INERTIA : Concept of moment of inertia, M.I of plane areas such as rectangle, triangle, circle, semicircle and quarter circle. Parallel axis and perpendicular axis theorem, M.I of composite sections, built up sections, symmetrical and unsymmetrical sections, radius of gyration & polar moment of inertia

UNIT-V

STRESSES IN BEAMS: Bending Stresses in Beams: Concept of pure bending, assumptions in theory of bending, neutral axis, bending stresses and their nature, bending stress distribution diagram, moment of resistance. Application of theory of bending to symmetrical and unsymmetrical sections. Shear stresses in beams, Shear stress equation, meaning of terms in equation, shear stress distribution for rectangular, hollow rectangular, circular sections and hollow circular sections, I sections and T sections. Relation between max. shear stress and average shear stress.

UNIT-VI

ANALYSIS OF TRUSSES: Definition frames, classification of frames, perfect, imperfect, redundant and deficient frame, relation between members and joints, assumption in analysis. Method of joint, method of section and graphical method to find nature of forces.

UNIT-VII

COLUMNS : End conditions, and equivalent length, slenderness ratio classification as per mode of failure, Euler's and Rankine's formula, Use of Euler's and Rankine's formula in solving various problems.

COURSE OUTCOMES: The student will gain fundamental of stress and strain, allowable stresses, allowable loads and safety factors and Tension, compression and shear, deflection of beams.

REFERENCE

Strength of Materials by R. S. Khurmi, S. Chand & Company, Delhi

1. *Strength of Materials by F. L. Singer ,Harpe Collins Publishers India , Delhi*
2. *Strength of Materials by Sadhu Singh.*
3. *Mechanics of structure by S. B. Junnarkar volume –I & II, Charotar Publishing House, Anand.*

List of Experiments

The experimental work to cover tension, compression, bending and impact test etc. on steel, cast iron, RCC and timber, Fire Resistant Test of Structures and Combustibility of Building Materials Test as per I.S.I. and other experiments based on the syllabus.

Subject Name	L	T	P	Credit
Railway and Tunnel (CVE290)	2	1	2	4

COURSE OBJECTIVE:

- 1) To understand the concept of transportation engineering
- 2) Design elements of Railways, Bridges and Tunnels

Unit- I

OVERVIEW OF TRANSPORTATION ENGINEERING :Role of transportation in the development of nation. Modes of transportation system – roads, railway, airways, waterways, Importance of each mode, comparison and their relative merits and demerits. Necessity & importance of Cross drainage works for roads& railways.

Unit- II

RAILWAY ENGINEERING :Alignment and Gauges, Classification of Indian Railways, zones of Indian Railway. Alignment- Factors governing rail alignment. Rail Gauges – types, factors affecting selection of gauge. Rail track cross sections-standard cross section of BG & M.G Single & double line in cutting and embankment. Permanent ways.

Unit- III

IDEAL REQUIREMENT, COMPONENT PARTS :Rails-function & its types. Rail Joints-requirements, types, Creep of rail- causes & prevention of creep. Sleepers – functions & Requirement, types – wooden, metal, concrete sleepers & their suitability, sleeper density. Ballast – function & different types with their properties, relative merits & demerits. Rail fixtures & fastenings – fish plate, bearing plates, spikes, bolts, keys, anchors & anti creepers. Railway Track Geometrics. Coning of wheels, tilting of rails, Gradient & its types, Super elevation, limits of Super elevation on curves, Cant deficiency, negative cant, grade compensation on curves. Branching of Tracks. Definition of point & crossing, a simple split switch turnout consisting of points and crossing lines. Sketch show indifferent components, their functions & working. Line sketches of track junctions-crossovers, scissor cross over, diamond crossing, triangle. Inspection of points and crossings. Station and Yards : Site selection for railway stations, Requirements of railway station, Types of stations (way side, crossing, junction & terminal) Station yards , types of station yard, Passenger yards, Goods yard Locomotive yard, its requirements, water column , Marshalling yard, its types. Track Maintenance - Necessity, types, Tools required and their function, organization, duties of permanent way inspector, gang mate, key man.

Unit- IV

BRIDGE ENGINEERING :Site selection and investigation Factors affecting selection of site of a bridge. Bridge alignment Collection of design data Classification of bridges according to function, material, span, size, alignment, position of HFL. Component parts of bridge. Plan & sectional elevation of bridge showing component parts of substructure & super structure. Different terminology such as effective span, clear span, economical span, waterway, afflux,

scour, HFL, freeboard, etc. Foundation-function, types Piers-function, requirements, types. Abutment -function, types, Wing walls – functions and types. Bearing -functions, types of bearing for RCC & steel bridges. Approaches -in cutting and embankment. Bridge flooring-open and solid floors. Permanent and Temporary Bridges- Permanent Bridges – Sketches& description in brief of culverts, causeways, masonry, arch, steel, movable steel bridges, RCC girder bridge, pre-stressed girder bridge, cantilever, suspension bridge. Temporary Bridges- timber, flying, floating bridges Inspection & Maintenance Of Bridge-Inspection of bridges, Maintenance of bridges & types, routine & special maintenance.

Unit- V

TUNNEL ENGINEERING :Definition, necessity, advantages, disadvantages. Classification of tunnels. Shape and Size of tunnels. Tunnel Cross sections for highway and railways. Tunnel investigations and surveying –Tunnel surveying locating center linen ground, transferring center line inside the tunnel. Shaft – its purpose &construction. Methods of tunneling in Soft rock-needle beam method, fore-poling method. line plate method, shield method. Methods of tunneling in Hard rock – Full face heading method,Heading and bench method, drift method. Precautions in construction of tunnels. Drilling equipment's-drills and drills carrying equipment's. Types of explosives used in tunneling. Tunnel lining and ventilation.

COURSE OUTCOMES: The student will gain an experience in the implementation of Railway, Bridge and Tunnel engineering on engineering concepts which are applied in field of transportation engineering, the student will get a diverse knowledge of railway, bridge and tunnel engineering practices applied to real life problems. The student will learn to understand the theoretical and practical aspects of railway, bridge and tunnel engineering along with the design and management application.

REFERENCE BOOKS

- 1*Railway Engineering, S.C. SaxenaDhanpatrai&sons*
- 2*Railway Track K.R. Antia, The New Book Co.Pvt. Ltd Mumbai*
- 3*Principles of RailwayEngineeringS.C. Rangwala, CharotarPublication.*
- 4*Principles and Practice ofBridge Engineering,S.P. BindraDhanpatrai& sons.*
- 5*A Text Book of TransportationEngineeringN.L.Arora andS.P.Luthra,IPH New Delhi.*
- 6 *Elements of BridgeEngineeringJ.S. AlagiaCharotar Publication.*
- 7*Bridge Engineering D.R. Phatak, Everest Publisher*
- 8 *Elements of Bridges, D. JohnosVictor, Oxford & IBHPublishing co.*
- 9*Road, Railway and Bridges, Birdi&Ahuja.Std. BookHouse.*
- 10 *Tunnel Engineering, S.C. Saxena, Dhanpatrai&sons.*

Visits & Report Generation: Student will have to prepare at least 08 reports on visits to different maintenance and operations related to railway tracks during visits. The write-ups for the reports should include following information :

- Objects of maintenance operations.
- Materials required.

- Tools and Equipment's needed.
- Maintenance procedure.
- Precautions to be taken during maintenance operations.
- Remedial measures and quality control to reduce the maintenance requirements.

TOPICS FOR VISITS & REPORTS

- 1.Through packing
- 2.Shovel packing
- 3.Track maintenance
- 4.Systematic overhauling
- 5.Lifting of track
- 6.Lowering of track
- 7.Counteraction, measurement and adjustment of creep
- 8.Organization, Tools and equipment for maintenance.
- 9.Maintenance of points and crossings
- 10.Maintenance of level crossing.
- 11.Maintenance of proper Drainage
- 12.Maintenance of gauge
- 13.Maintenance of track components.
- 14.Welding of Rails.
- 15.Visit to a nearby bridge site where the construction is in Progress.
- 16.Visit for cross drainage works for roadways and railways other items may be suggested by Teacher/guide.

Subject Name	L	T	P	Credit
Advanced Surveying (CVE300)	2	1	2	4

COURSE OBJECTIVE :

- 1) To understand the basic concepts of Advanced Surveying.
- 2) Understand the knowledge of Advanced Equipment which are used in the field of Surveying.
- 3) Concepts of Aerial Survey and Remote Sensing.

UNIT-I

PLANE TABLE SURVEY: Principles of plane table survey. Accessories required. Setting out of plane table, Leveling, Centering and orientation. Methods of plane table surveying – Radiation, Intersection, and Traversing. Merits and Demerits of plane table Surveying. Situations where plane table survey is used. Use of Telescopic Alidade.

UNIT-II

THEODOLITE SURVEY: Components of Transit Theodolite and Their functions. Technical terms used. Temporary adjustments of Transit Theodolite. Swinging the telescope, Transiting, Changing the face. Measurement of Horizontal angle, method of Repetition, errors eliminated by method of repetition. Measurement of Deflection angle. Measurement of Vertical angle. Measurement of magnetic bearing of a line by Theodolite. Sources of errors in Theodolite Surveying. Permanent adjustment of transit Theodolite (only relationship of different axes of Theodolite.) Traversing with Theodolite – Method of included angles, locating details, checks in closed traverse, Calculation of bearings from angles. Traverse Computation Latitude, Departure Consecutive Coordinates error of Closure, Distribution of a angular error, balancing the traverse by Bowditch rule and Transit Rule, simple problems on above topic.

UNIT-III

TACHEOMETRIC SURVEY: Principle of Tacheometry. Essential requirements of Tacheometer. Use of Theodolite as a Tacheometer with staff held in vertical and fixed hair method (No derivation). Determination of tacheometric constants, simple numerical problems on above topics

UNIT-IV

CURVES: Types of curves used in road and railway alignments. Notations of simple circular curve. Designation of curve by radius and degree of curves. Method of Setting out curve by offset from Long chord method and Rankine's method of deflection. angles. Simple Numerical problems on above topics.

UNIT-V

ADVANCED SURVEY EQUIPMENTS: Construction and use of one second Micro Optic Theodolite, Electronic Digital Theodolite. Features of Electronic Theodolite Principle of E.D.M, Components of E.D.M and their functions, use of E.D.M. Total station

UNIT-VI

AERIAL SURVEY AND REMOTE SENSING: Aerial Survey Introductions, definition, Aerial photograph. Remote Sensing – Introduction, Electro-Magnetic Energy, Remote sensing system Passive system, Active system. Applications – mineral, land use / Land cover, Natural Hazards and Environmental engineering system.

COURSE OUTCOMES :

- 1) Students will be able to apply the concept of Advanced Surveying in the field of Civil Engineering.
- 2) Awareness about various equipments.

Reference Books:

1. *Surveying and Levelling, N N Basak, Tata Mc Graw-Hill*
2. *Surveying and Levelling Part I and II, T .P. Kanetkar & S. V, Kulkarni, PuneVidhyarthi Griha*
3. *Surveying and Levelling Vol. I and II, Dr. B. C. Punamiya, Laxmi Publication*
4. *Surveying and Levelling Vol. I and II, S. K. Duggal, Tata Mc Graw-Hil*

LIST OF PRACTICALS

1. Using accessories carry out temporary adjustments of plane table. Locating details by method of Radiation
2. Locating details with plane table by method of intersection.
3. Understanding the components of Theodolite and their functions, reading the vernier and temporary adjustments of theodolite.
4. Measurement of Horizontal angle by transit theodolite.
5. Measurement of Horizontal angle by method of Repetition.
6. Measurement of vertical angles by theodolite.
7. Measurement of Magnetic bearing of a line using theodolite.
8. Measurement of deflection angle by taking open traverse of 4 –5 Sides
9. To find Reduced levels and horizontal distances using theodolite as a Tacheometer
10. Study and use of 1 second Micro Optic Theodolite for measurement of Horizontal and Vertical angles
11. Study of E.D.M. for knowing its components
12. Use of EDM for finding horizontal and vertical distances and reduced levels.
13. Determine the geographical parameters by total station.