



ITM UNIVERSITY

Naya Raipur, Raipur

B. Tech (Bachelor of Technology)

Fourth Year Engineering Syllabus

Eighth Semester



Department of Civil Engineering
2017

Civil Engineering Branch
B. Tech Eighth Semester Syllabus
 Teaching and Examination Scheme

Subject Code	Subject Name	Teaching Scheme		Examination Scheme				
		Th.+T ut (L+T)	Pr. (P)	Theory Marks		Term Work (Internal)	Practical (External)	Total
				End Sem. Exam	Internal Assessment			
301801	Estimation and Costing	04	-	70	30	-	-	100
301802	Construction Planning and management	04	-	70	30	-	-	100
301803	Structure Analysis-III	04	-	70	30	-	-	100
301804	Elective – II	04	-	70	30	-	-	100
301805	Elective – III	04	-	70	30	-	-	100
301806	Estimation and Costing Lab	-	02	-	-	15	35	050
301807	Construction Planning and management Lab	-	02	-	-	15	35	050
301808	Structure Analysis-III Lab	-	02	-	-	15	35	050
301809	General Proficiency-II	04	-	-	-	30	70	100
301810	Project - VI	-	06	-	-	50	200	250
		24	12	350	150	125	375	1000

Table – I			
Elective– II			
S. N.	Subject Code	Subject	
1	301804 A	Geotechnical Processes	
2	301804 B	Rock Mechanics	
3	301804 C	Appraisal and Implementation of Infrastructure Projects	
4	301804 D	Water Shed Management	
5	301804 E	Construction Equipment's and Techniques	

Elective – III			
S.N.		Subject Code	Subject
1	Elective - III	301805 A	Disaster Management
2		301805 B	Advance Engineering Geology
3		301805 C	Solid waste management
4		301805 D	Expansive Soils
5		301805 E	GIS and Its Applications





Subject Code: 301801
Lectures : 4 Hrs/week

Subject Name: Estimation and Costing
Theory Exam Duration : 4 Hrs

Detailed Syllabus

Topic	
Unit-I	General: Importance of the subject, purpose of quantity estimates, Mode and unit of measurement as per I.S.1200. Methods and Stages of estimates. Item of a work and Description of an item of work, Approximate estimation of Civil Engineering Works Proposal and Development of Project , Nature of contract between owner and Architect / Engineer, Duties and Liabilities of Architect / Engineer, Architects / Engineers normal professional services, Various important terminology required like Work charged establishment, muster roll, contingencies, measurement book, overheads etc.
Unit-II	Quantity and cost estimates: (a) Methods of detailed estimates, forms used for detailed estimates, Working out the quantities of various materials required for construction of various Civil Engineering Works, Building, Culverts, Hydraulic Structures, Water supply and Sanitary works, road works, retaining walls, water Tanks etc. (b) Earthwork estimates in road (Including hill roads), canals, mass excavation, mass haul curve (c) Detailed estimates of Steel in RCC works, bar bending Schedule
Unit-III	Arranging Works : P.W.D. as the construction agency, method of carrying out works, arranging contract works, pretender and contract planning, tender notice, acceptance of tender, essentials of contract, type of contracts, conditions of contract, contract documents, various schedules in the tender document, measurement and payment to contractor, Indian contract law, and the Engineering contract.
Unit-IV	Specifications: Purpose and principles of specifications. Writing types of specifications, writing an developing detailed specifications of Important items. Cost Build up : Purpose and principles, Importance of Schedule of rates (DSR) in Cost Estimates : Factors affecting analysis of rates, information from National Building Organization. Task work, factors affecting task work. Market rates, escalation.
Unit-V	Valuation: Purpose of valuation, Factors affecting value of property price and cost, market value, potential value, sentimental value, scrap value, reversionary value etc. Real Estate, Guide edged securities, Net and Gross return, tenure of land, Valuation of land. Depreciation, Capitalised value, methods of valuation, differed annuity. Cost Accounting: Various methods, classification of cost, direct and indirect charges, distribution of overheads, M.A.S. Account issue rates and store account.

Recommended Books:

1. Estimating and Costing in Civil Engineering – B.N. Dutta (UBS Publishers, New Delhi)
2. Estimating and Costing and specifications – M. Chakrabarty (UBS Publishers, New Delhi)
3. Estimating and Costing – G.S. Birdi (Dhanpat Rai Publications) Valuation of real properties – S.C. Rangwala (Charotar Publication)



Subject Code: 301802
Lectures: 4 Hrs/Week

Subject Name: Construction Planning and Management
Theory Exam Duration: 3 Hrs
Detailed Syllabus

Topic	
Unit-I	Objectives and functions of construction management , stages in construction, stages of planning, bar chart and milestone charts, project feasibility reports, scheduling job layout and line of balance technique, applications.
Unit-II	Pert: Necessity for good scheduling, Elements of Network, Development of Network, PERT: Time estimates, Time computation, Network Analysis –slack, critical path
Unit-III	CPM-Steps in CPM Project Planning , Network Analysis, Activity times and floats, Critical activities and Critical Path Determination
Unit-IV	Cost control in construction-importance , objectives of cost control, cost control systems. Economic analysis of engineering projects, economic studies, Resources allocation, Resources leveling, Project updating, Construction cost monitoring
Unit-V	Construction Safety and Quality Control: Importance, Causes of Accidents, Safety measures, Responsibility for safety, Safety benefits to various parties, Safety clauses in contract, Safety policy, Safety hazards. Quality control in construction: Importance, Elements of Quality, Quality Assurance Techniques, Quality Control Circles.

Recommended Books:

1. Project Planning and Control with PERT and CPM – B. C. Punmia, and K. K. Khandelwal (Laxmi Publications)
2. Construction Planning and Management–P.S.GahlotandB.M.Dhir(NewAge International)
3. Construction Planning, Equipment and Methods – R. Peurify, C. J. Schexnayder, A. Shapira, R. Schmitt (Tata McGrawHill)
4. PER Tand CPM: Principles and Applications–L.S.Sreenath (AffiliatedEastWestPress)
5. Construction Management andAccounts –V.N.VaziraniandS.P.Chandola(Khanna Publishers)
6. Construction Planning and Scheduling–J.W.Hinze(PearsonEducation)
7. Construction Project Planning and Scheduling–W.C. Patrick(PearsonEducation)
8. Construction Management and Planning–B.SenguptaandH.Guha(TataMcGrawHill)
9. Construction Engineering and Management –S.Seetharaman(UmeshPublications)
10. Construction Project Management –Planning, Scheduling and Controlling–K.K.Chitkara(TataMcGraw Hill)



Subject Code: 301803
Lectures: 4 Hrs/Week

Subject Name: Structure Analysis-III
Theory Exam Duration: 3 Hrs

Detailed Syllabus

Topic	
Unit-I	Basic concept, Degree of Freedoms, Basic concept of Direct Stiffness Method, Formulation of elemental / local stiffness matrix and global stiffness matrix for plain truss. Transformation Matrix, Assembly of Global/ Structure stiffness matrix up to (8X8).
Unit-II	Formulation of elemental / local stiffness matrix and global stiffness matrix for Beam members for continuous beams, Transformation matrix Assembly of global/Structure stiffness matrix, Member load matrix due to concentrated load, Uniformly distributed load, Moment assembly of global/ structure load matrix up to (8X8).
Unit-III	Formulation of elemental /local stiffness matrix and global stiffness matrix for Plane Frame member, Transformation matrix, Assembly of global / Structure stiffness matrix, Member load matrix due to concentrated loads, Uniformly distributed loads, moments, Assembly of Global /Structure load matrix.
Unit-IV	Formulation of element / local stiffness matrix and global stiffness matrix and global stiffness matrix for plane Grid transformation Matrix, Assembly of global/ structure stiffness matrix, Member load matrix due to concentrated loads, uniformly distributed Loads, moments, Assembly of global/ structure load matrix.
Unit-V	Analysis of Member for temperature loading, initial joint displacement (sinking of support), lack of fit in trusses, trusses with inclined roller, storing of global/ structure stiffness Matrix, full storage , banded storage, band Minimization.

Recommended Books:

1. Matrix Method of Structural Analysis – Gere and Weaver
2. Computer analysis of structures – Beaufait , Rowen , Headlyetal.
3. Computer Anaqlysis of Structures – Flemmings
4. Computational Structural Mechanics , S Rajasekaran& G Sankarasubramanian
5. Finite Element Method – R. D. Cook



ELECTIVE-II

Subject Code: 301804 A

Subject Name: Geotechnical Processes

Lectures: 4 Hrs/Week

Theory Exam Duration: 3 Hrs

Detailed Syllabus

Topic	
Unit-I	Dewatering: Methods, selection, analysis and design of dewatering system.
Unit-II	Grouting: Types of grouts and their properties; Methods of grouting; Grout selection and control.
Unit-III	Compaction: Diffused double layer theory of compaction; Methods of compaction; Engineering properties of compacted, soil; Field compaction and its control.
Unit-IV	Soil Stabilisation: Stabilisation using chemical additives and other methods.
Unit-V	Reinforced Earth: Concept, materials, application and design of reinforced earth wall.

Recommended Books:

1. Modern Geotechnical Engineering – Alam Singh (IBT Publishers, Delhi, 1987)
2. Analysis and Design of Substructures – Swami Saran (Oxford and IBH, New Delhi, 1996)
3. Foundation Design and Construction (5th Edition) – Tomlinson, M.J. (ELBS, Singapore, 1988)
4. Foundation Engineering (Ed.) – Leonards, G.A. (McGraw Hill, New York, 1962)
5. Geotechnical Engineering – Lee, I.K., White, W. and Ingles, O.G. (Pitman, Marshfield, Mass (U.S.A.), 1983)



Subject Code: 301804 B
Lectures: 4 Hrs/Week

Subject Name: Rock Mechanics
Theory Exam Duration: 3 Hrs

Detailed Syllabus

Topic	
Unit-I	Structural Geology of Rocks , Subsurface Investigations in Rocks and Engineering Characteristics of Rock Masses.
Unit-II	Engineering Classification of Rocks and Rock Masses: Classification of rock mass, Parameters of rock mass classification, Objective & Importance of rock mass classification, RQD, Q –system and Bieniaswski’s Geomechanics classification of rock mass., RSR system, CMRI-ISM Geomechanics Classification, Terzaghi Rock load theory.
Unit-III	Rock properties: Physico-mechanical properties of rock, Preparation and testing of specimen in the laboratory, ISRM standards, Determination of Physico-mechanical properties of rock as per ISRM standard testing procedures, Strength indices Bearing Capacity of Rocks: Estimation of bearing capacity (foundation on intact rock, heavily fractured rock, foundation settlement in rocks (from joint factor, for horizontal joints, from field tests).
Unit-IV	Stability of Rock Slopes: Modes of failure, rotational failure, plane failure, wedge method of analysis, buckling failure, toppling failure, improvement of slope stability and protection.
Unit-V	Rock Bolting and Grouting: Grouting in rocks, objectives, contact grouting, consolidation grouting, process of grouting, grout requirement, types of grout, stage grouting, grout curtain. rock anchors, modes of failure, uplift capacity.

Recommended Books:

1. Fundamentals of Rock Mechanics: J. C. Jaeger and N. G. W. Cook, Oxford Press.
2. Rock Mechanics and Design of Structures on Rock: Obert, Leon and W. I. Duvall
3. Rock Mechanics in Engineering Practice: K. G. Stagg and O. C. Zienkiewicz, John Willey & Sons, New York.
4. Rock Mechanics - Vol. I & II: Jumukis, Trans Tech Publication, USA.

Subject Code: 301804 C

Subject Name: Appraisal and Implementation of Infrastructure Projects

Lectures: 4 Hrs/Week

Theory Exam Duration: 3 Hrs

Detailed Syllabus

Topic	
Unit-I	Project report preparation Basic study, investigations and feasibility studies, project formulation, SWOT analysis, project report
Unit-II	Appraisal what is an infrastructure project, project development cycle, what is appraisal, Need of appraisal, steps of appraisal, Market appraisal Demand analysis, forecasting demand, sources of information, market survey, uncertainties in demand forecasting.
Unit-III	Management appraisal Assessment of entrepreneur, chief executive, board of directors, departmental heads, organization as a whole, Technical appraisal Location, land, buildings, technology and its appropriateness, size of plant, plant and machinery, raw materials, energy requirements, water supply, effluent disposal
Unit-IV	Financial and economic appraisal: Cost of project, means of financing, profitability, break-even analysis, financial projections, financial appraisal tools: urgency, payback period, accounting rate of return, net present value, internal rate of return, benefit cost ratio, cost of capital, risk analysis, social cost benefit analysis
Unit-V	Ecological appraisal: Environmental impact analysis, Project Implementation. Agencies involved in implementation, methods of implementation like Build, operate and transfer (BOT) method and its variants like BOO, BOOT, BOLT etc. Project financing: types and sources (local and international).

Recommended Books:

1. Project Preparation, Appraisal, Budgeting, and Implementation: Prasanna Chandra, Tata McGraw Hill.
2. Strategic Project Risk Appraisal and Management Elaine Harris



Subject Code: 301804 D
Lectures : 4 Hrs/week

Subject Name: Water Shed Management
Theory Exam Duration : 3 Hrs

Detailed Syllabus

Topic	
Unit-I	Soil and Water, Issues related to plant life like composition of soil, water requirement of crops, necessary conditions for plant growth etc. Soils, their origin and classification.
Unit-II	Land classification for WM, Land capability rating, determination of land capability class, land capability and suitability surveys.
Unit-III	Soil erosion, problem, types, conservation, and control measures in agricultural and non-agricultural land. Water conservation and Harvesting, Agronomical measures in soil and water conservation. Examples and critical reviews.
Unit-IV	Watershed Management, Approach in Govt. programmes, people's participation, conservation farming, watershed-management planning, identification of problems, objectives and priorities, socioeconomic survey, use of tools like GIS.
Unit-V	Hill slope processes, forest and land use, hill slope conservation. Bad lands, bad land development.

Recommended Books:

1. Watershed Management – J.V.S. Murthy (New Age International Ltd.)
2. Watershed Management – B.M. Tideman Modern physical geography – Strahler A.N. and Strahler A.H.



Subject Code: 301804 E
Lectures : 4 Hrs/week

Subject Name: Construction Equipment's and Techniques
Theory Exam Duration : 3 Hrs

Detailed Syllabus

Topic	
Unit-I	Construction Equipments Fundamentals Of Earthwork Operations - Earth moving operations -Types of Earthwork Equipment-Tractors, Motor Graders, Scrapers, Front end waders, Earth Movers. Equipment for Dredging, Trenching, Tunnelling, Drilling, Blasting-Equipment for compaction-Erection Equipment. Types of pumps used in construction - Equipment for Dewatering and Grouting -Foundation and Pile Driving Equipment. Forklifts and Related Equipment - Portable Material Bins – Conveyors - Hauling Equipment.
Unit-II	Equipment For Production Of Aggregate And Concreting Crushers -Feeders-Screening Equipment-Handling Equipment-Batching and Mixing Equipment-Hauling, Pouring and Pumping Equipment-Transporters
Unit-III	Sub-Structure Construction Techniques Box Jacking -Pipe Jacking-Under Water Construction of diaphragm walls and basement -Tunnelling techniques piling techniques-driving well and caisson-sinking cofferdam-cable anchoring and grouting- driving diaphragm walls, sheet piles-laying operations for built up offshore system-horing for deep cutting-Large reservoir, construction with membranes and Earths system-well points-Dewatering and stand by Plant equipment for underground open excavation.
Unit-IV	Super Structure Construction Vacuum Dewatering Of Concrete Flooring -Concrete paving technology-Techniques of construction for continuous concreting operation in Tall buildings of various shapes and Varying sections-Launching Techniques- Suspended from work-erection techniques of tall structures, Large span structures- Launching techniques for heavy decks in situ prestressing in high rise structures, aerial transporting handling erecting light weight components on tall structures- erection of lattice tower as and rigging of transmission line structures.
Unit-V	Repair Construction Mud Jacking Grout Through Slab Foundation -micropiling for strengthening floor and shallow profile-pipeline laying protecting sheet piles, screw anchors-sub grade water proofing under pining advanced techniques and sequence in demolition and dismantling.

Recommended Books:

1. Construction Planning, Equipment and Methods (5th Edition) – Peurifoy, R.L., Ledbetter, W.B.andSchexnayder, C. (McGraw Hill, Singapore, 1995)
2. Construction Equipment and Management – Sharma S.C. (Khanna Publishers New Delhi, 1988)
3. Construction Equipment and Job Planning – Deodhar, S.V. (Khanna Publishers, New Delhi, 1988)
4. Construction Equipment and its Planning and Application – Dr. Mahesh Varma (Metro-politan Book 3 Company, New Delhi-, 1983)
5. Practical foundation engineering hand book – Robertwade Brown (McGraw Hill Publications, 1995)



Subject Code: 301805 A
Lectures : 4 Hrs/week

Subject Name: Disaster Management
Theory Exam Duration : 3 Hrs

Detailed Syllabus

Topic	
Unit-I	Disasters: Definitions & terminologies–hazard, risk, accident, disaster, vulnerability, disaster management, Significance of disaster management and role of civil engineers in it.
Unit-II	Types of hazards and disasters: Natural and human made, geological, biological, environmental, climatic, chemical, nuclear and other industrial, civil and political hazards, earthquakes, landslides, floods, cyclones, draughts, pest attacks, cold and heat waves, tsunamis, terrorist attacks, war and other industrial accidents etc and their impact on constructed facilities and the construction activity in general
Unit-III	Performance of structures during earthquakes, landslides, liquefaction, fires, tsunamis, floods, radiation, chemical spills etc., effect on life of the structure due to exposures to hazardous environment.
Unit-IV	Safe construction of facilities: Design concepts and construction materials for Earthquake / cyclone / fire resistant facilities
Unit-V	National disaster management acts, policies, guidelines and plans, National Disaster Management framework and role of local / state/ national government and non-government and other multilateral agencies

Recommended Books:

1. Manual natural disaster management in India, M C Gupta, NIDM, New Delhi
2. Encyclopaedia of disaster management, VOL I, II and III, S L Goyal, Deep & Deep, New Delhi
3. Disaster management act 2005, Govt. of India
4. Publications of NDMA on various templates and guidelines for disaster management



Subject Code: 301805 B
Lectures: 4Hrs/Week

Subject Name: Advance Engineering Geology
Theory Exam Duration: 3 Hrs

Detailed Syllabus

Topic	
Unit-I	Introduction Importance of geological studies in engineering investigations, precautions to avoid misleading conclusions likely to be drawn while interpreting drilling data with particular reference to RQD, case studies illustrating economics made possible by proper geological studies
Unit-II	Engineering Geology of Deccan trap basalts. Factors affecting strength and water tightness, stability of cuts and ability to stand without support, significance of features like gas cavities, jointing, weathering, hydrothermal alteration, volcanic breccias, tachylytes, dykes, fractures, field structures of flows, stratigraphic sequence of flows etc. and their significance in civil engineering projects.
Unit-III	Tunnelling Methodologies of investigations for different types of tunnels for different purposes, location spacing ,angles & depths of drill holes for different types of tunnels, difference in behaviour of basalts because of jointing as exemplified by compact basalts& amygdaloidal basalts. Difficulties introduced by tachylytes, volcanic breccias, tuffs, inter trappean beds, fractures, dykes, hydrothermal alteration. Computing structural discontinuities in rock masses, RQD, joint frequency index. RMR values, Q system, stand up time. Selection & provision of protective measures such as gunniting, rock bolting, shotcreting, steel supports depending on geological conditions.
Unit-IV	Geology of soil formation Residual & transported soils. Rock weathering conditions favourable for decomposition & disintegration, influence of climate on residual & transported soils in the deccan trap area. Nature of alluvium of deccan trap rivers & its engineering character. Effect of deposition of calcium carbonate. Scarcity of sand in the rivers in deccan trap area
Unit-V	Geophysical Investigations Seismic and electrical resistivity methods of explorations, Construction material Deccan trap basalts and sedimentary rocks as construction material. Use of compact basalt and amygdaloidal basalt as rubble for masonry metal for concrete making.

Recommended Books:

1. PWD Hand Book, Engineering Geology, Government of Maharashtra
2. Text Book of Engineering Geology: R.B.Gupte, PVC Prakashan
3. Geology of India: D.H.Wadia, McGraw Hill, New Delhi.
4. Geology of India and Burma: M,S,Krishnan, CBS Publications
5. Engineering and General Geology: Parbin Singh, Kataria S. K., New Delhi
6. Test book of Engineering Geology: N.Chenna.Kesavulu
7. Principles of Geomorphology: Thornbury, W.D.
8. Earthquake Geophy and Management: Srivastav, H,N

Subject Code: 301805 C
Lectures : 4 Hrs/week

Subject Name: Solid Waste Management
Theory Exam Duration : 3 Hrs

Detailed Syllabus

Topic	
Unit-I	Definition of solid waste. Domestic: garbage, ashes, rubbish, dust, debris. Commercial: wastes from offices, shops and markets etc. Hazardous waste: household, industrial.
Unit-II	Sources of solid wastes: Household wastes. Waste from commercial establishments, offices, vegetable markets, fish and meat markets, stables. Solid waste from construction activities. Hospital wastes, dead animals.
Unit-III	Quantity, composition and properties of solid wastes : Per capita municipal solid waste. Quantity of industrial solid waste per unit produced. Compositions: physical, chemical and biological constituents. Sampling and characterization of solid wastes.
Unit-IV	Collection, segregation, storage and transportation of solid waste : House to house collection, collection centers: location, sizes, types and maintenance. Transportation methods: manual, mechanical, methods with or without compaction, economy in transportation of waste, optimization of transportation routes. Effects of solid waste on environment: effects on air, soil, water surface and ground, health hazards
Unit-V	Industrial solid waste: Waste products during manufacture, filling and parking, operation of pollution control facilities, generation, minimization at source, recycling and disposal. Introduction to hazardous waste: generation, minimization at source, treatment and disposal. Municipal solid waste in Indian conditions, legal aspects of solid waste disposal.

Recommended Books:

1. Integrated Solid Waste Management: Tchobanoglous, Thisen and Vigil, McGraw Hill International.
2. Hazardous Waste Management: Lagrega, Buckingham and Evans, McGraw Hill International.
3. Solid Waste Management in Developing Countries: A.D. Bhide, Nagpur publications



Subject Code: 301805 D
Lectures: 4 Hrs/Week

Subject Name: Expansive Soils
Theory Exam Duration: 3 Hrs

Detailed Syllabus

Topic	
Unit-I	Introduction and Identification Expansive Soils of India, related civil engineering problems, formation of expansive soils in field, identification of expansive solids in laboratory by X-ray diffraction method and differential thermal analysis.
Unit-II	Physical and Chemical Properties Soil structure and clay minerology of expansive soil, atomic bond and molecular bonds, honey comb structure, base exchanges capacity, clay water relation, electrolysis processes.
Unit-III	Foundation on Black Cotton Soil Foundations on swelling soils, swelling potential and mechanism of volume change, chemical composition of black cotton soil, construction techniques in black cotton soil, modern method of construction in under reamed coil.
Unit-IV	Ground Improvement Techniques Stabilization of expansive soils with lime, slag(silica fume and aluminium sludge), cement, fly ash, chemicals, reinforced earth technique, micro reinforced vegetation, vibro floatation, grouting and soil nailing.
Unit-V	Liquifaction Hazard Mitigation Factors affecting the expansive soil, method of assessment for liquifaction, effect instrumentation for monitoring, consolidation of marine clay deposits, expansive soil model of Bingham fluid bounded by porous beds.

Recommended Books:

1. Design Aids in Soil Mechanics and Foundation Engineering – S.R. Kaniraj (Tata McGraw Hill, New Delhi)
2. Foundation Engineering – Dr. B.J. Kasmalkar (Pune VidyarthiGrihaPrakashan, Pune)
3. Basic and applied Soil Mechanics (Revised Edition) – Gopal Rajan and Rao A.S.R. (New Age, New Delhi. 1998)
4. Foundation Engineering (2nd Edition) – Peck,R.B., Hanson (W.E. and Thornburn. W.H. Johan Wiley, New York 1976)
5. Soil Engineering in Theory and Practice (Vol. - II) – Alam Singh (Asia Publishing House, New Delhi, 1981)



Subject Code: 301805 E
Lectures: 4Hrs/Week

Subject Name: GIS And Its Applications
Theory Exam Duration: 3 Hrs

Detailed Syllabus

Topic	
Unit-I	Basic Concept of GIS Introduction, Information systems, spatial and non-spatial information, Geographical concepts and terminology, Advantages of GIS, Basic components of GIS, Commercially available GIS hardware and software, organisation of data in GIS.
Unit-II	GIS Data Input data, Field data, Statistical data, Maps, Aerial photographs, Satellite data, Points, lines and areas features, Vector and Raster data, Advantages and Disadvantages, Data entry through keyboard, digitizers and scanners, Digital data, GIS data formats and standards.
Unit-III	Data Management Data Management, Data Base Management System (DBMS), Various data Models, Run – length encoding, Quadrees, Data Analysis – Data layers, analysis of spatial and non-spatial data, Data overlay and modelling, smart features of DBMS
Unit-IV	Applications of GIS Applications of GIS in Map Revision, Land use, Agriculture, Forestry, Archaeology, Municipal, Geology, Water Resources, Soil Erosion, Land suitability analysis, Change detection.
Unit-V	Case Study A case study in GIS implementation, the consultant, the client, the initial applications, types of GIS analysis used for case study.

Recommended Books:

1. Introduction to Remote Sensing – Campbell, J.B. (The Guilford Press, London, 1986)
2. Remote Sensing and Geographic Information Systems – Legg, C.A. (Ellis Horwood, London, 1992)
3. Principles of Geographic Information System for Land Resources Assessment – Burrough, P.A. (Monograph on Soil Resources Survey No. 12, Claredon, Press, Oxford, 1988)
4. Remote Sensing in Hydrology – Engaman, E.T. and Gurney, R.J. (Chapman and Hall, London, 1991)



PRACTICAL

Subject Code: 301806
Practical: 2Hrs/Week

Subject Name: Estimation and Costing Lab

Detailed Syllabus

Term Work: The candidate shall submit 10 experiments in the following:

LIST OF EXPERIMENT

1. A complete set of contract documents (Including specification along with a building estimate.
2. Detailed estimate of the following: - (Minimum Three)
Load bearing Structure, R.C.C. framed structures, Hydraulic Structures, steel structure, culvert, Water supply & sanitary work, roadwork, water tank.
3. Rate analysis of 10 major items of building and 3 items of roadwork.
Specification of 10 major items of building and 3 items of road work
4. Site visit to: Study of Schedule of Rates and Comparison with market rates and report by the students.
5. Valuation and rent fixation.
6. Earth work of road for one km length.
7. Detailed estimate wood work of Doors and windows.
8. Calculation of reinforcement in RCC with bar bending schedule.
9. Study of IS-1200.
10. Expert lecture by legal advisor on various legal aspect of contracts and report by the Students.
11. Expert lecture by accounting of Construction Department (Preferably Govt.) on various accounting methods, materials management etc. and report by the students.



Subject Code: 301807
Practical: 2Hrs/Week

Subject Name: Construction Planning and management Lab

Detailed Syllabus

Term Work: The candidate shall submit all experiments of the following:

LIST OF EXPERIMENT

Term work: Term work shall consist of record of the following;

Study, drawing and analysis by software (Microsoft project) and manual methods

1. PERT
2. CPM
3. Scheduling job layout
4. Economic analysis of engineering projects.
5. Complete report any site or industry and observe safety policy.





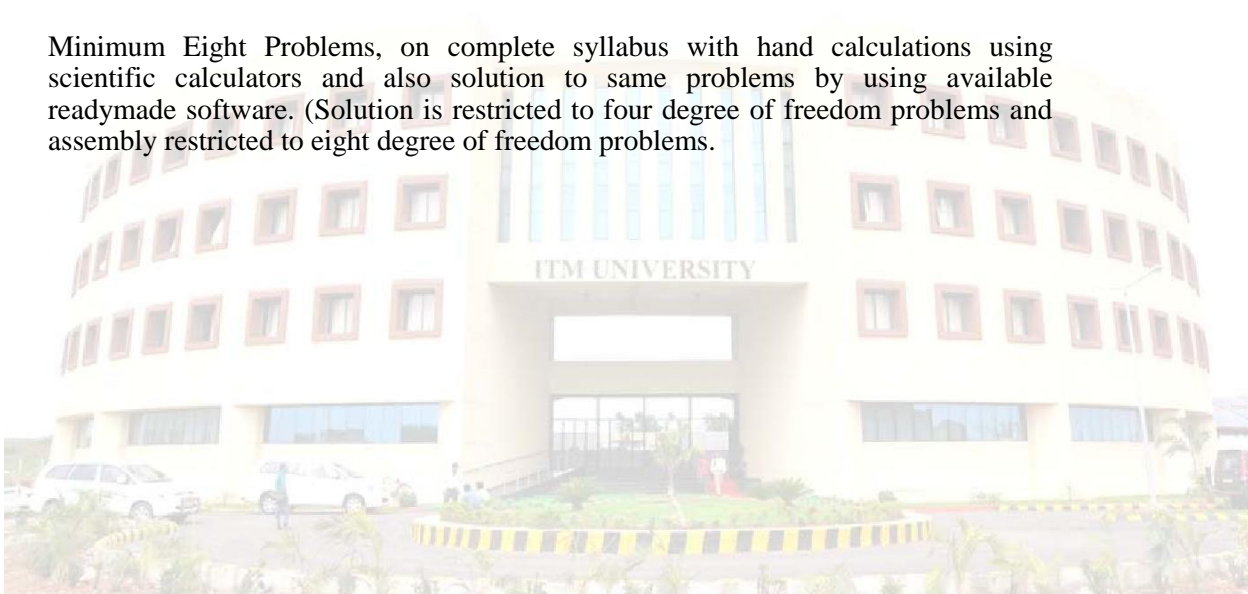
Subject Code: 301808
Practical: 2 Hrs/Week

Subject Name: Structure Analysis-III Lab

Detailed Syllabus

LIST OF EXPERIMENT

Minimum Eight Problems, on complete syllabus with hand calculations using scientific calculators and also solution to same problems by using available readymade software. (Solution is restricted to four degree of freedom problems and assembly restricted to eight degree of freedom problems.)



Subject Code: 301809

Lectures: 4Hrs/Week

Subject Name: General Proficiency-II

Theory Exam Duration: 3 Hrs

Detailed Syllabus

Topics	
UNIT- I	English Proficiency for Technical Writing: Writing Technical Reports, Scientific Terminology, Format of Research Paper and Various Citations Formats, Plagiarism. Reconstruction and Translation of Scientific Documents
UNIT- II	Leadership and HR Skills: Individually and Team Dynamics, Synergy, Leadership concepts, skills and Quality, Team work & Team building, Conflict Management.
UNIT -III	Advanced Reasoning Proficiency: Verbal: Blood relations, Direction sense test, Input output, Coding-decoding, Number ranking, and Making judgments. Non Verbal: Figure Matrix, Figure Formation and Analysis, Rule Detection, Paper Cutting.
UNIT-IV	Advanced Mathematical Proficiency: Allegation, Problem on trains, Ratio and Proportions, Unitary Method, Races, Algebra, Average, Probability, Geometry, Simple and Compound Interest, Data Interpretation (Tabulation, Pie chart, Line chart, Line graph and Bar graph), Banker's Discount, Percentage, Time and Work.
UNIT -V	Advanced Skills : Etiquettes, IQ and EQ, Time Management, Public Speaking, Negotiation Skills, Body language, Interview Skills.

Recommended Books:

1. Sharma RC & Mohan K – "Business Corresponding and Report Writing", Tata McGraw Hill, New Delhi, 1994.
2. Alok Jain, P S Bhatia & A M Shiekh – "Professional Communication Skills; S. Chand & Company Ltd. 2005.
3. R.S. Aggarawal, Quantitative Aptitude For Competitive Examinations (English) 7th Edition
4. 4. Emily Kittle Morrison, Leadership skills: Developing volunteers for organizational success, perseus books group.
5. 5. R.S. Aggarawal, A Modern Approach To Verbal & Non-Verbal Reasoning (English), Revised Edition.
6. Barun K. Mitra, Personality development and soft skills (English), Oxford University press, New Delhi
7. Clare Dignall, Negotiation Skills in 7 simple steps (English), Harper Collins publications.
8. Dr. S. K. Mandal, How to Succeed in Group Discussions & Personal Interviews (English) 1st Edition, Jaico publishing house.



Subject Code: 301810

Subject Name: Project - VI

Practical: 4 Hrs/Week

Detailed Syllabus

Term work: Term work shall consist of report / thesis submitted based on the topic of one good Engineering / Research based problem.

1. **Formation of team, selection of topic :** Presentation on different project topics, Team formation including students and guide, Literature review in Library and internet on different project topics, Selection of Project topic and objectives
2. **Site Visits (If required):** Before undertaking the project design, team should visit sites where the project is already implemented and get acquainted with different perspectives. They should meet experienced personalities in the area and take their advice.
3. **Preliminary Design:** After selection of topic, the team should carry out further literature review and then come out with the preliminary design of the project in the form of drawing and explanation.
4. **Semester Project Progress Report:** A semester project progress report should be prepared comprising the work done as said above. The report should be presented before the Department faculty and subject experts.

The Report / Thesis must contain the following:-

- Well-defined Case – based Problem
- Motivation to select such problem
- General approach to solve such problems
- Methods Applied to Solve such Problems
- Flowchart and Algorithm to solve Problem
- Basic Software and Hardware required to solve such problem
- Practical Applications
- Final Observations and Conclusions
- Any help to the Society through the above said Problem.

Please Note: - Based on the above work a power point presentation must be given by the candidate and defended with positive attitude. The candidate will be appreciated if he / she present his / her work in a Conference or publish his / her work in a reputed Journal