ANNA UNIVERSITY, CHENNAI
AFFILIATED INSTITUTIONS
REGULATIONS – 2017
CHOICE BASED CREDIT SYSTEM
M.E. CONSTRUCTION ENGINEERING AND MANAGEMENT

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):
I. To prepare students to excel in research or to succeed in Construction Engineering and Management profession through global, rigorous post graduate education.
II. To provide students with a solid foundation in mathematical, scientific and construction engineering fundamentals required to solve Construction Engineering and Management problems
III. To train students with efficient and effective construction knowledge in project formulation, planning, scheduling techniques, quantitative methods, costing, quality control and assurance techniques for the existing and new construction projects.
IV. To inculcate students in professional and ethical attitude, effective communication skills, teamwork skills, leadership quality, safety management, energy management in construction, multidisciplinary approach, and an ability to relate Construction Engineering and Management issues in broader social context.
V. To provide student with an academic environment aware of excellence, leadership, written ethical codes and guidelines, and the lifelong learning needed for a successful professional career

PROGRAMME OUTCOMES (POs):
On successful completion of the programme,
1. Graduates will demonstrate knowledge of statistical methods and queuing theory and its applications science and construction engineering.
2. Graduates will demonstrate an ability to identify, formulate, plan and schedule construction engineering projects.
3. Graduate will demonstrate an ability to understand and structure the construction engineering activities and its management.
4. Graduates will demonstrate an ability to design required man, material, equipment, cost and time as per needs and specifications.
5. Graduates will demonstrate an ability to visualize and work on laboratory in advanced concrete technology.
6. Graduate will demonstrate skills to use modern construction engineering tools, software and equipment.
7. Graduates will demonstrate knowledge of professional and ethical responsibilities.
8. Graduate will be able to communicate effectively in both verbal and written form.
9. Graduate will show the understanding of impact of engineering solutions on the society and also will be aware of contemporary issues.
10. Graduate will develop confidence in self education and ability for lifelong learning.
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### M.E. CONSTRUCTION ENGINEERING AND MANAGEMENT

#### REGULATIONS – 2017

#### CHOICE BASED CREDIT SYSTEM

#### CURRICULA AND SYLLABI

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### SEMESTER III

#### ELECTIVE V & VI

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### EMPLOYABILITY ENHANCEMENT COURSES (EEC)

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OBJECTIVES:

- This course is designed to provide the solid foundation on topics in various statistical methods which form the basis for many other areas in the mathematical sciences including statistics, modern optimization methods and risk modeling. It is framed to address the issues and the principles of estimation theory, testing of hypothesis, correlation and regression, design of experiments and multivariate analysis.

UNIT I  ESTIMATION THEORY  12

UNIT II  TESTING OF HYPOTHESIS  12
Sampling distributions - Small and large samples - Tests based on Normal, t, Chi square, and F distributions for testing of means, variance and proportions – Analysis of r x c tables – Goodness of fit.

UNIT III  CORRELATION AND REGRESSION  12
Multiple and partial correlation – Method of least squares – Plane of regression – Properties of residuals – Coefficient of multiple correlation – Coefficient of partial correlation – Multiple correlation with total and partial correlations – Regression and partial correlations in terms of lower order coefficients.

UNIT IV  DESIGN OF EXPERIMENTS  12
Analysis of variance – One way and two way classifications – Completely randomized design – Randomized block design – Latin square design - 2^2 Factorial design.

UNIT V  MULTIVARIATE ANALYSIS  12
Random vectors and matrices – Mean vectors and covariance matrices – Multivariate normal density and its properties – Principal components: Population principal components – Principal components from standardized variables.

TOTAL: 60 PERIODS

OUTCOMES:

After completing this course, students should demonstrate competency in the following topics:

- Consistency, efficiency and unbiasedness of estimators, method of maximum likelihood estimation and Central Limit Theorem.
- Use statistical tests in testing hypotheses on data.
- Concept of linear regression, correlation, and its applications.
- List the guidelines for designing experiments and recognize the key historical figures in Design of Experiments.
- Perform exploratory analysis of multivariate data, such as multivariate normal density, calculating descriptive statistics, testing for multivariate normality.

The students should have the ability to use the appropriate and relevant, fundamental and applied mathematical and statistical knowledge, methodologies and modern computational tools.

REFERENCES:


CN5101 MODERN CONSTRUCTION MATERIALS

OBJECTIVES:
- To study and understand the properties of modern construction materials used in construction such as special concretes, metals, composites, water proofing compounds, non weathering materials, and smart materials.

UNIT I SPECIAL CONCRETES

UNIT II METALS

UNIT III COMPOSITES
Types of Plastics – Properties & Manufacturing process – Advantages of Reinforced polymers – Types of FRP – FRP on different structural elements – Applications of FRP.

UNIT IV OTHER MATERIALS
Types and properties of Water Proofing Compounds – Types of Non-weathering Materials and its uses – Types of Flooring and Facade Materials and its application, concrete admixtures and construction chemicals.

UNIT V SMART AND INTELLIGENT MATERIALS
Types & Differences between Smart and Intelligent Materials – Special features – Case studies showing the applications of smart & Intelligent Materials.

TOTAL : 45 PERIODS

OUTCOME:
- On completion of this course the students will have the knowledge of modern construction materials to be used in the field.

REFERENCES:
1. ACI Report 440.2R-02, “Guide for the design and construction of externally bonded RP systems for strengthening concrete structures”, American Concrete Institute, 2002.
OBJECTIVES:

- To study and understand the various types of equipments used for earthwork, tunneling, drilling, blasting, dewatering, material handling conveyors and its applications in construction projects.

UNIT I CONSTRUCTION EQUIPMENTS AND MANAGEMENT 9

UNIT II EQUIPMENT FOR EARTHWORK 9

UNIT III OTHER CONSTRUCTION EQUIPMENT 9
Equipment for Dredging, Trenching, Drag line and clamshells, Tunneling – Equipment for Drilling and Blasting - Pile driving Equipment - Erection Equipment - Crane, Mobile crane - Types of pumps used in Construction - Equipment for Dewatering and Grouting – Equipment for Demolition.under water concreting equipments

UNIT IV ASPHALT AND CONCRETE PLANTS 9

UNIT V MATERIALS HANDLING EQUIPMENT 9
Forklifts and related equipment - Portable Material Bins – Material Handling Conveyors – Material Handling Cranes- Industrial Trucks.

TOTAL : 45 PERIODS

OUTCOME:

- At the end of this course students will be able to know various types of equipments to be used in the constructions projects.

REFERENCES:

OBJECTIVES:

- To study and understand the concept of planning, scheduling, cost and quality control, safety during construction, organization and use of project information necessary for construction project.

UNIT I  CONSTRUCTION PLANNING

UNIT II  SCHEDULING PROCEDURES AND TECHNIQUES

UNIT III  COST CONTROL, MONITORING AND ACCOUNTING

UNIT IV  QUALITY CONTROL AND SAFETY DURING CONSTRUCTION

UNIT V  ORGANIZATION AND USE OF PROJECT INFORMATION

TOTAL : 45 PERIODS

OUTCOME:

- On completion of this course the students will know the development of construction planning, scheduling procedure and controls.

REFERENCES:

OBJECTIVES:

- To study and understand the latest construction techniques applied to engineering construction for sub structure, super structure, special structures, rehabilitation and strengthening techniques and demolition techniques.

UNIT I  
SUB STRUCTURE CONSTRUCTION
Box jacking - Pipe jacking - Under water construction of diaphragm walls and basement - Tunneling 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 - Shoring for deep cutting - Large reservoir construction - well points - Dewatering for underground open excavation.

UNIT II  
SUPER STRUCTURE CONSTRUCTION FOR BUILDINGS
Vacuum dewatering of concrete flooring – Concrete paving technology – Techniques of construction for continuous concreting operation in tall buildings of various shapes and varying sections – Erection techniques of tall structures, Large span structures – launching techniques for heavy decks – in-situ prestressing in high rise structures, Post tensioning of slab- aerial transporting – Handling and erecting lightweight components on tall structures.

UNIT III  
CONSTRUCTION OF SPECIAL STRUCTURES
Erection of lattice towers - Rigging of transmission line structures – Construction sequence in cooling towers, Silos, chimney, sky scrapers - Bow string bridges, Cable stayed bridges – Launching and pushing of box decks – Construction of jetties and break water structures – Construction sequence and methods in domes – Support structure for heavy equipment and machinery in heavy industries – Erection of articulated structures and space decks, precast concrete erection/temporary propping/connections.

UNIT IV  
REHABILITATION AND STRENGTHENING TECHNIQUES

UNIT V  
DEMOLITION
Demolition Techniques, Demolition by Machines, Demolition by Explosives, Advanced techniques using Robotic Machines, Demolition Sequence, Dismantling Techniques, Safety precaution in Demolition and Dismantling.

OUTCOME:

- On completion of this course the students will know the modern construction techniques to be used in the construction of buildings and special structures and also rehabilitation and strengthening techniques and demolition.

REFERENCES:

1. Jerry Irvine, Advanced Construction Techniques, CA Rocketr, 1984
OBJECTIVES:
- To study the various types of construction contracts and their legal aspects and provisions.
- To study the of tenders, arbitration, legal requirement, and labour regulations.

UNIT I  CONSTRUCTION CONTRACTS  9

UNIT II  TENDERS  9

UNIT III  ARBITRATION  9

UNIT IV  LEGAL REQUIREMENTS  9

UNIT V  LABOUR REGULATION  9

TOTAL : 45 PERIODS

OUTCOME:
- On completion of this course the students will know different types of contracts in construction, arbitration and legal aspect and its provisions.

REFERENCES:
1. Gajaria G.T., Laws Relating to Building and Engineering Contracts in India,
OBJECTIVES:

To study and understand the hardware and software requirements of computer, programming, optimization techniques, inventory models and scheduling techniques applied to construction engineering.

UNIT I  INTRODUCTION

UNIT II  OPTIMIZATION TECHNIQUES
Linear, Dynamic and Integer Programming - Branch and Bound Techniques – Application to Production Scheduling, Equipment Replacement, Material Transportation and Work Assignment Problems – Software applications.

UNIT III  INVENTORY MODELS
Deterministic and Probabilistic Inventory Models - Software applications.

UNIT IV  SCHEDULING APPLICATION
PERT and CPM - Advanced planning and scheduling concepts – Computer applications – Case study.

UNIT V  OTHER PROBLEMS
Sequencing problems – Simulation – Enterprises – Introduction to ERP systems.

TOTAL : 45 PERIODS

OUTCOME:

On completion of this course the students will know the computer applications in construction, different optimization techniques and sequencing problems.

REFERENCES:

OBJECTIVES:

To study the concepts of Construction Economic and Finance such as comparing alternatives proposals, evaluating alternative investments, management of funds, and management of accounting.
UNIT I  BASIC PRINCIPLES  
Time Value of Money – Cash Flow diagram – Nominal and effective interest- continuous interest .  
Single Payment Compound Amount Factor (P/F,F/P) – Uniform series of Payments (F/A,A/F,F/P,A/P)– Problem time zero (PTZ)- equation time zero (ETZ). Constant increment to periodic payments – Arithmetic Gradient(G), Geometric Gradient (C).

UNIT II  COMPARING ALTERNATIVES PROPOSALS  
Comparing alternatives- Present Worth Analysis, Future Worth Analysis, Rate of Return Analysis (ROR) and Incremental Rate of Return (IROR)Analysis, Benefit/Cost Analysis, Break Even Analysis.

UNIT III  EVALUATING ALTERNATIVE INVESTMENTS  
Real Estate - Investment Property, Equipment Replace Analysis, Depreciation – Tax before and after depreciation – Value Added Tax (VAT) – Inflation.

UNIT IV  FUNDS MANAGEMENT  

UNIT V  FUNDAMENTALS OF MANAGEMENT ACCOUNTING  

TOTAL : 45 PERIODS

OUTCOME:
• On completion of this course the students will be able to know the concepts in economics and finance in constructions.

REFERENCES:

CN5211  ADVANCED CONSTRUCTION ENGINEERING AND COMPUTING  
TECHNIQUES LABORATORY  
L T P C  
0 0 4 2

(A) ADVANCED CONSTRUCTION ENGINEERING LABORATORY

OBJECTIVES:
• This course provides a thorough knowledge of material selection through the material testing based on specification.
LIST OF EXPERIMENTS
1. Mix design of concrete as per IS, ACI & BS methods for high performance concrete.
3. Effect of minerals and chemical admixtures in concrete at fresh and hardened state with relevance to workability, strength and durability.
4. NDT on hardened concrete - UPV, Rebound hammer and core test.
5. Permeability tests on hardened concrete – Demonstration

TOTAL: 30 PERIODS

OUTCOMES:
- On completion of this laboratory course students will be able to test the concrete mixes designed as per IS, ACI and BS methods.
- Students will also be able to know various tests on hardened concrete.

(B) ADVANCED COMPUTING TECHNIQUES LABORATORY

OBJECTIVES:
- This course gives an exposure to students in utilizing the sophisticated spread sheets programs, estimation software and other package programs.

LIST OF EXPERIMENTS
1. Quantity takeoff, Preparation and delivery of the bid or proposal of an engineering construction project.
2. Design of a simple equipment information system for a construction project.
3. Scheduling of a small construction project using Primavera scheduling systems including reports and tracking.
4. Scheduling of a small construction project using tools like MS project scheduling systems including reports and tracking.
5. Simulation models for project risk analysis.

TOTAL: 30 PERIODS

OUTCOME:
- On completion of this laboratory course the students will be able to do the scheduling of constructions projects using tools primavera and MS projects.

CN5212 PRACTICAL TRAINING I (2 Weeks) L T P C - - - 1

OBJECTIVES:
- To train the students in the field work so as to have a firsthand knowledge of practical problems related to Construction Management in carrying out engineering tasks.
- To develop skills in facing and solving the problems experiencing in the field.

SYLLABUS:
The students individually undertake training in reputed engineering companies doing construction during the summer vacation for a specified duration of four weeks. At the end of training, a detailed report on the work done should be submitted within ten days from the commencement of the semester. The students will be evaluated through a viva-voce examination by a team of internal staff.
OBJECTIVES:

- To study the concepts of quality assurance and control techniques in construction.
- To study the design philosophy, design of special elements, flat slabs and yield line based design, and ductile detailing.

UNIT I  QUALITY MANAGEMENT


UNIT II  QUALITY SYSTEMS


UNIT III  QUALITY PLANNING


UNIT IV  QUALITY ASSURANCE AND CONTROL

Objectives – Regularity agent, owner, design, contract and construction oriented objectives, methods – Techniques and needs of QA/QC – Different aspects of quality – Appraisals, Factors influencing construction quality – Critical, major failure aspects and failure mode analysis, – Stability methods and tools, optimum design – Reliability testing, reliability coefficient and reliability prediction.

UNIT V  QUALITY IMPROVEMENT TECHNIQUES

Selection of new materials – Influence of drawings, detailing, specification, standardization – Bid preparation – Construction activity, environmental safety, social and environmental factors – Natural causes and speed of construction – Life cycle costing – Value engineering and value analysis.

TOTAL: 45 PERIODS

OUTCOME:

- On completion of this course the students will be able to know the quality control aspects in planning, systems, management, assurance and improvement techniques.

REFERENCES:

CN5311  PRACTICAL TRAINING II (2 Weeks)  L  T  P  C  -  -  -  1

OBJECTIVES:
- To train the students in the field work so as to have a firsthand knowledge of practical problems related to Construction Management in carrying out engineering tasks.
- To develop skills in facing and solving the problems experiencing in the field.

SYLLABUS:
The students individually undertake training in reputed engineering companies doing construction during the summer vacation for a specified duration of four weeks. At the end of training, a detailed report on the work done should be submitted within ten days from the commencement of the semester. The students will be evaluated through a viva-voce examination by a team of internal staff.

CN5312  SEMINAR  L  T  P  C  0  0  2  1

OBJECTIVES:
- To work on a specific technical topic in Construction Engineering and Management in order to acquire the skills of oral presentation.
- To acquire technical writing abilities for seminars and conferences.

SYLLABUS:
The students will work for two hours per week guided by a group of staff members. They will be asked to talk on any topic of their choice related to construction engineering and management and to engage in dialogue with the audience. A brief copy of their talk also should be submitted. Similarly, the students will have to present a seminar of not less than fifteen minutes and not more than thirty minutes on the technical topic. They will also answer the queries on the topic. The students as audience also should interact. Evaluation will be based on the technical presentation and the report and also on the interaction during the seminar.

   TOTAL: 30 PERIODS

CN5313  PROJECT WORK (PHASE I)  L  T  P  C  0  0  12  6

OBJECTIVES:
- To identify a specific problem for the current need of the society and collecting information related to the same through detailed review of literature.
- To develop the methodology to solve the identified problem.
- To train the students in preparing project reports and to face reviews and viva-voce examination.

SYLLABUS:
The student individually works on a specific topic approved by the head of the division under the guidance of a faculty member who is familiar in this area of interest. The student can select any topic which is relevant to the area of construction engineering and management. The topic may be theoretical or case studies. At the end of the semester, a detailed report on the work done should be submitted which contains clear definition of the identified problem, detailed literature review related to the area of work and methodology for carrying out the work. The students will be
evaluated through a viva-voce examination by a panel of examiners including one external examiner.

TOTAL: 180 PERIODS

OUTCOME:
- At the end of the course the students will have a clear idea of his/her area of work and they are in a position to carry out the remaining phase II work in a systematic way.

CN5411  PRACTICAL TRAINING III (2 Weeks)  L  T  P  C
- - - 1

OBJECTIVES:
- To train the students in the field work so as to have a firsthand knowledge of practical problems related to Construction Management in carrying out engineering tasks.
- To develop skills in facing and solving the problems experiencing in the field.

SYLLABUS:
The students individually undertake training in reputed engineering companies doing construction during the summer vacation for a specified duration of four weeks. At the end of training, a detailed report on the work done should be submitted within ten days from the commencement of the semester. The students will be evaluated through a viva-voce examination by a team of internal staff.

CN5412  PROJECT WORK (PHASE II)  L  T  P  C
0 0 24 12

OBJECTIVES:
- To solve the identified problem based on the formulated methodology.
- To develop skills to analyze and discuss the test results, and make conclusions.

SYLLABUS:
The student should continue the phase I work on the selected topic as per the formulated methodology under the same supervisor. At the end of the semester, after completing the work to the satisfaction of the supervisor and review committee, a detailed report should be prepared and submitted to the head of the department. The students will be evaluated through based on the report and the viva-voce examination by a panel of examiners including one external examiner.

TOTAL: 360 PERIODS

OUTCOME:
- On completion of the project work students will be in a position to take up any challenging practical problems in the field of construction engineering and management and find better solutions to it.
OBJECTIVES:
- To study the properties of concrete making materials, tests, mix design, special concretes and various methods for making concrete.

UNIT I CONCRETE MAKING MATERIALS

UNIT II TESTS ON CONCRETE

UNIT III MIX DESIGN

UNIT IV SPECIAL CONCRETE

UNIT V CONCRETING METHODS

OUTCOME:
- On completion of this course the students will know various tests on fresh, hardened concrete, special concrete and the methods of manufacturing of concrete.

REFERENCES:
UNIT I  PLANNING, SITE EQUIPMENT & PLANT FOR FORM WORK

Introduction - Forms for foundations, columns, beams walls etc., General objectives of formwork building - Planning for safety - Development of a Basic System - Key Areas of cost reduction - Planning examples. Overall Planning - Detailed planning - Standard units - Corner units - Pass units - Calculation of labour constants - Formwork hours - Labour Requirement - Overall programme - Detailed programme - Costing - Planning crane arrangements - Site layout plan - Transporting plant - Formwork beams - Scaffold frames - Framed panel formwork - Formwork accessories.

UNIT II  MATERIALS ACCESSORIES PROPRIETARY PRODUCTS & PRESSURES


UNIT III  DESIGN OF FORMS AND SHORES

Basic simplification - Beam formulae - Allowable stresses - Deflection, Bending - Lateral stability - Shear, Bearing - Design of Wall forms - Slab forms - Beam forms - Column forms - Examples in each. Simple wood stresses - Slenderness ratio - Allowable load vs length behaviour of wood shores - Form lining Design Tables for Wall formwork - Slab Formwork - Column Formwork - Slab props - Stacking Towers - Free standing and restrained - Rosett Shoring - Shoring Tower - Heavy Duty props.

UNIT IV  BUILDING AND ERECTING THE FORM WORK

Carpentry Shop and job mill - Forms for Footings - Wall footings - Column footings - Sloped footing forms - Strap footing - Stepped footing - Slab form systems - Sky deck and Multiflex - Customized slab table - Standard Table module forms - Swivel head and uniportal head - Assembly sequence - Cycling with lifting fork - Moving with table trolley and table prop. Various causes of failures - ACI - Design deficiencies - Permitted and gradual irregularities.

UNIT V  FORMS FOR DOMES AND TUNNELS, SLIP FORMS AND SCAFFOLDS

Hemispherical, Parabolic, Translational shells - Typical barrel vaults Folded plate roof details - Forms for Thin Shell roof slabs design considerations - Building the forms - Placing concrete - Form removed -Strength requirements -Tunnel forming components - Curb forms invert forms - Arch forms - Concrete placement methods - Cut and cover construction - Bulk head method - Pressures on tunnels - Continuous Advancing Slope method - Form construction - Shafts. Slip Forms - Principles -Types - advantages - Functions of various components - Planning -Desirable characteristics of concrete - Common problems faced - Safety in slip forms special structures built with slip form Technique - Types of scaffolds - Putlog and independent scaffold -Single pole scaffolds - Truss suspended - Gantry and system scaffolds.

TOTAL: 45 PERIODS

OUTCOME:

- On completion of this course the students will be able to know the detailed planning of framework, design of forms and erection of form work.

REFERENCES:

2. Hurd, M.K., Formwork for Concrete, Special Publication No.4, American Concrete Institute, Detroit, 1996
OBJECTIVES:

- To study the various quantitative methods applied to the elements of management.
- To study the effect of production management, finance management, decision theory and managerial economics.

UNIT I OPERATIONS RESEARCH
Introduction to Operations Research - Linear Programming – Graphical and Simplex Methods, Duality and Post – Optimality Analysis – Transportation and Assignment Problems.

UNIT II PRODUCTION MANAGEMENT

UNIT III FINANCIAL MANAGEMENT

UNIT IV DECISION THEORY

UNIT V MANAGERIAL ECONOMICS

OUTCOME:

- On completion of this course the students will be able to know operations research, production management, financial management and cost concepts.

REFERENCES:
OBJECTIVES:

- To study and understand the construction system integration, environmental factors, services, maintenance and safety systems.

UNIT I  STRUCTURAL INTEGRATION  9

UNIT II  ENVIRONMENTAL FACTORS  9

UNIT III  SERVICES  9
Plumbing – Electricity – Vertical circulation and their interaction – HVAC.

UNIT IV  MAINTENANCE  9
Component longevity in terms of operation performance and resistance to deleterious forces - Planning systems for least maintenance materials and construction – access for maintenance – Feasibility for replacement of damaged components – equal life elemental design – maintenance free exposed and finished surfaces.

UNIT V  SAFETY  9
Ability of systems to protect fire – Preventive systems – fire escape system design – Planning for pollution free construction environmental – Hazard free Construction execution.

TOTAL : 45 PERIODS

OUTCOME:

- On completion of this course the students will be able to know various Structural systems, Services, Safety and Maintenance requirements in construction.

REFERENCES:


OBJECTIVES:

- To study the design of energy efficient buildings which balances all aspects of energy, lighting, space conditioning and ventilation by providing a mix of passive solar design strategies and to learn the use of materials with low embodied energy.
UNIT I INTRODUCTION

UNIT II PASSIVE SOLAR HEATING AND COOLING

UNIT III DAYLIGHTING AND ELECTRICAL LIGHTING

UNIT IV HEAT CONTROL AND VENTILATION

UNIT V DESIGN FOR CLIMATIC ZONES

TOTAL : 45 PERIODS

OUTCOME:
• On completion of this course the students will be able to know various components which makes the building energy efficient such as lighting, space conditioning, heat control and energy efficient.

REFERENCES:
OBJECTIVES:

- To study the various management techniques for successful completion of construction projects.
- To study the effect of management for project organization, design of construction process, labour, material and equipment utilization, and cost estimation.

UNIT I THE OWNERS' PERSPECTIVE

UNIT II ORGANIZING FOR PROJECT MANAGEMENT
Project Management – modern trends - Strategic Planning - Effects of Project Risks on Organization - Organization of Project Participants - Traditional Designer-Constructor Sequence - Professional Construction Management - Owner-Building Operation - Turnkey Operation - Leadership and Motivation for the Project Team.

UNIT III DESIGN AND CONSTRUCTION PROCESS

UNIT IV LABOUR, MATERIAL AND EQUIPMENT UTILIZATION

UNIT V COST ESTIMATION

TOTAL : 45 PERIODS

OUTCOME:

- On completion of this course the students will be able to know the modern trends in project management viz. design, construction, resource utilization and cost estimation.

REFERENCES:

OBJECTIVES:
- To study the various aspects of manpower management such as man power planning, organization, human relations, welfare and development methods in construction.

UNIT I MANPOWER PLANNING 9

UNIT II ORGANISATION 9

UNIT III HUMAN RELATIONS AND ORGANISATIONAL BEHAVIOUR 9
Basic individual psychology – Approaches to job design and job redesign – Self managing work teams – Intergroup – Conflict in organizations – Leadership-Engineer as Manager – al aspects of decision making – Significance of human relation and organizational – Individual in organization – Motivation – Personality and creativity – Group dynamics, Team working – Communication and negotiation skills.

UNIT IV WELFARE MEASURES 9

UNIT V MANAGEMENT AND DEVELOPMENT METHODS 9

TOTAL : 45 PERIODS

OUTCOME:
- On completion of this course the students will know various processes in manpower planning, organizational and welfare measures.

REFERENCES:
CN5008  STRESS MANAGEMENT  L T P C
3 0 0 3

OBJECTIVE:
- To provide a broad physical, social and psychological understanding of human stress. The main focus is on presenting a broad background of stress research.

UNIT I  UNDERSTANDING STRESS  6

UNIT II  COMMON STRESS FACTORS TIME & CAREER PLATEAUING  12
Time Management – Techniques – Importance of planning the day – Time management schedule – Developing concentration – Organizing the Work Area – Prioritizing – Beginning at the start – Techniques for conquering procrastination – Sensible delegation – Taking the right breaks – Learning to say ‘No’.

UNIT III  CRISIS MANAGEMENT  10

UNIT IV  WORK PLACE HUMOUR  5

UNIT V  SELF DEVELOPMENT  12

TOTAL: 45 PERIODS

OUTCOME
- Students will be able to understand the management of work related stress at an individual and organizational level and will help them to develop and implement effective strategies to prevent and manage stress at work.

REFERENCES
3. Cooper, Managing Stress, Sage, 2011

CN5009  PROJECT FORMULATION AND APPRAISAL  L T P C
3 0 0 3

OBJECTIVES:
- To study and understand the formulation, costing of construction projects, appraisal, finance and private sector participation.

UNIT I  PROJECT FORMULATION  9
UNIT II PROJECT COSTING

UNIT III PROJECT APPRAISAL
Indian Practice of Investment Appraisal – International Practice of Appraisal – Analysis of Risk –
Different Methods – Selection of a Project and Risk Analysis in Practice.

UNIT IV PROJECT FINANCING
Project Financing – Means of Finance – Financial Institutions – Special Schemes – Key Financial
Indicators – Ratios.

UNIT V PRIVATE SECTOR PARTICIPATION
Private sector participation in Infrastructure Development Projects - BOT, BOLT, BOOT -
Technology Transfer and Foreign Collaboration - Scope of Technology Transfer.

TOTAL : 45 PERIODS

OUTCOME:
- On completion of this course the students will be able to know the formulations of projects,
  projects costing, appraisal and financing.

REFERENCES:
1. Barcus, S.W. and Wilkinson.J.W., Hand Book of Management Consulting Services,
2. Joy P.K., Total Project Management - The Indian Context, New Delhi, Macmillan India
   Ltd., 1992
3. Prasanna Chandra, Projects – Planning, Analysis, Selection, Implementation Review,
UNIT IV  
TIME MANAGEMENT  
Personnel time, Management and planning, managing time on the project, forecasting the future, Critical path measuring the changes and their effects – Cash flow and cost control.

UNIT V  
RESOURCE ALLOCATION AND LEVELLING  

TOTAL : 45 PERIODS

OUTCOME:
- On completion of this course the students will be able to know resource planning, management, allocation and resource leveling in construction.

REFERENCES:

CN5011  
PROJECT SAFETY MANAGEMENT  
L T P C  
3 0 0 3

OBJECTIVES:
- To study and understand the various safety concepts and requirements applied to construction projects.
- To study the prevention of construction accidents, safety programmes, contractual obligations, and design for safety.

UNIT I  
CONSTRUCTION ACCIDENTS  

UNIT II  
SAFETY PROGRAMMES  

UNIT III  
CONTRACTUAL OBLIGATIONS  
Safety in Construction Contracts – Substance Abuse – Safety Record Keeping.

UNIT IV  
DESIGNING FOR SAFETY  

UNIT V  
OWNERS’ AND DESIGNERS’ OUTLOOK  
Owner’s responsibility for safely – Owner preparedness – Role of designer in ensuring safety – Safety clause in design document.

TOTAL : 45 PERIODS
OUTCOME:
- On completion of this course the students will be able to know various constructions safety concepts.

REFERENCES:

OUTCOME:
- On completion of this course the students will be able to know the various applications of information systems in management.

REFERENCES: