SATHYABAMA UNIVERSITY
(Established under section 3 of UGC Act, 1956)
Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai - 119.

SYLLABUS
BACHELOR OF ENGINEERING PROGRAMME
IN
CIVIL ENGINEERING (8 SEMESTERS)
REGULATIONS 2010
SATHYABAMA UNIVERSITY
REGULATIONS – 2010

Effective from the academic year 2010-2011 and applicable to the students admitted to the Degree of Bachelor of Engineering / Technology. (Eight Semesters)

1. Structure of Programme

1.1 Every Programme will have a curriculum with syllabi consisting of theory and practical such as:
   (i) General core courses comprising Mathematics, Basic Sciences, Engineering Sciences.
   (ii) Core course of Engineering / Technology.
   (iii) Elective course for specialization in related fields.

1.2 Each semester curriculum shall normally have a blend of lecture courses not exceeding 7 and practical courses not exceeding 4.

1.3 The medium of instruction, examinations and project report will be in English.

2. Duration of the Programme

A student is normally expected to complete the B.E/B.Tech. Programme in 8 semesters but in any case not more than 12 consecutive semesters from the time of commencement of the course (not more than 10 semesters for those who join 3rd semester under Lateral entry system) The Head of the Department shall ensure that every teacher imparts instruction as per the number of hours specified in the syllabus and that the teacher teaches the full content of the specified syllabus for the course being taught.

3. Requirements for Completion of a Semester

A candidate who has fulfilled the following conditions shall be deemed to have satisfied the requirement for completion of a semester.

3.1 He/She secures not less than 90% of overall attendance in that semester.

3.2 Candidates who do not have the requisite attendance for the semester will not be permitted to write the University Exams.

4. Examinations

The examinations shall normally be conducted between October and December during the odd semesters and between March and May in the even semesters. The maximum marks for each theory and practical course (including the project work and Viva Voce examination in the Eighth Semester) shall be 100 with the following breakup.

(i) Theory Courses
   Internal Assessment : 20 Marks
   University Exams : 80 Marks

(ii) Practical Courses
   Internal Assessment : - -
   University Exams : 100 Marks
5. **Passing requirements**

(i) A candidate who secures not less than 50% of total marks prescribed for the course (For all courses including Theory, Practicals and Project work) with a minimum of 35 marks out of 80 in the University Theory Examinations, shall be declared to have passed in the Examination.

(ii) If a candidate fails to secure a Pass in a particular course, it is mandatory that he/she shall reappear for the examination in that course during the next semester when examination is conducted in that course. However the Internal Assessment marks obtained by the candidate in the first attempt shall be retained and considered valid for all subsequent attempts.

6. **Eligibility for the Award of Degree**

A student shall be declared to be eligible for the award of the B.E/B.Tech. degree provided the student has successfully completed the course requirements and has passed all the prescribed examinations in all the 8 semesters within the maximum period specified in clause 2.

7. **Award of Credits and Grades**

All assessments of a course will be done on absolute marks basis. However, for the purpose of reporting the performance of a candidate, Letter Grades will be awarded as per the range of total marks (out of 100) obtained by the candidate as given below:

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<th>RANGE OF MARKS FOR GRADES</th>
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<tr>
<td>Grade Points (GP)</td>
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**CUMULATIVE GRADE POINT AVERAGE CALCULATION**

The CGPA calculation on a 10 scale basis is used to describe the overall performance of a student in all courses from first semester to the last semester. F and W grades will be excluded for calculating GPA and CGPA.

\[
\text{CGPA} = \frac{\sum C_i \times GP_i}{\sum C_i}
\]

where

- \( C_i \) - Credits for the subject
- \( GP_i \) - Grade Point for the subject
- \( \sum C_i \) - Sum of all subjects successfully cleared during all the semesters

8. **Classification of the Degree Awarded**

1. A candidate who qualifies for the award of the Degree having passed the examination in all the courses of all the semesters in **his/her first appearance** within a maximum period of 8 consecutive semesters after commencement of study (maximum of 6 semesters for Lateral entry system who join the course in the third semester) securing a **CGPA not less than 9.0** shall be declared to have passed the examination in **First Class – Exemplary**.
2. A candidate who qualifies for the award of the Degree having passed the examination in all the courses of all the semesters in his/her first appearance within a maximum period of 8 consecutive semesters after commencement of study (maximum of 6 semesters for Lateral entry system who join the course in the third semester) securing a CGPA not less than 7.5 shall be declared to have passed the examination in First Class with Distinction.

3. A candidate who qualifies for the award of the Degree having passed the examination in all the courses of all the semesters within a maximum period of 8 consecutive semesters after commencement of study (maximum of 6 semesters for Lateral entry system who join the course in the third semester) securing a CGPA not less than 6.0 shall be declared to have passed the examination in First Class.

4. All other candidates who qualify for the award of the Degree having passed the examination in all the courses of all the 8 semesters within a maximum period of 12 consecutive semesters (10 consecutive semesters for Lateral Entry system who join the course in the third semester) after his/her commencement of study securing a CGPA not less than 5.0 shall be declared to have passed the examination in Second Class.

5. A candidate who is absent in semester examination in a course/project work after having registered for the same, shall be considered to have appeared in that examination for the purpose of classification of degree. For all the above mentioned classification of Degree, the break of study during the programme, will be counted for the purpose of classification of degree.

6. A candidate can apply for revaluation of his/her semester examination answer paper in a theory course, within 1 week from the declaration of results, on payment of a prescribed fee along with prescribed application to the Controller of Examinations through the Head of Department. The Controller of Examination will arrange for the revaluation and the result will be intimated to the candidate concerned through the Head of the Department. Revaluation is not permitted for practical courses and for project work.

Final Degree is awarded based on the following:

- CGPA ≥ 9.0 - First Class - Exemplary
- CGPA ≥ 7.50 < 9.0 - First Class with Distinction
- CGPA ≥ 6.00 < 7.50 - First Class
- CGPA ≥ 5.00 < 6.00 - Second Class

Minimum CGPA requirements for award of Degree is 5.0 CGPA.

9. Discipline

Every student is required to observe disciplined and decorous behaviour both inside and outside the University and not to indulge in any activity which will tend to bring down the prestige of the University. If a student indulges in malpractice in any of the University theory / practical examination, he/she shall be liable for punitive action as prescribed by the University from time to time.

10. Revision of Regulations and Curriculum

The University may revise, amend or change the regulations, scheme of examinations and syllabi from time to time, if found necessary.
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L - Lecture hours; T - Tutorial hours; P - Practical hours; C - Credits
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LIST OF ELECTIVES

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DUAL DEGREE IN COMPUTER SCIENCE

Provision for candidates from Non-IT Branches of B.E/B.Tech to undergo Dual Degree Programme leading to B.E in Computer Science.

A. Duration and Curriculum

Candidates selected for a Dual degree programme shall undergo additional courses pertaining to Computer Science. These courses constitute with additional Curriculum as per annexure and consist of both core course and electives. The additional courses are to be undergone concurrently from the 3rd semester of the B.E/B.Tech. (Non-IT) degree programme and extends for one more year beyond the fourth year of the regular B.E/B.Tech. (Non-IT) degree programme to which he/she was first admitted. The additional courses are to be offered from 3rd to 8th Semester after normal working hours so that the regular B.E/B.Tech. (NonIT) remains unaffected.

B. A candidate undergoing dual degree programme should satisfy minimum attendance requirements for the course of additional Curriculum for each semester, as stipulated for the regular B.E/B.Tech. Degree Programme.

C. For the courses of additional Curriculum, a candidate has to write the same examination that is held for the regular B.E. Computer Science.

D. The passing rules for the dual degree programme shall be same as that of the regular B.E/B.Tech. Degree programme.

E. A candidate shall be declared to be eligible for the additional degree of B.E. Computer Science provided that

(i) The candidate has qualified for the regular B.E. or B.Tech. Degree in the non-IT branch in which he/she was originally admitted.
(ii) The candidate has successfully completed all the courses prescribed in the additional Curriculum within a maximum period of 12 semesters from the date of first admission.
(iii) There is no disciplinary action pending against the student.
## Curriculum

### Subjects for Dual Degree Programme in Computer Science

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**TOTAL CREDITS** 22

# TENTH SEMESTER

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**TOTAL CREDITS** 15

**TOTAL COURSE CREDITS**: 92
## ELECTIVES FOR DUAL DEGREE PROGRAMME IN COMPUTER SCIENCE

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UNIT I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES  

Definition, scope and importance - need for public awareness - forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams, floods, drought, conflicts over water, dams-benefits and problems - mineral resources: use effects on forests and tribal people - water resources: use and over-utilization of surface and ground water - exploitation, environmental effects of extracting and using mineral resources, case studies - food resources: world food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies - energy resources: growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies - land resources: land as a resource, land degradation, man induced landslides, soil erosion and desertification - role of an individual in conservation of natural resources - equitable use of resources for sustainable lifestyles.

UNIT II ECOSYSTEMS AND BIODIVERSITY  

Concept of an ecosystem - structure and function of an ecosystem - producers, consumers and decomposers - energy flow in the ecosystem - ecological succession - food chains, food webs and ecological pyramids - introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) - introduction to biodiversity - definition: genetic, species and ecosystem diversity - biogeographical classification of India - value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - biodiversity at global, national and local levels - India as a mega-diversity nation - hot-spots of biodiversity - threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts - endangered and endemic species of India - conservation of biodiversity: in-situ and ex-situ conservation of biodiversity.

UNIT III ENVIRONMENTAL POLLUTION  

Definition - causes, effects and control measures of: (a) air pollution (b) water pollution (c) soil pollution (d) marine pollution (e) noise pollution (f) thermal pollution (g) nuclear hazards - solid waste management: causes, effects and control measures of urban and industrial wastes - role of an individual in prevention of pollution - pollution case studies - disaster management: floods, earthquake, cyclone and landslides.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT  


UNIT V HUMAN POPULATION AND THE ENVIRONMENT  


Visit to a local area to document environmental assets-river/forest/grassland/hill/mountain. Visit to a local polluted site-urban/rural/ industrial/agricultural-study of common plants, insects, birds-study of simple ecosystems-pond, river, hill slopes etc.

TEXT / REFERENCE BOOKS:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 hrs.
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B : 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I TRIGONOMETRY 10 hrs.

Review of Complex numbers and De Moivre’s Theorem. Expansions of Sinθ and Cosθ; Sinθ and Cosθ in powers of θ, Sin^nθ and Cos^nθ in terms of multiples of θ. Hyperbolic functions – Inverse hyperbolic functions. Separation into real and imaginary parts of complex functions

UNIT II MATRICES 10 hrs.

Characteristic equation of a square matrix - Eigen values and Eigen vectors of a real matrix- properties of Eigen values and Eigen vectors, Cayley-Hamilton theorem (without proof) verification – Finding inverse and power of a matrix. Diagonalisation of a matrix using similarity transformation (concept only) , Orthogonal transformation – Reduction of quadratic form to canonical form by orthogonal transformation.

UNIT III GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS 10 hrs.

Curvature –centre, radius and circle of curvature in Cartesian co-ordinates only – Involutes and evolutes – envelope of family of curves with one and two parameters – properties of envelopes and evolutes – evolutes as envelope of normal.

UNIT IV FUNCTIONS OF SEVERAL VARIABLES 10 hrs.


UNIT V ORDINARY DIFFERENTIAL EQUATION 10 hrs.

Second order linear differential equation with constant coefficients – Particular Integrals for e^{αx}, sin ax, cos αx, x^m, x^n e^{αx}, e^{αx} sin bx, e^{αx} cos bx. Equations reducible to Linear equations with constant co-efficient using x=e^t. Simultaneous first order linear equations with constant coefficients - Method of Variations of Parameters.

TEXT / REFERENCE BOOKS:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks : 80
Exam Duration : 3 hrs.

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B : 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I  CONDUCTING AND SUPERCONDUCTING MATERIALS

Classical Free electron theory of Metals-Derivation of Electrical and Thermal Conductivity- Deduction of Wiedemann Franz law-Lorentz number. Introduction to Band theory, Difference between Conductors, Semiconductors and Insulators - Superconductivity-Transition temperature - occurrence of superconductivity - BCS Theory(Qualitative), properties of superconductors -Type I &Type II superconductors, High Tc superconductors, AC & DC Josephson effects. Applications of superconductors – basic concepts of SQUID, cryotron, magnetic levitation.

UNIT II  MAGNETIC AND DIELECTRIC MATERIALS

Types based on spin. Hard and soft magnetic materials, domain theory of Ferromagnetism, magnetic bubbles, formation and propagation of magnetic bubbles, applications of magnetic materials - Magnetic storage devices. Dielectric parameters, polarization, polarisability, types of polarization. Internal or local electric field - derivation of Lorentz Equation and Clausius - Mossotti Equation, dielectric loss and breakdown, types of dielectric breakdown, types of dielectric materials, applications.

UNIT III  OPTICAL MATERIALS


UNIT IV  MODERN ENGINEERING MATERIALS


UNIT V  CHARACTERIZATION OF MATERIALS


REFERENCES :

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 hrs.

PART A: 2 Questions from each unit, each carrying 2 marks
Out of 20 marks, maximum of 10% problems may be asked.

PART B: 2 Questions from each unit with internal choice, each carrying 12 marks
Out of 60 marks, maximum of 10% problems may be asked
‘Applications’ mentioned in the syllabus refer to the basic applications and not to any specific case.
UNIT I  WATER TECHNOLOGY  
10 hrs.


UNIT II  BATTERIES AND FUEL CELLS  
10 hrs.


UNIT III  CORROSION SCIENCE  
10 hrs.


UNIT IV  EXPLOSIVES AND ROCKET PROPELLANTS  
10 hrs.

Introduction - Explosives: Requirements, Classification of Explosives: Low explosives, primary explosives and high explosives. Assessment of explosives.

UNIT V  SURFACE CHEMISTRY  
10 hrs.


TEXT / REFERENCE BOOKS:

UNIVERSITY EXAM QUESTION PAPER PATTERN:
Max. Marks: 80
Exam Duration: 3 hrs

PART A : 2 Questions from each unit, each carrying 2 marks
20 marks

PART B : 2 Questions from each unit with internal choice, each carrying 12 marks
60 marks
One problem for 5 marks may be asked in Unit 1 - Water Technology
UNIT I 10 hrs.

Introduction: Algorithms & flowcharts-Overview of C-Features of C-IDE of C Structure of C program-Compilation & execution of C program-Identifiers, variables, expression, keywords, data types, constants, scope and life of variables, local and global variables. Operators: arithmetic, logical, relational, conditional and bitwise operators- Special operators: size of () & comma (,) operator-Precedence and associativity of operators & Type conversion in expressions.

Basic input/output and library functions: Single character input/output i.e. getch(), getchar(), getche() & putchar()-Formatted input/output: printf() and scanf()-Library Functions: concepts, mathematical and character functions.

UNIT II 10 hrs.

Control structures: Conditional control-Loop control and Unconditional control structures.

Functions: The Need of a function-User defined and library function- Prototype of a function-Calling of a function-Argument Passing arguments to function- Return values-Nesting of function- main()-Command line arguments and recursion. Storage class specifier – auto, extern, static, & register.

UNIT III 10 hrs.

Arrays: Single and multidimensional arrays-Array declaration and initialization of arrays. 

Strings: Declaration-Initialization and string handling functions.

Structure and Union: Defining structure-Declaration of structure variable-Accessing structure members-Nested structures-Array of structures-Structure assignment-Structure as function argument-Function that returns structure- Union.

UNIT IV 10 hrs.

Pointers: The ‘&’ and ‘*’ operators-Pointers expressions-Pointers vs arrays-Pointer to functions-Function returning pointer-Static and dynamic memory allocation in C.

DMA functions: malloc(), calloc(), sizeof(), free() and realloc()-Preprocessor directives.

UNIT V 10 hrs.


TEXT / REFERENCE BOOKS:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks : 80  Exam Duration : 3 hrs.
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B : 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I  CONSTRUCTION OF PLANE CURVES  10 hrs.

UNIT II  PROJECTION OF POINTS AND LINES  10 hrs.
General principles of orthographic projection – first angle projection – layout of views – projections of points, straight lines located in the first quadrant – Determination of true lengths of lines and their inclinations to the planes of projection – Traces

UNIT III  PROJECTION OF SOLIDS AND SECTION OF SOLIDS  10 hrs.
Projection of solids like prism, pyramid, cylinder and cone when the axis is inclined to only one plane of projection – Change of position method only - Sectioning of above mentioned solids in simple vertical positions by cutting plane inclined to one reference plane and perpendicular to the other – True shapes of sections

UNIT IV  DEVELOPMENT OF SURFACES AND FREE HAND SKETCHING  10 hrs.
Need for development of surfaces – Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders and cones.- Pictorial representation of engineering objects – Representation of three dimensional objects in two dimensional media – Need for multiple views – Developing visualization skills through free hand sketching of three dimensional objects.

UNIT V  ISOMETRIC PROJECTIONS & PERSPECTIVE PROJECTIONS  10 hrs.
Principles of isometric projection – Isometric scale – Isometric projections of simple solids and combination of solids - Prisms, pyramids, cylinders, cones and spheres (excluding isometric projections of truncated solids) - Perspective projections - Simple objects like – cube, prisms, pyramids by Vanishing point method & Visual Ray method (excluding perspective projections of truncated solids)

TEXT / REFERENCE BOOKS:
5. IS 9609 (Parts 0 & 1 )-2001: Technical Products Documentation – Lettering
7. IS 11669-1986 & SP 46-2003: Dimensioning of Technical Drawings
8. IS 15021(Parts 1 to 4)-2001: Technical Drawings-Projection Methods

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks : 80
Exam Duration : 3 hrs.

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
Part A: equal distribution of questions from each unit.

PART B : 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
Part B - Split up:
Unit 1: 1 question from construction of hexagon / pentagon / ellipse & 1 question from construction of parabola / hyperbola
Unit 2: 1 question from projection of points & 1 question from projection of lines inclined to both the planes.
Unit 3: 1 question from projection of solids & 1 question from section of solids.
Unit 4: 1 question from development of surfaces & 1 question from orthographic projection.
Unit 5: 1 question from isometric projection & 1 question from perspective projection.
UNIT I SOIL 8 hrs.
Formation - Index properties - Specific gravity - Grain size distribution - Textural and I.S. Classification - Bulking of sand - Fineness modulus.

UNIT II STONE AND BRICKS 11 hrs.
Various types of building stones and their properties - Quarrying of stones - Study on Quarry Dust, properties and its applications - Dressing of stones - Tests on stones - Deterioration and preservation - Alternate material for stone - Fly ash stone, sandstone, hollow blocks

Bricks - Manufacture of bricks - properties, tests on brick - uses - types.

UNIT III TIMBER 10 hrs.
Classification, properties - defects in timber - Processing, seasoning and preservation. Alternate and Composite materials - Veneering, Plywood, Particle board, Gypsum board, PVC doors and windows.

UNIT IV CEMENT AND MORTAR 11 hrs.
Cement - Composition - properties - Types and uses - tests for cement - lime, gypsum, Portland Pozzolana Cement, white cement

Mortar - classifications - properties of good mortar - uses of mortar - Admixtures and grades of mortar.

UNIT V STEEL 10 hrs.
Manufacture of steel - properties and uses of different types of steel - Market forms of steel - mechanical and heat treatment of steel - Anticorrosive measures for steel.

TEXT BOOKS:

REFERENCES:
2. Shetty M.S., "Concrete Technology", 1st Edition Sultan Chand and Co.Ltd., New Delhi, 2005

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80 Exam Duration: 3 hrs.
PART A: 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks

B.E. (CIVIL ENGINEERING) 7 REGULATIONS 2010
1. To write a simple menu driven calculator program using switch statement.
2. To write a program to calculate the nCr using functions.
3. To write a program to find the largest and smallest number using arrays.
4. To write a program to generate Fibonacci series.
5. To write a program to find the factorial of a number using recursion.
6. To write a program to print the sum of elements of an array using pointers.
7. To write a program to implement file handling
8. To write a program to perform matrix addition and multiplication.
9. To write a program to check for perfect number.
10. To write a program to implement string manipulation functions without using library functions.
11. To write a program to perform ASCII equivalent keystrokes.
12. To write a program to solve a polynomial equation.

LIST OF EXPERIMENTS

CARPENTRY

Handling of carpentry tools, A practice in marking, sawing planning and chiseling to size. Making simple joints such as half-lap, dove-tail and mortise and tenon joints.

Use of modern materials such as plywood, chip board, novapan, laminated sheet (demonstration only).

FITTING

Use of fitting tools-practice in marketing, fitting to size and drilling-making of simple mating and profiles such as V, Square, Dove-tail, Half-round joints.

WELDING

i. Electric Arc Welding
   a) Study on Edge preparation techniques for Arc welding
   b) List of Welding Exercises
   ii. Study on gas welding and gas cutting
   iii. Study on TIG & MIG welding

FOUNDRY

i. Sand testing - Grain fineness - Permeability test.
ii. Study on Pattern Allowances
iii. Preparation of green sand moulding
iv. Metal casting technique (Demonstration only)
UNIT I
Reading comprehension- Skimming and Scanning - Transcoding -Bar diagram, Tables and Pie chart –Discussing topics of general interest or on current topics and making a presentation in the class - Conjunctions and discourse markers- cloze reading- affixes – definitions- tense- voice – jumbled sentences.

UNIT II
Subject verb agreement - Idioms and phrases, reading passages to answer evaluative, inferential and hypothetical type of questions- Listening - Creative thinking and speaking- Formal letters - application for job- resume preparation- inviting dignitaries to department workshops, symposium and university functions - Letter to the editor.

UNIT III
Reading and summarising reports - Writing a project proposal - Editing - Checking punctuation and grammatical errors- Types of Sentences – preparation of Check List- formulating questions and answers - communicating politely.

UNIT IV
Reported speech- Parts of speech- confusable words - Report on industrial visit - project report - Making effective Power Point presentations - speaking about the future plans-expressing opinions-reading and guessing meanings of unknown words from the context – using appropriate verb forms

UNIT V
Modal auxiliaries – Presentation of problems and solutions – wh- questions- question tags- punctuation- hyponymy- listening and taking notes – study skills – preparing notes

TEXT / REFERENCE BOOKS:
1. Aeda Abidi & Ritu Chowday, “English For Engineers Made Easy”, Cengage India Learning Limited, New Delhi, 2010

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max Marks : 80
Exam Duration : 3 hrs.
Part A: 10 questions of 2 marks each – no choice 20 marks
Part B: 6 questions from the five units with internal choice, each carrying 10 marks 60 marks
UNIT I BASICS & STATICS OF PARTICLES

Introduction - Units and Dimensions - Laws of Mechanics - Vectors - Vectorial representation of forces and moments - Vector operations, Coplanar forces resolution and composition of forces - equilibrium of a particle - forces in space - equilibrium of a particle in space - equivalent systems of forces - principle of transmissibility - Single equivalent force.

UNIT II EQUILIBRIUM OF RIGID BODIES

Free body diagram - Types of supports and their reactions - requirements of stable equilibrium - Moments and Couples - Varignon's theorem - Equilibrium of Rigid bodies in two dimensions - Equilibrium of Rigid bodies in three dimensions

UNIT III PROPERTIES OF SURFACES AND SOLIDS

Determination of Areas - First moment of Area and the centroid - simple problems involving composite figures.

Second moment of plane area - Parallel axis theorems and perpendicular axis theorems - Polar moment of Inertia - Principal moments of Inertia of plane areas - Principle axes of inertia - relation to area moments of Inertia. Second moment of plane area of sections like C,I,T,Z etc. - Basic Concept of Mass moment of Inertia

UNIT IV FRICTION

Frictional Force - Laws of Coulomb friction - Cone of friction- Angle of repose- Simple contact friction - Screw - Wedge - Ladder - Rolling resistance - Belt friction.

UNIT V DYNAMICS OF PARTICLES


Translation and rotation of rigid bodies- General plane motion.

TEXT / REFERENCE BOOKS:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks : 80 Exam
Exam Duration : 3 hrs.

PART A : 2 Questions from each unit, each carrying 2 marks
PART B : 2 Questions from each unit with internal choice, each carrying 12 marks

80% Problems and 20% Theory Questions may be asked
UNIT I  THEORY OF EQUATIONS  

Relation between roots and Co-efficient of equations – Symmetry function of roots – Formation of equations – To increase or decrease the roots of a given equation by a given quantity – Reciprocal equations – Descartes rule of signs – Cardon’s method of solving cubic equations.

UNIT II  THREE DIMENSIONAL ANALYTICAL GEOMETRY  

Direction cosines and ratios – The equation of a plane – Equation to a straight line – Shortest distance between two skew lines – Coplanar lines – Sphere – Tangent line – Plane section of a sphere – Orthogonal spheres.

UNIT III  INTEGRAL CALCULUS  

Double integrals – Change of order of integration – Change of Variables from Cartesian to Polar coordinates – Area - using double integral - Triple integrals - Volume using Triple integrals.

UNIT IV  BETA AND GAMMA FUNCTIONS  

Properties of definite Integrals – Related definite Integrals – Reduction formulae for $e^{ax}$, $x^n \sin ax$, $x^n \cos ax$, $\sin^n x$, $\cos^n x$ and $\sin^m x \cos^n x$. Definitions of Beta and Gamma integrals – Relation between them – Properties – Evaluation of definite integrals in terms of Beta and Gamma function – Simple applications.

UNIT V  VECTOR CALCULUS  

Differentiation of a vector function – Gradient, divergence and curl – Directional derivative – Identities (without proof) - Irotational and Solenoidal fields, Vector Integration – Line, Surface and Volume Integrals, Integral theorems (without proof), Green's theorem (in the plane), Gauss divergence theorem and Stoke's theorem – Simple applications involving rectangles and cuboids.

TEXT / REFERENCE BOOKS:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks : 80  
Exam Duration : 3 hrs.

PART A : 2 Questions from each unit, each carrying 2 marks  
20 marks

PART B : 2 Questions from each unit with internal choice, each carrying 12 marks  
60 marks
UNIT I  FIBER OPTICS


UNIT II  ACOUSTICS OF BUILDINGS

Introduction – Musical sound & noise - Characteristics of musical sound: pitch, loudness, quality - Weber-Fechner law - Relation between pitch & frequency - Factors on which intensity & loudness depend - Decibel scale - Sound intensity level and sound pressure level - Decibel absorption - OWU - Sound absorption coefficient and its measurements - Reverberation time - Standard Reverberation time - Sabine's formula to determine the Reverberation time (Jaeger method) - Factors affecting the acoustics of a building and the remedies - Principles to be followed in the acoustical design of a good auditorium.

UNIT III  FUNDAMENTALS OF DIGITAL ELECTRONICS

Number systems - Binary, decimal, Hexadecimal and Octadecimal - Conversion from one number system to another - Binary addition - Subtraction - Subtraction by 1's & 2's complement - BCD-ASCII - Excess 3 code and gray code.

UNIT IV  NANO DEVICES


UNIT V  MEDICAL PHYSICS


REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80 Exam Duration: 3 hrs.
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
Out of 20 marks, maximum of 10% problems may be asked

PART B : 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
Out of 60 marks, maximum of 10% problems may be asked
‘Applications’ mentioned in the syllabus refer to the basic applications and not to any specific case
UNIT I FUELS


UNIT II LUBRICANTS AND ADHESIVES


UNIT III PHASE RULE


UNIT IV ALLOYS AND COMPOSITES


Composites: Definition, Constituents: Matrix Phase and Dispersed phase. Types of Composites: Metal matrix composites (MMC), Ceramic matrix composites (CMC), Polymer matrix composites (PMC), Fiber reinforced plastics (FRP), Cermets.

UNIT V INTRODUCTION TO NANOMATERIALS


TEXT / REFERENCE BOOKS:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks : 80 Exam Duration : 3 hrs.

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

PART B : 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I THE CLIMATE  
Factors that determine Climate - Components of climate - Site Climate - Characteristics of different climates - Climatic zones of India.
Orientation - Meaning, factors affecting orientation, orientation criteria for tropical climate.

UNIT II THERMAL SENSATION  

UNIT III BUILDING ENVELOPE  
General, Mandatory requirements - Fenestration - Opaque construction - building envelope sealing, Prescriptive requirements - Roofs - cool roofs - opaque walls - vertical fenestration - skylights.

UNIT IV INTRODUCTION TO VENTILATION AND LIGHTING  

UNIT V ENERGY EFFICIENT BUILDINGS AND TECHNOLOGIES  
Introduction and need for energy efficiency historic buildings. Renewable energy systems - solar passive cooling and heating of buildings, solar active thermal and photovoltaic systems, wind, biomass, biogas, building management system - Introduction to Green Buildings Concepts.

TEXT / REFERENCE BOOKS:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80 Exam Duration: 3 hrs.
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B : 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I CONCRETE
Ingredients - suitability requirements for aggregates - grades of concrete - mix proportioning and batching - workability - durability - methods of mixing, transporting, placing, compaction and curing. Quality control - Field Test - Laboratory Test.

UNIT II INTRODUCTION TO SPECIAL CONCRETE
Types of concrete - Reinforced cement concrete, light weight concrete, no fines concrete, high density concrete, fiber reinforced concrete, polymer concrete, High Strength Concrete, High Performance Concrete - properties and uses of special concretes-failure mechanisms and degradation processes of materials in R.C.C.

UNIT III GLASS AND ALUMINIUM
Manufacture flowchart in glass - Classification, properties - Glasses commonly used in construction industry. Aluminium- properties, aluminium extrusion and aluminium foil - uses of aluminium composite panels - Introduction to Anodisation process.

UNIT IV PLASTICS AND TILES IN CONSTRUCTION INDUSTRY
Introduction to plastics - Classification - uses. Tiles - Types of Tiles and applications - Clay Tiles, Vitrified, Mosaic, Granite, Marble and Glazed.

UNIT V WATER PROOFING AND DAMP PROOFING MATERIALS
Different types, properties and their uses. Terrace water proofing.

Paints, Enamels, Distempers, Plastic emulsions, Varnishes and Luminous painting - properties and uses.

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80
Exam Duration: 3 hrs.

PART A : 2 Questions from each unit, each carrying 2 marks
20 marks

PART B : 2 Questions from each unit with internal choice, each carrying 12 marks
60 marks

B.E. (CIVIL ENGINEERING) 15 REGULATIONS 2010
SCIX4001  BUILDING SERVICES LAB  

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MASONRY

1. Types of brick joints

PLUMBING

2. Water line pipe fittings and connections
3. Waste line pipe fittings and connections
4. Cast iron pipe works
5. Flush Tank - Basin - Indian Water Closet fittings

ELECTRICAL

6. Domestic Wiring
7. Staircase Wiring
8. 3- Phase Indicator
9. Making Switch Box & Cable laying joints

SCIX4002  COMPUTER AIDED ENGINEERING DRAWING LAB  

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List of Exercises using software capable of Drafting and Modeling

1. Creation of simple figures and general multi-line figures view of objects from the given pictorial views with Dimensioning
2. Drawing of a Title Block with necessary text and projection symbol.
3. Drawing of curves like Parabola, Spiral, Involute using B - spline or cubic spline.
4. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, and cone with dimensioning.
5. Drawing sectional views of prism, pyramid, cylinder, cone, etc,
6. Drawing isometric projection of simple objects.
7. Creation of 3-D models of simple Perspective Projection.
9. Drawing of a plan of residential building (Two bed rooms, kitchen, hall, etc.)
UNIT I LAPLACE TRANSFORM
Transforms of simple functions – properties of transforms – Transforms of derivatives and Integrals – Periodic functions – Inverse transforms – Convolution theorems – Initial and final value theorems

UNIT II APPLICATIONS OF LAPLACE TRANSFORM

UNIT III COMPLEX VARIABLES

UNIT IV COMPLEX INTEGRATION
Cauchy’s integral theorem – integral formula – Taylor’s and Laurent’s series (without proof) – Residues – Cauchy’s residue theorem – Contour integration and the circle and semi circular contours.

UNIT V THEORY OF SAMPLING AND TEST OF HYPOTHESIS

TEXT / REFERENCE BOOKS:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max Marks : 80
Exam Duration : 3 hrs.
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B : 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I INTRODUCTION
Stress and strain – Application to uniform and varying, Composite sections – Elastic constants, Stress – Strain diagram for brittle and ductile materials, Definition of creep, fatigue, Thermal stresses

UNIT II BENDING MOMENT AND SHEAR FORCE
Types of Beams, Supports and Loads – Concept and significance of shear force and bending moment – Shear force and Bending moment diagram for cantilever, simply supported and overhanging beams.

UNIT III BENDING AND SHEAR STRESS DISTRIBUTION, TORSION
Stresses in Beams – Simple bending theory – Composite Beams – Combined bending and Direct stress – Shear stress distribution for Rectangular and I section – Simple Torsion theory – Stresses and deformations in Solid and Hollow circular shafts

UNIT IV SLOPE AND DEFLECTION OF BEAMS
Double integration method – Macaulay’s method – Moment area method – Conjugate method for simply supported and cantilever beams, (only point loads & Uniformly distributed loads.)

UNIT V THIN CYLINDERS AND SPHERES, THICK CYLINDERS
Stresses and deformation in thin cylinders and spherical shells subjected to internal pressure, Thick cylinders – Hoop and radial stress variation, Lame’s equation, Compound cylinders – Shrink fit

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max Marks : 80 Exam Duration : 3 hrs.
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B : 100% Problem - 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I FLUID PROPERTIES

UNIT II FLUID STATICS
Pascal's and Hydrostatic Law – Pressure Measurement – Forces on plane and curved surfaces – Buoyancy – Metacentric height.

UNIT III FLUID KINEMATICS
Types of fluid flow – Velocity and Acceleration – Types of flow lines- Control Volume – Continuity equation in Cartesian co-ordinates -Velocity potential function and Stream function- Flow net

UNIT IV FLUID DYNAMICS
Euler’s and Bernoulli’s equations – Application of Bernoulli’s equation -Measurement of Discharge – Momentum principle – Free Liquid Jet.

UNIT V DIMENSIONAL ANALYSIS

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80
Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 20% Theory & 80% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I  HIGHWAY PLANNING AND CLASSIFICATION  
Introduction to Transportation systems – Highway development in India – Classification of Roads- Planning of roads – Highway alignment – Planning surveys – Construction aspects of Earth roads – Gravel Roads – Water Bound Macadam Roads – Bituminous Roads – Cement Concrete Roads

UNIT II  GEOMETRIC DESIGN ELEMENTS & PAVEMENT DESIGN  

UNIT III  HIGHWAY MATERIALS TESTING AND HIGHWAY DRAINAGE  

UNIT IV  WATERWAYS  
Introduction – Roles, advantages and limitations – Ports, Classification, Requirements – Harbour, Classification, Requirements – Docks, Classification – General terminology – Moles, Quays, Wharves, Jetties, Dolphins, Trestles, Fenders – Breakwaters and Classification

UNIT V  NAVIGATIONAL AIDS AND MODERN TRANSPORT SYSTEMS  

TEXT BOOKS: 

REFERENCES: 

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80                                      Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 80% Theory & 20% Problematic Questions may be asked 60 marks
                      2 Questions from each unit with internal choice, each carrying 12 marks
UNIT I FOUNDATIONS 
Soils and investigations – Bearing capacities of soils – Methods to determine the bearing capacity – Types of foundation – Excavations of foundations- Foundation concrete -Timbering to trenching.

UNIT II MASONRY 

UNIT III FLOOR AND ROOF CONSTRUCTION 
Floors, general principles, ground and basement floors, upper floors, types of floors, their selection -Types of floor finishes – Roofs – general principles – different types of flat roofs – their relative merits and usage – sloping roofs – different types and usage, shell roofs and domes – Other roof coverings – Galvanized sheets, Poly Carbonate, Asbestos, Mangalore Tiled.

UNIT IV STAIRS, DOORS AND WINDOWS 

UNIT V INSULATION 

TEXT BOOKS:

REFERENCES:
UNIT I INTRODUCTION AND CHAIN SURVEYING
10 hrs.

UNIT II COMPASS SURVEYING AND PLANE TABLE SURVEYING
10 hrs.


UNIT III LEVELLING AND APPLICATIONS
11 hrs.

UNIT IV THEODOLITE SURVEYING
9 hrs.
Theodolite – Vernier and Microptic – Description and uses – Temporary and Permanent adjustments of Vernier transit – Horizontal angles – Heights and Distances – Traversing – Closing error and distribution – Omitted measurements

UNIT V ENGINEERING SURVEYING
10 hrs.

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80 Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 50% Theory & 50% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I GENERAL GEOLOGY


UNIT II MINEROLOGY

Physical properties of Minerals – Crystallographic system – Study of following rock forming minerals- Quartz, Felspar, Piroxene, Amphibole, Mica, Calcite, Gypsum and Clay

UNIT III PETROLOGY


UNIT IV STRUCTURAL GEOLOGY

Civil Engineering Importance of Folds, Faults, Unconformity and Joints relevance to civil engineering –Prospect of ground water

UNIT V ENGINEERING APPLICATIONS IN GEOLOGY

Geological consideration in construction of Dam, Tunnel, Secured Landfill -Earthquake, causes and Distribution in India – Tsunami – Remote Sensing for Civil Engineering Applications.

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks
20 marks

PART B: 100% Theory Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks
60 marks
### Strength of Materials Lab

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<th>STRENGTH OF MATERIALS LAB</th>
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1. By conducting tension test, draw the stress-strain curve on mild steel, thin wire and twisted rod.
2. Compression Test on bricks and Concrete blocks.
3. Deflection Test – Verification of Maxwell theorem
4. Determination of hardness values of Steel, Copper and aluminum by using Brinell and Rockwell hardness testing machines.
5. Test on springs Under tension and compression.
7. Shear test on metal specimen by using U.T.M.
8. Hardness values of Steel, Copper and aluminum by Vicker’s hardness tester.

### Surveying Lab – I

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#### Chain Surveying

1. (a) Pacing (b) Ranging (c) Spreading and Folding of Chain (d) Chaining of a line
2. (a) Determination of Area by taking Perpendicular Offsets (b) Determination of Area by taking Oblique Offsets
3. Determination of Obstacle Length
4. Chain and Cross Staff Survey – Running a closed traverse around an existing building

#### Compass Surveying

5. Compass traverse – Plotting and Adjustments of Traverse
6. Compass Surveying – Distance between Two Inaccessible Points

#### Plane Table Surveying

7. (a) Radiation method of plane table survey (b) Intersection method of plane table survey
8. Plane Table traverse
9. Two Point Problem
10. Three Points Problem – Trial and error method

#### Leveling

11. Simple Leveling (Including an inverted staff reading)
12. Fly LEVELING
13. Check LEVELING
14. Longitudinal sectioning and Cross Sectioning
UNIT I PARTIAL DIFFERENTIAL EQUATION
10 hrs.

Formulation of equations by elimination of arbitrary constants and arbitrary functions-solutions by
equations-general, particular and complete integrals-Lagrange’s linear equation-standard type of first order
equation-second and higher order equations with constant coefficients-homogenous equations.

UNIT II FOURIER SERIES
10 hrs.

Euler’s formula-Dirichlet's conditions-convergence statement only-change of interval-odd and even functions-half
range series-RMS value-Parseval's formula-complex form of Fourier series-harmonic analysis.

UNIT III WAVE AND HEAT EQUATION
10 hrs.

One dimensional wave equation-Transverse vibration of finite elastic string with fixed ends-boundary and initial
value problems-Fourier series solution-Derivation of one dimensional heat equation-steady and unsteady state-boundary
and initial value problems-Fourier series solutions. Two dimensional heat equation-steady state heat flow in two
dimensions-Laplace equation in Cartesian coordinates - Fourier series solution.

UNIT IV FOURIER TRANSFORM
10 hrs.

The infinite Fourier transform-sine and cosine transform-Properties-Inversion theorem-Finite Fourier transform-sine
and cosine transform-Convolution theorem-Parseval’s identity.

UNIT V Z – TRANSFORM AND DIFFERENCE EQUATIONS
10 hrs.

equations – Solution of difference equations using Z – transforms.

TEXT / REFERENCE BOOKS:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max Marks : 80
Exam Duration : 3 hrs.
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B : 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I PRINCIPAL STRESSES AND THEORIES OF FAILURE  10 hrs.

Principal Stresses and Maximum Shear Stress- Analytical Method - Mohr’s Circle Method Theories of Failure – Rankine’s theory, St. Venant’s theory, Guest’s theory, Haigh’s theory and VonMises – Henky Theory – Comparison of failure theories.

UNIT II THEORY OF COLUMNS  10 hrs.


UNIT III ANALYSIS OF TRUSSES  10 hrs.


UNIT IV FIXED AND CONTINUOUS BEAMS  10 hrs.

Bending moment and Shear force diagram for fixed beam – Slope – Deflection method for fixed beam for point load and UDL – Advantages, Continuous beams – Theorem of three moments – Bending moment and shear force diagram.

UNIT V UNSYMMETRICAL BENDING AND SHEAR CENTRE  10 hrs.


TEXT BOOKS:

REFERENCES:
UNIT I BOUNDARY LAYER  
Theory – Boundary layer parameters – displacement, momentum and energy thickness – Von Karmann momentum integral equation – laminar and turbulent boundary layers – boundary layer separation

UNIT II FLOW THROUGH PIPES  
Reynold’s experiment – laminar and turbulent flows for circular pipes – Hagen Poissuillie’s equation – Darcy’s Weisbach equation – friction factor – minor and major losses – pipes in series and parallel – flow through reservoirs

UNIT III OPEN CHANNEL FLOW  

UNIT IV NON UNIFORM FLOW  

UNIT V PUMPS & TURBINES  

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80  
Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks  
20 marks
PART B: 20% Theory & 80% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks  
60 marks
UNIT I RAILWAY PLANNING  
Development of railways in India – Components of a permanent way and its functions – Rails, Sleepers, Ballast, Formation, Rail fittings and fastenings – Comparison of roadways and railways – Engineering surveys for Track alignment and GIS, GPS and RS applications – Track alignment considerations – Track construction & Track maintenance – Track drainage – Introduction to Modern Developments in Railways.

UNIT II GEOMETRIC ELEMENTS AND OPERATIONS  

UNIT III POINTS & CROSSINGS, SIGNALING & INTERLOCKING  
Types of Points / Switch – Stub, Split switch – Types of crossing, acute angle, Obtuse angle, Square – Design calculation of Turnout – Various types of Track junctions. Signaling and Interlocking – Different types of signals, their working and location – Control systems of signals – Track circuiting – Mechanical method of interlocking systems.

UNIT IV AIRPORT LAYOUT AND DESIGN  

UNIT V AIRPORT PLANNING AND AIR TRAFFIC CONTROL  
Landing aids – Air Traffic Control – Airfield marking and Lighting- Sign – Aircraft Parking system – Flight Planning and Operations – Design standards, planning and Design of Airport as per Indian condition.

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80  
Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks  
20 marks
PART B: **100% Theory Questions may be asked**  
2 Questions from each unit with internal choice, each carrying 12 marks  
60 marks
UNIT I INTRODUCTION

UNIT II BUILDING BYE – LAWS & REGULATIONS

UNIT III PRINCIPLES OF BUILDING PLANNING
Introduction – Selection of Site – Aspects of Selection of Site – Grouping – Circulation – Services – Practical Considerations – Flexibility of planning – Economic considerations – Requirements – Factors affecting various kinds of areas in building typologies

UNIT IV PLANNING OF RESIDENTIAL BUILDINGS
Introduction – Minimum Standards for various parts of the Buildings and requirements – Entrance, Drawing room, Living room, Bed room, Kitchen, Dining room, Store room, Toilet, Bathroom Staircase, Porch, Staircase – Categories in residential building types and plan

UNIT V DRAWING OF SIMPLE RESIDENTIAL BUILDINGS

TEXT BOOKS:

REFERENCES:
5. National Building Code, 2005
6. Development Control Rules, CMDA, 2010

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80
Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 100% Drawing Question may be asked
1 Question from Unit-V with internal choice, each carrying 60 marks 60 marks

B.E. (CIVIL ENGINEERING) 29 REGULATIONS 2010
UNIT I TACHEOMETRIC SURVEYING

Systems of tacheometry – Tangential, Stadia and substense methods, Stadia systems – Horizontal and inclined sights – Vertical and normal staff – Fixed and movable hair – Stadia constants - Analytic lens – Use of subtense bar

UNIT II CONTROL SURVEYING


UNIT III SURVEYING ADJUSTMENTS

Classification of errors – True and most probable value – Weighted observations – Method of equal shifts – Adjustment of simple triangulation networks – Principle of least square – Level nets – Normal equation – Correlates

UNIT IV HYDROGRAPHIC SURVEYING

Tides – MSL – Sounding and methods – Location of soundings and methods -Three point problem – Tides – Prediction of tides

FUNDAMENTALS OF FIELD ASTRONOMY

Celestial sphere – Astronomical terms and definitions – Motion of sun and stars - Latitude and longitude of a place – Celestial co-ordinate systems – Nautical almanac – Star Constellation – Field observations and calculations for azimuth and time.

UNIT V PHOTOGRAMMETRY


TEXT BOOKS:


REFERENCES:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

PART B: 50% Theory & 50% Problematic Questions may be asked 60 marks

2 Questions from each unit with internal choice, each carrying 12 marks
UNIT I MANAGEMENT FUNCTIONS & STRUCTURE


UNIT II MANAGEMENT OF ORGINASATION


UNIT III ORGANISATIONAL BEHAVIOUR


UNIT IV GROUP DYNAMICS


UNIT V PROFESSIONAL ETHICS


TEXT / REFERENCE BOOKS

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks : 80
Exam Duration : 3 hrs.
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B : 2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
FLUID MECHANICS
1. Determination of Friction Co-efficient using Pipe friction apparatus
2. Determination of Co-efficient of discharge of Venturimeter
3. Determination of Co-efficient of discharge of Orificemeter
4. Determination of Co-efficient of discharge of Notches
5. Determination of Metacentric Height of Ship model
6. Determination of Co-efficient of discharge of Orifice and Mouth piece – Constant head Method & Variable head Method.
7. Determination of Co-efficient of velocity of pilot tube

FLUID MACHINERY
1. Study of Centrifugal Pump.
2. Performance characteristics of Centrifugal Pump
3. Study of Reciprocating pump
4. Performance characteristics of Reciprocating pump
5. Performance characteristics of Multi stage centrifugal pump
6. Performance characteristics of gear pump
7. Performance characteristics of Jet pump
9. Study of Pelton Wheel Turbine
10. Performance characteristics of Pelton Wheel Turbine
11. Performance characteristics of Francis Turbine
12. Performance characteristics of Kaplan Turbine

SURVEYING LAB – II
1. Determination of horizontal angle – Reiteration
2. Determination of horizontal angle – Repetition
3. Measurement of vertical angles and determination of height of an object
4. Height and distances – Single plane method
5. Height and distances – Double plane method
6. Tacheometry – Constants of Tacheometer
7. Stadia Tachometry
8. Tangential Tachometry
9. Tacheometric contouring – Radial method
10. Setting out simple curve using offsets from long chord
11. Setting out simple curve using Single Theodolite method (Rankine’s Method)
12. Setting out simple curve using Double Theodolite method
13. Setting out of works – Foundation marking
14. Field exercise using Total station
**APPLIED NUMERICAL METHODS**

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**UNIT I CURVE FITTING AND RELATION BETWEEN OPERATORS**

- Curve Fitting
- Method of group averages
- Principle of least squares
- Method of moments
- Finite Differences
- Operators E & D
- Relationship between operators.

**UNIT II INTERPOLATION**

- Interpolation
- Newton’s method
- Lagrange’s method
- Numerical Differentiation and Integration
- Trapezoidal and Simpson’s Rule
- Finite Difference Equations.

**UNIT III ALGEBRAIC AND TRANSCENDENTAL EQUATIONS**

- Numerical solution of Algebraic and Transcendental Equations
- Regula Falsi method
- Newton Raphson method
- Graffe’s Root Squaring method
- Simultaneous linear algebraic equations
- Gauss Jordan method
- Crout’s method
- Gauss Seidel method
- Relaxation method.

**UNIT IV ORDINARY DIFFERENTIAL EQUATIONS**

- Numerical solution of Ordinary Differential Equations
- Taylor’s series
- Modified Euler’s method
- Runge Kutta method of fourth order
- Predictor-Corrector methods
- Milne’s method
- Adam’s Bashforth method.

**UNIT V PARTIAL DIFFERENTIAL EQUATIONS**

- Numerical solution to Partial Differential Equations
- Classification
- Elliptic equations
- Poisson’s equations
- Leibmann’s iteration procedure
- Parabolic equation
- Bender Schmidt Scheme
- Crank Nicholson’s Scheme
- Hyperbolic equations.

**TEXT / REFERENCE BOOKS:**


**UNIVERSITY EXAM QUESTION PAPER PATTERN**

- Max Marks : 80
- Exam Duration : 3 hrs.
- PART A : 2 Questions from each unit, each carrying 2 marks
- 20 marks
- PART B : 2 Questions from each unit with internal choice, each carrying 12 marks
- 60 marks

B.E. (CIVIL ENGINEERING) 33 REGULATIONS 2010
UNIT I INTRODUCTION


UNIT II MOVING LOADS AND INFLUENCE LINES

Effect of moving loads – Influence lines for Beams & Trusses, Shear force and Bending moment for Determinate beams – Load position – Absolute maximum Bending Moment.

UNIT III SLOPE DEFLECTION AND MOMENT DISTRIBUTION METHODS

Application of Slope deflection and Moment distribution methods to analysis of continuous beams with and without settlement – Rigid plane frames with and without sway.

UNIT IV ARCHES

Theoretical Arch – Eddy’s theorem analysis of two & three hinged arches – Moving loads on arches -Settlement and Temperature effect.

UNIT V CABLES AND SUSPENSION BRIDGES

General Cable theorem – Analysis of cables under Concentrated and Uniformly Distributed Loads – Shape and Stresses due to self weight – Anchor Cables – Temperature effect – Suspension bridges with three hinged and two hinged stiffening girders.

TEXT/REFERENCES BOOKS:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80  Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks  20 marks

PART B:  10% Theory & 90% Problematic Questions may be asked.
  2 Questions from each unit with internal choice, each carrying 12 marks  60 marks
UNIT I LIMIT STATE DESIGN OF RECTANGULAR & T-BEAMS


UNIT II SLABS


UNIT III CONTINUOUS BEAMS & SLABS

Limit State Design of Continuous beams and slabs using code coefficients – Design for Bond development length, Splicing Curtailment & Codal requirement – Analysis design with and without shear reinforcement as per IS – 456.

UNIT IV COLUMNS

Limit State Design of columns, Behaviour of Reinforced Concrete columns, Design of Axially loaded and Eccentrically loaded columns.

UNIT V FOOTINGS

Limit State Design of Footings – Design loads for Foundation design, Design of Isolated Square and Rectangular footings, Combined Rectangular footings.

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks
20 marks

Part B: 20% Theory & 80% Problematic Questions may be asked.
2 Questions from each unit with internal choice, each carrying 12 marks
60 marks
UNIT I SOIL PROPERTIES

Objectives and Values of Geotechnical Engineering – Physical properties of soil – Phase relations, Grain size distribution, Atterberg Limits, Soil description and classification for Engineering purposes, their significance, IS Classification and Textural classification.

UNIT II SOIL WATER AND WATER FLOW


UNIT III STRESS DISTRIBUTION


UNIT IV CONSOLIDATION


UNIT V SHEAR STRENGTH AND STABILITY


TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

PART B: 50% Theory & 50% Problematic Questions may be asked 60 marks

2 Questions from each unit with internal choice, each carrying 12 marks
UNIT I WATER AND ENVIRONMENT

Objectives of public water supply – Requirements of water supply – Need of protected water supply – Planning factors for public water supply – Types of demand and their contribution – Rate of consumption – Factors affecting the rate of consumption – Forecasting the population by different methods and its applications– Variation in demand pattern

UNIT II SOURCE & CONVEYANCE OF WATER


UNIT III QUALITY OF WATER


UNIT IV TREATMENT OF WATER


UNIT V DISTRIBUTION SYSTEM


TEXT BOOKS:
3. K.N. Duggal, Elements of Environmental Engineering, S.Chand & Co Ltd.,2002

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

PART B: 50% Theory & 50% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I CONCRETE MAKING MATERIALS


UNIT II PROPERTIES OF CONCRETE


UNIT III ADMIXTURES


UNIT IV CONCRETE TESTING

Tests of cement, Fine aggregate, Coarse aggregate and Quality control at batching plant and Quality control at site – Water-Fresh concrete testing – Hardened concrete testing – Durability testing – Maturity of concrete.

UNIT V SPECIAL CONCRETE


TEXT BOOKS:


REFERENCES:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

Part B: 80% Theory & 20% Problematic Questions may be asked

2 Questions from each unit with internal choice, each carrying 12 marks 60 marks

B.E. (CIVIL ENGINEERING) 38 REGULATIONS 2010
UNIT I INTRODUCTION AND LINEAR PROGRAMMING
10 hrs.
Operations Research (OR) - Nature - Characteristics - Phases - Role of OR in Decision making - Outline of OR Models
Linear Programming - Formulation of L.P. problems - Solution by graphical method, simplex method, and big M methods
- Applications of O.R. in production management

UNIT II TRANSPORTATION AND ASSIGNMENT MODEL
10 hrs.
Transportation problem - Initial feasible solution - Northwest corner method, Least Cost method, Vogel's approximation method - Test for optimality-MODI method
Assignment problems - Hungarian assignment models - Travelling salesman problems

UNIT III RESOURCE SCHEDULING AND NETWORK ANALYSIS
10 hrs.
Problem of Sequencing - Problem with N jobs and 2 machines, 3 jobs and M machines. Project Management
- Basic concepts - Case studies - Network construction and scheduling, Program evaluation and resource leveling by network techniques, time - Cost trade off.

UNIT IV INVENTORY CONTROL AND SIMULATION
10 hrs.
Inventory Control - Various Types of inventory models - deterministic inventory models - Production model,
Purchase model - with and without shortage - EOQ - Buffer stock - Shortage quantity, Probabilistic inventory models
- Quantity Discount and Price Breaks Simulation - Use, advantages & limitations, Monte Carlo simulation, application
to queuing, inventory & other problems

UNIT V QUEUEING THEORY, GAME THEORY AND REPLACEMENT MODELS
10 hrs.
Queueing theory - Poisson arrivals and exponential service times, Single channel models only. Game theory-Pay off matrix, competitive games with pure strategy, minimax criterion, principles of dominance & mixed strategies
Replacement policy for items whose maintenance cost increases with time - Consideration of money value - Replacement policy - Individual, Group replacement of items that fail completely

TEXT BOOK:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max Marks : 80
Exam Duration : 3 hrs.

PART A : 2 Questions from each unit, each carrying 2 marks
20 marks

PART B : 2 Questions from each unit with internal choice, each carrying 12 marks
60 marks

B.E. (CIVIL ENGINEERING) 39 REGULATIONS 2010
SCIX4007 | CONCRETE TECHNOLOGY LAB

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TESTS ON CEMENT
1. Soundness
2. Consistency
3. Initial & Final Setting time
4. Compressive Strength of cement

TESTS ON FINE AGGREGATE
1. Fineness Modulus
2. Specific Gravity / Void Ratio
3. Bulking of Sand

TESTS ON COARSE AGGREGATE
1. Fineness Modulus
2. Crushing Value
3. Impact Value
4. Specific Gravity & Water Absorption

TESTS ON CONCRETE
1. Mix Design
2. Slump
3. Compaction Factor
4. Compressive strength of concrete

SCIX4008 | HIGHWAY LAB

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TESTS ON BITUMEN
1. Penetration Test on Bitumen
2. Ductility test on bitumen
3. Softening point test on bitumen / tar
4. Flash and fire point test on bitumen – tar bitumen
5. Specific gravity test
6. Viscosity test on tar
7. Marshall Stability Test for bitumen

TESTS ON COARSE AGGREGATES
1. Shape test
2. Los Angeles Abrasion test

TEST ON SUBGRADE SOIL
1. California Bearing Ratio Test
UNIT I CHARACTERISTICS OF FLEXIBILITY AND STIFFNESS MATRICES 10 hrs.

UNIT II FLEXIBILITY METHOD 10 hrs.
Formulation of Structure – Flexibility matrix, Determination of Displacements – Application to Determinate and Indeterminate trusses, beams, frames – Effect of Temperature, lack of fit.

UNIT III STIFFNESS METHOD 10 hrs.
Forces not acting at co-ordinates – Formulation of Structure Stiffness matrix – Comparison of Flexibility and Stiffness method – Determination of Displacements – Application to determinate and indeterminate trusses, beams, frames – Effect of Temperature, lack of fit – Static Condensation Technique. Use of Analysis software for application to the analysis of plane trusses and frames.

UNIT IV PLASTIC ANALYSIS OF STRUCTURES 10 hrs.

UNIT V SPACE STRUCTURES 10 hrs.
Introduction to analysis of space trusses using method of tension coefficients – Introduction to FEM.

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80
Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 10% Theory & 90% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I CIRCULAR AND FLAT SLABS
10 hrs.
Limit state design of circular slabs – Simply supported and Fixed end conditions with Uniformly Distributed Loads
– Limit state design of Flat slabs.

UNIT II RETAINING WALLS
10 hrs.
Limit state design of Retaining walls – Design of Cantilever and Counterfort types.

UNIT III WATER TANKS
10 hrs.

UNIT IV BUNKERS AND SILOS
10 hrs.
Introduction to Limit state design of Bunkers and Silos – Rectangular and Circular types.

UNIT V STAIRCASES
10 hrs.
Limit state design of Staircases – Design of dog legged and open newel staircase.

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

PART B: 5% Theory & 95% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
# SCIX1024 FOUNDATION ENGINEERING

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<td>UNIT II BEARING CAPACITY</td>
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<td>UNIT III SETTLEMENT</td>
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<td>UNIT IV PILES</td>
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<td>UNIT V RETAINING WALLS</td>
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## TEXT BOOKS:


## REFERENCES:


## UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80

Exam Duration: 3 Hours

**PART A:** 2 Questions from each unit, each carrying 2 marks

- 20 marks

**PART B:** 60% Theory & 40% Problematic Questions may be asked.

- 2 Questions from each unit with internal choice, each carrying 12 marks

- 60 marks
UNIT I INTRODUCTION
Material properties of steel – Hot Rolled structural steel sections and their properties – General design requirements – Limit state design concepts – Loads on structures – Local buckling and classification of sections.

UNIT II CONNECTIONS

UNIT III DESIGN OF TENSION MEMBERS

UNIT IV DESIGN OF COMPRESSION MEMBERS

UNIT V DESIGN OF MEMBERS SUBJECTED TO BENDING

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80

PART A: 2 Questions from each unit, each carrying 2 marks

PART B: 80% Theory & 20% Problematic Questions may be asked.
2 Questions from each unit with internal choice, each carrying 12 marks

Exam Duration: 3 Hours

20 marks
60 marks

B.E. (CIVIL ENGINEERING) 44
REGULATIONS 2010
UNIT I SEWERAGE SYSTEM


UNIT II LAYOUT OF SEWERAGE SYSTEM

Shapes and materials of sewer – Laying, jointing and testing of sewers – Sewer appurtenances, Principles governing the design for drainage in buildings – Plumbing systems for drainage – Layout of house Drainage.

UNIT III CHARACTERISTICS OF SEWAGE


UNIT IV TREATMENT OF SEWAGE

Objectives – Design and layout of Screening, grit chambers, skimming tanks, grease traps – Sedimentation tank (rectangular and circular sedimentation tanks) Septic tank – Advances in sewage treatment: Theory on UASB and Activated Sludge Process

UNIT V DISPOSAL OF SEWAGE


TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80  Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks  20 marks

PART B: 50% Theory & 50% Problematic Questions may be asked

2 Questions from each unit with internal choice, each carrying 12 marks  60 marks
1. Moisture content determination
2. Specific gravity of soil
3. Sieve analysis for Coarse-grained soil
4. Hydrometer analysis for Fine-grained soil
5. Consistency limits and Indices
6. Standard Proctor Compaction test
7. Field density test – By Sand Replacement method & Core Cutter method
8. Permeability tests – Constant head and Variable head test
9. Unconfined Compression test for Cohesive soil
10. Direct Shear test on sand
11. Triaxial Compression test for Cohesive soil
12. Consolidation test

1. Determination of pH.
2. Determination of Acidity.
3. Determination of Alkalinity
4. Determination of Turbidity (NTU).
5. Determination of Optimum dosage of Coagulant (Jar Test).
7. Determination of Total Dissolved Solids.
8. Determination of Total Solids
10. Determination of Chlorides (Mohr’s method).
11. Determination of Residual Chlorine.
13. Determination of Biochemical Oxygen Demand (BOD5).
15. Determination of Total Organic Carbon (TOC)

List of drawings using Auto CAD software
1. Section of Arches
2. Section of load bearing wall from parapet to foundation partly showing all the details across the section (single storey)
3. Section of Spread Footing Foundation
4. Elevation of door partly panelled & Partly glazed
5. Section of Lean – To – Roof
6. Plan, Section and Elevation of Canteen Building
7. Plan of single bed roomed R.C.C Roof
8. Plan of single bed roomed R.C.C Curved roof
9. To fix the drawing in the standard size of the paper
10. Plotting drawing
UNIT I ESTIMATION OF BUILDING  
Introduction, Types of estimate – Methods of measurement – Units of measurement for various item of work – Methods of estimation, Calculation of quantities of earth work excavation, brickwork, PCC, RCC, Plastering, white washing, colour washing and painting/varnishing for shops and residential building with flat roof. Steel requirement and Bar bending schedule

UNIT II ESTIMATE OF OTHER STRUCTURES  
Estimating of septic tank, soak pit – Estimation of roads works, Estimation of culverts – Specifications – Purpose and basic principles of general and detailed specifications of various item of work. Use of various software for estimating

UNIT III COSTING  

UNIT IV TENDERS AND CONTRACTS  

UNIT V VALUATION  
Valuation – Purpose, Common terms used in valuation – Valuation of building using different methods, Fixation of rent for a building. Valuation of land – Depreciation, Escalation, Mortage, lease – Valuation of residential building with case study.

TEXT BOOKS:

REFERENCES:
3. PWD Data Book

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80  Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks  20 marks

PART B: 70% Theory & 30% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks  60 marks
UNIT I R.C.C

Detailed Design and Drawing of the following Reinforced Concrete Structures

1. Typical Building Floors consisting of Slabs and Beams
2. Isolated and Combined footing
3. Cantilever and Counterfort retaining walls
4. Rectangular & Circular Overhead water tanks

UNIT II STEEL

Detailed design and drawing of the following steel structures

1. Rectangular and circular overhead steel tank
2. Design of steel chimneys
3. Gantry Girder
4. Steel roof truss

TEXT BOOKS:


REFERENCES:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 Hours

PART A : 5 Questions from each unit, each carrying 2 marks 20 marks

PART B : 100% Design & Drawing question may be asked
2 Questions from each unit with internal choice, each carrying 30 marks 60 marks
UNIT I INTRODUCTION – THEORY AND BEHAVIOUR 10 hrs.

UNIT II DESIGN FOR FLEXURE 10 hrs.

UNIT III DEFLECTION 10 hrs.
Short term deflection of uncracked members – Long term deflection – Deflection due to creep – Code requirements of limit state deflection.

UNIT IV TRANSFER OF PRESTRESS 10 hrs.
Anchorage Zone – Stresses in post tensioned members – Calculation of bearing stress and bursting tensile forces & reinforcement in anchorage zones based on IS : 1343 method.

UNIT V INDETERMINATE STRUCTURES 10 hrs.
Methods of achieving continuity – Assumptions in Elastic analysis – Continuous beams – Linear transformation – Concordant cables.

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80 Exam Duration: 3 Hours
PART A: 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 15% Theory & 85% Problematic Questions may be asked 60 marks
2 Questions from each unit with internal choice, each carrying 12 marks
UNIT I CONSTRUCTION PROJECT MANAGEMENT 10 hrs.
Introduction – Project Life Cycle – Major Types of construction – Selection of professional services – Construction contractors – Financing of constructed facilities – Legal & Regulatory requirements – Role of project managers

UNIT II PROJECT PLANNING & ORGANIZATION 10 hrs.
Development of project plan, objective and conception– Programming – Scheduling – Project Organization – Project budget fund flow statement – Controlling system

UNIT III LABOUR, MATERIAL & EQUIPMENT UTILIZATION 10 hrs.

UNIT IV CONTRACTS 10 hrs.

UNIT V NETWORK ANALYSIS 10 hrs.
Introduction – Basic concepts of network analysis – CPM and PERT – Use of CPM & PERT Techniques – Problems, and prospects and applications of CPM & PERT – Introduction to software applications in project Management

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80  Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
Part B: 80% Theory & 20% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks

B.E. (CIVIL ENGINEERING) 50 REGULATIONS 2010
UNIT I INTRODUCTION


UNIT II SURFACE WATER HYDROLOGY


UNIT III GROUND WATER HYDROLOGY

Ground water – Types of aquifers – Rain water harvesting storage co-efficient – Co-efficient of transmissibility – Steady radial flow into a well located in an unconfined and confined aquifers, Measurement of yield – Pumping test – Recuperation test – Dupit equilibrium formula – Tube wells and Open wells – Yield from an open well.

UNIT IV WATER RESOURCE NEEDS

Numerical analysis of Consumptive and Non – consumptive water use – Quantification of water requirements for irrigation, drinking and navigation – Concept of basin as a unit for development – Water budget and development plan – Watershed Management.

UNIT V RESERVOIR PLANNING AND MANAGEMENT


TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

PART B: 80% Theory & 20% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
AutoCADD

Introduction to AutoCADD Commands

Exercises:
1. Foundation Reinforcement Detailing
2. Pile Foundation Reinforcement Detailing
3. Pile Cap Reinforcement Detailing
4. Longitudinal Section of RCC Beam Reinforcement Detailing
5. Slab Reinforcement Detailing
6. Staircase Reinforcement Detailing

STAAD.Pro

Introduction to STAAD.Pro
STAAD – Pre creation of input files by using the Text Editor and Graphical input Generator
STAAD – Post Graphical Post processing
Viewing and Printing the output files

Exercises:
1. Analysis and Design of Continuous beam with fixed at both ends
2. Analysis and Design of Continuous beam with simply supported ends
3. Analysis and Design of Continuous beam with over hangings
4. Analysis and Design of Propped cantilever beam with different materials
5. Analysis and Design of Continuous beam with member moment
6. Analysis and Design of Plane frames
   (a) Analysis and Design of Portal Frame type I
   (b) Analysis and Design of Portal Frame type II
   (c) Analysis and Design of Portal Frame type III
   (d) Analysis and Design of Portal Frame type IV
   (e) Analysis and Design of Portal Frame type V
7. Analysis and Design of trusses

The objective of the project work is to make use of the knowledge gained by the student at various stages of the degree course. Students, will also be permitted to undertake industrial/consultancy project Work, outside the department, in industries/Research labs.

There shall be three assessments during the semester by a review committee. The student shall make three presentations on the progress made before the committee at various stages of the Project work. The Head of the Department shall constitute the review committee for each branch of study. The total marks obtained in the three reviews, shall be taken in to account. There will be a viva-voce examination at the end of the Project work, conducted by one internal examiner and one external examiner. The total marks secured will be the sum of marks secured in the Project reviews and Viva Voce Examination.

Each student is required to submit a Project report on the project assigned to him by the department. The report should be based on the information available in the literature or data obtained by the student by way of experiments conducted in the laboratory/industry.
UNIT I QUALITY CONTROL

Quality Assurance for Concrete construction – As built concrete properties – strength, permeability, thermal properties and cracking – Effects due to climate, temperature, chemicals, water and erosion – Design and construction errors.

UNIT II CORROSION

Corrosion mechanism – Diagnosis – Causes and effects – Cover thickness and cracking, measurements for corrosion – Methods of Corrosion protection, Corrosion inhibitors, Corrosion resistant steels, Coatings, Cathodic protection.

UNIT III MAINTENANCE


UNIT IV SPECIAL CONCRETES


UNIT V MISCELLANEOUS TOPICS


TEXT/REFERENCE BOOKS:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 Hours

PART A: 2 Questions from each unit, each carrying 2 marks 20 marks

PART B: 100% Theory Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I LOW COST HOUSING

UNIT II FOUNDATION SYSTEM

UNIT III PRESTRESSING SYSTEMS

UNIT IV CONSTRUCTION EQUIPMENT PLANNING

UNIT V BRIDGE LAUNCHING TECHNIQUES
Introduction – Temporary and Enabling structures – Setting out of Bridges – Girder Erection – Balanced Cantilever Segmental construction – Cable Stayed Bridges – Fixing of Bearings – Case Study.

TEXT BOOKS:
2. Chudley R., “Construction Technology”, [Vol. 3 and 4], ELBS Publisher, 2006

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80
Exam Duration: 3 Hours
PART A: 2 Questions from each unit, each carrying 2 marks
20 marks
PART B: 100% Theory Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks
60 marks

B.E. (CIVIL ENGINEERING) 54
REGULATIONS 2010
UNIT I INTRODUCTION

UNIT II SHORT SPAN BRIDGES
Load distribution theories – Analysis and Design of Slab Culverts – Tee beam and Slab bridges.

UNIT III DESIGN OF PLATE GIRDER BRIDGES
General Standards for Railway Bridges – Design of Welded Plate Girder Bridges.

UNIT IV DESIGN OF BEARINGS
Importance of Bearings – Bearings for Slab Bridge – Bearings for Girder Bridge – Expansion Bearing – Fixed Bearing and Elastomeric Bearing.

UNIT V BRIDGE FOUNDATION

TEXT/REFERENCE BOOKS:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80 Exam Duration: 3 Hours
PART A: 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 20% Theory & 80% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I PLANNING, SITE EQUIPMENT AND PLANT FOR FRAMEWORK  
10 hrs.

UNIT II FORM MATERIALS AND PRESSURES ON FORMWORK  
10 hrs.
Design considerations – Live loads and Wind pressure – Concrete pressure on form work- Concrete density – Height of discharge -Temperature -Rate of Placing – Consistency of concrete – Vibration – Hydrostatic pressure and pressure distribution. Beam forms – Slab forms – Column forms -Wall forms – Allowable stresses – Check for deflection, bending and lateral stability – Examples.

UNIT III SHORES AND FORM DESIGN  
10 hrs.

UNIT IV FORM WORK FOR BUILDINGS AND FAILURES  
10 hrs.

UNIT V TUNNEL FORMS, SLIP FORMS AND SAFETY PRACTICES FOR SCAFFOLDS  
10 hrs.

TEXT BOOKS:

REFERENCES:
1. “Guide for Concrete Formwork”, American Concrete Institute, Box No. 9150, Michigan 48219

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80  
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks  
20 marks

Part B: 95 % Theory & 5% Problematic Questions may be asked  
2 Questions from each unit with internal choice, each carrying 12 marks  
60 marks
UNIT I CONSTRUCTION AND FORM  
Structure and Form Equilibrium under simple tension or compression- the catenary and the arch-the simply supported beam- the domical shell. Structural elements: Beams and slabs Arches and catenaries; vaults, domes and curved membranes; Trusses, Portal frames and space frames.

UNIT II STRUCTURE AND ARCHITECTURE  
Relation between structure and architecture- Geometry of form and structural function- Aesthetic theories of the expression of structural function in architectural form.

UNIT III STRUCTURAL SYSTEMS  
Structural Systems: single and double layer grids; braced domes, ribbed domes, plate type domes, Network domes, Lamella domes, Geodesic domes, Grid domes. Braced and folded structures.

UNIT IV SPACE FRAMES AND CABLE STRUCTURES  
Space frames: Folded plates, shells, cyclonical shells, Hyperbolic paraboloids, free forms.

Cable structures: Simply curved suspended roofs, combination of cables and struts.

UNIT V CURTAIN WALLS  
Curtain Walls: Types of Curtain Walls and their Components Structural problems, construction and erection.

REFERENCES:

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN
Max. Marks: 80  
Part A: 2 questions from each unit, each carrying 2 marks.  
Part B: 2 question from each unit with an internal choice, each carrying 12 marks.  
Exam Duration: 3 hrs.  
60 marks
UNIT I INTRODUCTION  

UNIT II TRAFFIC SURVEYS  

UNIT III TRAFFIC CONTROL MEASURES  

UNIT IV DESIGN OF INTERSECTIONS  

UNIT V TRAFFIC MANAGEMENT  
Scope of Traffic Management Measures – Traffic System Management (TSM) and Travel Demand Management (TDM) – Restrictions of turning movement – One way streets – Tidal flows – Cycle tracks and Exclusive bus lanes – Introduction to Intelligence Transport System (ITS), RTS, BRTS, MRTS.

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80  
Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 70 % Theory & 30% Problematic Questions may be asked  
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I INTRODUCTION

UNIT II FINANCING

UNIT III COST ESTIMATES AND ROAD PRICING
Economic of Transport operation – Types of Cost Estimates – Size and capacity – Utilization – Road pricing breakeven analysis

UNIT IV ECONOMIC ANALYSIS

UNIT V TRANSPORT COORDINATION
Transport Coordination policies – Objectives and method to achieve coordination among different modes and between private and public undertakings.

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

PART B: 80% Theory & 20% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I PRINCIPLES OF PAVEMENT DESIGN

UNIT II FLEXIBLE PAVEMENT DESIGN

UNIT III RIGID PAVEMENT DESIGN
Stress in Concrete Pavements – IRC Method – Design of Steel Reinforced Concrete Pavement – Design of Different Joints in Concrete Pavements and their Function – Construction of Concrete Pavements and their Maintenance

UNIT IV PAVEMENT EVALUATION AND STRENGTHENING

UNIT V HIGHWAY MAINTENANCE
Maintenance of Bituminous Surface Concrete Roads and Low Cost Roads – Maintenance of Shoulders and Drainage System – Maintenance of Bridges and Road Structures

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80
Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 60 % Theory & 40% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I INTRODUCTION

10 hrs.


UNIT II ORGANIZATION PLANNING

10 hrs.


UNIT III FINANCING AND BUDGETING

10 hrs.

Methods of Financing – Budgeting and Recounting – Fare Structures – Replacement Programs – Fare Collected System – Revenue Leakage and Prevention – Incentives – Public Relations

UNIT IV ROUTING AND ACCIDENT STUDY

10 hrs.

Route Surveys and Planning – Preparation of Schedules and Duty Roasters – Travel Time Accidents Studies

UNIT V ORGANIZATIONAL OPERATION

10 hrs.


TEXT/REFERENCE BOOKS:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80

Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

PART B: 80 % Theory & 20% Problematic Questions may be asked

2 Questions from each unit with internal choice, each carrying 12 marks 60 mark
UNIT I INTRODUCTION

Definition of Basic Terms – House, Home, Household, Apartments – Objectives of National Housing Policies, Principle of Sustainable Housing, Housing Laws at State level, Local bodies – Bye – laws at Urban and Rural Level and Development Control Regulations, Institutions for Housing at National, State and Local levels

UNIT II HOUSING PROGRAMMES

Basic Concepts – Contents and Standards for Housing Programmes – Sites and Services, Neighbourhoods, Open Development Plots, Apartments, Rental Housing, Co-operative Housing, Slum Housing Programme, Role of Public, Private and Non-Government Organizations.

UNIT III PLANNING AND DESIGN OF HOUSING PROJECTS

Formulation of Housing Projects – Site Analysis, Layout Design, Design of Housing Units – Intelligent Housing – BMS.

UNIT IV CONSTRUCTION TECHNIQUES AND COST-EFFECTIVE MATERIALS

New Construction Techniques – Cost Effective Modern Construction Materials, Building Centers – Concept, Functions and Performance Evaluation

UNIT V HOUSING FINANCE AND PROJECT APPRAISAL

Appraisal of Housing Projects – Housing Finance, Cost Recovery – Cash Flow Analysis, Subsidy and Cross Subsidy, Pricing of Housing Units, Rents, Recovery Pattern

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

PART B: 100% Theory Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 mark
UNIT I INTRODUCTION

10 hrs.


UNIT II GREEN BUILDING SYSTEMS

10 hrs.


UNIT III GREEN BUILDING IMPLEMENTATION

10 hrs.


UNIT IV GREEN BUILDING ASSESSMENT

10 hrs.


UNIT V ECONOMICS OF GREEN BUILDINGS

10 hrs.


TEXT BOOKS:


REFERENCES:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80

Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks

20 marks

PART B: 100% Theory Questions may be asked

2 Questions from each unit with internal choice, each carrying 12 marks

60 marks

B.E. (CIVIL ENGINEERING) REGULATIONS 2010
UNIT I INTRODUCTION
Ships and their role in International trade – International trade and Port – Types of Ports and features – Port development – Port management

UNIT II PLANNING AND ITS OPERATION
Port function – Planning and operations – Agencies in ports – Activities Port Charges – Port Security, Safety Regulations – Repairs and Maintenance – Dredging

UNIT III GOODS OPERATIONS
Types and Salient features of Sea – Borne Cargo – Cargo Handling in Ports – Interface with Inland Transport – Customs operation and Documentation procedure

UNIT IV SAFETY AND STANDARDS

UNIT V FINANCIAL MANAGEMENT AT PORT

TEXT/REFERENCE BOOKS:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80 Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 95 % Theory Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks

B.E. (CIVIL ENGINEERING) 64 REGULATIONS 2010
UNIT I EMR INTERACTION WITH ATMOSPHERE & EARTH MATERIALS  
12 hrs.


UNIT II PLATFORMS & SENSORS  
10 hrs.

Types of platforms – Orbit types, Sunsynchronous and Geosynchronous – Passive and Active sensors – Resolution concept – Pay load description of important Earth Resources and Types of Meteorological satellites – Airborne and Space borne TIR and Microwave sensors.

UNIT III IMAGE INTERPRETATION & ANALYSIS  
10 hrs.


UNIT IV GEOGRAPHIC INFORMATION SYSTEMS  
10 hrs.


UNIT V APPLICATIONS OF REMOTE SENSING & GIS  
8 hrs.


TEXT BOOKS:

REFERENCES:
UNIT I IRRIGATION PRINCIPLES  
10 hrs.


UNIT II CROP WATER REQUIREMENTS  
10 hrs.


UNIT III IRRIGATION SYSTEM COMPONENTS  
8 hrs.

Components of irrigation network – Canal regulators – Canal drop – Canal cross drainage works, Canal outlets, – Functions of the above components – Canal lining – Concepts of Kennedy's and Lacey's formulae.

UNIT IV DIVERSION HEADWORK'S  
12 hrs.


UNIT V IRRIGATION WATER MANAGEMENT  
10 hrs.


TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80
Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

PART B: 80% Theory & 20% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I HYDROGEOLOGICAL PARAMETERS


UNIT II EVALUATION OF AQUIFER PROPERTIES

Darcy’s equation- Governing equation of ground water flow – Steady and Unsteady flow equations for confined and unconfined aquifer- water table aquifer- Dupit Forchheimer assumption – One dimensional flow – Well hydraulics – Hydrogeological boundaries – Concept of image- Image well – Well theory – Interference of wells – Partial penetration of well

UNIT III WELL HYDRAULICS


UNIT IV GROUND WATER EXPLORATION


UNIT V GROUNDWATER CONSERVATION


TEXT BOOK/REFERENCE BOOKS:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80 Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 80% Theory & 20% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I INTRODUCTION

Need for solid waste management – Social and economic aspects – Effects of improper disposal of solid waste – Green House Gases – Global Warming – Climate change, Public health effects, Public awareness; Role of NGOs; Salient features of Indian legislations on management. Sources and Types of solid waste (Degradable, Non-Degradable & e-waste) – Quantity – Factors affecting generation of solid waste; Characteristics – Methods of sampling and characterization.

UNIT II ON-SITE STORAGE & PROCESSING


UNIT III COLLECTION AND TRANSFER

Methods of Collection – Types of vehicles – Manpower requirement – Collection routes – Transfer stations – Selection of location, operation and maintenance – Transportation Procedures – Options under Indian conditions.

UNIT IV OFF-SITE PROCESSING


UNIT V DISPOSAL METHODS

Open dumping – Ocean disposal with Treatment – Classification, types and methods – Site selection for disposal – Design and operation of biomedical waste landfill, Design of Secured landfills, Design of Leachate collection and treatment methods

TEXT BOOKS:


REFERENCES:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80

Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

Part B: 90% Theory & 10% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I ENERGY SCENARIO

Energy scenario resources principles and imperatives of energy conservation – Total energy systems – Advantages and limitations application

UNIT II ENERGY AUDIT

Energy audit- purpose, Methodology with respect to construction Industry – Energy conservation in construction and buildings – Green Building Concept

UNIT III ENVIRONMENTAL MANAGEMENT

Environmental management – Global and National Environmental issues -Environmental strategies for developing environmental awareness and protection.

UNIT IV LEGAL ASPECTS

Legal aspect – National and International standards for environment quality. MINAS, BIS – Rational for Environmental legislation – Environmental audit

UNIT V ENVIRONMENTAL IMPACT ASSESSMENT

EIA of projects – elements of EIA- FIA – methodologies

TEXT BOOKS:


REFERENCE:


UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80

Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

Part B: 100% Theory Questions may be asked.

2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I INTRODUCTION

UNIT II AIR POLLUTION METROLOGY

UNIT III AIR POLLUTION CONTROL TECHNOLOGIES

UNIT IV AIR QUALITY MANAGEMENT
Air quality standards – Air quality monitoring – Air Pollution indices – Air Pollution Control efforts – Zoning – Town Planning – Regulation for New Industries, Legislation and Enforcement

UNIT V NOISE POLLUTION

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80  Exam Duration: 3 Hours
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 100% Theory Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I INTRODUCTION

UNIT II SOLAR ENERGY APPLICATIONS


UNIT III WIND, WAVE AND GEO – ENERGY
Energy from the wind: Types of wind mills – Calculation on electric power generation – General theory and working aspects of standard Windmills and applications – Calculation on electric power generation – Energy from Tides and Waves: Working principles of various Tidal plants and Ocean Thermal Energy Conversion (OTEC) plants – Calculation on electric power generation – Power from geothermal energy: Types and principles of working of Geothermal Power Plants – Calculation on electric power generation

UNIT IV BIOENERGY

UNIT V DIRECT ENERGY CONVERSION

TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80
Exam Duration: 3 hrs.
PART A : 2 Questions from each unit, each carrying 2 marks 20 marks
PART B: 100% Theory Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I INTRODUCTION

Types of organizations – Inspection, control and enforcement – Quality Management Systems and method -Responsibilities and authorities In quality assurances and quality Control – Architects, engineers, contractors, and special consultants, Quality circle.

UNIT II QUALITY POLICY


UNIT III QUALITY ASSURANCE AND QUALITY 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.

UNIT IV SAFETY AND FAILURE ASPECT IN CONSTRUCTION

Critical, major failure aspects and failure mode analysis – Stability methods and tools, optimum design -Reliability testing- Reliability coefficient and reliability prediction – Selection of new materials – Influence of drawings detailing, specification, and standardization – Bid preparation – Reliability Based Design.

UNIT V SAFETY AND VALUE ENGINEERING IN CONSTRUCTION


TEXT BOOKS:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max. Marks: 80  Exam Duration: 3 Hours

PART A : 2 Questions from each unit, each carrying 2 marks 20 marks

Part B: 85% Theory & 15% Problematic Questions may be asked
2 Questions from each unit with internal choice, each carrying 12 marks 60 marks
UNIT I  STEEL STRUCTURE  
Standard structural steel - thermal properties - Fireproofing

Long span structures using steel - Steel Roofing namely Cable suspended roof, Hyperbolic paraboloid roof, Catenary, Pneumatic & Membrane roof - Vertical, Horizontal & Hexagonal joints

UNIT II  COMPOSITE CONSTRUCTION USING STRUCTURAL STEEL  
Concept of Composite materials - structural engineering & Material properties - Flitch Beam - Light weight construction - Other composite construction materials

UNIT III  DESIGN & CONSTRUCTION OF STEEL BUILDINGS  
Steel buildings design - manufacture and assemble steel framed buildings - factories - multi-storey buildings and car parks - commercial buildings - Industrial and agricultural buildings - Bridges and multi-storey steel framed structures - Case Studies

UNIT IV  APPLICATIONS & INNOVATIVE TECHNOLOGIES  
General application- Structural Elements - Innovative Technology - Construction Methods & Techniques - Case Studies

REFERENCES:
2. Roger Brockenbrough, Frederick Merritt, Merritt Frederick, Structural Steel Designer’s Handbook, McGraw-Hill Companies, Inc
3. Michael Barnes, Michael Dickson, Widespan roof structures, Thomas Telford, 2000

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max. Marks: 80
Exam Duration: 3 Hours

Part A: 8 Questions from each of the four units of 4 marks of each without choice  
(8 × 4 = 32 marks)

Part B: 4 Questions from each of the four units with internal choice of 12 marks  
(4 × 12 = 48 marks)

20% Theory & 80% Problematic Questions may be asked
UNIT I INTRODUCTION  
10 hrs.
Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs – Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership – Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation.

UNIT II TQM PRINCIPLES  
10 hrs.

UNIT III STATISTICAL PROCESS CONTROL (SPC)  
10 hrs.
The seven tools of quality, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools.

UNIT IV TQM TOOLS  
10 hrs.

UNIT V QUALITY SYSTEMS  
10 hrs.

TEXT BOOK:

REFERENCES:

UNIVERSITY EXAM QUESTION PAPER PATTERN
Max Marks : 80  
Exam Duration : 3 hrs.
PART A : 2 Questions from each unit, each carrying 2 marks  
20 marks
PART B : 2 Questions from each unit with internal choice, each carrying 12 marks  
60 marks