B.Tech. (Full Time) – ARCHITECTURAL ENGINEERING

Curriculum & Syllabus

2009 - 2010

Faculty of Engineering & Technology
SRM University
SRM Nagar, Kattankulathur – 603 203
# B.TECH (ARCHITECTURAL ENGINEERING) CURRICULUM

## I SEMESTER

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### TOTAL CREDITS TO BE EARNED FOR THE AWARD OF DEGREE: 177

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**THEORY**

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**Electives**

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G: General programme comprising language/communication skills, humanities and social sciences, economics and principles of management, and NSS/NCC/NSO/YOGA.

B: Basic sciences comprising Computer Literacy with Numerical Analysis, Mathematics, Physics, and Chemistry.

E: Engineering Sciences and Technical Arts comprising Engineering Graphics, Workshop Practice, Basic Engineering, etc.

P: Professional subjects corresponding to the Branch of Studies, which will include core subjects, electives, and project work.

G - GENERAL
B - BASIC SCIENCES
E - ENGINEERING SCIENCES AND TECHNICAL ART
P - PROFESSIONAL SUBJECTS
L - LECTURE HOURS
T - TUTORIAL HOURS
P - PRACTICAL HOURS
C - CREDITS
PURPOSE
To provide an adequate mastery of communicative English Language training primarily - reading and writing skills, secondarily listening and speaking skills.

INSTRUCTIONAL OBJECTIVES
To provide language training to the engineering students which will enable them to understand and acquire knowledge in technical subjects.

LISTENING
Listening Practice – Hints on Listening – Listening Practice
Note Taking: Note Taking Strategies

SPEAKING
Phonetics: Pronunciation-Phonetic Transcription-Stress-Intonation

READING
Comprehension: Skimming-scanning-close reading-Comprehension – Transferring Information – Exercise – An unseen passage should be given and questions may be asked in the form of True or False statements, MCQ, short answers.
Transcoding : Interpreting tables, flow charts, piechart, bar diagram, tree diagram, graphs.

WRITING
Art of Writing : Writing Language – Rules for effective writing – Technical Essay Writing – Exercise
Report Writing : Technical Writing – Lab Report – Exercise
Curriculum Vitae – Placing an Order.
Dialogue Writing

FOCUS ON AND COMMUNICATION AND “COMPUNICATION”
Communication (Communicate through Computers – Power Point & Tele Conference).

INTERNAL ASSESSMENT
Based on the submission of Assignments and test performance of the students marks will be awarded.

TEXT BOOKS

REFERENCE BOOKS
**PURPOSE**
To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.

**INSTRUCTIONAL OBJECTIVES**
At the end of the course, student should be able
1. To apply advanced matrix knowledge to Engineering problems.
2. To improve their ability in solving geometrical applications of differential calculus problems.
3. To equip themselves familiar with the functions of several variables.
4. To familiarize with the applications of differential equations.
5. To expose to the concept of three dimensional analytical geometry.

**MATRICES**

**GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS**

**FUNCTIONS OF SEVERAL VARIABLES**

**ORDINARY DIFFERENTIAL EQUATIONS**
Simultaneous first order linear equations with constant coefficients – Linear equations of second order with constant and variable coefficients – Homogeneous equation of Euler type – Equations reducible to homogeneous form.

**THREE DIMENSIONAL ANALYTICAL GEOMETRY**

**TEXT BOOK**

**REFERENCE BOOKS**
PURPOSE
The purpose of this course is to develop scientific temper and analytical capability through learning physical concepts and their applications in engineering and technology. Comprehension of some basic physical concepts will enable the students to logically solve engineering problems.

INSTRUCTIONAL OBJECTIVES
At the end of the course, the student will be able to:
1. Understand the general scientific concepts required for technology,
2. Apply the concepts in solving engineering problems,
3. Explain scientifically the new developments in engineering and technology, and
4. Get familiarized with the concepts, theories, and models behind many technological applications.

PROPERTIES OF MATTER AND SOUND

ELECTROMAGNETISM AND MICROWAVES

OPTICS

CRYSTAL PHYSICS AND CRYOGENICS

ENERGY PHYSICS
Introduction to non-conventional energy sources – Solar cells – Thermoelectric power generators – Thermionic power generator – Magneto hydrodynamic power generator – Fuel cells (H₂O₂) – Solid state batteries (Lithium) – Low voltage and high voltage nuclear cells – Thermocouple based nuclear cell – Ultra capacitors.

TEXT BOOKS
REFERENCE BOOKS

<table>
<thead>
<tr>
<th>CY 0101 CHEMISTRY</th>
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PURPOSE
To impart a sound knowledge on the principles of chemistry involving the different application oriented topics required for all engineering branches.

INSTRUCTIONAL OBJECTIVES
The students should be conversant with
1. The role of applied chemistry the field of engineering.
2. The knowledge of water quality parameters and the treatment of water.
3. The principles involves in corrosion and its inhibitions.
4. Important analytical techniques, instrumentation and the applications.
5. Knowledge with respect to the phase equilibria of different systems.

TECHNOLOGY OF WATER

CORROSION AND ITS CONTROL

PHASE EQUILIBRIA
Phase rule: Statement – explanation of the terms involved - one component system (water system only). Condensed phase rule - thermal analysis – two component systems: simple eutectic, Pb-Ag; Br, Cd - solid solution Cu-Ni and compound formation Mg-Zn - applications of eutectics.

POLYMERS AND REINFORCED PLASTICS

INSTRUMENTAL METHODS OF ANALYSIS
TEXT BOOKS

REFERENCE BOOKS

<table>
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<tr>
<th>GE 0101</th>
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PART A CIVIL ENGINEERING

PURPOSE
To get exposed to the glimpses of Civil Engineering topics that is essential for an Engineer.

INSTRUCTIONAL OBJECTIVES
1. To know about different materials and their properties.
2. Engineering aspects related to buildings.
3. To know about importance of Surveying.
4. To know about the transportation systems.
5. To get exposed to the rudiments of engineering related to Dams, Water Supply, Transportation system and Sewage Disposal.

BUILDING MATERIALS AND THEIR PROPERTIES

BUILDINGS AND THEIR COMPONENTS

UTILITY AND SERVICES

TEXT BOOKS

REFERENCE BOOKS
PART B MECHANICAL ENGINEERING

PURPOSE
To familiarize the students with the basics of Mechanical Engineering.

INSTRUCTIONAL OBJECTIVES
To familiarize with
1. The basic machine elements
2. The Sources of Energy and Power Generation
3. The various manufacturing processes

MACHINE ELEMENTS

ENERGY
Sources: Renewable and non-renewable (various types, characteristics, advantages/disadvantages). Power Generation: External and internal combustion engines - Hydro and nuclear power plants (layouts, element/component description, advantages, disadvantages, applications). Simple Problems.

MANUFACTURING PROCESSES

TEXT BOOKS

REFERENCE BOOKS
4. Nagpal G. R., “Power Plant Engineering”, Khanna Publisher, Delhi, 2004

<table>
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<tr>
<th>PD 0101</th>
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PURPOSE
The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential

INSTRUCTIONAL OBJECTIVES
1. To guide thought process.
2. To groom students’ attitude.
3. To develop communication skill.
4. To build confidence.
METHODOLOGY
The entire program is designed in such a way that every student will participate in the classroom activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.

1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation
5. Empirical Learning

Self-analysis SWOT - Time management - Creative chain story telling

Vocabulary games I – Attitude - Interpersonal skills

Motivation I - Vocabulary games II - Article review

Team building exercise - Critical Thinking - Event Management

Business situation - Leadership Qualities – Review

SCHEME OF INSTRUCTION
Marks allocated for regular participation in all oral activities in class

SCHEME OF EXAMINATION
Complete Internal evaluation on a regular basis

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I. YOGA SYLLABUS

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<td>II</td>
<td>Meditation Santhi Physical Exercises (I &amp; II)</td>
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<td>III</td>
<td>Kayakalpa Yoga Asanas, Kiriyas, Bandas, Muthras</td>
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<td>IV</td>
<td>Meditation Santhi Physical Exercises III &amp; IV</td>
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<td>Meditation Santhi Kayakalpa Asanas, Kiriyas, Bandas, Muthras</td>
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TEXT BOOKS:
1. Vedatri Maharshi, “Yoga for Modern Age”
2. Vedatri Maharshi, “Simplified Physical Exercises”

II. NATIONAL SPORTS ORGANISATION (NSO)
Each student must select two of the following games and practice for two hours per week. An attendance of 80% is compulsory to earn the credits specified in the curriculum.
List of games:

1. Basket Ball
2. Football
3. Volley Ball
4. Ball Badminton
5. Cricket
6. Throwball

III. NATIONAL CADET CORPS (NCC)

Any student enrolling as a member of National Cadet Core (NCC) will have to attend sixteen parades out of twenty parades each of four periods over a span of academic year.

Attending eight parades in first semester will qualify a student to earn the credits specified in the curriculum.

IV. NATIONAL SERVICE SCHEME (NSS)

A student enrolling as member of NSS will have to complete 60 hours of training / social service to be eligible to earn the credits specified in the curriculum.

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PURPOSE

The purpose of this course is to develop scientific temper and analytical capability among the engineering students.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student will be able to:

1. Understand scientific concepts in measurement of different physical variables
2. Develop the skill in arranging and handling different measuring instruments and
3. Get familiarized with the errors in various measurements and planning / suggesting how these contributions may be made of the same order so as to make the error in the final result small.

LIST OF EXPERIMENTS

1. Determination of Young’s Modulus of the material – Uniform bending
2. Determination of Rigidity Modulus of the material – Torsion Pendulum
3. Determination of velocity of Ultrasonic waves in liquids
4. Determination of dispersive power of a prism using spectrometer
6. Particle size determination using laser
7. Study of attenuation and propagation characteristics of optical fiber cable
10. Construction and study of regulation properties of a given power supply using IC

REFERENCE BOOKS

PURPOSE
An integrated laboratory course consists of experiments from applied chemistry and is designed to illustrate the underlying principles of measurement techniques, synthesis, dynamics and chemical transformation.

INSTRUCTIONAL OBJECTIVES
Students should be able to understand the basic concept and its applications.

LIST OF EXPERIMENTS
1. Preparation of standard solutions.
2. Estimation of total hardness, permanent and temporary hardness by EDTA method.
3. Conductometric titration – determination of strength of an acid.
4. Estimation of iron by potentiometer – titration.
6. Determination of dissolved oxygen in a water sample by Winkler’s method
7. Determination of Na / K in water sample by Flame photometry.
8. Estimation of Copper in ore.
10. Determination of total alkalinity and acidity of a water sample.

REFERENCE

PURPOSE
1. To draw and interpret various projections of 2: Dimensional & 3: Dimensional objects
2. To prepare and interpret the drawings of buildings.

INSTRUCTIONAL OBJECTIVES
To familiarize with
- The construction of geometrical figures
- The projection of 2: Dimensional & 3: Dimensional elements.
- Preparation and interpretation of building drawing

FUNDAMENTALS OF ENGINEERING DRAWING
Lettering, 2: Dimensional geometrical construction, conics and representation of 3: Dimensional objects – principles of projections – orthographic projection.

PROJECTION OF POINTS, LINES, PLANES AND SOLIDS
Projection of points, straight lines, planes & solids.

PICTORIAL PROJECTIONS – I
Conversion of Isometric view of regular solids to Orthographic projection.

PICTORIAL PROJECTIONS – II
Conversion of orthographic projection of regular solids and combination of solids to isometric view.
BUILDING DRAWING
Building Drawing – plan, elevation and section of single storied residential (or) office building with flat RCC roof and brick masonry walls having not more than 3 rooms (planning/designing is not expected in this course).

TEXT BOOKS

REFERENCE BOOKS

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PURPOSE
This Lab Course will enable the students to understand the basics of computer and to know the basics of MS-Office.

INSTRUCTIONAL OBJECTIVES
1. To learn the basics of computer.
2. To work on Ms-Word, Ms-Excel, Ms-Power Point and Ms-Access

EXPERIMENTS TO IMPLEMENT
1. Study experiment on evolution of computer programming languages.
2. Suggest some of the Network Topologies that can be incorporated in your campus. Justify your choice.
3. Experiments to demonstrate directory creation and file creation.
4. Create a document with all formatting effects.
5. Create a document with tables.
6. Create labels in MS word.
7. Create a document to send mails using mail merge option.
8. Create an Excel File to analyze the student’s performance. Create a chart for the above data to depict it diagrammatically.
10. Create Excel sheet to maintain employee information and use this data to send mails using mail merge.
11. Create a Power Point presentation for your personal profile with varying animation effects with timer.
12. Consider student information system which stores student personal data, mark information and non academic details.
   * Use MS Access to create Tables and execute SQL queries to do this following
     * Display all student records.
     * Display student details with respect to his identity.
     * Delete some records from the table.
     * Find total marks obtained by student in each list.

TEXT BOOK
II SEMESTER

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PREREQUISITE
Nil

PURPOSE
To provide guiding principles and tools for the development of the whole person, recognizing that the individual is comprised of Physical Intellectual, Emotional and Spiritual dimensions.

INSTRUCTIONAL OBJECTIVES
- To help individuals think about and reflect on different values.
- To deepen understanding, motivation and responsibility with regard to making personal and social choices and the practical implications of expressing them in relation to themselves, others, the Community and the world at large.
- To inspire individuals to choose their own personal, social, moral and spiritual values and be aware of practical methods for developing and deepening them.

Value Education—Introduction – Definition of values – Why values? – Need for Inculcation of values – Object of Value Education – Sources of Values – Types of Values:
  i) Personal values
  ii) Social values
  iii) Professional values
  iv) Moral and spiritual values
  v) Behavioral (common) values


REFERENCE BOOKS
2. Values(Collection of Essays)., Published by : Sri Ramakrishna Math., Chennai—4.,(1996)
5. Tirukural (English Translation by Dr.G.U.Pope).
6. The Bible
7. The Kuran
8. The Bagavath Geetha
MA 0102  |  MATHEMATICS II  |  L  |  T  |  P  |  C  \\
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Prerequisite  |  |  |  |  \\
MA0101  |  |  |  |  \\

**PURPOSE**
To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.

**INSTRUCTIONAL OBJECTIVES**
At the conclusion of the course, students should have understood Multiple Integrals, Laplace Transforms, Vector Calculus and Functions of a complex variable including contour integration and able to apply to all their Engineering problems.

**MULTIPLE INTEGRALS**
Double integration in Cartesian and polar coordinates – Change of order of integration – Area as a double integral – Triple integration in Cartesian coordinates.

**LAPLACE TRANSFORMS**
Transforms of simple functions – Basic operational properties – Transforms of derivatives and integrals – Initial and final value theorems – Inverse transforms – Convolution theorem – periodic functions – Applications of Laplace transforms for solving linear ordinary differential equations up to second order with constant coefficients only.

**VECTOR CALCULUS**
Gradient, divergence, curl – Solenoidal and irrotational fields – Vector identities (without proof) – Directional derivatives – Line, surface and volume integrals – Statements of Green’s, Gauss divergence and Stroke’s theorems only – Verification and applications to cubes and parallelopipeds only.

**ANALYTIC FUNCTIONS**

**COMPLEX INTEGRATION**
Line integral – Cauchy’s integral theorem (without proof ) – Cauchy’s integral formulae (with proof) – application of Cauchy’s integral formulae – Taylor’s and Laurent’s expansions (statements only) – Singularities – Poles and Residues – Cauchy’s residue theorem (with proof) - Evaluation of line integrals.

**TEXT BOOK**

**REFERENCE BOOKS**
PURPOSE
The purpose of this course is to develop comprehension of the rapidly changing technological scenario and the requisite expertise for appropriate selection of materials for specific engineering applications.

INSTRUCTIONAL OBJECTIVES
At the end of the course, the student will be able to:
- Understand electrical properties of materials,
- Understand the properties and applications of semi conducting materials,
- Understand general properties and applications of magnetic and dielectric materials,
- Understand the behaviour of materials on exposure to light,
- Understand general properties and application of modern engineering and bio materials, and
- Get familiarized with the concepts of Nano Science and Technology.

ELECTRONIC AND PHOTONIC MATERIALS
Electronic materials: Importance of Classical and Quantum free electron theory of metals – Fermi energy and Fermi Dirac distribution function – Variation of Fermi level with temperature in intrinsic and extrinsic semiconductors – Hall effect – Dilute Magnetic Semiconductors (DMS) and their applications – High temperature Superconductivity. Photonic materials: LED and LCD materials – Photo conducting materials – Nonlinear optical materials (elementary ideas) and their applications.

MAGNETIC, DIELECTRIC AND MODERN ENGINEERING MATERIALS

BIO MATERIALS
Classification of biomaterials – Comparison of properties of some common biomaterials – Effects of physiological fluid on the properties of biomaterials – Biological responses (extra and intra vascular system) – Metallic, Ceramic and Polymeric implant materials – Introduction to bio sensors and tissue engineering.

NANO MATERIALS AND NANOTECHNOLOGY

MECHANICAL PROPERTIES OF MATERIALS
Stress Strain diagram for different engineering materials – Engineering and true stress strain diagram – Ductile and brittle material – Tensile strength – Hardness – Impact strength – Fatigue – Creep – Fracture (Types and Ductile to brittle transition) – Factors affecting mechanical properties.

<table>
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<th>PH 0102</th>
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Band gap determination using Post office box.
Dielectric constant measurement.
Photoconductivity measurement.
Resistivity determination for a semiconductor wafer using Four probe method.
Determination of Hall coefficient and carrier type for a semiconductor material.
To trace the hysteresis loop for a magnetic material.
Magnetic susceptibility – Quincke’s method.
Determination of thermal conductivity – Lee’s Disc method.
Visit to Nano Technology Laboratory (optional)
TEXT BOOKS

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>GE 0102</th>
<th>BIOLOGY FOR ENGINEERS</th>
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PURPOSE
To provide a basic understanding of biological mechanisms from the perspective of engineers.

INSTRUCTIONAL OBJECTIVES
To familiarize the students with the basic organization of organisms and subsequent building to a living being. With this knowledge, the student will be then imparted with an understanding about the machinery of the cell functions that is ultimately responsible for various daily activities. Nervous and immune systems will be taught as examples of this signaling machinery.

FROM ATOMS TO ORGANISMS
The Cell: the Basic Unit of Life - Molecular Components of Cells - Expression of Genetic Information - Protein Structure and Function- Cell Metabolism - Cells Maintain Their Internal Environments - Cells Respond to Their External Environments - Cells Grow and Reproduce - Cells Differentiate

THE MOLECULAR DESIGN OF LIFE
Biochemistry and the Genomic Revolution-. DNA Illustrates the Relation between Form and Function- Biochemical Unity Underlies Biological Diversity-. Chemical Bonds in Biochemistry -. Biochemistry and Human Biology-. Protein Synthesis Requires the Translation of Nucleotide Sequences Into Amino Acid Sequences-. 2. Aminoacyl-Transfer RNA Synthetases Read the Genetic Code- A Ribosome Is a Ribonucleoprotein Particle (70S) Made of a Small (30S) and a Large (50S) Subunit-Protein Factors Play Key Roles in Protein Synthesis-. Eukaryotic Protein Synthesis Differences from Prokaryotic Protein Synthesis Primarily in Translation Initiation

CATALYTIC STRATEGIES

MECHANOCHEMISTRY

SENSORY AND IMMUNO SYSTEMS6General Principles of Cell Signaling-Signaling via G-Protein-linked Cell-Surface Receptors-Signaling via Enzyme-linked Cell-Surface Receptors-Target-Cell Adaptation-The Logic of Intracellular Signaling: Lessons from Computer-based "Neural Networks"-The Cellular Basis of Immunity-
The Functional Properties of Antibodies-The Fine Structure of Antibodies-The Generation of Antibody Diversity-T Cell Receptors and Subclasses-MHC Molecules and Antigen Presentation to T Cells-Cytotoxic T Cells-Helper T Cells and T Cell Activation-Selection of the T Cell Repertoire

TEXT BOOK

STUDENT COMPANION to accompany Biochemistry, Fifth Edition -Richard I. Gumport
Frank H. Deis, Nancy Counts Gerber, Roger E. Koepppe, II Molecular motors

REFERENCE BOOKS:
Alberts, 2003 Molecular Biology of the cell
Lodish, 2004 Molecular cell biology

<table>
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<tr>
<th>GE 0104</th>
<th>PRINCIPLES OF ENVIRONMENTAL SCIENCE</th>
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PURPOSE
The course provides the comprehensive knowledge in environmental science, environmental issues and the management.

INSTRUCTIONAL OBJECTIVES
1. The importance of environmental education, ecosystem and ethics.
2. Knowledge with respect to biodiversity and its conservation.
3. To create awareness on the various environmental pollution aspects and issues.
4. To educate the ways and means to protect the environment.
5. Important environmental issues and protection

ENVIRONMENT AND ECOSYSTEMS
Environmental education: definition - scope - objectives and importance. Concept of an ecosystem – types (terrestrial and aquatic ecosystems) – structure and function – ecological succession - food chains, food webs and ecological pyramids

BIODIVERSITY
Introduction: definition - genetic, species and ecosystem diversity - value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - threats to biodiversity: habitat loss, poaching of wildlife - endangered and endemic species of India, Conservation of biodiversity: in-situ and ex-situ conservations.

POLLUTION AND WASTE MANAGEMENT
Solid waste management: causes - effects of municipal waste, hazardous waste, bio medical waste - process of waste management.

CURRENT ENVIRONMENTAL ISSUES
Environmental ethics -issues and possible solutions- population explosion, climatic change, ozone layer depletion, global warming, acid rain and green house effect.
Sustainable development: definition, objectives and environmental dimensions of sustainable development-environmental audit for sustainable development.

ENVIRONMENTAL PROTECTION
National and international concern for environment: Important environmental protection acts in India – water, air (prevention and control of pollution) act, wild life conservation and forest act – functions of central and state pollution control boards - international effort – key initiatives of Rio declaration, Vienna convention, Kyoto protocol and Johannesburg summit.
TEXT BOOKS

REFERENCE BOOKS

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<th>GE 0106</th>
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PURPOSE
This course provides comprehensive idea about circuit analysis, working principles of machines and common measuring instruments. It also provides fundamentals of electronic devices, transducers and integrated circuits.

INSTRUCTIONAL OBJECTIVES
1. At the end of the course students will be able
2. To understand the basic concepts of magnetic, AC & DC circuits.
3. To explain the working principle, construction, applications of DC & AC machines & measuring instruments.
4. To gain knowledge about the fundamentals of electric components, devices, transducers & integrated circuits.

PART A ELECTRICAL ENGINEERING

ELECTRICAL MACHINES
Definition of mmf, flux and reluctance, leakage flux, fringing, magnetic materials and B-H relationship. Problems involving simple magnetic circuits. Faraday’s laws, induced emfs and inductances, brief idea on Hysteresis and eddy currents. Working principle, construction and applications of DC machines and AC machines (1-phase transformers, 3-phase induction motors, single phase induction motors – split phase, capacitor start and capacitor start & run motors).

AC & DC CIRCUITS
Circuit parameters, Ohms law, Kirchhoff’s law. Average and RMS values, concept of phasor representation. RLC series circuits and series resonance, RLC parallel circuits (includes simple problems in DC & AC circuits) Introduction to three phase systems – types of connections, relationship between line and phase values.
(qualitative treatment only)

WIRING & LIGHTING
Types of wiring, wiring accessories, staircase & corridor wiring, Working and characteristics of incandescent, fluorescent, SV & MV lamps. Basic principles of earthing, simple layout of generation, transmission & distribution of power.

TEXT BOOKS

REFERENCE BOOKS
PART B ELECTRONICS ENGINEERING

ELECTRONIC COMPONENTS AND DEVICES
Passive components – Resistors, Inductors and Capacitors and their types.
Semiconductor: Energy band diagram, Intrinsic and Extrinsic semiconductors, PN junction diodes and Zener diodes – characteristics.

TRANSUDCERS AND MEASURING INSTRUMENTS
Measuring Instruments: Basic principles and classification of instruments, Moving coil and moving iron instruments, CRO – Principle of operation.

DIGITAL ELECTRONICS & LINEAR ICs

TEXT BOOKS

REFERENCE BOOKS

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<th>ARE0102</th>
<th>THEORY OF ARCHITECTURE</th>
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PURPOSE
To provide the student of architecture a foundation in the conception of forms, spatial aspects, compositions and their analysis in buildings

INSTRUCTIONAL OBJECTIVES
To develop understanding of the basic principles of space and mass, circulation and architectural composition.

ARCHITECTURAL SPACE AND MASS
Definition of architecture- elements of architecture - Space defining elements , openings in space defining elements, spatial relationship, spatial organization
Primary forms, properties of form, transformation of forms - dimensional transformation, subtractive, additive forms, organization of additive forms - Articulation of forms

AESTHETIC COMPONENTS OF DESIGN
Exploration of the basic principles of design such as Proportion, scale, balance, rhythm, symmetry, hierarchy, axis with building examples.
CIRCULATION
Components of building circulation - The building approach, The building entrance, Configuration of path, Path space relationship, Form of circulation space - Circulation diagram for residence and restaurant

PRINCIPLES OF COMPOSITION
Study of the basic principles that govern an architectural composition such as Unity, Harmony, Dominance, Fluidity, Emphasis, Contrast etc.

DESIGN PROCESS AND ANALYSIS OF BUILDING
Design process – integration of aesthetics and function - Understanding of formative ideas, organization concepts, spatial characteristics, - Massing and circulation in design analysis of the following buildings: Falling water house, & Guggenheim museum by f. l. wright - Villa Savoye & Chapel of Notre Dame DuHaut by le corbusier.

TEXT BOOKS

REFERENCE BOOKS

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<th>PD 0102</th>
<th>PERSONALITY DEVELOPMENT - II</th>
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PURPOSE
The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential

INSTRUCTIONAL OBJECTIVES
1. To guide thought process.
2. To groom students' attitude.
3. To develop communication skill.
4. To build confidence.

METHODOLOGY
The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.

1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation.
5. Empirical Learning
Puzzles I - Poster design/Caption/Slogan writing (Social issues) - Bone of contention I – debate

Bone of contention II - Puzzle II - Survey and Reporting (favorite channel, music, food)

Interpretation of Visuals of I & II - Vocabulary games III

Book Review - Quiz I - Presentation Skills I

Presentation Skills II - Analytical Thinking - Review

EVALUATION
1. Activities assessed by both group and individual participation
2. Continuous assessment based on daily participation

SCHEME OF INSTRUCTION
Marks allocated for regular participation in all oral activities in class

SCHEME OF EXAMINATION
Complete Internal evaluation on a regular Basis

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<th>ARE0104 BUILDING CONSTRUCTION I</th>
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PURPOSE
The course in Building Construction is visualized as having two essential components:
1. A lecture course on Building materials and principles of construction
2. A “Construction Studio” where these principles will be applied to construction problems and architectural detailing.

INSTRUCTIONAL OBJECTIVES
Understanding the basic components of a building with its construction details such as Foundation Footing (stone, brick & RCC), Wall section (plinth, floor, sill, lintel, roof & parapet), Roofs (flat, sloped, Pyramid & dome), Fenestration (Different types of doors, windows & ventilators) and Interior details (wardrobe, kitchen cabinet, TV shelf & show case).

STONES

BRICKS & CLAY PRODUCTS
Clay products: Tiles, terra cotta, stoneware, earthenware, porcelain, and clay blocks their properties and uses.

BASIC BUILDING COMPONENTS, FOUNDATION, WALLS& ROOFS
Basic building components: Cross section of a small building to understand foundation, plinth beam flooring, sill, lintel, roof beam and slabs parapet & weathering course Foundation: various types of foundation in stone, brick & RCC. Walls: Details of walls section across the opening (door & window) Roofs: simple configurations and details of various forms of roofs (flat, slope pyramidal & dome)

DOORS, WINDOW & VENTILATOR
FURNITURE & FITMENTS
Showcase & shelf: TV shelf, showcase & room divided, dressing ward robe. Cupboard & Cabinets: kitchen cupboard & wall cabinets.

TEXT BOOKS
1. W.B. Mickay – Building construction Vol 1 and 3 – Longmans, UK 1981

REFERENCE BOOKS
2. Dr. B.C. Pumia – Building construction
3. R. Chudley, construction Technology.

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<th>ARE0106</th>
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PURPOSE
Students should acquire knowledge of the various drawings which effectively communicate their ideas as designers.

INSTRUCTIONAL OBJECTIVES
To train the Students in the field of Perspective Drawing and Sciography, Representation skills, Techniques for Construction, as a Tool towards effective visualization and presentation.

PLANS & SECTIONS OF BUILDINGS
Floor plans, elements above & below plan cut, reflected ceiling plan, site plan with contours, site sections, building elevations, building sections.

PERSPECTIVE
Principles of perspective and visual effects of three dimensional objects, study of picture plane, Station point, vanishing Point, Eyelevel, Ground level, etc. - its variations and Effects. Principles of Drawing One point & Two point perspectives - Perspective Drawing of Three Dimensional Objects, Interiors and Exteriors of Building.

SCIOGRAFY

MEASURED DRAWING
Understanding of different scales and their uses in practice - Drawings to scale. Examples of Measured drawing - Furniture, Class room plan, Doors, Windows, Entrance Gate, building etc.

PRESENTATION TECHNIQUES
Techniques of rendering with pen & ink- graphical representation of buildings & entourage such as Trees, Lawns, Shrubs, Paving, Pathways, Flower Bed, Water Pools, Human Figures, Vehicles etc. Exposure to other medium of presentation - Pencil, Pastel Colors, and water Colors, Color Theory and Use of Colors in Presentation.

TEXT BOOK
1. Perspective & Sciography by Shankar Mulik Allied Publishers

REFERENCE BOOKS
PURPOSE
To provide the students with hands on experience on different trades of engineering like fitting, carpentry, smithy, welding and sheet metal.

INSTRUCTIONAL OBJECTIVES
To familiarize with
1. The basics of tools and equipments used in fitting, carpentry, sheet metal, welding and smithy.
2. The production of simple models in the above trades.

LIST OF EXPERIMENTS
EMPHASIS TO BE LAID ON REAL LIFE APPLICATIONS WHEN FRAMING THE EXERCISES.

FITTING
Tools & Equipments – Practice in Filing and Drilling.
Making Vee Joints, Square, dovetail joints, Key Making.

CARPENTARY
Tools and Equipments- Planning practice. Making Half Lap, dovetail, Mortise & Tenon joints, a mini model of a single door window frame.

SHEET METAL
Tools and equipments - Fabrication of a small cabinet, Rectangular Hopper, etc.

WELDING
Tools and equipments - Arc welding of butt joint, Lap Joint, Tee Fillet. Demonstration of Gas welding, TIG & MIG.

SMITHY
Tools and Equipments –Making simple parts like hexagonal headed bolt, chisel.

TEXT BOOKS

REFERENCE BOOKS
III SEMESTER

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PURPOSE
Enabling the Engineering Students to one more Foreign Language, especially German, which is scientific and technical language. This may be useful in the field of employment opportunities as well as helping them to develop projects on browsing German websites.

INSTRUCTIONAL OBJECTIVES
Developing pronunciation so that they can read the text and e-mail during their employment, instructing them to write their own CV and developing a fundamental conversation with any German national.

INTRODUCTION
German Language, Alphabets and Pronunciation.

THEMEN
Name, Land, Leute, Beruf, Familie geschwister, Einkaufen, Reisen, Zahlen, Haus, Freunden, Essen and Stadium, Fest, Zeit.

LISTENING
Listening to the cassette and pay special attention to the meaning and sounds. Listening Comprehension – Announcements / Airport / Station / General.

READING
Listening to the cassette and reading it allowed.
READING COMPREHENSION BASICS / STATION / NEWS / NOTICE BOARDS.

GLOSSARY
Technical Words Lesson (1-5)

TEXT BOOK WITH CASSETTES
1. Grundkurs Deutsch
2. Momentmal (Max Mueller Bhavan – Goethe Institute, Germany).

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<th>LE0203</th>
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PURPOSE
1. In view of globalization, learning Foreign Language by Engineering graduates enhances their employment opportunities.
2. Get awareness of understanding of International culture.
3. Widening the Linguistic Skills of the Students.

INSTRUCTIONAL OBJECTIVES
To learn the scripts of Japanese Languages namely Hiragana, Katakana and Kanji, Vocabularies etc. To learn basic grammar and acquire basic communication skills. To understand Japanese culture.

Alphabets (Hiragana), Self Introduction, Greetings, Classroom expressions, Numbers, Conversation.
Alphabets Hiragana (continued), Vocabularies.

Counters , Time expression, Conversation

Katakana and related vocabulary.
Kanjis – introduction, conversation.


TEXT BOOKS
1. Nihongo Shoho I main Text sold in India by the Japanese Language Teachers Association Pune.
2. Hiragana and Katakana Work Book published by AOTS Japan
3. Grammar and Kotoba ( Work Book )
4. Japanese for Dummies. (Conversation) CD.

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Prerequisite
Nil

PURPOSE
1. As language skills are as valuable as technical skills a knowledge of French enables the engineering graduates in career orientation.
2. As a second international global Lang after English there is a wider choice of job opportunities in the international employment market and also multinationals in India and an understanding of French culture through language.

INSTRUCTIONAL OBJECTIVE
Characterised by the Roman script, grammar, vocabulary and colloquial expressions are taught which enables them to communicate effectively with any native speaker.

INTRODUCTION AND PRONUNCIATION
Introduction of the French Language, Alphabets and Pronunciation, Greetings (Wishing, Thanking and Bidding good bye), Introducing oneself & someone - conversational French sentences based on the topics discussed above.

VOCABULARY
Numbers and Dates, Days, Months and Seasons, Time, Nouns, Professions and Nationalities. Conversational sentences on weather, time, and professions.

GRAMMAR
Basic Verbs (Avoir, Etre, Aller, Faire) – Conjugation – Present tense, Affirmative, Negative, Interrogative, Adjectives (Qualitative), Subject Pronouns and Disjunctive Pronouns.

CONVERSATION AND LISTENING
Conversational sentences on physical description and expressions with verbs like avoir, etre and faire

GRAMMAR
Prepositions (a, de, dans, en, sur, sous, pour…); Contracted Articles, Question Tag (Qui, Quel, Ou, ……etc)

TEXT BOOK
1. Panorama – Goyal Publishers
2. Apprenons le Francais I, Sarawathy publication.
PURPOSE

This subject area also known by the term building science in earlier times, enlightens the students to the processes by which building and entire habitats can be designed to respond to nature, with climate as the basic parameter of design.

INSTRUCTIONAL OBJECTIVES

- In order to equip the students with the scientific background required to design climate responsive buildings, a clear understanding of the various climate elements. - radiation, air temperature, humidity and wind speed as tools of design is intended.
- It also includes the articulation of the building into its various components in response to the above mentioned climatic elements.

CLIMATE & THERMAL COMFORT


SOLAR GEOMETRY & DESIGN OF SUNSHADING DEVICES

Apparent movement of the sun, sun path diagrams (solar chart) Solar angles, Shadow angles, solar shading masks, etc Exercises on plotting isopleth, transfer of isopleth to solar chart, fitting a shading mask over the overheated period & design of sun shading devices for different orientations.

PRINCIPLES OF THERMAL DESIGN IN BUILDINGS


VENTILATION & DAY LIGHTING

Functions of ventilation – stack effect due to the thermal forces, wind velocity – wind rose diagram, wind pressure. Air movement through building & around buildings – factors affecting indoor air flow, wind shadow etc. The nature of light, its transmission, reflection – colored light, the munsell system – photometric quantities – illumination, day lighting prediction – the daylight design graph.

DESIGN FOR CLIMATIC TYPES

Building design & lay out planning consideration for warm humid, hot dry, composite & tropical upland climates, climatic data sets – analysis – climate graph – the mahoney tables & its recommended specification. Exercises on design of small buildings for various climates.

TEXT BOOK

REFERENCE BOOKS

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PURPOSE
To measure the land area, to prepare map and to find out the elevation of a point for constructional purpose.

INSTRUCTIONAL OBJECTIVES
1. To measure the land area by chaining and the methods of clearing the obstacles.
2. To measure the area and distance between the points by compass and plane table.
3. To measure the elevation of points for the preparation of map.
4. To measure the height and distance by theodolite.
5. To know the setting out works for constructional purposes.

CHAIN, COMPASS AND PLANE TABLE SURVEYING

LEVELLING AND THEODOLITE SURVEYING

TACHEOMETRIC SURVEYING

TRIANGULATION SURVEYING

ENGINEERING SURVEYS
Reconnaissance, Preliminary and location surveys for engineering projects – layout – setting out works
CURVES: Curve ranging – Horizontal and Vertical curves – Simple curves – setting with chain and tapes, tangential angles by theodolite.
CONTOUR: Contouring – Methods – Characteristics and uses of contours – Plotting – Calculation of areas and volumes.
TEXT BOOKS

REFERENCE BOOKS

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Prerequisite
Nil

PURPOSE
Knowledge about the art & architecture of the European, Egyptian & Middle eastern cultures, which have served as the cradle of human civilization is a prime requisite for a student of architecture.

INSTRUCTIONAL OBJECTIVES
The course creates awareness about the planning, construction, function and aesthetics of historical buildings and an appreciation of architectural style as a product of the time, place and culture in the western world.

EGYPT AND WEST ASIA (ANCIENT) ARCHITECTURE

GREEK AND ROMAN (CLASSICAL) ARCHITECTURE
Factors influencing the development of Hellenic & Hellenistic Art, Sculpture and Architecture - Outline of architectural character – Orders in Greek architecture – Doric, Ionic and Corinthian. – Examples - Parthenon, Athens, Theatre of Epidaurus, Agora

EARLY CHRISTIAN, BYZANTINE & ROMANESQUE
Formation of guilds - Factors influencing Romanesque architecture - Outline of architecture character in Italy, France and England - Examples: Pisa group, Italy; Abbaye aux Hommes, Caen

GOTHIC ARCHITECTURE

RENAISSANCE ARCHITECTURE
Italian Renaissance - Architecture during the early Renaissance, High Renaissance and Baroque Periods - Features of a typical Renaissance palace, eg. Palazzo Ricardi, Study of the contribution of the following architects: Brunelleschi, Michaelangelo, Andrea Palladio, Example - St. Peter Rome, Villa capra in Vicenza,
TEXTBOOKS

REFERENCE BOOKS

ARE0207 STRUCTURAL MECHANICS
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PURPOSE
To know the basics of solid mechanics. To understand the concepts of mechanics of structures.
To understand the behaviour, determine the internal forces and analyse the stresses of various structural elements under action of different types of forces.

INSTRUCTIONAL OBJECTIVES
1. Resolution of forces and to comprehend the various forces (Internal and External) and their action on different structural elements and determine the stresses and strains.
2. Awareness on the properties of plane areas.
3. To analyse and determine the internal forces in pin jointed plane trusses by various methods.
4. To study the behaviour of determinate beams and examine the internal forces, stresses induced and learn the theory of torsion and stresses developed in solid, hollow shafts and helical springs.
5. To analyse the state of stress (two dimensional) and evaluate the principal stresses and principal planes by analytical and graphical treatment.

BASICS OF MECHANICS, STRESS, STRAIN AND DEFORMATION OF SOLIDS

CENTRE OF GRAVITY AND MOMENT OF INERTIA
Areas and volumes – Theorems of Pappus and Guldinus - Centroid of simple areas and volumes by integration – centroid of composite areas – Second and product moment of areas – radius of gyration – parallel axis and perpendicular axis theorems - moment of inertia of simple areas by integration –moment of inertia of composite areas – mass moment of inertia of thin plates and simple solids.

ANALYSIS OF STATICALLY DETERMINATE PLANE TRUSSES

BENDING OF BEAMS AND TORSION OF SHAFTS
BEAMS & DEFLECTION, THEORY OF COLUMNS

Beams and Deflections
Determination of deflection for simply supported and Cantilever beams using Macaulay's method

Theory of Columns
Axial load - Combined bending and axial load – Euler’s and Rankine formulae for columns

TEXT BOOKS

REFERENCE BOOKS

L T P C
ARE 0209 BUILDING CONSTRUCTION -II 1 0 3 3

Prerequisite
Nil

PURPOSE
This course is a combination of lecture & studio classes aimed at developing the students understanding of material properties and interior design construction techniques.

INSTRUCTIONAL OBJECTIVES
To expose the students to different materials of construction, progressively and to enable them to represent the different building components through relevant drawings.

WOOD

GLASS, PAINTS & DISTEMPERS

PARTITIONS & SHELVES & FALSE CEILING

THERMAL INSULATION AND ACOUSTICS INSULATION
Thermal insulation: Heat transfer heat gain/ loss by materials - vapour barriers and rigid insulations, blanket, poured and reflective insulation – properties and uses of spun glass foamed glass, cork, vegetable fibers Gypsum plaster of paris hydride gypsum properties and uses. Acoustics: Definition of sound and noise Reverberation time echo sound, foci Acoustics insulation: porous, baffle and perforated materials such as Acoustic plastic, Acoustic tiles, wood, partition board, fiber board, cook, quilts and mats – their properties and
uses – current developments. **Applications**: Applications of the above insulations in seminar hall, theater and cold storage.

**LIFTS, ESCALATORS & CONVEYORS**

**Elevator**: Study of elevators – size, capacity, speed, and Mechanical safety methods, positioning in core under planning grid. Types like passenger and freight lifts, dumbwaiters, details of lift cage, lift shaft & other mechanism. **Escalator**: Parallel and criss cross escalators, **Conveyors**: horizontal belt conveyors, horizontal moving walk way – Mechanical safety systems and automatic control.

**TEXT BOOKS**
1. W.B. Mickay – *Building construction Vol 1,2 and 3* – Longmans, UK 1981.

**REFERENCE BOOKS**
1. Dr.B.C.Punmia – *Building construction*
2. R.Chudley, *construction Technology*.

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**PURPOSE**
The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential.

**INSTRUCTIONAL OBJECTIVES**
- To guide thought process.
- To groom students' attitude.
- To develop communication skill.
- To build confidence.

**METHODOLOGY**
The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.

1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation.
5. Empirical Learning

Goal Setting - Problem Solving - Emotional Quotien

Assertiveness - Stress Management - Quiz II

Lateral Thinking (Situational) - Team Work (Role Plays) Impromptu - Text Analysis

Business plan presentation I - Business plan presentation II - Chinese Whisper

Picture Perfect - Case Studies – Review

**SCHEME OF INSTRUCTION**
Marks allocated for regular participation in all oral activities in class

**SCHEME OF EXAMINATION**
Complete Internal evaluation on a regular Basis
## Purpose

To measure the land area, preparation of map, elevation of point, setting out works by practical work.

### Instructional Objectives

Practical experiments in chaining, compass, plane table, leveling and theodolite will give experience in handling surveying equipments and help in civil engineering career.

### Experiments

1. Simple chain survey – calculation of area using cross staff.
2. Traversing - Measurement of bearing of survey lines by prismatic compass – Local attraction.
   - Running closed and open compass traverse.
   - Plotting and adjustments of traverse.
3. Plane table survey by Radiation and Intersection methods.
   - Resection : Field solution of two and three point problems (any one method).
4. Reduction of levels : (a) Height of collimation method
   - (b) Rise and Fall method
5. Theodolite - Measurement of horizontal angles by reiteration and repetition.
7. Heights and distances : Single plane method and Double plane method

### Reference

1. Laboratory Manual.

## Purpose

To impart a good foundation in design through hands-on experience in designing simple two dimensional and three dimensional compositions.

### Instructional Objectives

- Introduction to design- problem-solving, elements of design, principles of design, 2-D designs in different mediums, colours and textures for articulation of abstract ideas.
- Development of student’s vision regarding 3-D forms (models and sculptures) in different materials, colours, and textures for specific themes/expressions to develop creative/imaginative thinking.

### Shape, Color and Texture

An introduction to various design elements such as line, shape, mass, colour etc including the theoretical aspects such as properties of line compositions, family of shapes, percepts, analysis of forms and colour theory - making two dimensional and three dimensional compositions involving various elements of design such as Line, Shape, Color, Texture, Transparency, Mass, space etc., aimed at understanding the principles of design such as Repetition, Harmony, Contrast, Dominance, Balance, Dynamism, etc.,

### Three Dimensional Sculptures

Making three dimensional sculptures involving the basic platonic solids and abstract sculptures using various techniques/ materials such as POP, wire/ matchstick, soap, clay etc., involving the principles of art.
COMPOSITION & FORMS IN NATURE
Compositions involving the progression of two-dimensional shapes into three-dimensional forms. Composition of three dimensional units using modular components with exercises in balance, Rhythm, contrast, transition and continuity.

Study of harmonious forms in nature and analysis with respect to their colour, form, texture and structure. Exercises involving these natural forms and various approaches to art such as – Representation, Abstraction, and Non-Representational/ Non-Objective compositions.

ANALYSIS OF SIMPLE OBJECTS
Critical analysis of simple man-made objects to understand the underlying concepts in their design. Studies to understand function - Aesthetic Relationship, and Anthropometrics.

MODEL MAKING
Introduction to concepts of model making and various materials used for model making
Preparation of base for models using wood or boards, Introduction to block models of buildings (or 3D Compositions) involving the usage of various materials like Thermocole, Soap/Wax, Boards, Clay etc.

TEXT BOOK

REFERENCE BOOKS
3. design projects, Van Nostrand Reinhold, New York.
5. H. Gardner, Art through ages.
PURPOSE
Enabling the Engineering Students to one more Foreign Language, especially German, which is scientific and technical language. This may be useful in the field of employment opportunities as well as helping them to develop projects on browsing German websites.

INSTRUCTIONAL OBJECTIVES
Developing pronunciation so that they can read the text and e-mail during their employment, instructing them to write their own C V and developing a fundamental conversation with any German national.

SPEAKING;
Dialogue – Questioning / Basic queries / Conversational with practical exposure.

GRAMMATIK (WRITING)

GLOSSARY
Technical words. Lesson (6-10)

TEXT BOOK WITH CASSETTES
A. Grundkurs Deutsch
B. Momentmal
(Prescribed by Max Mueller Bhavan – Goethe Institute, Germany).

PURPOSE
1. In view of globalization, learning Foreign Language by Engineering graduates enhances their employment opportunities.
2. Get awareness of understanding of International culture.
3. Widening the Linguistic Skills of the Students.

INSTRUCTIONAL OBJECTIVES
To learn the scripts of Japanese Languages namely Hiragana, Katakana and Kanji, Vocabularies etc. To learn basic grammar and acquire basic communication skills. To understand Japanese culture.

Lesson 2-{Korewa Tsukue desu } – Grammar, Sentence pattern, Marume . Conversation
Lesson 4– {Asokoni hito ga imasu} - Grammar, Sentence pattern, Marume .
Lesson 5– {Akairingo wa ikutsu arimasu ka}-Grammar, Sentence pattern, Marume . Conversation.
Lesson 6– {Barano hana wa ippon ikura desu ka}- Grammar, Sentence pattern.Marume.Conversation
TEXT BOOKS
1. Nihongo Shoho Imain Text sold in India by the Japanese Language Teachers Association Pune.
2. Hiragana and Katakana Work Book published by AOTS Japan
3. Grammar and Kotoba (Work Book)
4. Japanese for Dummies.(Conversation) CD.

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PURPOSE
1. As language skills are as valuable as technical skills a knowledge of French enables the engineering graduates in career orientation.
2. As a second international global Lang after English there is a wider choice of job opportunities in the international employment market and also multinationals in India and an understanding of French culture thro language.

INSTRUCTIONAL OBJECTIVE
Characterised by the Roman script, grammar, vocabulary and colloquial expressions are taught which enables them to communicate effectively with any native speaker.

Sports (Ski, natation, tennis, Tour de France), Cuisine (French dishes), Cinema (Review of a film) – Articles on these topics and group discussion will be followed.

GRAMMAR
Possessive Adjectives, Demonstrative Adjectives, Past tense – Passé Compose( Verbe Auxiliare: Etre et Avoir)

Culture and Civilization French Monuments (Tres celebres), French History (Jeanne d’ Arc, Louis XIV, Prise de la Bastille), Culture and Civilisation (vin, fromage, mode, parfums)

Transport system, government and media in France – articles on these topics.

Comprehension and Grammar Comprehension passages and conversational sentences in different situations (at the restaurant, at the super market)

TEXT BOOK:
1. Panorama – Goyal Publishers
2. Apprenons le Francais II, Sarawathy Publications.

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PURPOSE
Preparation of influence lines and effect of rolling loads. Introduce classical methods in analysing indeterminate structures (trusses, beams and plane frames). To learn advanced methods like plastic theory for indeterminate structures.

INSTRUCTIONAL OBJECTIVES
1. Concept of rolling loads and study its characteristics in structures.
2. Analysis of indeterminate structures (beams, frames and trusses) for internal forces, deflections etc.
4. Moment distribution method – Iterative method often used in analysing indeterminate structures.
STATICALLY INDETERMINATE STRUCTURES


SLOPE DEFLECTION METHOD
Analysis of Continuous beams and Rigid plane frames with and without sway.

MOMENT DISTRIBUTION METHOD
Stiffness and Distribution factors – Carry over factors – Analysis of Continuous beams – Plane rigid frames with and without sway- Introduction to Kani’s method and Column analogy method applied to indeterminate beams.

PLASTIC ANALYSIS OF STRUCTURES

ROLLING LOADS

TEXT BOOKS

REFERENCE BOOKS

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<th>ARE 0204</th>
<th>WATER SUPPLY, SANITATION AND FIRE FIGHTING</th>
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PURPOSE
To create awareness about the importance of sanitation, domestic water supply and fire services

INSTRUCTIONAL OBJECTIVES
Development to technical and practical knowledge in these services.

WATER SUPPLY
Demand of water for domestic, commercial, industrial and public utility purposes as per BIS standards. Per capita demand, leakage and wastage of water and its preventive measures. Storage and Distribution of Water - Different methods of water distribution boosting water, gravity and pressure distribution by storage tanks of individual buildings.

System of water supply: Continuous, intermittent, their advantages and disadvantages Service connections, types and sizes of pipes, water supply fixture and installations, special installation in multistoried buildings.
DRAINAGE
Principles of drainage, surface drainage combined and separate system of drainage, shape and sizes of drains and sewers, storm water over flow chambers, methods of laying and construction of sewers
House drainage: traps – shapes, sizes, types, materials and function.
Inspection chambers: sizes and construction.
Ventilation of house drainage: Anti siphonage and vent pipes, single stack and double stack system
Types of fixtures and materials: sinks, baths, water closets, flushing cisterns, urinals, sinks etc Septic tanks, Dispersion trench and soak pits.

SOLID WASTE DISPOSAL

FIRE FIGHTING SERVICES
Behaviour of fire – ignition, igniter, Combustible contents, causes of fire, Mechanism of fire spread in building and prevention – fire safety standards – concepts in fire protection

EXERCISE
Simple exercises on water supply, fire fighting and sanitary layout of residential and public buildings.

TEXT BOOKS
1. S.C.Rangwala, Water supply and sanitary engineering, Charotar publishing house.

REFERENCE BOOKS
3. Marrimuthu et al., Environmental Engineering, Pratheeba publishers.
5. V.K.Jain, Fire Safety in Buildings

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<tr>
<th>ARE 0206</th>
<th>HISTORY OF ARCHITECTURE - II</th>
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PURPOSE
Knowledge about Indian culture, building art and construction techniques helps an architecture student to develop designs that are rooted in this country, art & architecture of the European, Egyptian & Middle eastern cultures, which have served as the cradle of human civilization is a prime requisite for a student of architecture.

INSTRUCTIONAL OBJECTIVES
The course creates awareness about the planning, construction, function and aesthetics of historical buildings and an appreciation of architectural style as a product of the time, place and culture in our heritage buildings and the western world.
BUDDHIST ARCHITECTURE IN INDIA

Buddhist Architecture - Ashokan School of Architecture – Examples - Ashokan Pillar at Sarnath, & Sanchi stupa. Buddhist rock cut architecture - Salient features of a Chaitya hall and Vihara, - Examples – Chaitya hall at Karli, Vihara at Nasik

HINDU ARCHITECTURE - INDO-ARYAN STYLE


HINDU ARCHITECTURE - DRAVIDIAN STYLE


ISLAMIC ARCHITECTURE – IMPERIAL & PROVINCIAL STYLES


ISLAMIC ARCHITECTURE – MUGHAL ARCHITECTURE

Mughal style under the different rulers - Babur, Humayun, Akbar, Jahangir, Shahjahan, Aurangzeb - Important examples –Humayuns Tomb,Delhi, Fatehpur Sikri (lay out, Buland darwaza, Dwani Khas, Tomb of Salim Chisti & Jami masjid) – The Taj Mahal, Agra – Red Fort, Delhi (Diwan-i- Am, Rang Mahal).

TEXTBOOKS

REFERENCE BOOKS

<table>
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<th>ARE 0208</th>
<th>TIMBER &amp; STEEL STRUCTURES</th>
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PURPOSE
- To enable students to analyse and design simple timber structural members and steel structural components.
- To enable the students to select suitable steel roof truss for different spans of industrial buildings.

INSTRUCTIONAL OBJECTIVE
By the end of the course the students shall be confident enough to independently workout the loads coming over structural components like timber and steel tension members, compression members, beams and design them as per BIS codes.

TIMBER STRUCTURES – BEAMS, COLUMNS AND ROOF TRUSSES
Properties, strength and types of timber used as structural components in timber construction – Permissible stresses in timber – Design of Columns and beams as per BIS codes. Types of Timber Roof Trusses used for small spans.
STEEL STRUCTURES

Introduction Properties of Indian standard rolled steel section – Use of IS 800 and steel tables – Permissible and stresses in tension, compression and shear. Connections: Welded and riveted connections – Types of failure – Design of welded and riveted connections for members subjected to axial forces.

TENSION AND COMPRESSION MEMBERS


BEAMS

Principal beams, allowable stresses, General specifications, Design of laterally supported beams.

STEEL ROOF TRUSSES

Types of roof trusses – Selection of trusses according to the span – Estimation of gravity loads and wind loads – Use of BIS and book SP-38 in analyzing and design of trusses – gusseted plate connections (Theory Only).

TEXT BOOKS


REFERENCE BOOKS

1. Arya .A.S, Ajamani .J.L, Design of Steel Structures, Nem Chand and Bros, Roorkee, 1999
2. Duggal, Design of Steel structures, Tata McGraw Hill Company, New Delhi, 2000

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<th>ARE 0210</th>
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PURPOSE

This course is a combination of lecture & studio classes aimed at developing the students understanding of material properties and construction techniques of industrial buildings.

INSTRUCTIONAL OBJECTIVES

To expose the students to different materials of construction, progressively and there by enabling them to represent the different building components through relevant drawings.

FERROUS METALS

Properties and uses of cast iron, wrought iron, pig iron and steel. Market forms of steel: structural steel, stainless steel, steel alloys – properties and uses.

STEEL TRUSSES FRAMES, GATES AND STEEL COMPONENTS

Steel trusses – saw tooth roof truss with north light glazing, simple trusses in steel, and types of connections – to foundations, steel stanchion, and beams etc. Space frames: - single & double layered tubular space frames with globe connections, Gates: entrance gate, rolling shutter. Steel components: Steel doors, (sliding) steel windows (casement window & sliding window) Steel stairs (dog legged, spiral stair) steel hand rails and balustrade, grill designs for windows

ALUMINIUM

forms of aluminum: properties and uses of aluminum, aluminum windows and doors Horizontal sliding, louvered & casement widows and ventilators – aluminum in interiors: aluminum frames, partitions glazing & panels – hinged and pivoted aluminum doors and aluminum curtain wall, cladding with aluminum composite panels (ACP)
PLASTICS

DAMP PROOFING AND WATER PROOFING
Damp proofing: Hot applied and cold applied – Emulsified asphalt, Bentonite clay. Butyl rubber, silicones, Vinlys, Epoxy resins and metallic water proofing materials, their properties and uses. Water proofing: water proofing membranes such as rag, asbestos, glass felt, plastic and synthetic rubber- vinyl, butyl rubber, neoprene, polyvinyl chloride – prefabricated membranes sheet lead, asphalt their properties and uses. Application: application of the above in basement floor, swimming pool, and terraces.

TEXT BOOKS
1. W.B. Mickay – Building construction Vol 1, 2 and 3 – Longmans, UK 1981.

REFERENCE BOOKS
1. Dr.B.C.Punmia – Building construction
2. R.Chudley, construction Technology.

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PURPOSE
The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential

INSTRUCTIONAL OBJECTIVES
1. To guide thought process.
2. To groom students' attitude.
3. To develop communication skill.
4. To build confidence.

METHODOLOGY
The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.
1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation.
5. Empirical Learning
Motivation II - Interpretation of Visuals of I & II
Humor in real life - Body language - Collage and poster designing and slogan writing
Brain Teasers – JAM - Current News Update I
Current News Update II - Enactment (SKIT –I) - Enactment (SKIT – II)
Survey and Reporting (heroes, sports persons etc.) - Quiz III – Review

EVALUATION:
1. Activities assessed by both group and individual participation
2. Continuous assessment based on daily participation

SCHEME OF INSTRUCTION
Marks allocated for regular participation in all oral activities in class
SCHEME OF EXAMINATION
Complete Internal evaluation on a regular Basis

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PURPOSE
To promote computer knowledge and applications in architecture

INSTRUCTIONAL OBJECTIVES
To familiarize the students to the concepts and working of computers. To enable them to present Computer Aided Architectural Drawings both 2D & 3D.

INTRODUCTION TO DRAWING TECHNIQUES
Introduction to graphical software; different 2D object drawing methods, editing objects and modifying their associated properties; texts; dimensioning Drawing unit association; scaling; associating limits; model space; organizing drawings in custom layouts, templates.

ADVANCED 2D DRAFTING TECHNIQUES
Concept of blocks and object grouping; styles; organizing objects in layers; hatching techniques; introduction to symbol libraries.

MISCELLANEOUS CONCEPTS, VIEW AND CO-ORDINATE MANAGEMENT
Database concepts; Attributes and scripts; Concepts of OLE; Introduction to Auto LISP. Different View management techniques; Concept of UCS; Icon management

3D DRAFTING AND MODELLING
Different types of 3D modeling techniques; Solid creation; Editing; Creating complex solids; Boolean operations on solids. Concept of shading; Rendering; Material mapping; Environment attributes

DRAWING EXERCISES
Application of the above in architectural exercises.

TEXT BOOKS
1. AutoCAD 2002 - The Ultimate Reference; Dreamtech Press, 1999

REFERENCE BOOKS
1. Advance Technique in AutoCAD 2002, Sham Tickoo; 1997
3. Inside AutoCAD 2002- Techmedia/ Harrington, 2002

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PURPOSE:
Design exercises involving small Architectural design problems involving simple spatial organizations starting from single space and progressing to small functional grouping of spaces.
INSTRUCTIONAL OBJECTIVES:
Sketching as a tool for visualization of various design alternatives should be emphasized. The use of 3D HOME software and models is also recommended for visualization.

Steps in design methodology through small studio problems. Relevant literature review, similar case studies, programming and formulation of concept in architectural studio assignments. Generation of Bubble Diagram and Activity Proximity Matrix to establish a functional relationship among various spaces. Application of climatic data, basic structural and social consideration in architectural design.

Some suggested design assignments: - Primary school, residential units, Library, guesthouse etc. with exterior and interior perspective views and model.

REFERENCE BOOKS
1. *Time saver standards for building types*, DeChiara and Callender, Mc Graw hill company
2. *Neufert Architect’s data*, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd

REFERENCE BOOKS
1. *Time saver standards for building types*, DeChiara and Callender, Mc Graw hill company
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**PURPOSE**
- To enable the students to design masonry walls made up of bricks, stones and concrete blocks along with their foundations.
- To enable the students to incorporate the limit state method of design of Concrete structures.
- To enable the students to analyse and design of slabs using reinforced cement concrete.

**INSTRUCTIONAL OBJECTIVES**
By the end of the course students shall be capable of designing steel roof trusses, different types of masonry walls and foundations. The students will also be capable of analyzing and design of slabs using limit state method.

**MASONRY STRUCTURE – INTRODUCTION**
Strength of brick, stone and concrete blocks – Permissible stresses in masonry consisting of brick, stone and concrete blocks (both solid and hollow) as per BIS codes.

**MASONRY STRUCTURES – BRICKS - WALLS & COLUMNS**
Types of walls – Effective length and height – Slenderness ratio of walls and columns – Estimation of loads transferred from slabs and beams to walls and columns made up of brick, Relative advantages of different types of masonry walls – use of nomograms.

**MASONRY FOUNDATIONS – SHALLOW FOUNDATIONS**
Concept of safe bearing capacity – SBC of different types of soils – Depth of foundations – Types of foundation – Design of shallow foundation using brick and stone masonry units for walls and columns.

**INTRODUCTION – LIMIT STATE DESIGN**

**LIMIT STATE DESIGN OF SLABS**
Classification of slabs – Estimation of loads – Design of one way, two way, circular and continuous slabs using SP – 16.

**TEXT BOOK**

**REFERENCE BOOK**
PURPOSE
To create awareness about the importance of electrical and mechanical services in buildings.

INSTRUCTIONAL OBJECTIVES
Development to technical and practical knowledge in these services.

ILLUMINATION AND ELECTRICAL SERVICES

LIGHTING DESIGN

HEAT VENTILATION AND AIR CONDITIONING (HVAC)
Behaviour of heat propagation, thermal insulating materials and their co-efficient of thermal conductivity. **General methods of thermal insulation:** Thermal insulation of roofs, exposed walls. **Ventilation:** Definition and necessity, system of ventilation. Principles of air conditioning Air cooling, Different systems of ducting and distribution, Essentials of air-conditioning system.

PUMPS AND MACHINERIES
Reciprocating, Centrifugal, Deep well, Submersible, Automatic pumps, Sewerage pumps, Compressors, Vacuum pump – their selection, installation and maintenance – Hot water boilers – Classification and types of lifts, lift codes, rules structural provision: escalators, their uses, types and sizes, safety norms to be adopted – Social features required for physically handicapped and elderly – Conveyors -Vibrators – Concrete mixers – DE/AC motors – Generators – Laboratory Service – Gas, water, Air and Electricity.

EXERCISE
Preparation of electrical layout of a simple residential building

REFERENCE BOOKS
PURPOSE
Knowledge about the behavior of sound & light in the built environment is of vital importance to a budding architect.

INSTRUCTIONAL OBJECTIVES
To train the students in the field of architectural acoustics & noise control

INTRODUCTION AND THEORY OF SOUND
Acoustics – Definitions, terms related to acoustics. Theory of sound: generation, propagation, transmission, reception of sound, sound waves, frequency, intensity, wavelength, sound pressure, measurement of sound, scales- decibel scale
Characteristics of speech: Characteristics of speech, music and hearing- distribution of energy in speech and music frequencies, intelligibility of speech, high fidelity reproduction of music. Human ear characteristics- making of sound, Binomial hearing, behavior of sound in enclosed spaces.

SOUND TRANSMISSION, ABSORPTION, INSULATION
Room acoustics- resonance, reverberation, echo, reverberation time, simple exercise using Sabine’s formula. Acoustical requirements of different types of building Sound absorption, absorption co-efficient and their measurements, Absorbing materials used and their choices, exercises involving reverberation time and absorption co-efficient. Sound insulation, materials

NOISE CONTROL AND SOUND REINFORCEMENT
Sources and types of noise- in and around buildings, characteristics and effect of noise impact on human beings/ behavior, noise curves, transmission of noise, noise control for buildings- laws and legislation, regulations.
Sound amplification and distribution, sound reinforcement of different rooms. Environmental acoustics-legislature – related to transportation, examples- airports, railway stations, railway tracks, MRTS etc.

ACOUSTICS IN BUILDING DESIGN
Design: Site selection, shape, volume, treatment for interior surface, basic principles in designing open air theatres, cinemas, broadcasting studios, concert halls, class rooms, lecture halls, theatres – Auditorium.

CONSTRUCTION DETAILS

REFERENCE BOOKS
1. Dr.V. Narasimhan – *An introduction to Building Physics*- Kabeer printing works, Chennai -5
PURPOSE
This course is aimed to develop analytical skills in dealing with soil as a medium of water flow, a medium for structural support and a primary building material.

INSTRUCTIONAL OBJECTIVES
1. Provide the description and classification of soil and analysis of stresses in soils under different loading conditions.
2. To develop an understanding of the principles of effective stress in saturated soils, and its application to one dimensional compression and consolidation.
3. Familiarize the students an understanding of permeability and seepage of soils.

BASIC CONCEPTS
Definition of Soil and Soil Mechanics – Soil Problems in Civil Engineering Field – Type of Soils – Basic definition in soil mechanics – Three phase systems & relation – Specific gravity – Pycnometer and density bottle methods – Field density from sand replacement and core cutter method.

INDEX PROPERTIES
Grain size analysis – Stoke’s law and hydrometer analysis – Atterberg limits – Plasticity, liquidity and consistency indexes – Classification of coarse grained and fine grained soils as per BIS.

PERMEABILITY AND SEEPAGE

COMPAC TION AND CONSOLIDATION

STRESS DISTRIBUTION AND SHEAR STRENGTH

TEXT BOOKS

REFERENCE BOOKS
PURPOSE
This course is a combination of lecture & studio classes aimed at developing the students understanding of material properties and construction techniques of concrete, RCC and special concreting methods and appropriate material and technology.

INSTRUCTIONAL OBJECTIVES
To expose the students the preparation of concrete mix placing and curing. Concrete construction methods and special concrete and concreting methods. To expose to students to appropriate material Construction method.

CEMENT & CONCRETE

SPECIAL CONCRETE AND CONCRETING METHOD

CONCRETE CONSTRUCTION
Introduction to RCC framed structures concrete in foundation: types of footing – Isolated, combined, continuous, strip raft & piles. Concrete slabs: one-way two way continuous & cantilever. Concrete beams: singly reinforced, doubly reinforced, cantilever & continuous beams. Concrete columns, floors, walls, partitions, lintels, arches, sunshades. RCC STAIRCASES: Types according to profile – straight flight, doglegged, quarter turn half turn, bifurcated, spiral & Helical. Structural system for the above types sloped slab, cranked slab, cantilevered slab, continuous slab& folded plate, foundation for RCC stair case. Vertical transportation Designing and detailing for physical and handicapped

APPROPRIATE MATERIALS

PRE - FABRICATION
Pre- fabrication: Introduction to pre- fabrication technology, column and beam system /panel system / box system, advantages of pre- fabrication. Pre- fabrication techniques and various building components – foundation, walls, floors, roofs, doors, windows, ferro cement products: sanitary and service core unit, trusses and rafters, water tanks. Design: Design considerations for pre fabrications.

TEXT BOOKS
1. W.B. Mickay – Building construction Vol 1, 2 and 3 – Longmans, UK 1981.

REFERENCE BOOKS
PERSONALITY DEVELOPMENT V

Prerequisite
Nil

PURPOSE
The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential.

INSTRUCTIONAL OBJECTIVES
At the end of the course the students will be able to
1. Acquire the important soft skills for employment
2. Take part in group discussions and job interviews confidently
3. Appear for placement aptitude tests confidently
4. Gain self confidence to face the placement process

METHODOLOGY
The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.

1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation.
5. Empirical Learning

Syllogism - Binary Logic [cause & effect] - Assertive & Counter Argument - Simple Interest - Time & Work - Time & Distance
Upstream & Downstream Reasoning - Verbal Comprehension I - Verbal Comprehension II - Compound Interest
Logarithms - Surds & Indices
Verbal Reasoning I - Verbal Reasoning II - Verbal Reasoning III - Percentage – Test – Averages
Deductive Reasoning I - Deductive Reasoning II - Language Usage I - Decimal Fractions - Profit & Loss – Probability
Language Usage II - Logic Games I - Logic Games II – Area - Pipes & Cisterns – Test.

SCHEME OF INSTRUCTION
Marks allocated for regular participation in all oral activities in class.

SCHEME OF EXAMINATION
Complete Internal evaluation on a regular Basis.

INTRODUCTION
New Features of Revit, Editing and Working with Families in a Project, Concepts of Revit, creating a shared Family, Project and System settings

BASIC MODEL
Creating the Basic Model, Adding Doors and Windows, Floors and Floor Openings, Roof and Ceiling, Staircases

MODELLING
Creating Walls, Doors. Windows, openings, stairs, railings, roofs, curtain systems
DOCUMENTATION
Creating drawings, Creating detail from Building Model, Scheduling, Annotating and Dimensioning, Viewing the Model

RENDERING
Applying Materials and textures, creating a perspective view, rendering an Exterior view, rendering an Interior view, Creating and Recording Walkthroughs, creating 3D cutaways with Section Boxes

TEXT BOOKS
1. Autodesk REVIT 9.1 Manual, Autodesk publications
2. REVIT 9.1 Tutorials, Autodesk publications

REFERENCE BOOKS
AUTODESK Publications

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This Design studio intends to make students comprehend that Architecture can also be thought of as a Design response to technology & materials. Scholars are required to develop an understanding of contemporary technological expressions and the use of modern materials such as glass, steel, aluminium and plastics. Explorations in geometry for the determination of form & structure using computers, is encouraged.

Image & its induction in buildings – Study of the architectural expressions that imbue a building with a certain image (posh, extravagant, luxurious, up market, down town, hi-tech, ethnic, contemporary etc). The relationship between a particular image and the materials & lighting should be established. Students have to understand the circulation patterns & services required in commercial buildings. Ex. Shopping mall / Art gallery / marriage hall / memorial complex etc.

Technological expressions – This project intends to explore the possibility of image induction using expressions of technology for industrial buildings. Hence the functional aspects and the external form assume significance. Students are encouraged to explore architectural styles in vogue such as deconstructivism, Bauhaus, post modern, hi-tech etc. Ex. Garment factory / watch factory / Electronic goods (computers, cellphones etc.) / Bicycle manufacturing unit etc.

Office buildings – Office spaces require special care in design & detailing. Students get exposed to the various services, structural systems and vertical access systems such as elevators, escalators etc of multi-storeyed buildings. Knowledge about various types of cores, fire fighting systems and special building rules applicable to multi-storeyed buildings are implied. Scholars will be required to do the Interior design scheme in detail. Ex. Multi-storeyed office buildings that do not exceed G+6 floors.

REFERENCE BOOKS
1. Time saver standards for building types, DeChiara and Callender, Mc Graw hill company
2. Neufert Architect’s data, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd

REFERENCE BOOKS
1. Time saver standards for building types, DeChiara and Callender, Mc Graw hill company
VI SEMESTER

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Prerequisite
Should have studied ARE 0207

PURPOSE
To introduce the material concrete and enable students to carry out limit state method of design of flat slabs, beams, columns and foundation using BIS codes and hand books.

INSTRUCTIONAL OBJECTIVE
By the end of the course the student shall be capable of designing R.C.C. beams, Flat Slabs columns, shallow foundations and Deep Foundations using limit state method.

LIMIT STATE DESIGN OF BEAMS

DESIGN OF FLAT SLABS
Advantages of flat slab construction – Components of flat slab – Configuration of columns – Design of flat slab by direct design method as per BIS codes.

LIMIT STATE DESIGN OF COLUMNS
Estimation of loads on columns – Load transfer from slab and beam to columns – Long and short columns – Rectangular and circular columns – Columns subjected to uni-axial and bi-axial bending – Design of columns using column interaction diagrams – Use of SP-16 – Detailing.

LIMIT STATE DESIGN OF FOUNDATION

DEEP FOUNDATIONS

TEXT BOOKS

REFERENCE BOOKS
PURPOSE
The various construction techniques keep changing over time. Hence it is imperative that the architect should be conversant with the various technologies that are currently in vogue.

INSTRUCTIONAL OBJECTIVES
To expose the students to various modern materials in construction, various construction systems and equipments available.

INTRODUCTION

MODERN MATERIALS OF CONSTRUCTION

CONSTRUCTION SYSTEMS
Planning - Cast in situ construction ready mixed, pumped etc.) Reinforced concrete steel and prestressed concrete constructions - Precast concrete and prefabrication system - Modular co-ordination - Structural systems.

CONSTRUCTION PRACTICE
Manufacture, storage, transportation and erection of precast component forms, moulds and scaffoldings in construction - Safety in erection and dismantling of constructions.

CONSTRUCTION EQUIPMENT
Uses of the followings: Tractors, bulldozers, Shovels; Draglines, cableways and belt Conveyors, Batching plants - Transit mixers and agitator trucks used for ready mix - Concrete pumps - Guniting equipments - Air compressors - Welding equipments - Cranes and other lifting devices - Choice of construction equipment for different types of works.

REFERENCE BOOKS
1. National Building Code

PURPOSE
To impart the knowledge about the fundamentals of load calculation, systems, design and detailing aspects of structures subject to earthquake loading including recent techniques.

INSTRUCTIONAL OBJECTIVES
1. To develop systematically from basic principles of structural dynamics the characteristic of dynamic behaviour of the structure, namely, response spectrum.
2. To expose important aspects of various theories of cause of earthquake and measurement of its effects on the structure as loads.
3. To impart knowledge about materials and structural systems for structures subject to earthquake. To introduce basic principles of design and detailing for ductility.
4. To expose aspects of modern methods for seismic damage evaluation, control, repair and rehabilitation.

**INTRODUCTION**


**FUNDAMENTALS OF EARTHQUAKE ENGINEERING**


**PRINCIPLES OF ASEISMIC DESIGN**


**DESIGN AND DETAILING**

Codal provision for detailing for earthquake resistance- IS 13920-1993 – shear wall design and detailing.

**SPECIAL TOPICS**

Repair and Rehabilitation techniques – seismic damage ratings – Passive and Active control of vibration – New and favorable materials – case studies in repair and rehabilitation.

**TEXT BOOKS**


**REFERENCE BOOKS**

5. *Learning earthquake Design and Construction*, Earthquake Tips 1 to 24, Authored by C.V.R. Murthy, IIT, Kanpur. eqtips @iitk.ac.in
6. Web sites: www.niceee.org
PURPOSE
To provide the student adequate knowledge to write the specifications for a given item of work, to work out the unit cost of individual items based on their specifications and arrive at the overall cost of the project.

INSTRUCTIONAL OBJECTIVES
• To enable the student to write specifications for various items of civil works with a view of controlling quality of work executed at site.
• To provide the student sufficient knowledge of estimation in order that he can advice prospective clients on project viability and also monitor/control project cost.

INTRODUCTION TO SPECIFICATION
Specification - Definition, purpose, procedure for writing specifications for the purpose of calling tenders, types of specification. General specifications for 1st, 2nd, 3rd and 4th class buildings.

SPECIFICATION FOR DIFFERENT ITEMS
Specifications for the following items – bricks; sand; cement; coarse aggregate; water; reinforcement; storing and handling of materials; Earth work in foundation; PCC; RCC; First class brick work in cement mortar; half brick thick partition in cement mortar; reinforced brick work; DPC; glazed tiles in skirting and dadoo; cement plaster; joinery in wood, steel & aluminum; painting to walls – cement paint, oil bound distemper, acrylic emulsion, enamel paint; painting to joinery; varnishing; French polishing;

INTRODUCTION TO ESTIMATION
Estimation – definition; purpose; types of estimate; various methods of approximate estimate of buildings.

RATE ANALYSIS
Rate analysis – definition; method of preparation; quantity and labour estimate for unit work; task or outturn work; rate analysis for: earth work, concrete works, first class brick work, reinforced brick work, cement plastering, DPC with cement mortar/ concrete, finishing (cement paint, distemper, acrylic emulsion, enamel paint) to walls & ceiling.

DETAILED ESTIMATE
Detailed estimate – data required, factors to be considered, methodology of preparation, abstract of estimate, contingencies, work-charged establishment, bill of quantities, different methods for estimating building works, methods of measurement of works.

TEXTBOOKS

REFERENCE BOOKS
1. PWD Specifications of Tamil Nadu State Government
2. CPWD Specifications of Government of India
PURPOSE
To develop an understanding of the behavior of foundations for engineering structures and to gain knowledge of the design methods that can be applied to practical problems.

INSTRUCTIONAL OBJECTIVES
1. Provide the students with a basic understanding of the essential steps involved in a geotechnical site investigation.
2. Introduce to the students, the principal types of foundations and the factors governing the choice of the most suitable type of foundation for a given solution.
3. Familiarize the student with the procedures used for: a) bearing capacity estimation, b) end bearing capacity, c) skin friction

SITE INVESTIGATION AND SELECTION OF FOUNDATIONS

BEARING CAPACITY

FOOTINGS AND RAFTS

PILE FOUNDATION
Function of Piles – Classification of pile – Load carrying capacity – Static and Dynamic formulae – Pile load test – Pile group – Spacing – Pile cap - Negative skin friction.
Introduction to well foundations-diaphragm walls-anchors

EARTH PRESSURE

TEXT BOOKS

REFERENCE BOOKS
**ARE 0310 WORKING DRAWING**

**L T P C**

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**Purpos**
The students learn to draw working drawings used for building construction

**Instructional Objectives**
- Reading of working drawing, their co-relation and cross-referencing in various technical projections like plans, elevations, sections, detailing etc.
- Introduction to drawings for approval of local authorities.
- Working drawing of more complex structures including services with interior details.

**Sessional Work**
- Producing drawings for approval of local authorities such as CMDA, Municipality etc, for a Load Bearing Residential unit with ground and upper floors.
- Complete set of working drawings for the regular class design project or any institute / public building of R.C.C. framed structure with part/basement, ground floor and first floor with lift/elevator including interior detail drawings like cabin / Board room, Toilet details etc..

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**PD 0302 PERSONALITY DEVELOPMENT VI**

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**Purpos**
The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential

**Instructional Objectives**
1. Acquire the important soft skills for employment
2. Take part in group discussions and job interviews confidently
3. Appear for placement aptitude tests confidently
4. Gain self confidence to face the placement process

**Metho**
The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.
- Group activities + individual activities.
- Collaborative learning.
- Interactive sessions.
- Ensure Participation.

**Current Tech Update**
- Verbal Aptitude Test I - GD –I - Odd man out series - Permutation & Combination - Problems on ages

**Current Tech Update**
- GD –II - Resume Writing - Mock Interview I / reading comprehension - Problems on trains – Allegation of Mixtures - Test


SCHEME OF INSTRUCTION
Marks allocated for regular participation in all oral activities in class

SCHEME OF EXAMINATION
Complete Internal evaluation on a regular Basis.

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Designing for sustainability – Sustainable architecture and planning has become vital factor in the design of all buildings because the building activity is considered as one of the major pollutants of the natural environment. Study of the various techniques of Energy-efficient design and recycling technologies for water & wastes is mandatory as these have to be incorporated in the design proposals. Awareness about LEEDS rating and best practices is expected.

Institutional buildings – These are buildings with complex spatial organizations, multifunctional spaces, large spans and variable circulation patterns. Environmental issues are emphasized and the Design studio aims to inculcate the techniques of designing for sustainability. Students are expected to do the landscape layout in detail to develop appreciation of a holistic environmental design. Ex. College / Hospital / theatre / Campus Planning / Performing Arts etc.

REFERENCE BOOKS
1. *Time saver standards for building types*, DeChiara and Callender, Mc Graw hill company
2. *Neufert Architect’s data*, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd
VII SEMESTER

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**PURPOSE**
Knowledge about the methodology of executing a Project, greatly enhances the professional ability of an Architect.

**INSTRUCTIONAL OBJECTIVES**
To expose the students to the currently prevalent techniques in the planning, programming and management of a project.

**INTRODUCTION**
Planning and project scheduling and project controlling, Role of Decision in project management, Method of planning and programming, Human aspects of project management, work breakdown structure, Life cycle of a project, disadvantages of traditional management system

**ELEMENTS OF NETWORK & CRITICAL PATH METHOD AND PERT ANALYSIS**
Event, activity, dummy, network rules, graphical guidelines for network, numbering of events. CPM network analysis & PERT time estimates, time computation & network analysis

**PROJECT TIME REDUCTION AND OPTIMIZATION**
Project cost, Indirect project cost, direct project cost, slope of the direct cost curve, TOTAL project cost and optimum duration, contracting the network for cost optimization, steps in cost-time optimization

**PROJECT UPDATING**
When to update? Data required for updating, steps in the process of updating

**RESOURCE ALLOCATION**
Resource usage profile: Histogram, Resource smoothing and Resource leveling, Computer applications in project management.

**TEXT BOOK**
1. Dr. B.C.Punmia et al. *Project planning and control with PERT and CPM*, Laxmi Publications, New Delhi

**REFERENCE BOOKS**
S.P.Mukhopadyay, *project management for Architect’s and civil Engineers*, IIT, Kharagpur, 1974

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**PURPOSE**
To develop an appreciation of the planning issues involved at the scale of a town or a city.

**INSTRUCTIONAL OBJECTIVES**
To expose the students to the history and development of planning, its relevance & application to modern day principles of town planning.
INTRODUCTION TO TOWN PLANNING AND PLANNING CONCEPTS
Definitions of town planning, levels of planning and steps for preparation of a town plan, survey techniques in planning, concepts, functions, components and preparation of a development plan.
Planning concepts related to garden city, geddesian triad, neighbourhood planning, radburn layout, ekistics, satellite towns and ribbon development.

ANCIENT SYSTEM OF TOWN PLANNING IN INDIA
Indus valley civilization - Mohenjodaro, Harappa, Extracts from Chanakya’s Arthasastra, manasara’s Vastushastra, planning thought behind Fatehpur sikhri, Shahjahanabad, Jaipur and delhi

LE CORBUSIER’S CONTRIBUTION TO TOWN PLANNING
Selected examples to include concentric city, radiant city, CIAM, linear industrial city and Chandigarh.

ZONING AND DEVELOPMENT CONTROL
zoning, regulations and control, the comprehensive role of urban design in town planning process.

INTRODUCTION TO HUMAN SETTLEMENTS
Introduction to human settlements, growth and decay of human settlements, influence of socio-economic factors in the development of human settlements

TEXT BOOK

REFERENCE BOOKS
1. John Ratcliffe, An Introduction to Town and Country Planning, Hutchinson 1981
3. Rangwala, Town Planning, Charotar publishing house
4. G.K.Hiraskar, Town Planning
5. Rame Gowda, Urban and Regional planning

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PURPOSE
To make the students aware that economics and sociology are integral parts of architectural consideration.

INSTRUCTIONAL OBJECTIVES
To expose the students to the various social issues and economic concepts that come with in the purview of architecture.

GENERAL ECONOMICS
Subject matter of Economics, relevant economic theories to urban economics.

URBAN ECONOMICS

LAND AND BUILDING ECONOMICS
RELEVANCE OF SOCIOLOGY
Definition and theories and their relevance to social set-up- Social structure – Organization – Social Institutions and Social Change.

SOCIAL PROBLEMS AND PROGRAMMES
Developmental programmes related to urban and rural society – Impact of programmes on social development.

REFERENCE BOOKS

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<th>HOUSING</th>
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PURPOSE
To create awareness about the causes and consequences of housing problems and to impart knowledge about the possible solutions.

INSTRUCTIONAL OBJECTIVES
Understanding of the various issues involved in urban and rural housing and knowledge about the planning and design solutions for low income groups.

INTRODUCTION
Review of different forms of housing globally – particularly with reference to third world countries.
Housing need & Demand – Calculation of future need.
Housing resources and options available in housing

HOUSING AGENCIES AND POLICIES
Housing Agencies and their contributions to housing development – HUDCO, State Housing Boards, Housing Co-operatives and Banks. Housing Policies in India and other countries like UK & USA.

SOCIO ECONOMIC ASPECTS
Social factors influencing Housing Design, affordability, economic factors and housing concepts – Slum upgrading and sites and services schemes.

HOUSING STANDARDS
Different types of Housing standards – Methodology of formulating standards – Relevance of standards in Housing Development.

HOUSING DESIGN PROCESS
Different stages in project development – Layout design including utilities and common facilities – Housing design as a result of environmental aspects, development of technology and community interests.
Case studies of Public Sector housing, Government housing, Private and Co-operative housing – their Advantages and disadvantages.

REFERENCE BOOKS
PURPOSE
To give practical exposure to the students by making them interact with the industry.

INSTRUCTIONAL OBJECTIVES
The students should undertake training as apprentice in registered Architectural firms/Engineering firms with at least 5 years standing. Every student should work as a full time trainee for a period of 1 month during the summer vacation. i.e. May or June. The work diary and portfolio of drawings will be evaluated by an internal examiner through viva voce examination.

REFERENCE BOOKS
1. *Time saver standards for building types*, DeChiara and Callender, Mc Graw hill company
2. *Neufert Architect’s data*, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd
3. *National Building Code - ISI*
VIII SEMESTER

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<tr>
<th>ARE 0402</th>
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PURPOSE
To expose the students to the various problems and issues encountered in the normal course of architectural practice & teach them the methods of legal redressal.

INSTRUCTIONAL OBJECTIVES
To develop understanding of the duties and liabilities of an architect along with knowledge of bye-laws that relate to the building & the environment in the Indian context.

ROLE OF AN ARCHITECTURAL ENGINEER & SERVICES RENDERED
Architectural services- conditions of agreement- scope of work, comprehensive architectural services and architectural competitions, conditions of engagement, remuneration, professional fees and charges.

LEGISLATIONS
Role of development authorities & urban arts commissions, salient features of the DCR for CMA, important regulations in the Tamilnadu cinema rules,1973 & the TN factory rules,1950,- Environmental acts & laws, special rules governing hill area development & coastal area management, heritage act of India etc.

EASEMENTS & ARBITRATION
Definition, types of Easements, acquisition, protection and extinction of easements – Need for Arbitration, arbitration agreement, role of arbitrators, umpire etc, excepted matters, arbitral award.

TENDER & CONTRACT
Calling for Tenders, tender documents, open & closed tenders, various types such as item rate, lump sum, labour & demolition tenders, conditions of tender, submission, scrutiny, recommendations & award of contract.
Conditions of contract. IIA form of contract, articles of agreement, certification of contractor’s bills, defects liability.

VALUATIONS & RENT

TEXT BOOK

REFERENCE BOOKS
2. Estimating and Costing by Dutta
3. CMDA-Development control rules for CMA.
Thesis project work should be done independently by students adopting the case study methodology. Internal Assessment for 50% of the marks will be awarded by conducting thesis reviews periodically. The remaining 50% of the marks will be awarded during the conduct of the thesis viva voce examination at the end of the semester. Candidates will be required to undertake the design & detailing of large complex buildings such as stadia, airports, transportation terminals, entertainment complex, IT parks, amusement parks, Hospital Complex, multi-storied apartments, offices, hotels etc., for thesis project work.

The Comprehensive Viva Voce exam will be conducted by a panel of faculty members drawn from departments of architecture, civil engineering, Mechanical Engineering and Electrical Engineering. Each candidate will be subjected for an intensive questioning session about the understanding of the subjects that he has undertaken during the eight semesters of his undergraduate program. Marks will be awarded by the panel based on the performance of the candidate and mutual agreement.
ELECTIVES

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<tr>
<th>ARE 0352</th>
<th>INTERIOR DESIGN</th>
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PURPOSE
To study the Interior Design principles and their applications in interiors.

INSTRUCTIONAL OBJECTIVES
Detailed study of History, principles and elements that go into making of an interior space more aesthetic, pleasing and functional with a few projects as practical.

INTRODUCTION TO INTERIOR DESIGN
Definition of interior design - Interior design process - Vocabulary of design in terms of principles and elements - Introduction to the design of interior spaces as related to typologies and functions, themes and concepts - Study and design.

HISTORY OF INTERIOR DESIGN
Brief study of the history of interior design through the ages relating to historical context, design movements and ideas etc. - Brief study of folk arts and crafts. (vernacular design in India) with reference to interior design and decoration.

ELEMENTS OF INTERIOR DESIGN - ENCLOSING ELEMENTS
Introduction to various elements of interiors like floors, ceilings, walls, staircases, openings, interior service elements, incidental elements etc. and various methods of their treatment involving use of materials and methods of construction in order to obtain certain specific functional, aesthetic and psychological effects.

ELEMENTS OF INTERIOR DESIGN - LIGHTING ACCESSORIES & INTERIOR LANDSCAPING
Study of interior lighting - Different types of lighting their effects types of lighting fixtures. Other elements of interiors like accessories used for enhancement of interiors – Paintings, objects de art, etc. Interior landscaping - Elements like rocks, plants, water, flowers, fountains, paving, artifacts, etc. their physical properties, effects on spaces and design values.

ELEMENTS OF INTERIOR DESIGN - FURNITURE DESIGN & SPACE PLANNING
Study of the relationship between furniture and spaces - human movements & furniture design as related to human comfort. Function, materials and methods of construction - changing trends and lifestyles - innovations and design ideas - Study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc. – Design Projects on Residential, Commercial and Office Interiors.

TEXTBOOKS

REFERENCE BOOKS
5. The Impulse to adorn - Studies in traditional Indian Architecture - Editor Dr.Saranya Doshi, Marg Publications, 1982.
ARE 0354 ART MOVEMENTS & ARCHITECTURE

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Prerequisite
Nil

PURPOSE
Introducing the students to various Art movements in history and their impact on Architecture of that period.

INSTRUCTIONAL OBJECTIVES
To provide the student an in-depth knowledge of the philosophies behind the various Art movements in History and to establish the links, mutual influences and symbiosis between Art and Architecture from ancient times.

ART STYLES IN THE CLASSICAL PERIOD
Hellenistic Art and examples from Greek Architecture – Parthenon, Tower of winds, Roman Art and its influences – Pantheon, Basilica of Constantine

MIDDLE AGES

PRE-MODERN ART STYLES AND THEIR INFLUENCES

ART MOVEMENTS IN THE MODERN PERIOD & THEIR ARCHITECTURAL INFLUENCES

ART MOVEMENTS IN THE POST MODERN PERIOD & THEIR ARCHITECTURAL INFLUENCES
Abstract Expressionism, Op Art, Pop Art, Minimal Art, New Realism, Conceptual Art, Performance Art, Neo-Expressionism and their influences on Architecture, Computer Art and the architecture of Greg Lynn, Peter Eisenmann, Frank Gehry, Post-Modern Classicism and the works of Charles Moore, Jeneks etc., Bio mimicry in architecture-study of the works of Santiago Calatrava, Zaha Hadid etc.,

REFERENCE BOOKS
6. Vikram Bhatt and Peter Scrive, Contemporary Indian Architecture: After the Masters, Mapin, Ahamedabad.

ARE 0451 CONTEMPORARY ARCHITECTURE

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Prerequisite
Nil

PURPOSE
Introducing the students to various Design philosophies of Modern & Post Modern Architecture.

INSTRUCTIONAL OBJECTIVES
To provide the student an in-depth knowledge of modern design philosophies in the evolution of innovative architectural forms and designs.
EVOLUTION OF MODERN ARCHITECTURE & INFLUENCE OF NEW MATERIALS

REVIEWS INDUSTRIALISATION
Arts & Crafts movement in Europe and America; Art nouveau, and the works of Horta, Guimard, Gaudi and Macintosh; Organic Architecture -Early works of F.L.Wright. Chicago school; Art deco Architecture in Europe and America.

EVOLUTION OF MODERNISM
Viennese secession, Adolph Loos and debates on ornamentation ; Futurism, Expressionism works of Mendelsohn &Taut, Cubism, Constructivism, De stijl and their influence on Architecture. Bauhaus school & Walter gropius, Modernism and the International style.

AFTER MODERNISM
Criticisms of Modern Architecture; Post Modernism, Collage, Technology and new science., Pop art Deconstruction, Critical Regionalism with examples from works of 2nd & 3rd generation architects.

MODERNISM AFTER CORBUSIER AND KAHN
Corbusier' works in India – Chandigarh and the Ahmedabad buildings - their influence on the modern rationalists; Louis Kahn’s works in India - their influence on the empiricists; Post-Nehruvian modernist architecture – modernism, utilitarian modernism and neo-modernism, brutalism. Criticisms on the modern movement in India; countering the stigma of colonialism; Critical regionalism and the neo-vernacular; the community architectural movement; integrating the new and the old; revivalism in religious and secular buildings; revivalism and post-modernism.

REFERENCE BOOKS
6. Vikram Bhatt and Peter Scriver, Contemporary Indian Architecture: After the Masters, Mapin, Ahmedabad.

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<tr>
<th>ARE 0453</th>
<th>VERNACULAR ARCHITECTURE</th>
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Prerequisite
Nil

PURPOSE
To expose the students to traditional architecture of the various parts of the country.

INSTRUCTIONAL OBJECTIVES
The students will have knowledge of the planning aspects, materials used in construction, constructional details and settlement planning of the settlements in various parts of the country.

INTRODUCTION TO VERNACULAR ARCHITECTURE
Approaches and concepts to the study of Vernacular architecture – Introduction to Kutcha architecture and Pucca architecture
DRAVIDIAN SOUTH
Planning aspects, materials of construction, Constructional details & Settlement Planning of
- Kerala – Nair houses(Tarawads), Kerala Muslim houses(Mappilah houses), Temples, Palaces and theaters – Thattchushastra.
- TamilNadu – Toda Huts, Chettinad Houses (Chettiars) & Palaces
- Karnataka – Gutthu houses (land owning community), Kodava ancestral home (Aynmane)
- Andhra Pradesh –Kaccha buildings
Religious practices, beliefs, culture & climatic factors influencing the planning of the above.

WESTERN REGION
Planning aspects, Materials used, Constructional details, Climatic factors influencing the planning of
- Jat houses for farming caste, Bhungas(Circular Huts) and Havelis(Pukka houses) of Rajasthan
- Pol houses of Ahmedabad - Primitive forms, Symbolism, Colour, Folk art etc in the architecture of the deserts of Kutch & Gujrat state.
- Vernacular architecture of Goa.

NORTHERN AND EASTERN INDIA
- Kashmir – Typical Kutch houses, mosque, Dhoongas(Boathouses), Ladakhi houses, bridges
- Himachal Pradesh – Kinnaur houses
- Uttar Pradesh – Domestic housing of Uttar Pradesh
- Bengal – Bangla (Rural house form), Aat Chala houses – change from Bangla to Bungalow, Kutcha & Pucca architecture of Bengal.Nagaland – Naga houses & Naga village, Khasi houses
Factors influencing the planning aspects, materials of construction & constructional details of the above.

TEXT BOOKS
1. Traditional buildings of India, Ilay Cooper, Thames and Hudson Ltd., London

REFERENCE BOOKS
1. Architecture of the Indian desert, Kulbushan Jain & Meenakshi Jain, Aadi Centre, Ahmedabad
2. The Royal Palaces of India, George Michell, Thames and Hudson Ltd., London
6. The Tradition of Indian architecture – Continuity & Controversy – Change since 1850, G.H.R.Tillotsum, Oxford University Press, Delhi

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<tr>
<th>ARE 0452</th>
<th>TECHNOLOGY OF TALL BUILDINGS</th>
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PURPOSE
To impart knowledge about the Structures and special service requirements of tall buildings and to create awareness about the systems, equipment and materials that are commonly employed in high rise buildings.

OBJECTIVES
Understanding the Structures and special systems required in mechanical, electrical and Fire safety services.
The ability to design vertical transportation systems, HVAC systems and Fire protection systems in line with the various standards, building codes and safety requirements.
LOADS
Gravity Loading – Dead and Live Load – Reduction of Live Load- Impact and Construction Loads. Wind loading –. Earthquake loading (Qualitative Treatment only) – Equivalent Lateral Force– Combination of loading.

STRUCTURES IN HIGH RISE BUILDINGS-BEHAVIOUR
Behaviour of High rise structures –Vertical and Horizontal load transfer systems – Braced frames –Shear walls – Wall frames – Tubular systems – Outrigger-braced systems

VERTICAL TRANSPORTATION & FIRE PROTECTION
Introduction to passenger elevator codes – Express & Local Elevators, Sky lobbies etc., - Study of elevator equipments, control systems and spatial requirements – Escalators and Capsule elevators – Stairways & Ramps


THERMAL CONTROL SYSTEMS & ELECTRICAL SYSTEMS
Calculation of Heating and Cooling loads – Selection of suitable HVAC system – Special equipments and systems for heating and cooling – Spatial requirements for HVAC plants – Design of duct layouts etc.,

Planning transformer & generator rooms, Preperation of electrical layouts for tall buildings – Spatial requirements of electrical rooms and ducts – Intelligent systems for electrical and illumination.

WATER SUPPLY AND SEWAGE DISPOSAL
Basic planning for water supply – Calculation of capacity for sumps and water tanks —Skip stage pumping etc., - Rainwater harvesting methods – Sanitation arrangements in high rise structures – Service floors – Ducts and vertical shafts – Waste treatment etc.,

TEXT BOOKS
Stein Reynolds Mc Guinness – Mechanical and Electrical equipment for buildings – vol 1 & 2 – John Wiley & sons

REFERENCE BOOKS
Bennetts Ian & others – Tall building structural systems
Proceedings of the council for tall buildings – vol 1 & 2

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<tr>
<th>ARE 0454</th>
<th>ADVANCED STRUCTURES</th>
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PURPOSE
• To inculcate the basic concepts of pre stressing.
• To familiarize the students with the tall building structural system and various types of shells and folded plates.
• To introduce the basic concepts of Space Frames, Shells and folded plates and Tensile structures

INSTRUCTIONAL OBJECTIVES
By the end of the course the student shall be capable of designing Shells and Space Frames. He shall be in a position to appreciate the difference between RCC and pre stressed concrete. Further he shall have sufficient knowledge to suggest appropriate tall structural systems, shells and folded plates and tensile structure for the space coverage.
PRE STRESSED CONCRETE
Introduction to pre stressed concrete – Pre stressed concrete materials – Methods of pre stressing - Analysis and approximate design of determinate beams - losses of prestressing - Comparison between RCC and pre stressed concrete.

TALL BUILDINGS

SPECIAL STRUCTURES
Definitions, Types – single, double & multilayered grids – two way & three way space grids, connectors, Grids – Domes - various forms - Geodesic domes.

SHELLS AND FOLDED PLATES

TENSILE STRUCTURES
Suspended cable structures – types of cable network systems, shapes of cable suspended systems, examples of tensile membrane structures – types of pneumatic structures.

TEXTBOOKS

REFERENCE BOOKS

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PURPOSE
To inculcate the fundamental principles of construction planning and management as applicable in Civil Engineering Projects.

INSTRUCTIONAL OBJECTIVES
1. To introduce a concepts of projects formulation
2. To impart the idea about planning and scheduling of activities.
3. To introduce the concepts of resource planning and allocation and control.
4. To provide a bird’s eye view of optimization techniques.

CONSTRUCTION PROJECT FORMULATION
CONSTRUCTION PLANNING AND SCHEDULING

RESOURCE PLANNING

RESOURCE ALLOCATION AND CONTROL

OPTIMISATION TECHNIQUES

TEXT BOOKS

REFERENCES

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<tr>
<th>ARE 0458</th>
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PURPOSE
• To enable the students understand the concept of Real Estate management
• To give an overview of the Real Estate Market to the students
• Providing exposure, at an advanced level, to the wide range of issues that reflect the principal areas of specialization in the real estate profession;
• Stimulating an awareness of the issues involved in international real estate;
• Developing analytical and methodological skills that are critical for management, decision-making and problem-solving roles.

OBJECTIVES
By the end of the course, students will be thoroughly exposed to the aspects of Real Estate Management. Students shall be capable of managing retail real estate and corporate real estate effectively.

REAL ESTATE DEVELOPMENT
Fundamental concepts and techniques, recognizing institutional and entrepreneurial elements, issues encountered in various phases of development like site evaluation and land procurement, development team
assembly, market study and development scheme, construction and project management, project marketing and hand-over of completed projects.

**DEVELOPMENT & PROJECT FINANCING**

Project Feasibility, Development Financing, Asset Disposal and Redevelopment Options, Analyses of Development Sites and Case Studies, integrated case study on a specific development project, which requires reviewing, analysing and resolving the problems or strategic issues.

**URBAN POLICY & REAL ESTATE MARKETS**

Impact of Government Regulations and Public Policies on Real Estate Markets, include urban land rent and location theories, land use structures, community and neighbourhood dynamics, degeneration and renewal in urban dynamics, private-public participation, government policies on public and private housing, and urban fiscal policy including property taxation, local government finance.

**CORPORATE REAL ESTATE ASSET MANAGEMENT**

Strategic plans to align real estate needs with corporate business plans; Performance measurement techniques to identify asset acquisition or disposal; methods for enhancing value through alternative uses, efficient space utilization or improving user satisfaction.

**COMMERCIAL REAL ESTATE APPRAISAL**

Determination of the capitalization rates across different types of properties; Appraisal of freehold and leasehold interests; Critical analysis of the valuation approaches adopted for securitized real estate; Asset pricing models; investment flexibility and future redevelopment opportunities.

**REFERENCES**


Project planning scheduling & control in construction an encyclopedia of terms & applications , New York, Wiley, 1995