

DETAILED SYLLABUS

FOR

DISTANCE EDUCATION

Diploma

(Three Years Semester Scheme)

Diploma in Architecture

(DARC)

COURSE TITLE : Diploma in ARCHITECTURE (DARC)
DURATION : 03 Years (Semester System)

FIRST SEMESTER

COURSE TITLE	Paper Code	MARKS				
		THEORY		PRACTICAL		TOTAL
		INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	
APPLIED MATHEMATICS-I	DARC-101	40	60			100
PHYSICS	DARC-102	40	60			100
CHEMISTRY	DARC-103	40	60			100
FUNDAMENTALS OF COMPUTERS	DARC-104	40	60			100
COMMUNICATION TECHNIQUES	DARC-105	40	60			100

Note:

Theory Paper : 40% Continuous Internal Assessment and 60 % University examination.

Practical Paper: 40 % Continuous Internal Assessment and 60 % University examination.

Continuous Internal Assessment:

- | | |
|--|--|
| 1) Two or three tests out of which minimum two will be considered for Assessment | 60% of Continuous Internal Assessment |
| 2) Seminars/Assignments/Quizzes | 30% of Continuous Internal Assessment |
| 3) Attendance, class participation and behavior | 10% of Continuous Internal Assessment |

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – I**

APPLIED MATHEMATICS I

Sub. Code: DARC 101

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

Unit 1: Algebra - 1

Application of Quadratic Equations; Simultaneous Equations (One Linear and Other Quadratic Equation) in Two Variables to Engineering Problems.

Arithmetic Progression, its n th Term and Sum of n Terms with their Applications to Engineering Problems.

Geometrical Progression, its n th Term and Sum of n Terms and to Infinity with Application to Engineering Problems.

Unit 2: Algebra – 2

Partial Fractions (Excluding Repeated Quadratic Factors)

Introduction to Permutations & Combinations; Applications of Formulae.

Binomial Theorem (Expansion without Proof) for Positive Integral Index (Expansion and General Term); Binomial Theorem for any Index (Expansion without Proof only); First and Second Binomial Approximation with Application to Engineering Problems.

Logarithm General Properties of Logarithms, Calculations of Engineering Problems using Log Tables

Unit 3: Determinants and Matrices

Determinants and Matrices-Expansion of Determinants (up to Third Order) using Sarrus Rule, Expansion Method and Pivotal's Condensation Method; .Properties of Determinants; Solutions of Equations (up to 3 unknowns) by Cramer's Rule; Definition of Matrix; Addition, Subtraction and Multiplication of Matrices (up to Third Order); .Inverse of a Matrix by Ad-joint Method and Elementary Row Transformations. Solution of Equations (up to 3 unknowns) by Matrix Method

BLOCK II

Unit 4: Trigonometry

Addition and Subtraction Formulae; Product Formulae and their Application in Engineering Problems; Transformation from Product to Sum or Difference of Two Angles and vice versa; Multiple and Sub-multiple Angles.
Conditional Identities; Solution of Triangles (excluding Ambiguous Cases).
Graphs of $\sin x$, $\cos x$, $\tan x$ and e^x

Unit 5: Vectors

Definition of Vector and Scalar Quantities; Addition and Subtraction of Vectors; Dot Product and Cross Product of Two Vectors; .Thumb Rule; Angle between Two Vectors; Application of Dot and Cross Product in Engineering Problems

Unit 6: Complex Numbers

Definition; Real and Imaginary Parts of a Complex Number; Polar and Cartesian Representation of a Complex Number and Conversion from One to the Other; Conjugate of a Complex Number; Modules and Argument of a Complex Number.

Suggested Readings:

1. Higher Engineering Mathematics, B.S. Grewal, Khanna Publishers.
2. Mathematics Vol. I, SS Sabharwal et. al., Eagle Prakashan.
3. Mathematics Vol. II, SS Sabharwal et. al., Eagle Prakashan
4. Advanced Engineering Mathematics, A B Mathur and V.P. Jagi; Khanna Publishers.
5. Engineering Mathematics, C Dass Chawla, Asian Publisher.
6. Engineering Mathematics, S Kohli and others, IPH.

Note:

1. Eight questions are to be set, at least one question from each unit. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – I**

PHYSICS

Sub. Code: DARC 102

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I:

Unit 1: Units & Dimensions

Fundamental and Derived Units in SI System; Dimensions of Physical Quantities; Principle of Homogeneity; Dimensional Equation; Applications of Dimensional Analysis; Checking the Correctness of Physical Equations; Derivation of Simple Physical Relations; Limitation of Dimensional Analysis.

Unit 2: Force & Motion

Scalars and Vectors; Velocity & Acceleration; Equations of Motion; Newton's Laws of Motion; Composition and Resolution of Forces; Motion of Projectiles: Parabolic Motion, Trajectory, Time of Flight, Horizontal Range and Maximum Horizontal Range, Centripetal Acceleration; Centripetal and Centrifugal Forces; Concept of Friction..

Unit 3: Work, Power and Energy

Work and its Units; Work Done on Bodies Moving on Horizontal and Inclined Planes; Concept of Power and its Units; Calculations of Power (Simple Cases); Concept of Kinetic Energy and Potential Energy; Law of Conservation of Energy; Conservation of Energy in Case of Freely Falling Bodies.

Unit 4: Waves and Vibrations

Simple Harmonic Motion (SHM): Definition, Dynamics of Simple Harmonic Motion; Energy of Simple Harmonic Motion; Vibration: Types of Vibration; Vibration Analysis: Free Vibration without Damping, Free Vibration with Damping, Forced Vibration, Resonant Vibration; Wave Motion: Types of Wave, Transverse and Longitudinal and Surface Wave, Relation between Velocity of Wave, Frequency and Wave Length of a Wave; Sound and Light Waves; Applications of Sound Waves in Engineering.

BLOCK II

Unit 5: Heat

Concept of Heat and Temperature; Unit of Temperature; Basic Principles and Methods of Measurement of Temperature: Thermocouple, Resistance and Bimetallic Thermometer, Pyrometers, Clinical and other Thermometers; Three Modes of Transfer of Heat: Conduction, Convection, Radiation, Coefficient of Thermal Conductivity, Thermal Resistance; Expansion of Solids: Linear thermal expansion coefficient, Surface thermal expansion coefficient, Volume thermal expansion coefficient, Relation amongst Three thermal expansion coefficients; Heat Radiation: Characteristics of Heat Radiation; Prevost's Theory; Black Body Radiations: Emissivity and Absorptivity, Kirchhoff's Law, Stefan's Law.

Unit 6: Principle of Optics

Reflection of Light: Laws of Reflection; Refraction of Light: Refractive Index; Concept of Mirror: Convex Mirror, Concave Mirror, Mirror Equation and Magnification; Concept of Lens: Lens Formulae, Real and Virtual Image, Magnification Power of Lens; Simple and Compound Microscope; Optical Telescope; Total Internal Reflection: Critical Angle, Conditions for Internal Reflection

Unit 7: Electrostatics

Coulombs Law: Electric and Magnetic Constants, Unit Charge, Electric Field, Electric Field of Point Charge, Electric Flux; Gauss's Law: Electric Field of Point Charge, Electric Field of Conducting Sphere, Electric Field: Outside a Sphere of Uniform Charge, Electric Field: Inside a Sphere of Charge, Electric Field of Line Charge, Electric Field: Conducting Cylinder, Electric Field: Sheet of Charge, Electric Field: Parallel Plates.

Unit 8: Electricity and Magnetism

Ohm's Law: Specific Resistance; Kirchhoff's Laws; Wheatstone Bridge: Operation and Significance; Joule Effect - Heating Effect of Current: Concept of Electric Power; Magnetic Fields and Forces; Magnetic Fields due to Current; Ampere's Law; Faraday's Law of Induction: Lenz's Law, Self Induction, Mutual Induction

Suggested Readings:

1. Applied Physics Vol. I & II, TTTI Publication Tata McGraw Hill.
2. Basic Applied Physics, RK Gaur; Dhanpat Rai and Co.
3. Numerical Problems in Physics: Volume I and II by RS Bharaj; Tata McGraw Hill
4. Text book of Physics, Vol. I & II, Resnik and Halliday, Wiley India.
5. Engineering Physics, R. Gaur & S. L. Gupta, Dhanpat Rai and Co.

Note:

1. Eight questions are to be set. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – I**

CHEMISTRY

Sub. Code: DARC 103

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

Unit 1: Structure of Atom

Introduction; Fundamental Particles of Atom; Electron, Proton and Neutron.; Bohr's Model of Hydrogen Atom; Line Spectrum of Hydrogen Atom; Limitation of Bohr's Model; Modern Concept of Atom; Four Quantum Numbers; Pauli's Exclusion Principle; Types of Bonds; Modern Periodic Table of Elements.

Unit 2: Chemical Equation, Oxidation & Reduction

Basic Concept of Elements; Mixture and Compound; Chemical Equation, its Balancing; Implications and Limitations.

Concept of Oxidation & Reduction: Electronic Concept of Oxidation and Reduction, Redox Reactions (Direct and Indirect), Oxidation No, Balancing of Simple Redox Reactions by Oxidation No.

Unit 3: Ionic Equilibrium

Ionization; Degree of Ionization; Focus Effecting Ionization; Ionization of Water; Ionization Equilibrium in Aqueous Solutions; Common Ion Effect.

BLOCK II

Unit 4: Acids & Bases

Concept of Acids and Bases & their Strength in Ionization Constant; PH Value; Acid Base Titration; Choice of Indicators; Hydrolysis; Buffer Solution.

Unit 5: Electrolysis:

Introduction; Concept of Electrolysis; Faraday's Law of Electrolysis; Engineering Applications; (Electro-Metallurgy; Electroplating & Electro-Refining).

Unit 6: Water

Hard and Soft Water; Removal of Hardness by A) Soda Lime Process), Permutit's Process, C). Ion Exchange Method.

Disadvantages of Hard Water in Industrial Use; Boiler Scales; Priming; Foaming Corrosion and Caustic Embitterment; Expressing the Degree of Hardness of Water in (with Simple Problems): A) Clark's Degree, B) O'Hener's Method; Determination of Degree of Hardness by (with Simple Problems): A) Soap Titration Method, B) O'Hener's Method; Water for Drinking Purposes.

Unit 7: Solutions & Colloids:

Solute; Solvent; Solution & Colloids; Particle Size and Colloidal State; Tyndell Effect; Brownian Movement; Coagulation.

Suggested Readings:

1. Chemistry in Engineering, J.C. Kuriacose and J. Rajaram, Tata McGraw-Hill.
2. Chemistry in Engineering, Dr. S. Rabindra and Prof. B.K. Mishra, Kumar and Kumar Publishers.
3. A Text Book of Applied Chemistry-I, SS Kumar, Tata McGraw Hill.
4. A Text Book of Applied Chemistry-I, Sharma and Others, Technical Bureau of India.

Note:

1. Eight questions are to be set. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – I**

FUNDAMENTALS OF COMPUTERS

Sub. Code: DARC 104

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

Unit 1: Introduction to Computer System

An Overview of the Computer System; the Processor (CU; ALU); Factors Affecting Processor Speed; the Bus: Data Bus and Address Bus; Memory (RAM; ROM; Registers; Cache).

Unit 2: I/O Devices

Introduction; I/O Devices: Mouse, Keyboard, Monitors, Printers, Pens, Touch, Screens, Microphones, and Voice Recognition; Storage Devices: Diskettes, Hard Disc, CD-ROM; Computer Categorization.

Unit 3: Introduction to Networks

Networks-Uses; Categories & Topologies; System Software and Application Software; Operating System; User Interface; Resource Management; Utility Software.

BLOCK II

Unit 4: Introduction to Database Management

Word Processing and Desktop Publishing; Spreadsheets; Basics of Database Management.

Unit 5: Programming Languages

Programming Language: High-level language, Low Level Language & Assembly language; Major Features of the Internet; Working with Graphics.

Unit 6: Information Systems

Types of Information Systems; System Development Life Cycle.

Suggested Readings:

1. Computer Fundamentals, P.K Sinha, BPB Publications.
2. Computers Today, Suresh .K Basandra, Galgotia Publications Private Ltd.
3. Computer Installation Troubleshooting, M. Radha Krishnan & D. Balasubramanian, ISTE Learning Material.
4. Computer Organization & Design, P. Pal Chaudhuri, Prentice Hall of India.

Note:

1. Eight questions are to be set; at least one question from each unit. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – I**

COMMUNICATION TECHNIQUES

Sub. Code: DARC 105

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

Unit 1: Correspondence (Official, Business and Personal)

One Letter from each Category - Official, Business and Personal may be set in the examination paper and the students be asked to write one of them.

Unit 2: Grammar

A Brief Review of Easy Form of Tenses; Conversion of Direct Narration into Indirect Form of Narration and Vice Versa (only Simple Sentences); Punctuation.

Unit 3: Essay

Preferably on Scientific Topic from the given outlines - the Paper Setter may be instructed to give a choice of attempting one out of three topics. The question paper may provide the outlines. The essay will be of 250 to 300 words. The examiner may select three topics one from each of the following.

- A) Science;
- B) Technology;
- C) General.

Suggested Readings:

1. Text Book on English and Communication Skills, Book-I, Kuldeep Jaidka et.al. Developed by NITTR, Chandigarh.
2. New Design English Grammar: Reading and Writing Skills, (Course A and course B), A. L. Kohli; Kohli Publishers.
3. New Design English Reading and Advanced Writing Skills for Class XI and XII, M. K Kohli and A. L Kohli, Kohli Publishers.

Note:

1. Six questions are to be set; at least one question from each unit. Students will have to attempt four questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

DETAILED SYLLABUS

FOR

DISTANCE EDUCATION

Diploma

(Three Years Semester Scheme)

Diploma in Architecture

(DARC)

COURSE TITLE : Diploma in ARCHITECTURE (DARC)
DURATION : 03 Years (Semester System)

SECOND SEMESTER

COURSE TITLE	Paper Code	MARKS				
		THEORY		PRACTICAL		TOTAL
		INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	
APPLIED MATHEMATICS-II	DARC-201	40	60			100
BASIC MECHANICAL ENGINEERING	DARC-202	40	60			100
BASIC ELECTRICAL ENGINEERING	DARC-203	40	60			100
BASIC ELECTRONICS	DARC-204	40	60			100
ENGINEERING DRAWING	DARC-205	40	60			100

Note:

Theory Paper : 40% Continuous Internal Assessment and 60 % University examination.

Practical Paper: 40 % Continuous Internal Assessment and 60 % University examination.

Continuous Internal Assessment:

- | | |
|--|--|
| 1) Two or three tests out of which minimum two will be considered for Assessment | 60% of Continuous Internal Assessment |
| 2) Seminars/Assignments/Quizzes | 30% of Continuous Internal Assessment |
| 3) Attendance, class participation and behavior | 10% of Continuous Internal Assessment |

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – II**

APPLIED MATHEMATICS II

Sub. Code: DARC 201

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

Unit 1: Co-ordinate Geometry -1

Area of Triangle, Centroid and In centre of Triangle (given the Vertices of a Triangle), Simple Problems on Locus.

Equation of Straight Lines in Various Forms (without Proof) with their Transformation from one to another; Angle between Two Lines and Perpendicular Distance Formula (without Proof).

Unit 2: Co-ordinate Geometry -2

Circle: General Equation and its Characteristics given:

- The Centre and Radius;
- Three points on it;
- The Co-ordinates of the end's of the diameter.

Conics: Parabola, Ellipse and Hyperbola; Standard Equation of Conics (without Proof); Given the Equation of Conics to Calculate Foci, Directrix, Eccentricity, Lotus Rectum, Vertices and Axis Related to Different Conics.

Unit 3: Differential Calculus -1

Concept of Function: Four Standard Limits:

$$\text{Lt } (x^n - a^n) / (x - a);$$

$$x \rightarrow a$$

$$\text{Lt } \sin x/x;$$

$$x \rightarrow 0$$

$$\text{Lt } (a^x - 1)/x;$$

$$x \rightarrow 0$$

$$\text{Lt } (1 + x)^{1/x}.$$

$$x \rightarrow 0$$

Concepts of Differentiation and its Physical Interpretation.

Differential by First Principle of x^n , $(ax + b)^n$, $\sin x$, $\cos x$, $\tan x$, $\csc x$ and $\cot x$, e^x , a^x , $\log x$

Differentiation of Sum, Product and Quotient of Different Functions.

Logarithmic Differentiation, Successive Differentiation excluding n^{th} order

Unit 4: Differential Calculus - 2

Application of Derivatives for (a) Rate Measure, (b) Errors, (c) Real Root by Newton's Method, (d) Equation of Tangent and Normal (e) Finding the Maxima and Minima of a Function (Simple Engineering Problems).

BLOCK II

Unit 5: Integral Calculus - 1

Integration as Inverse Operation of Differentiation.

Simple Integration by Substitution by Parts and by Partial Fractions

Evaluation of Definite Integrals (Simple Problems) by Expanding; the General Properties of Definite Integrals.

Unit 6: Integral Calculus - 2

Application of Integration for Simple Problem on Evaluation of Area under a Curve where Limits are prescribed for Circle, Ellipse, Parabola and Straight Line.

Calculation of Volume of a Solid formed by Revolution of an Area about Axis (Simple Problems) where Limits are prescribed for Sphere and Cylinder.

To calculate Average and Root Mean Square of a Function.

Area by Trapezoidal Rule and Simpson's Rule.

Unit 7: Differential Equations

Solution of First Order and First Degree Differential Equation by Variable Separation and their Simple Numerical Problem.

Suggested Readings:

1. Higher Engineering Mathematics, B.S. Grewal, Khanna Publishers.
2. Engineering Mathematics, C Dass, Chawla, Asian Publishers.
3. Engineering Mathematics, S. Dasgupta, McGraw-Hill.
4. Advanced Engineering Mathematics by A.B. Mathur and V.P Jaggi, Khanna Publishers.
5. Applied Mathematics Vol. II, RD Sharma, Khanna Publishers.
6. A text Book of Matrices, Shanti Narayan, S. Chand & Co.
7. Calculus and Analytical Geometry, Thomas/Finney, Narosa Publishing House.
8. Mathematics for Engineers, C.Prasad, Prasad Mudranalaya.
9. Differential & Integral Calculus, N Piskunov, Moscow Peace Publisher.
10. Higher Engineering Mathematics, Bird, J O, Butter worth-Heinemann.
11. Introduction to Engineering Mathematics, Croft, Davis & Hargreaves, Addison-Wesley.

Note:

1. Eight questions are to be set. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – II**

BASIC MECHANICAL ENGINEERING

Sub. Code: DARC 202

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

Unit 1: Mechanical Properties of Metals

Definitions; Elasticity; Plasticity; Ductility; Brittleness; Toughness; Hardness; Malleability; Fatigue; Examples of Applications of above Terms Related to Engineering.

Unit 2: Basic Concept of Thermal Engineering

Energy: Internal Energy, Potential Energy, Kinetic Energy; Heat: Work and Enthalpy, Specific Heat, Specific Heat Ratio; Characteristics Gas Equation; Universal Gas Constant; First Law of Thermodynamics; Second Law of Thermodynamics.

Unit 3: Hydraulics

Physical Properties of a Fluid: Density, Specific Volume, Specific Weight, Specific Gravity Viscosity; Pascal's Law; Pressure Measuring Devices: Manometers, Simple Manometers, Differential Manometers, Inverted 'U' Tube, Pressure Gauges; Continuity Equation; Bernoulli's Theorem: Energy of a Fluid, Pressure Energy, Velocity Energy, Datum Energy; Venturimeter & its Uses.

Unit 4: Pumps and Turbine

Pumps: Types of Lumps, Centrifugal Pump, Reciprocation Pump, their Relative Advantages and Performance.

Turbine: Working Principles and Types of Water Turbines, Selection of Turbines, Brief Idea of Turbine, Pelton Wheel Turbine, Francis Turbine.

BLOCK II

Unit 5: Properties of Steam

Generation of Steam at Constant Pressure, Enthalpy of Water Wet Steam, Enthalpy of Dry Saturated Stem, Dryness Fraction, Superheated Steam, Latent Enthalpy, Enthalpy of Steam, Specific Volume, External Work During Evaporation, Internal Content Enthalpy, Internal Energy of Steam, Use of Steam Table

Unit 6: Boilers and Steam Turbines

Boilers: Classification of Boilers, Working of Common Boilers, Babcox and Wilcox, Chichram Boiler, Boiler Mounting and their Accessories, Introduction to Modern High Pressure Boiler for Thermal Power Station: Lamont Boiler, Weffler Boiler, Benson Boiler and Velox Boiler.

Steam Turbines: Introduction, Types of Steam Turbine, Working Principle of Steam Turbine Uses and Advantages of Steam Turbine.

Unit 7: I.C. Engines

I.C. Engine Cycle: Otto, Diesel; Working Principle: Two Stroke Petrol and Diesel, Four Stroke Petrol and Diesel.

Unit 8: Transmission and Lubrication

Transmission: Belt Drive, Rope Drive, Velocity Ratio, Tension Ratio, Effect of Centrifugal Tension; Application of these Drives.

Lubrication: Object of Lubrication, Different Methods of Lubrication, Properties of Lubricants.

Suggested Readings:

1. Thermodynamics & Heat Power Engineering, Mathur & Mehta, Jain Brothers.
2. Thermal Engineering, P.L. Ballaney, Khanna Publishers.
3. A Text Book of Hydraulics, Khurmi, S. Chand.
4. A Text Book of Hydraulic Machines, Khurmi, S. Chand.
5. Strength of Materials, G.H.Ryder, Macmillan, India.
6. Strength of Materials: A Rudimentary Approach, M.A. Jayaram, Sapna Book House.
7. Elements of Heat Engines: Pande & Shah, Charotar Publishing House.

Note:

1. Eight questions are to be set. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – II**

BASIC ELECTRICAL ENGINEERING

Sub. Code: DARC 203

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

Unit 1: DC Circuits

Concept of Electricity; Various Applications of Electricity; Advantages of Electricity over other Types of Energy; Basic Terms: Voltage, Current, Potential Difference, Power; Energy and their Units.

Ohm's Law and its Practical Applications; Concepts of Resistance, Conductance, Resistivity and their Units.

Effect of Temperature on Resistance; Temperature Coefficient of Resistance.

Series and Parallel Combination of Resistors; Wattage Consideration; Simple Problems.

Kirchhoff's Current Law and Kirchhoff's Voltage Law and their Applications to Simple Circuits.

Conversion of Circuits from Star to Delta and Delta to Star.

Unit 2: DC Circuits Theorems

Thevenin's Theorem; Norton's Theorem; Super Position Theorem; Maximum Power Transfer Theorem, Application of Network Theorem in solving D.C Circuit Problems.

Constant Voltage and Constant Current Sources: A) Concept of Constant Voltage Source, Symbol and Graphical Representation, Characteristics of Ideal and Practical Sources, B) Concept of Constant Current Sources, Symbol, Characteristics and Graphical Representation of Ideal and Practical Current Sources.

Unit 3: Electro Magnetic Induction

A) Concepts of Magnetic Field Produced by Flow of Current; Magnetic Circuit; Concept of Magneto-Motive Force (MMF); Flux; Reluctance; Permeability; Analogy between Electric and Magnetic Circuit.

B) Faraday's Law and Rules of Electro-Magnetic Induction; Principles of Self and Mutual Induction; Self and Mutually Induced E.M.F; Simple Numerical Problems.

C) Concept of Current Growth; Decay and Time Constant in RL and RC Circuit.

D) Energy Stored in an Inductor; Series and Parallel Combination of Inductors.

Unit 4: Batteries

Basic Idea about Primary and Secondary Cells; Construction; Working and Applications of Lead-Acid Battery and Nickel-Cadmium Cells; Silver-Oxide Cells; Charging Methods used for Lead-Acid Battery (Accumulator); Care and Maintenance of Lead-Acid Battery; Series and Parallel Connections of Batteries; General Idea of Solar Cells; Solar Panels and their Applications

BLOCK II

Unit 5: AC Fundamentals

Concept of Alternating Voltage and Current; Difference between A.C and D.C; Concept of Cycle, Frequency, Time Period, Amplitude, Instantaneous Value, Average Value, R.M.S. Value, Maximum Value, Form Factor and Peak Factor; Representation of Sinusoidal Quantities by Phasor Diagrams; Equation of Sinusoidal Wave Form (with Derivation); Effect of Alternating Voltage Applied to a Pure Resistance, Pure Inductance and Pure Capacitance.

Unit 6: AC Circuits

Inductive Reactance and Capacitive Reactance; Alternating Voltage Applied to Resistance and Inductance in Series; Alternating Voltage Applied to Resistance and Capacitance in Series; Impedance Triangle and Phase Angle; Solutions and Phasor Diagrams for Simple RLC Circuits (Series and Parallel); Introduction to Series and Parallel Resonance and its Conditions; Power in Pure Resistance, Inductance and Capacitance, Power in Combined RLC Circuits; Power Factor; Active and Reactive Power and their Significance; Importance of Power Factor; J-Notation and its Application in Solving a Series and Parallel AC Circuits; Definition of Conductance, Susceptance and Admittance

Unit 7: Various Types of Power Plants

Brief Explanation of Principle of Power Generation in Thermal, Hydro and Nuclear Power Stations and their Comparative Study; Elementary Block Diagram of above Mentioned Power Stations.

Suggested Readings:

1. Electrical Technology, Vol. I, B.L. Theraja, S. Chand & Company Ltd.
2. Electrical Engineering, V.K. Mehta, S. Chand & Company Ltd.
3. Electrical Engineering,, Nitin Saxena, Laxmi Publisher.

Note:

1. Eight questions are to be set. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – II

BASIC ELECTRONICS

Sub. Code: DARC 204

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

Unit 1: Semiconductor Physics

Review of Basic Atomic Structure and Energy Levels; Concept of Insulators; Conductors and Semi Conductors; Atomic Structure of Ge and Si; Covalent Bonds.

Concept of Intrinsic and Extrinsic Semi Conductor; P and N Impurities; Doping of Impurity.

P and N Type Semiconductors and their Conductivity; Effect of Temperature on Conductivity of Intrinsic Semi Conductor.

Energy Level Diagram of Conductors; Insulators and Semi Conductors; Minority and Majority Carriers.

Unit 2: Semi Conductor Diode

PN Junction Diode; Mechanism of Current Flow in PN Junction; Drift and Diffusion Current; Depletion Layer; Forward and Reverse Biased PN Junction; Potential Barrier; Concept of Junction Capacitance in Forward and Reverse Bias Condition.

V-I Characteristics; Static and Dynamic Resistance and their Calculation from Diode Characteristics.

Diode as Half Wave, Full Wave and Bridge Rectifier; PIV, Rectification Efficiencies and Ripple Factor Calculations; Shunt Capacitor Filter, Series Inductor Filter, LC Filter and π Filter.

Types of Diodes; Characteristics and Applications of Zenor Diodes; Zenor and Avalanche Breakdown.

Unit 3: Introduction to Bipolar Transistor

Concept of Bipolar Transistor, Structure, PNP and NPN Transistor, their Symbols and Mechanism of Current Flow; Current Relations in Transistor; Concept of Leakage Current; CB, CE, CC Configuration of the Transistor; Input and Output Characteristics in CB and CE Configurations; Input and Output Dynamic Resistance in CB and CE Configurations; Current Amplification Factors. Comparison of CB CE and CC Configurations; Transistors as an Amplifier in CE Configurations; D.C Load Line and Calculation of Current Gain, Voltage Gain using D.C Load Line.

BLOCK II

Unit 4: Transistor Biasing Circuits

Concept of Transistor Biasing and Selection of Operating Point; Need for Stabilization of Operating Point; Different Types of Biasing Circuits.

Unit 5: Single Stage Transistor Amplifier

Single Stage Transistor Amplifier Circuit; A.C Load Line and its use in Calculation of Currents and Voltage Gain of a Single Stage Amplifier Circuit; Explanation of Phase Reversal of Output Voltage with respect to Input Voltage; H- Parameters and their Significance; Calculation of Current Gain; Voltage Gain; Input Impedance and Output Impedance using h-Parameter.

Unit 6: Field effect Transistors

Construction, Operation and Characteristics of FET and Its Application; Construction, Operation and Characteristics of MOSFET in Depletion and Enhancement Modes and its Applications; C MOS: Advantages and Applications; Comparison of JFET, MOSFET and BJT; FET Amplifier Circuit and its Working Principle. (No Analysis).

Suggested Readings:

1. Basic Electronics and Linear Circuit, NN Bhargava and Kulshreshta, Tata McGraw Hill.
2. Principles of Electrical and Electronics Engineering, VK Mehta; S Chand and Co.
3. Electronic Components and Materials, SM Dhir, Tata McGraw Hill.
4. Electronics Devices and Circuits, Millman and Halkias; McGraw Hill.
5. Principles of Electronics, Albert Paul Malvino; Tata McGraw Hill.
6. Electronics Devices and Circuits-I, Naresh Gupta, Jyotesh Malhotra and Harish C Saini, Eagle Prakashan.
7. Electronics Devices and Circuits by Rama Reddy, Narosa Publishing House Pvt. Ltd.

Note:

1. Eight questions are to be set, at least one question from each unit. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – II**

ENGINEERING DRAWING

Sub. Code: DARC 205

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

Unit 1: Introduction

Application of Engineering Drawing in Engineering; Lettering and Dimensioning; Construction of Geometrical Figures like Pentagon; Hexagon etc.

Unit 2: Scales

Plain Scale; Diagonal Scale; Venier Scale.

Unit 3: Projections

First Angle and Third Angle Projections; Simple Projection of Points; Lines and Planes; Orthographic Projection of Simple Solids in Simple Positions.

Unit 4: Sections

Importance and Salient Features; Drawing of Full Section; Half Section; Partial or Broken Out Sections; Offset Sections; Revolved Sections and Removed Sections; Drawing of Different Conventions for Materials Intersection.

Unit 5: Isometric Projections

Principle of Isometric Projection; Isometric Projection using Box and Offset Method

Unit 6: Development of Surfaces

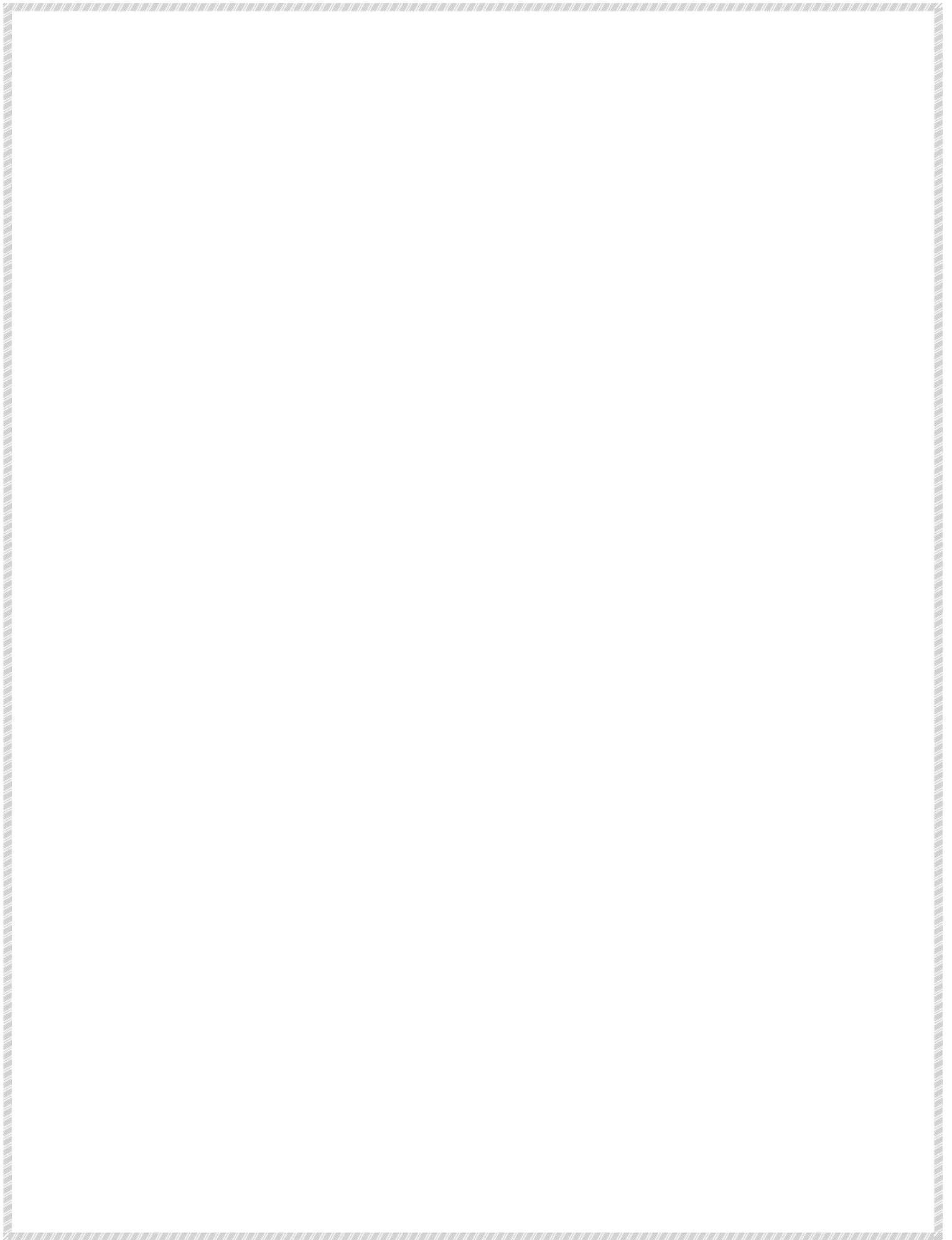
Development of Surfaces of Regular Solids like Pyramids and Prisms.

Suggested Readings:

1. Elementary Engineering Drawing, Bhatt N.D, Charothar Publisher
2. A Text Book of Practical Geometry on Geometrical Drawing, Laxmi Narayan V & Vaish W, Pearson Education.
3. Design for manufacture, Cordett J, Dooner M, Meleka J and Pyn C, Addison Wesley.
4. The Engineering Design Process, Hawkes B and Abinett R, Longman.

Note:

1. Eight questions are to be set, at least one question from each unit. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.



DETAILED SYLLABUS

FOR

DISTANCE EDUCATION

Diploma

(Three Years Semester Scheme)

Diploma in Architecture

(DARC)

COURSE TITLE : Diploma in ARCHITECTURE (DARC)
DURATION : 03 Years (Semester System)

THIRD SEMESTER

COURSE TITLE	Paper Code	MARKS				
		THEORY		PRACTICAL		TOTAL
		INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	
History of Architecture	DARC-310	40	60			100
Free Hand Drawing & Painting	DARC-320	40	60			100
Building Construction	DARC-330	40	60			100

Note:

Theory Paper : 40% Continuous Internal Assessment and 60 % University examination.

Practical Paper: 40 % Continuous Internal Assessment and 60 % University examination.

Continuous Internal Assessment:

- | | |
|--|--|
| 1) Two or three tests out of which minimum two will be considered for Assessment | 60% of Continuous Internal Assessment |
| 2) Seminars/Assignments/Quizzes | 30% of Continuous Internal Assessment |
| 3) Attendance, class participation and behavior | 10% of Continuous Internal Assessment |

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – III**

HISTORY OF ARCHITECTURE

Sub. Code: DARC 310

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

UNIT1: INTRODUCTION - HISTORY OF ARCHITECTURE : Difference between history & history of architecture, Importance of studying history of architecture, History of human civilization, Periods of architecture, Factors influencing history of architecture.

INDUS VALLEY CIVILIZATION : Study of Mohen Jo Dero, planning, construction systems and materials.

ARCHITECTURE OF VEDIC PERIOD : Characteristics of Vedic Village, Forms & Construction of Hut, Railing & Gate

UNIT 2. BUDDHIST ARCHITECTURE : Background to Buddhist Architecture, Classification of Buddhist School, Stambha & its character study of Ashokan Pillar, Railing, Stupa Architectural Character of Sanchi Stupa, Chaitya, Architectural Character of Karle Chaitya Hall, Vihara Development of Vihara at Ajanta Caves.

UNIT 3: ROCK CUT ARCHITECTURE : Study of Kailash Temple – Ellora, Rathas of Mahabalipuram.

TEMPLE ARCHITECTURE : Study of typical parts of a temple, Garbha Griha, Sabha Mandap, Nritya Mandap, Shikhar

UNIT 4: ISLAMIC ARCHITECTURE : General Architectural Characters of Islamic period. Study of parts of a Mosque, Sanctuary, Court yard, Liwan, Minars, Study of Jama Masjid Ahmedabad & Delhi, Study of Taj Mahal, Gol Gumbaz, Study of Qutb Minar Fatehpur Sikri, Buland Darwaja, Salim Chistie Mosque.

COMPARISON OF MOSQUE WITH TEMPLE

TERM WORK & SKETCHES

- ☐ Indus Valley Civilization
- ☐ Vedic Period Civilization
- ☐ Buddhist Architecture
- ☐ Rock cut Architecture

- ☐ Temple Architecture
- ☐ Islamic Architecture
- ☐ Comparison of mosque with temple

Reference Books:

1. History of Indian Architecture I & II - Percy Brown
2. History of Indian Architecture - Satish Grover (Hindu & Vedic Period)
3. History of Indian Architecture - Satish Grover (Islamic Period)
4. History of Architecture - Bannister Fletcher.
5. Indian Architecture Vol I & II - James Fergusson.6) Indian Monuments - Archaeological Dept
- 6.2 Study of Aihole & Badami Temple
- 6.3 Study of Lingraj Temple - Bhubaneswar
- 6.4 Study of Sun Temple Konark & Modhera.
- 6.5 Study of Kandaria Mahadevo

Note:

1. Eight questions are to be set, at least one question from each unit. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – III**

FREE HAND DRAWING AND PAINTING

Sub. Code: DARC-320

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

Unit I : Free Hand Sketching Exercises: Free hand sketching of simple geometrical surface Free hand drawing of three dimensional geometrical objects (Cube, Cone, Prism, Pyramid, Cylinder, Sphere), Free hand sketching of simple buildings and landscaping Free hand sketching of monuments, buildings and trees in different techniques and mediums (Pencil, pen, ink, charcoal, colored-inks, colours and crayons)

Unit II : Colouring and Rendering Exercises: Definition and perception of colour and colour materials, Hue values and intensity, value scale, intensity scale and colour circle, Study of colours; Emotional effects of colours, warm and cool colours, receding and advancing colours; affect of light on colours, colour harmonies and contrasts Colour in nature, art and architecture Shades and shadows, indication of surroundings, sky, clouds, trees, human figures in pencil, ink, colour and crayons

Unit III : Simple exercises on murals. Mural design Exercises.

Unit IV: Lettering Practice: Ratio between height and width of letters and numerals, capitals and small letters (7:4 and 5:40). Roman lettering, Gothic and Italics. Free hand lettering, Single line lettering, Broad pen lettering, Stylized lettering, Spacing, Lettering with the help of Stencils. Tracing of a simple building drawing made In Pencil & Ink.

Unit V : Blue Prints Preparations of Blue Prints of tracing drawings prepared for the purpose. Folding of the Blue Print to a standard file size.

Note:

1. Eight questions are to be set. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – III**

BUILDING CONSTRUCTION

Sub. Code: DARC-330

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

UNIT1.: FOUNDATION : Know the purpose of foundation, Function of foundation, Know the significance of safe B.C. of soil, Define safe B.C. of soil - Importance of S.B.C. of soil in relation to foundation design, Explain the various methods to improve B.C. of soil, Suggest proper methods to improve B.C. of soil for the given situation, Types of foundations –Shallow, Deep etc, Draw the sketches of different types of shallow foundation, Suggest the type of foundation for the various situations

(1) Wall, (2) Isolated column, (3) Column carrying unequal load, (4) space limitations, (5) Low S.B.C. of soil and heavy loads, (6) Heavy load from steel column.

Deep foundation, Pile Foundation, Classification of Pile according to its material and function. State the situation where the pile foundation is necessary. Know the treatment required for providing foundation in Black cotton soil for various situations, Know the causes of failure of foundation, State and explain the causes of failure of foundation: Non-uniform settlement, Horizontal movement of soil, Swelling and shrinkage, Lateral pressure, Root of trees etc., Action of weather, Explain the method of setting out foundation plan on site., Fixation of centre-line on ground, Suggest the type of foundation for the various situations

UNIT 2. MASONRY : PART A - BRICK MASONRY: a. Define the terms related to Brick Masonry – header, stretcher, bond, closer, frog, quoins, course, face, back, hearting, joint, bat, etc.

b. State the general principles to be followed in construction of Brick Masonry

c. Explain the different types of Bonds: - English Bond, Flemish Bond, Stretcher bond, header Bond, Racking Bond, Zigzag Bond, Garden Wall Bond

d. Draw the plan and elevation of above bonds.

e. Compare English Bond with Flemish Bond.

f. Explain the various types of junctions in Brick Masonry.

g. Reinforced Brick Masonry - explain the procedure and purpose of Reinforced Brick Work

PART B - STONE MASONRY: Define the terms related to Stone Masonry, State the stages of stone-dressing, State and explain the different types of stone dressing:, Draw joints in stone masonry, such as Butt Joint,(b) Rebated joint, (c) Rusticated joint; (d) Channelled joint (e) dowel joints.Explain with sketches types of stone masonry: Rubble masonry - Un coursed Rubble, Coursed Rubble, Random Rubble, Dry Rubble, Ashlar Masonry: Ashlar fine Ashlar rough tool Ashlar chamfered, Ashlar facing

PART C- COMPARE BRICK MASONRY WITH STONE MASONRY

UNIT 3. LOAD BEARING AND FRAME STRUCTURE : Understand the principle of Load-Bearing and Frame Structure, Compare Load Bearing Structure with Frame Structure, Merit and Demerits of Load Bearing Structure and Frame Structure

OPENINGS : Lintels: Function of lintel Classification of lintels of different materials, pre-cast and cast in situ, Arches Explain various parts of an arch – Soffit, Springing line, Rise Key, Haunch, Span, Rise, Spandrel & Skewback etc. Explain with sketches the types of arches in relation to shapes & material, Describe stage wise the methods of construction of arches with Sketches, Doors --- Know the function, location, terms, general sizes, location & types battened, ledged, framed & braced door. panelled doors: Glazed doors, flush & louvered doors, Revolving door , Windows -- Know the function, location, terms, general sizes, location, & types Double hung, Casement, Pivoted, Glazed, Louvered, Ventilators -- Know the function, location, terms, general sizes, location & types Top hung Bottom hung Louvered/fixed ventilators.

UNIT 4. PARTITION WALLS : Various types of partitions like clay-block, glass-block, brick, hollow-block, concrete, straw-board, wooden, plaster-slab, metal & asbestos – cement, gypsum board partitions.

PLASTERING & POINTING : Introduction, Preparation of surface for plastering, Various types like mud, lime, cement & stucco plastering, Pointing – general, Preparation of surface for pointing, Various types of pointing

Reference Books:

1. Building Construction By Sushil kumar
2. Building Construction By W.B.Mckay. Vol 1,2,3,4.
3. Elementary Building Construction By Mitchell
4. Building Construction By S.P. Arora & S.B.Bindra
5. Building Construction By Medlycol.
6. Building Construction By Rangwala.

Note:

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DETAILED SYLLABUS

FOR

DISTANCE EDUCATION

Diploma

(Three Years Semester Scheme)

Diploma in Architecture

(DARC)

COURSE TITLE
DURATION

: Diploma in ARCHITECTURE (DARC)
: 03 Years (Semester System)

FOURTH SEMESTER

COURSE TITLE	Paper Code	MARKS				
		THEORY		PRACTICAL		TOTAL
		INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	
Structural Mechanics	DARC-410	40	60			100
Theory of Structures	DARC-420	40	60			100
Estimation and Costing	DARC-430	40	60			100

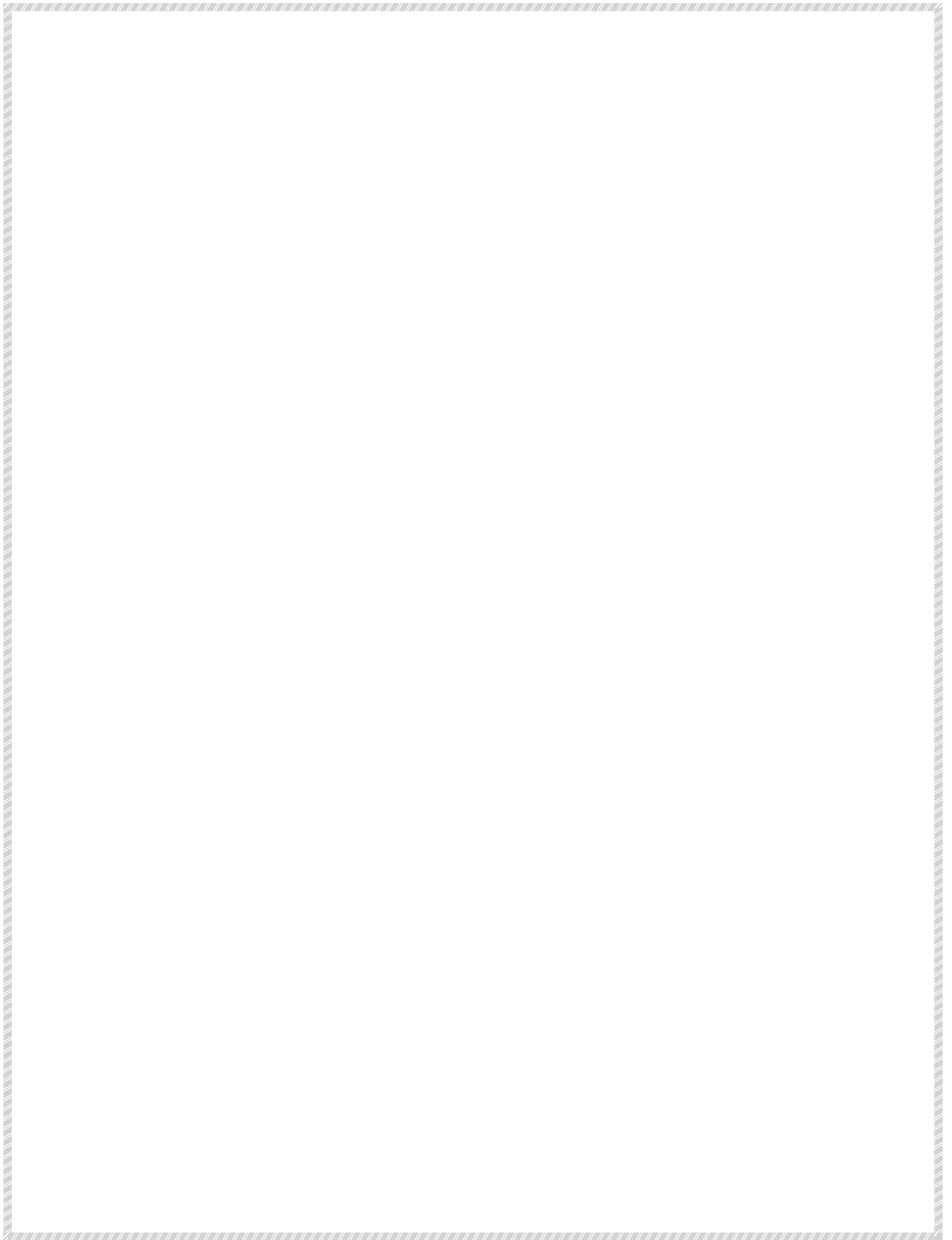
Note:

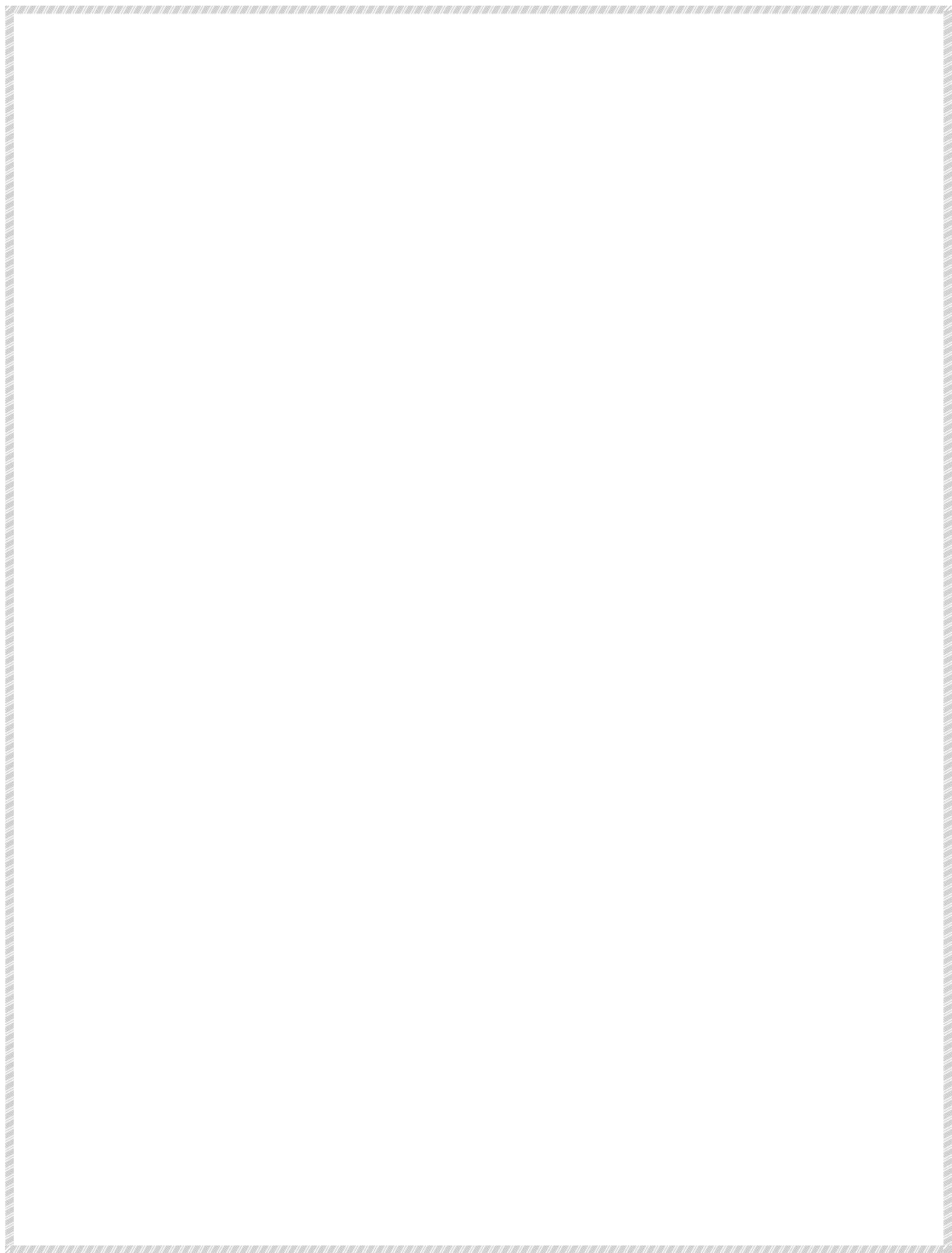
Theory Paper : 40% Continuous Internal Assessment and 60 % University examination.

Practical Paper: 40 % Continuous Internal Assessment and 60 % University examination.

Continuous Internal Assessment:

- | | |
|--|--|
| 1) Two or three tests out of which minimum two will be considered for Assessment | 60% of Continuous Internal Assessment |
| 2) Seminars/Assignments/Quizzes | 30% of Continuous Internal Assessment |
| 3) Attendance, class participation and behavior | 10% of Continuous Internal Assessment |





**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – IV**

STRUCTURAL MECHANICS

Sub. Code: DARC-410

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

UNIT I Introduction:

Forces, composition, resolution, moments and couples, transformation of couple, force systems, Resultant and equilibrate (analytical methods only)

Unit – II Simple stresses and strains:

Stress, strain, types of stresses, stress strain curve for ductile material, elastic limit, modulus of elasticity, compound sections, Composite sections, stresses due to change in temperature.

Unit – III Elastic constants:

Types of strains, linear strains, lateral strains, volumetric strains, Poisson's ratio, shear modulus, bulk modulus, relation between E, N and K (derivations also), members subjected to three mutually perpendicular forces.

Unit – IV Shear force and Bending Moment:

Types of beams, loads, definition of shear force and bending moment, Shear Force and Bending Moment diagram for cantilever, simply supported and over hanging beams for various loadings (analytical method only), relation between load, Shear Force and Bending Moment.

Unit – V Theory of Simple Bending:

Moment of inertia for various structural shapes like Rectangle, Triangle, Circle, (Derivation also) and Moment of Inertia for shapes like T, L and I sections (No derivation) Theory of simple bending: Assumptions, derivation of flexure equation $M/I = f/y = E/R$, application of flexure formula for various shapes.

Unit – VI Shear stresses in beams:

Shear stress distribution of various shapes like Rectangle, Triangle, Circle, symmetrical I section (Derivation also), shear stress distribution for asymmetrical I sections, T section, C section etc. (No derivations)

Unit – VII Deflection of beams:

slope and deflection for cantilevered and simply supported beams with standard loading (derivation), slope and deflection for cantilever and simply supported for various loads (point loads and Uniformly Distributed Loads) using double integration method, Macaulay's method and moment area method.

Unit – VIII Analysis of Frames:

Analysis of 2-D plane trusses by method of joints and method of sections.(Analytical method only)

Reference books:

Khurmi. R.S.: Engineering Mechanics, S. Chand and Co. Ltd., New Delhi, 1999.

Ramamrutham. S.: Engineering Mechanics, 7th ed. Dhanpat Rai Pub. Co. Ltd., Delhi, 2004.

Timoshenko. S. and Young, D.H.: Engineering Mechanics, McGraw-Hill International Editions

SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – IV

THEORY OF STRUCTURES

Sub. Code: DARC-420

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

Unit I : Resultant of force system and equilibrium: Force-Definition, SI units, types, system of forces, graphical representation, Resultant of concurrent forces, law of parallelogram, triangle law of forces, polygonal law of forces, resolution and addition of forces.

Moment of force - Statement of various theorems, resultant of non concurrent forces - parallel and non parallel forces. Problems on resultant of forces systems.

Equilibrium - Concept of equilibrium, equilibrium of two and more forces, conditions of equilibrium, graphical conditions of equilibrium, body constraints type of reaction provided by each constrain, free body diagram, problems on equilibrium.

Unit II : Centre of Gravity: Centre of gravity by geometrical consideration for rectangular, triangle, semicircle, Centre of gravity of regular solids, cubes, spheres, semi spheres, right circular cones, Centre of gravity by method of moments of area, mass or volume of regular figures, composite figures and regular figures with cut out holes.

Unit III : Moment of Inertia:

- Meaning of terms - second moment of area, radius of gyration of a section Theorem of parallel axis

and perpendicular axis (statement only without proof).

- Second moment of regular figures - rectangle, triangle circle and annular sections (formulae only).

Unit IV : Shear force and Bending moment: Definition and concepts of S.F and B.M, calculations of reactions, SF and BM diagrams for simply supported, overhanging, cantilever beams, subjected to concentrated or uniformly distributed loads on entire or partial span, Calculation of position and magnitude of maximum shear force and bending moment, point of contra flexure.

Unit V : Simple Stress and Strain: Concept and definitions, units, types of stresses, axial stresses in bars, strains Hooks law, tensile test on mild steel, working stress and factor of safety, temperature stresses in composite bars, problems on above.

Theory of Simple Bending: Bending stresses, neutral axis, Symmetrical and asymmetrical sections, Assumptions in theory of bending, Flexural formulae and their applications, Shear stresses in beams.

Suggested Books:

Bari, S. A., Elements of Structural Analysis
Macdonald, A. J., Structure and Architecture
Rajput, R. K., Strength of Materials
Khurmi, R. S., Strength of Materials

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – IV**

ESTIMATION AND COSTING

Sub. Code: DARC-430

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

UNIT1• Introduction to quantity surveying, method of preparing estimates, Data required for framing estimate and type of estimates.

UNIT 2• Mensuration, standard mode of measurements, schedule of rates, Administrative approval, Technical sanction, Competent authority, Issue rate, Interest, Indent of work, etc.

UNIT 3• Method and procedure of working out abstracts, and bills. Examples and exercise for working out quantities for items from excavation to the final finishing.

UNIT 4• Rate analysis, cost of material and labour for various works, detailed rate analysis of important items of construction work. Measurement of work for interim and final certificate of payment.

UNIT5• Detailed estimate of project given in the case and use of computers for the same.

DETAILED SYLLABUS

FOR

DISTANCE EDUCATION

Diploma

(Three Years Semester Scheme)

Diploma in Architecture

(DARC)

COURSE TITLE
DURATION

: Diploma in ARCHITECTURE (DARC)
: 03 Years (Semester System)

FIFTH SEMESTER

COURSE TITLE	Paper Code	MARKS				
		THEORY		PRACTICAL		TOTAL
		INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	
Production Drawing**-I	DARC-510	40	60			100
Professional Practice – Architecture	DARC-520	40	60			100
Structures	DARC-530	40	60			100
Design*-I	DARC-540	40	60			100
Model Making Techniques	DARC-550	40	60			100

Note:

Theory Paper : 40% Continuous Internal Assessment and 60 % University examination.

Practical Paper: 40 % Continuous Internal Assessment and 60 % University examination.

Continuous Internal Assessment:

- | | |
|--|--|
| 1) Two or three tests out of which minimum two will be considered for Assessment | 60% of Continuous Internal Assessment |
| 2) Seminars/Assignments/Quizzes | 30% of Continuous Internal Assessment |
| 3) Attendance, class participation and behavior | 10% of Continuous Internal Assessment |

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – V**

PRODUCTION DRAWING-I

Sub. Code: DARC-510

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

UNIT1: (a) Induction to drafting procedure, graphics codes, symbol and architecture letterings.

(b) Construction of architectural scales and application to real object and drawings. (Plain scale, diagonal scale, isometric scale).

UNIT2: (a) Construction of basic and complex geometrical shapes.

(b) Orthographic projection of simple regular two dimension shapes.

UNIT3: Orthographic projections of simple, complex solids and hollow object and sections.

- Study of interpenetration of solids and development of surfaces.
- Isometric axonometric and oblique projections.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – V**

PROFESSIONAL PRACTICE-ARCHITECTURE

Sub. Code: DARC-520

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

UNIT1: Office : Office set up and administration, Filing and recording of letters and drawings, Nature of partnership, registration of firm and dissolution. Practice Procedure and conduct, membership of professional organisation. Architect's Registration Act. Code of Professional Conduct. Code relation to Architectural Competition. Architect's Services and scale of normal and partial fees. Architect's Act 1972 for registration. Copy-rights of drawings.

UNIT2: Tenders: Types of tenders and tenders document, tender draft notices and invitation of tenders. Procedure for opening and selection of tenders. Analysis and report to owner. Work order.

UNIT3: Contract : Type of contracts and contract documents, detailed knowledge about various conditions of contract as published by the Indian Institute of Architects and specially about : Earnest Money. Security Deposit. Retention Money. Mobilisation Fund. Bank Guarantee. Architect's Instructions. Clerk of works. Variation and extras. Defects after completion. Certificates and payments. Insurance and fire Insurance. Liquidate damage. Termination of the contract. Arbitration clause. Arbitration, Conciliation and Mediation. Arbitration proceedings and Awards.

UNIT4: Duties and liabilities in profession. Legal responsibility of architect to Employer. Government bodies and local bodies. Express and implied authority of the Architect. Architect's relationship with the client and the contractor. Duration of liability. Consumer Protection Act 1986.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – V**

STRUCTURES

Sub. Code: DARC-530

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

- Concurrent and non-concurrent coplanar forces, moment, conditions of equilibrium.
- Statically determinant plane frames, determination of forces in members of pinjointed frames by analytical and graphical methods, wind forces on frames.
- Stress, strain, hook's law, lateral strain, Poisson's ratio, young's modulus, modulus of rigidity, bulk modulus and their relationships.
- Shear force and bending moment diagrams for strained beams subjected to concentrated and distributed loadings
- Centroid and moment of inertia of plain areas, parallel axis theorem, moment of inertia, principal axis
- Bending stresses and deflection in simply supported beams and cantilever beams.
- Combined bending and direct strain, eccentric loading, stability of retaining walls and dams, fixed and continuous beams, theorem of three moment.
- Different types of welded joints, eccentric loading on welded joints, efficiency of joints, eccentric loading on riveted joints. Introduction to various structural forms, viz vaults, domes, shells, folded plates with an understanding through force diagrams. Advantages of folded plate roof, domes, shells etc.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – V**

DESIGN-I

Sub. Code: DARC-540

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

UNIT1: Parameters of design, Anthropometrics, human activity and the use of spaces Interrelationship of architectural space to form, structure, materials and to nature as a contextual setting.

UNIT2: Problems related to the understanding of the elements of architectural design, concepts of space and form and their perception.

UNIT3: Study of a given space through elementary measured drawings, sketching and Photography. Synthesis of observations in design of a basic shelter, an architectural form with a specific function.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – V**

MODEL MAKING TECHNIQUES

Sub. Code: DARC-550

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

UNIT1: Use of clay, Plaster of Paris, metal scrap, jute fiber etc. for study of forms.

UNIT2: Development of surfaces of simple and composite forms using paper, thermocole, wire, Wax, plaster of Paris, plaster, acrylic, sheets and similar materials.

UNIT3: Introduction to metallic sections, joinery tools joinery processes and working with them

UNIT4: Models in appropriate materials for understanding joinery in wooden construction and bonds in masonry based on the programme of building, construction.

DETAILED SYLLABUS

FOR

DISTANCE EDUCATION

Diploma

(Three Years Semester Scheme)

Diploma in Architecture

(DARC)

COURSE TITLE
DURATION

: Diploma in ARCHITECTURE (DARC)
: 03 Years (Semester System)

SIXTH SEMESTER

COURSE TITLE	Paper Code	MARKS				
		THEORY		PRACTICAL		TOTAL
		INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	
Entrepreneurship Development	DARC-610	40	60			100
Production Drawing**-II	DARC-620	40	60			100
Design *-II	DARC-630	40	60			100
Town Planning	DARC-640	40	60			100
Computer Application	DARC-650	40	60			100

Note:

Theory Paper : 40% Continuous Internal Assessment and 60 % University examination.

Practical Paper: 40 % Continuous Internal Assessment and 60 % University examination.

Continuous Internal Assessment:

- | | |
|--|--|
| 1) Two or three tests out of which minimum two will be considered for Assessment | 60% of Continuous Internal Assessment |
| 2) Seminars/Assignments/Quizzes | 30% of Continuous Internal Assessment |
| 3) Attendance, class participation and behavior | 10% of Continuous Internal Assessment |

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – VI**

ENTREPRENEURSHIP DEVELOPMENT

Sub. Code: DARC-610

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

UNIT –I : Entrepreneurship- definition. growth of small scale industries in developing countries and their positions vis-a-vis large industries; role of small scale industries in the national economy; characteristics and types of small scale industries; demand based and resources based ancillaries and sub-control types. Government policy for small scale industry; stages in starting a small scale industry.

UNIT –II: Project identification- assessment of viability, formulation, evaluation, financing, field-study and collection of information, preparation of project report, demand analysis, material balance and output methods, benefit cost analysis, discounted cash flow, internal rate of return and net present value methods.

UNIT –III : Accountancy- Preparation of balance sheets and assessment of economic viability, decision making, expected costs, planning and production control, quality control, marketing, industrial relations, sales and purchases, advertisement, wages and incentive, inventory control, preparation of financial reports, accounts and stores studies.

UNIT –IV: Project Planning and control: The financial functions, cost of capital approach in project planning and control. Economic evaluation, risk analysis, capital expenditures, policies and practices in public enterprises. profit planning and programming, planning cash flow, capital expenditure and operations. control of financial flows, control and communication.

UNIT –V: Laws concerning entrepreneur viz, partnership laws, business ownership, sales and income taxes and workman compensation act. Role of various national and state agencies which render assistance to small scale industries.

Text / Reference Books:

1. Forbat, John, "Entrepreneurship" New Age International.
2. Havinal, Veerbhadrappa, "Management and Entrepreneurship" New Age International
3. Joseph, L. Massod, "Essential of Management", Prentice Hall of India.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – VI**

PRODUCTION DRAWING-II

Sub. Code: DARC-620

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

- Architectural presentation techniques, isometric and oblique three dimensional views, Conical projections, perspectives, one point and two point Sciography
 - Introduction of basic principles of sciography and it's application to the field of Architecture.
 - Sciography of two dimensional objects in plan and elevation.
 - Sciography of three dimensional objects in plan and elevation and views. (isometric, Axonometric and Perspective)
 - Sciography of simple building elements.
- Perspective
- Introduction to basic terms, principles, types and techniques of perspective drawing: realistic expression of ideas.
 - Two point perspective of simple objects.(drafted and free hand)presentation of interior and exterior views in one point perspective .(drafted and free hand).

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – VI**

DESIGN-II

Sub. Code: DARC-630

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

- Graphic representation of ideas, concepts and design principles (two dimensional and three dimensional composition) Co-ordination skills (eye-mindhand/perceptual) drawing ,and painting, indoor and out door sketching in colour pencil pestles, ink, poster colour and water colour-creative skills -three dimensional perception using liquid transparent, reflective, opaque, flexible and hard materials.
- Structure form-space, Relation, animated graphics-frame/space relation. Coordination skills eye-mind-hand perceptual, photography.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – VI**

TOWN PLANNING

Sub. Code: DARC-640

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

- Introduction to Town Planning, need, basic term and definition. Development and impact of Industrial revolution on settlement planning; Philosophies of eminent planners and their work.
 - Introduction to survey of planning, planning acts and bye laws. New towns and introduction to planning process, zoning and document.
- Note: sessional shall be in form of design of small town planning schemes, site layout in urban areas and villages schemes.

**SYLLABUS
DIPLOMA IN ARCHITECTURE
SEMESTER – VI**

COMPUTER APPLICATION

Sub. Code: DARC-650

Credits: 02

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

- Introduction to computer, Hardware and software components. computer terminology.
- Introduction to windows and its applications. Introduction to Microsoft. office. word. excel. Introduction to Internet, using e-mail.

NOTE: Sessional work should include assignments incorporating the use of AutoCAD, in form of drawings.