Integral University, Lucknow

Department of Architecture

Study and Evaluation Scheme

Program: Diploma in Engineering

Semester -I

S. No.	Course code	Course Title	Type of Paper	Period Per hr./week/sem.			Evaluation Scheme				Sub. Total	Credit	Total Credits	Attributes						
				L	T	P/ST	CT	TA	Total	ESE				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics
THEORIES																				
1	DMA-101	Applied Mathametics-1(A)	Core	03	01	00	40	20	60	40	100	3:1:0	4	Y		Y				
2	DPH-101	Applied Physics (A)	Core	03	01	00	40	20	60	40	100	3:1:0	4	Y	Y	Y		Y		
3	DCH-101	Applied Chemistry (A)	Core	03	01	00	40	20	60	40	100	3:1:0	4	Y	Y	Y		Y		
4	DAR-101	Technical Drawing-I	Core	03	01	00	40	20	60	40	100	3:1:0	4	Y	Y	Y		Y		
5	DAR-102	Building Materials	Core	03	01	00	40	20	60	40	100	1:3:0	4	Y	Y	Y		Y		
6	DAR-103	Electrical Engineering	Core	03	01	00	40	20	60	40	100	3:1:0	4	Y		Y				
1	DCH-151	Applied Chemistry Lab	Core	00	00	02	40	20	60	40	100	0:0:1	1	Y	Y	Y		Y		
2	DAR-152	Building Materials Lab	Core	00	00	02	40	20	60	40	100	0:0:1	1	Y	Y	Y		Y		
3	DAR-153	Electrical Engineering Lab	Core	00	00	02	40	20	60	40	100	0:0:1.5	1.5	Y		Y				
4	DCS-151	Computer Application Lab	Core	01	00	02	40	20	60	40	100	1:0:1	2	Y	Y	Y				
5	GP-151	General Proficiency		_	_	_	_	_	60	_	60								Y	Y
Total				19	06	08	**400**	200	660	400	1060		29.5							

APPLIED MATHEMATICS-I (A)
(DMA-101)
(Common to All Diploma Engineering Courses)

L T P

3 1 0

UNIT-1 9

Series:

Arithmetical Progression**:**n^{th} term of AP, Sum of **'n'** terms, Arithmetic Mean.

Geometrical Progression**:**n^{th} term of GP, Sum of **'n'** terms& infinite terms, Geometric Mean.

Binomial theorem:

Definition of factorial notation, permutation and combination, Binomial theorem for positive index, negative and fractional index(without proof), Application of Binomial theorem.

Determinants:

Definition, expansion and elementary properties of determinant of order 2 and 3. Solution of system of linear equations, Consistency of equations, Cramer's rules.

UNIT-2 8

Trigonometry:

Trigonometric functions of allied, compound, multiple and submultiple angles.Trigonometric identities.Sine, Cosine, Projection and Tangent rules.

Hyperbolic and Inverse circular functions.

UNIT-3 7

Complex Number:

Definition of imaginary number, complex number & its conjugate.Algebra of complex number (equality, addition, subtraction, multiplication and division).Geometrical representation of a complex number, modulus and amplitude.Polar form of a complex number, Square root of a complex number.De Moivre's theorem (without proof)& its application.

UNIT-4 8

Coordinate Geometry:

Standard from of curves.

Parabola: $= 4ay, y^2 = 4ax$

Ellipse: $\frac{x^2}{} + \frac{y^2}{b^2} = 1$, Hyperbola: $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

Distance between two points in space, direction cosine and direction ratio.

UNIT-5 8

Plane and Sphere:

Finding equation of straight line and shortest distance between two lines, Equation of a plane, Relation between lines and planes, Sphere.

References:

1. Applied Mathematics: Kailash Sinha, Meerut publication.
2. Applied Mathematics: P.K Gupta, Asian Publication.
3. Applied Mathematics: H.R Luthra, Bharat Bharti publication.
4. Applied Mathematics: H.K Das, C.B.S Publication.
5. Mathematics for Polytechnic: S.P Deshpande, Pune Vidyarthi Grih

APPLIED PHYSICS-(A)

(DPH-101)

[COMMON TO ALL DIPLOMA ENGINEERING COURSES]

L T P

3 1 0

UNIT-1

Measurement:
Units and Dimensions **6**
Fundamental and derived units:
S.I. Units and Dimensions of physical quantities, Dimensional formula and dimensional equation, Principal of homogeneity and application of homogeneity principle to:
(i) Checking the correctness of physical equations
(ii) Deriving relations among various physical quantitions,
(iii) Conversion of numerical values of physical quantities form one system of units into another, Limitations of dimensional analysis, Errors in measurement, accuracy and precision, random and systematic errors, estimation of probable errors in the result of measurement (combination of errors in addition, subtraction, multiplication and power). Significant figures and order of accuracy in respect to instruments.

Vector:
Scaler and vector quantities; Addition, Subtraction, Resolution of vector; Cartesian components of vector, Scaler and vector product of vectors.

UNIT-II **10**

Force and Motions:
Newton's Law of Motion, Circular motion, angular velocity, angular acceleration and centripetal acceleration. Relationship between linear velocity and angular velocity, Relationship between linear acceleration and angular acceleration.

Fluid mechanics and fiction:
Surface tension, capillaries, equation of continuity, Bernoulli's theorem, stream line and turbulent flow, Reynold's number. Physical significance of friction, Advantage and disadvantage of friction and its role in every day life, Static and dynamic frictional forces, Coefficients of static and dynamic frictions and their measurement, Viscosity, Coefficients of viscosity and its determination by Stoke's method.

Work, Power and Energy:
Work done by force on bodies moving on horizontal and inclined planes in presence of frictional forces, Concept of power and its units, Calculation of power(simple cases). Concept of kinetic and potential energy, various forms of energy, conservation of energy, Force constant of spring, Potential energy of stretched spring.

Unit-III **8**

Elasticity:
Elasticity, Stress and Strain, Hooke's law, Elastic limit, Yielding point and breaking point, Modulus of elasticity, Young's modulus, Bulk modulus and modulus of rigidity, Poisson ratio, Resilience.
Simple Harmonic Motion, Peridic Motion,Characteristics of Simple Harmonic Motion,Equation of Simple Harmonic Motion and determination of Velocity and acceleration, Graphical representation, Spring Mass system, Simple pendulum, Derivation of their periodic time, Energy conservation in Simple Harmonic Motion, Definition of free, Forced, undamped and damped vibrations, Resonance and its sharpness, Q-factor.

Unit-IV **8**

Gas laws and specific heats of gases:
Boyle's law, Charle's law, Gay Lussac's law, Absolute temperature, Kelvin scale of temperature, General gas equation(without derivation), Molar or universal gas constant, Universal gas equation, Standard or normal temperature and pressure (N.T.P), Specific heat of gases, Relation between two specific heat, Thermodynamics variables, first law of thermodynamics(statement and equation only), Isothermal, Isobaric, Isochoric and adiabatic processes (Difference among these processes and equation of state).

Unit-V **8**

Heat transfer and radiation:
Modes of heat transfer, Coefficient of thermal conductivity and its determination by
(i) Searle's Method for good conductors.
(ii) Lee's Method for poor conductors.
Conduction of heat through compound media, Conduction and convection, Radial flow of heat, Blackbody radiation, Stefan's law, Wein's displacement and Rayleigh- Jeans laws, Planck's law.

References:

1. Nootan Physics: Kumar & Mittal
2. Applied Physics: P.K. Gupta.
3. Pradeep Fundamental: Gogia & Gomber.
4. Applied Physics: P.S. Kushwaha.

DCH-101	Applied Chemistry (A)				
Pre-requisite	**Co-Requisite**	**L**	**T**	**P**	**C**
None	**None**	**03**	**01**	**00**	**--**
Objective	To know the basic concept of Chemistry and their Applications in Engineering				
UNIT I	**Atomic Structure and Classification of Elements:**				08
Basic concept of atomic structure, Matter wave concept, Quantum number, Heisenberg's uncertainty principle, Shapes of orbitals. Modern classification of elements (s, p, d, and f block elements), periodic properties: ionization potential, electro negativity, electron affinity.					
UNIT II	**Chemical Bonding:**				07
Overview of basic concept of Ionic, Covalent & Co-ordinate bonds, Hydrogen bonding, Valence bond theory, Hybridization, VSEPR theory, Molecular orbital theory.					
UNIT III	**Electrochemistry-I and Electrochemistry-II:**				08
Arrhenius theory of electrolytic dissociation, Transport number, Electrolytic conductance, Ostwald dilution law. Concept of acid and bases: Arrhenius, Bronsted and Lewis theory. Concept of pH and numericals. Buffer solutions, Indicators, Solubility product, Common ion effect with their application. Redox reactions, electrode potential (Nernst equation), Electro-chemical cell (Galvanic and Electrolytic). EMF of a cell and free energy change. Standard electrode potential, Electrochemical series and its application. Chemical and electrochemical theory of corrosion, Galvenic Series. Prevention of corrosion by various methods.					
UNIT IV	**Chemical Kinetics, Catalysis and Solid State:**				09
Introduction, Law of mass action, order and molecularity of reaction. Activation energy, rate constants, 1st order reactions and 2nd order reactions. Definition, Characteristics of catalytic reactions, Catalytic promoters and poison, autocatalysis and negative catalysis. Theory of catalysis and applications. Types of solids (Amorphous and Crystalline), classification (Molecular, Ionic, Covalent and Metallic), Band theory of solids (Conductors, Semiconductors and Insulators), types of crystals, FCC, BCC, Crystal imperfection.					

UNIT V	**Water Treatment:**	08
Hardness of water, its limits and determination of hardness of water by EDTA method. Softening methods (Only Soda lime, Zeolite and Ion exchange resin process). Disadvantages of hard water in different industries, scale and sludge formation, corrosion, caustic embrittlement, priming and foaming in boilers. Disinfection of Water by chloramine-T, Ozone and chlorine. Advantages and disadvantages of chlorination. Industrial waste and sewage, Municipality waste water treatment, Definition of BOD and COD. Numerical problems based on topics.		
Reference books:	1. Applied Chemistry: R. S. Katiyar and J. P. Chaudhary 2. Applied Chemistry: Rakesh Kapoor 3. Principles of general and inorganic chemistry: O. P. Tandon 4. Engineering Chemistry: S. Chandra 5. Applied Chemistry: M. Gupta	

TECHNICAL DRAWING-I
(DAR-101)

L T P
3 1 0

UNIT-I

(a) Printing & lettering – small & capital letters, both vertical & italics. Roman printing as per I.S. code and lettering.

(b) Scale construction of plane, diagonal & vernier scales & their use. **8**

UNIT-II

Plane geometry problems of lines, triangles, polygons & circles. **8**

UNIT-III

Difference & use of I angle and III angle projections I-angle orthographic projections **8**

UNIT-IV

Isometric projections of simple compound solids. Isometric views of building block, a column with isolated footing. **8**

UNIT-V

Wall section through arch, door & window. **8**

References :

1. Engineering Drawing : ND Bhatt
2. Engineering Drawing : R.K. Dhawan
3. Engineering Drawing : B.K.Goel.

BUILDING MATERIALS
(DAR-102)

L T P
3 1 0

UNIT-I

Building Stones, Bricks and Timber

Classification of rocks, selection of stones for different building works. Classification of bricks, characteristics of good bricks, size and weight of standard brick. Composition of brick earth. Introduction, classification, property and uses. Defects in timber and prevention. **8**

UNIT-II

Lime and Cement

Use of lime, setting and hardening action of lime. Introduction, properties and uses of cement, chemical constituents of cement. Functions of ingredients of cement. Setting and hardening of cement types of cement, grading of cement. **8**

UNIT-III

Concrete

Introduction, characteristics of good concrete, classification of concrete, plain cement concrete, pre-cast concrete, general aspects and application of fly-ash. **8**

UNIT-IV

Glass, Insulating Materials

Introduction, properties of glass, sheet glass, float glass, plate glass, bullet proof glass, fiber glass. Heat and sound insulating materials, uses of cork, slage wool, light weight concrete, aluminum foil. **8**

UNIT-V

Paints, Varnishes, Distempers and Gypsum plaster

Definition of paints, function of paints, constituents of an oil paint and their functions, characteristics of good paint. Types of paints, failure of paint, defects in painting.

Definition of varnish, functions of varnish, ingredients of varnish, characteristics of gold varnish, types of varnish, distempering process, properties of distempers, white washing, color washing and gypsum plaster.

8

References :

1. Building Material : Sushil Kumar
2. Building Construction : S.K.Sinha& J. Jha
3. A Text Book Of Building Construction : S.P. Arora&S.P.Sindra

ELECTRICAL ENGINEERING

(DAR-103)

L T P

3 1 0

UNIT 1

FUNDAMENTALS OF ELECTRIC CIRCUIT

Ampere volt and ohm. Kirchhoff's laws, analysis of D.C. Circuits with KCL and KVL. Resistance, grouping of resistors, capacitance grouping of capacitance, temperature coefficient of resistance. Work, energy and power. Joule's law. Sample problems. **8**

UNIT 2

ALTERNATING CURRENT FUNDAMENTALS

Concept of alternating quantities, nature of alternating voltage and current. Sinusoidal equations, different standard values (instantaneous, maximum average, R.M.S. Phasor diagram, lagging, leading quantities, simple problems. **8**

UNIT 3

A.C. CIRCUITS

Power in A.C. Circuit, power factor, active and reactive currents. Relationship between current and voltage in purely resistive, inductive and capacitive reactance, basic principle of single and three phase transformers. Phase sequence, star & delta connections, line and phase values, phasor diagrams. **8**

UNIT 4

ELECTRICAL WIRING AND INSTALLATION

Introduction, systems of distribution of electrical energy, types of wiring, wires and cables, conductor materials used in cables, conductor materials used in cables, insulation and tis types, types of cables used for internal wiring load calculation and cable selection conducts accessories and fittings, basic of fuse system. **8**

UNIT 5

LIGHTING SCHEME

Introduction, lighting accessories and fittings, lighting schemes, types of electric lamps, tungsten filament lamps, fluorescents tubes and sodium vapour lamps, layout of lighting schemes, factory lighting street lighting and decorative lighting. **8**

References:

1. Fundamental of Electrical Engg. – Ashfaq Husain

2. Electrical Technology Volume-I – B.L. Thereja

DCH-151/251	Applied Chemistry Lab				
Pre-requisite **None**	**Co-Requisite** **None**	**L** **00**	**T** **00**	**P** **02**	**C** **----**
Objective	**To develop the practical knowledge for qualitative analysis of salts and determination of hardness, chloride contents, dissolved oxygen in water**				
	ANY TEN EXPERIMENTS				
Experiment 1-5	To analyze inorganic mixture for two acid and basic radicals from following radicals A. Basic Radicals : NH_4^+, Pb^{++}, Cu^{++}, Bi^{+++}, Cd^{++}, As^{+++}, Sb^{+++}, Sn^{++}, Al^{+++}, Fe^{+++}, Cr^{+++}, Mn^{++}, Zn^{++}, Co^{++} Ni^{++}, Ba^{++}, Sr^{++}, Ca^{++}, Mg^{++} B. Acid Radicals : CO_3^{--}, S^{--}, SO_3^{--}, CH_3COO^-, NO_2^-, NO_3^-, Cl^-, Br^-, I^-, SO_4^{--}				10
Experiment 6	To determine the total hardness of water sample in terms of $CaCO_3$ by EDTA titration method using E Br indicator.				02
Experiment 7	Determination of temporary hardness of water sample by O-hener's method.				02
Experiment 8	To determine the Chloride content in supplied water sample by using Mohr's methods.				02
Experiment 9	Determination of Dissolved oxygen (DO) in given water sample.				02
Experiment 10	To determine the strength of given HCl solution by NaOH solution using pH meter				02
Experiment 11	To determine the percentage of available Chlorine in the supplied sample of Bleaching powder.				02

BUILDING MATERIALS LAB
(DAR-152)

L T P
0 0 2

1. Identification of different types of stones and aggregates (visual identification).
2. Identification of timbers: teak, sal, chir, shisum, siras, deodar, kail and mango. (visual identification)
3. To conduct field tests of cement.
4. To determine normal consistency of cement.
5. To determine setting time (initial and final) of cement.
6. To determine fineness of given sample of cement.
7. To determine compressive strength of bricks.
8. To determine water absorption of bricks
9. To determine soundness of cement.
10. To identify hydraulic & fat lime.

ELECTRICAL ENGINEERING LAB

(DAR-153)

L T P

0 0 2

1) To Control one lamp with one switch.
2) To control two lamps in series, two lamps in parallel and one alone.
3) Study of stare case lighting system using two-way switch.
4) Study of intermediate switch and its application in corridor lighting system.
5) To make connections for gallery lighting.
6) i) To make connection for 230V bell.
   ii) To make connection for 6V bell using 230/6V transformer.

   iii) To make connection for bell with indicator.

7) i) Study of various types of wires and cables used in domestic wiring.
   ii) Practice in making 'T' and mesh joint.

8) Practice in making plastic casing-capping wiring for one point.
9) Prctice in making P.V.C. Conduit wiring for one point.
10) Testing of following faults of electrical installation by megger.
   i) Open circuit fault

   ii) Short circuit fault

COMPUTER APPLICATION LAB

(DCS-151)

L T P
1 0 2

1. Introduction of computer types, generation, Application, characteristic & Memory.
2. Introduction and practice of Ms-Office package (Ms-Word, Ms- Excel, and Ms- Power point & Ms-Access).
3. Introduction & Practice of Internet and e-mail.
4. Programming of 'C' history of character set, variables, keywords, token data types input and output function.
5. Introduction of Decision control statement- if, if- else, nester if statement and switch case.
6. Programming practice of if, if – else, nested if statement and switch case.
7. Loops- while loop, do- while loop, for loop, break and continuous statements.
8. Programming practice of while loop, do- while loop, for loop, break and continuous statements.
9. Array Declaration, initialization of one and two dimensional array.
10. Programming practice on array.

Reference:

1. Computer fundamental- Sinha & Sinha
2. Computer Basics & 'C'- V. Rajaraman
3. Office 2007 - Ruthosky, Seguim, Ruthosky
4. Programming in ANSI- E Balagurusamy