Faculty of Engineering & Technology

P.K.University

Shivpuri (MP)

Department of Civil Engg.

Evaluation Scheme & Syllabus for

Diploma-(Civil Engg.)

(II Semester)

(Effective from session 2025-26)

DIPLOMA –CIVIL ENGINEERING

STUDY AND EVALUATION SCHEME FOR DIPLOMA CIVIL ENGINEERING

YEAR-1st /SEMESTER -2nd

SUBJECTCODE	SUBJECTS NAME	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME						Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT			
		L	T	P		Th	Pr	Tot	Th	Pr	Tot	
DAPPLCE201	Applied Mathematics -II	3	1	0	4	30	-	30	70	-	70	100
DAPPLCE202	Applied Physics -II	2	1	0	3	30	-	30	70	-	70	100
DAPPLCE203	Applied Mechanics	3	1	0	4	30	-	30	70	-	70	100
DBUILCE204	Building Materials	3	0	0	3	30	-	30	70	-	70	100
DINTRCE205	Introduction to Computer	3	0	0	3	30	-	30	70	-	70	100
DAPPLCE206	Applied Mechanics Lab	0	0	2	1	-	25	25	-	25	25	50
DAPPLCE207	Applied Physics –II Lab	0	0	2	1	-	25	25	-	25	25	50
DINTRCE208	Introduction to Computer Lab	0	0	2	1	-	25	25	-	25	25	50
DCIVICE209	Civil Lab-I	0	0	2	1	-	25	25	-	25	25	50
Total		14	3	8	21	150	100	250	350	100	450	700

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DAPPLCE201
APPLIED MATHEMATICS -II
(Common to all branch of Diploma engineering)

L	T	P
3	1	0

1. INTEGRAL CALCULUS - I : Methods of Indefinite Integration :-1.1 Integration by substitution.

1.2 Integration by rational function.

1.3 Integration by partial fraction.

1.4 Integration by parts.

2. INTEGRAL CALCULUS -II :

2.1 Meaning and properties of definite integrals, Evaluation definite integrals. Integration of special function.

2.2 Application : Finding areas bounded by simple curves, Length of simple curves, Volume of solids of revolution, centre of mean of plane areas.

2.3 Simposns 1/3rd and Simposns3/8th rule and Trapezoidal Rule : their application in simple cases.

3. CO-ORDINATE GEOMETRY (2 DIMENSION):

3.1 CIRCLE: Equation of circle in standard form. Centre - Radius form, Diameter form, Two intercept form.

3.2 Standard form and simple properties

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

Ellipse $\frac{x^2}{} + \frac{y^2}{} = 1$

Hyperbola $\frac{x^2}{} - \frac{y^2}{} = 1$

4. CO-ORDINATE GEOMETRY (3 DIMENSION):

4.1 Straight lines and planes in space - Distance between two points in space, direction cosine and direction ratios, Finding equation of a straight line and Plane (Different Forms),

4.2 Sphere $x2 + y2 + z2 + 2gx + 2fy + 2wz=d$ (Radius, Centre and General Equation)

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DAPPLCE202
APPLIED PHYSICS-II
(Common to all branch of Diploma engineering)

L	T	P
2	1	0

1. Optics :

Nature of light, Laws of Reflection and Refraction, Snell's Law, Interference (Constructive and Destructive), Diffraction and Polarization (Concept Only), Law of Mallus and Polaroid's.

2. Introduction To Fibre Optics :

Critical angle, Total internal reflection, Principle of fiber optics, Optical fiber, Pulse dispersion in step-index fibers, Graded index fiber, Single mode fiber, Optical sensor.

3. Lasers and its Applications :

Absorption and Emission of energy by atom, Spontaneous and Stimulated Emission, Population inversion, Main component of laser and types of laser- Ruby Laser, He-Ne laser and their applications. Introduction to MASER.

4. Electrostatics :

Coulomb's Law, Electric field, Electric potential, Potential energy, Capacitor Energy of a charged capacitor, Effect of dielectric on capacitors.

5. D.C. Circuits :

Ohm's Law, Kirchoff's Law and their simple application, Principle of Wheat Stone bridge and application of this principle in measurement of resistance (Meter bridge and Post Office Box); Carey Foster's bridge, potentiometer.

6. Magnetic Materials and Their Properties:

Dia, Para and Ferro-magnetism, Ferrites, Magnetic Hysteresis Curve and its utility. Basic idea of super conductivity, Meissner's effect.

7. Semiconductor Physics :

Concept of Energy bands in solids, classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semi conductors, Electrons and holes as charge carriers in semiconductors, P-type and N-type semiconductors.

8. Junction Diode and Transister :

Majority and Minority charge carriers P-N junction reverse biasing of a junction diode, P-N junction transistor, transistor-action, Base, emitter and collector currents and their relationship LED's.

formation, barrier voltage, Forward and device characteristics, Formation of

9. Introduction To Digital Electronics :

Concept of binary numbers, Inter conversion from binary to decimal and decimal to binary. Concepts of Gates (AND, NOT, OR).

10. Non-conventional energy sources:

(a) Wind energy : Introduction, scope and significance, measurement of wind velocity by anemometer, general principle of wind mill.

(b) Solar energy: Solar radiation and potentiality of solar radiation in India, uses of solar energy: Solar Cooker, solar water heater, solar photovoltaic cells, solar energy collector.

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DAPPLCE203
APPLIED MECHANICS

L	T	P
3	1	0

1. Introduction:

Mechanics and its utility. Concept of scalar and vector quantities. Effect of a force. Tension & compression. Rigid body. Principle of physical independence of force. Principle of transmissibility of a force.

2. (A). System of Forces :

Concept of coplanar and non-coplanar forces including parallel forces. Concurrent and non-concurrent forces. Resultant force. Equilibrium of forces. Law of parallelogram of forces. Law of triangle of forces and its converse. Law of polygon of forces. Solution of simple engineering problems by analytical and graphical methods such as simple wall crane, jib crane and other structures. Determination of resultant of any number of forces in one plane acting upon a praticle, conditions of equilibrium of coplanar concurrent force system.

(B). General Condition of Equilibrium:

General condition of equilibrium of a rigid body under the action of coplaner forces, statement of force law of equilibrium, moment law of equilibrium, application of above on body.

3. Moment & couple:

Concept of Varignon's theorem. Generalized theorem of moments. Application to simple problems on levers-Bell crank lever, compound lever, steel yard, beams and wheels, lever safety valve, wireless mast, moment of a couple; Properties of a couple ; Simple applied problems such as pulley and shaft.

Types of friction: statical, limiting and dynamical friction, statement of laws of sliding friction, Coefficient of friction, angle of friction; problems on equilibrium of a body resting on a rough inclined plane, simple problems on friction. Conditions of sliding and toppling.

5. Machines:

Definition of a machine. Mechanical advantage, velocityratio, input, output, mechanical efficiency and relation between them for ideal and actual machines. Law of a machine Lifting machines such as levers, single pulley, three system of pulleys. Weston differential pulley, simple wheel and axle, differential wheel and axle. Simple screw jack, differential screw jack, simple worm and worm wheel.

6. Centre of Gravity:

Concept, definition of centroid of plain figures and center of gravity of symmetrical solid bodies. Determination of centroid of plain and composite lamina using moment method only, Centroid of bodies with removed portion. Determination of center of 'gravity' of solid bodies - cone, cylinder, hemisphere and sphere, composite bodies and bodies with portion removed.

7. Moment of Inertia:

Concept of moment of inertia and second moment of area and radius of gyration, theorems of parallel and perpendicularaxis, second moment of area of common geometrical section : rectangle, triangle, circle (without derivations). Second moment of area for L, T, I and channel section, section of modulus.

8. Beams & Trusses:

Definition of statically determinate and indeterminate trusses. Types of supports. Concept of tie & strut, Bow's notation, space diagram, polar diagram, funicular polygon; calculation of reaction at the support of cantilever and simply supported beams and trusses graphically and analytically; graphical solution of simple determinate trusses with reference to force diagram for determining the magnitude and nature of forces in its various members. Analytical methods: method of joints and method of sections.(simple problems only)

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DBUILCE204
BUILDING MATERIALS

L	T	P
3	1	0

1. Building Stones:

Classification of rocks: Geological and physical classification; Common rock forming minerals; Testing of stones for specific gravity, water absorption, durability, weathering, hardness by Moh's scale, of rocks.

Quarrying: Terminology used in quarrying; basic principles involved, methods of quarrying. Blasting: where used, principles of blasting, line of least resistance, drilling of holes (manually and mechanically), charging, tamping, firing, fuses & detonator, safety precautions, common explosives only names, their uses and storage. Wedging: where used, tools required and operation of wedging. Stone crushing: process &equipment used, crushers, grinding mills like hammer mill, ball mill & screens. Availability,

Characteristics and uses of the following stones:

Granite, sandstone, limestone, dolomite, slate, basalt, trap, quartzite and marble. Availability of different stones in state.

2. Bricks and Clay Products:

Raw materials for brick manufacture, properties of good brick making earth, field testing of brick clay. Manufacture of bricks: Preparation of clay-manually/mechanically. Moulding: hand molding and machine moldings. Drying of bricks. Burning of bricks. Clamps. Types of kilns, details of Bull's trench kiln and Hoffman's Kiln, process of burning, size of standard bricks. IS Classification of bricks as per IS: 1077 and testing of common building bricks as per IS: 3495 recommendations. Compressive strength, water absorption, efflorescence test; refractory bricks: composition, properties and uses. Building tiles: types- wall, ceiling, roofing and flooring tiles, their properties, and uses. Other clay products: earthenware and stoneware, their properties and uses.

3. Lime

Natural sources of lime. Definitions of quick lime, fat lime, hydraulic lime, hydrated lime, lump lime, calcinations, slaking, manufacture of lime. Process of setting and hardening action of lime. Field tests of lime as per IS 1624. Pozzolonic materials. Types, properties and uses.

4. Cement

Natural and artificial cement, raw material, manufacture of ordinary Portland cement, flow diagram for dry and wet process, setting and hardening of cement, types of cement, properties of cement test of cement as per IS.

5. Timber and wood based Products:(Identification of different types of timber):

Teak, chir, shisham, sal,mango,devdar, kail etc. Market forms of converted timber as per IS. Seasoning of timber: purpose, types of sea- soning.air seasoning, water seasoning, kiln seasoning, chemical seasoning, Solarseasoning kiln. Defects in timber. Decay in timber. Preservation of timber and methods of treatment. Properties of good timber. Common structural timbers in India, thier availability, and uses.Plywood, veneers; manufacture of plywood, uses of plywood. Other wood based product their brief description, maufacture and uses. Laminated boards: block

boards, fiber boards, resistant board, hard board,plastic coated finishes, water & fire resistant ply wood, PVC boards.

6. Paints

Various types of paints. Constituents of oil paints, their functions and properties. Cement paints, their properties and uses, Varnish and polish: types, properties and uses. Lacquars and enamels: their properties and uses. Trade names of different products.

7. Insulating Materials

Properties, uses and requirements of heat and sound insulating materials. Properties and uses of: cork, rock wool, glass wool, concrete, aluminum foil, asbestos sheets for ceiling, commercial names of different insulating materials.

8. Glass

Types of glasses and their properties: Sheet glass, plate glass, frosted glass, wired glass, fiber glass bullet resisting glass, colored glass and glass wool Commercial sizes, forms and their uses.

9. Plastics

Methods of moldings and types, properties and uses of plastics. Important commercial product, uses of plastic in Civil Engineering: plastic pipes, taps, valves, plastic coated paper, polythene sheets, Thermo Cole, Bakelite, PVC.

10. Water proofing materials.

List of water proofing materials, suitable for use in D.P.C., Basement floor and walls, Toilet, Kitchen, Roof Terraces, Water tanks, etc. Properties & commercial trade names, approxy.

11. Exposure to non-conventional & waste by product

Fly ash, Stone Cladding and other finishing materials, ACC bricks, Hollow concrete block, Eco friendly material, Fly ash bricks, Micro silica.

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L	T	P
3	0	0

DINTRCE205: INTRODUCTION TO COMPUTER

1. INTRODUCTION TO COMPUTER:

A. Block Diagram of Computer.
B. Types Of Computer
C. Types of Input and Output devices
D. Memories Devices (Its Types and Basic).

2. INTRODUCTION TO OPERATING SYSTEMS (MS-DOS/MS-WINDOWS:)

What is operating system, its significance, Commands of DOS, Features/Application of window.

3. WORD PROCESSING:

File : Open, Close, Save, Save as, Search, Send to, Print Preview, Print and Page Setup
Edit : Cut, Copy,Paste, Office Clipboard, Select All, Find, replace, Goto, etc.
View : Normal/Web Layout/Print Layout; Tool Bars; Header/Footer; Zoom, etc.
Insert: Break, Page Number, Date & Time, Symbol, Comment, Reference, etc.
Format: Font, Paragraph, Bullets & Numbering, Borders & Shading, Column, Change case, Back ground, etc.
Tools : Spelling & Grammer, Language, Word Count, Letters & Mailing, Options, Customize, etc.
Table : Draw, Insert, Delete, Select, Auto Format, AutoFit, Convert, Sort, Formula, etc.
Mail Merge

4. WORKSHEET:

Introduction, Use of Tools/Icons for preparing simple Mini Project.

5. PRESENTATION :

Introduction, Use of Tools/Icons for preparing simple presentation on Power Point.

6. DATABASE OPERATION :

Create database using MS Access, Create Table and Creating Reports.

7. INTRODUCTION TO INTERNET:

What is Network, How to send & receive messages, Use of Search Engines, Surfing different web sites. Creating Mail ID, Use of Briefcase, Sending./replying emails.

8. INTRODUCTION TO ADVANCE TOOLS :

I. Steps requires to solving problems.
A. Flow Chart B. Algorithm C. Programming

II. Use of advance Tools such as Skype, Teamviewer, Installation of Modem, use of WiFi, Etc.

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0	0	2

DAPPLCE206: APPLIED PHYSICS-II LAB

Note: Any 4 experiments are to be performed.

1. Determination of coefficient of friction on a horizontal plane.
2. Determination of 'g' by plotting a graph T2 verses l and using the formula g=4n2/Slope of the graph line
3. Determine the force constant of combination of springs incase of 1. Series 2.Parallel.
4. To verify the series and parallel combination of Resistances with the help of meter bridge.
5. To determine the velocity of sound with the help of resonance tube.
6. Determination of viscosity coefficient of a lubricant by Stoke's law.
7. Determination of E1/E2 of cells by potentiometer.
8. Determination of specific resistance by Carry Foster bridge.
9. Determination of resistivity by P.O.Box.
10. Verification of Kirchhoff's Law.
11. To draw Characteristics of p-n Junction diode.
12. To measure instantaneous and average wind velocity by indicating cup type anemometer/hand held anemometer.

NOTE :

Students should be asked to plot a graph in experiments (where possible) and graph should be used for calculation of results. Results should be given in significant figures only.

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DAPPLCE207
Applied Mechanics Lab

List of Experiments

1. To verify the law of Polygon of forces.
2. To verify the law of parallelogram and triangle of forces.
3. To verify the law of principle of moments.
4. To find the coefficient of friction between wood, steel, copper and glass.
5. To find the reaction at supports of a simply supported beam carrying point loads only.
6. To find the forces in the jib & tie of a jib crane
7. To find the forces in the members of a loaded roof truss (King / Queen post truss)
8. To find the mechanical advantage, velocity ratio and Efficiency of any three of the following machines:
   (i) Simple wheel & axle
   (ii) Differential wheel & axle
   (iii) Differential pulley block
   (iv) Simple Screw jack
   (v) Simple Worm & worm wheel
   (vi) System of Pulleys (any type).
9. To find out center of gravity of regular lamina.
10. To find out center of gravity of irregular lamina.

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L	T	P
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DINTRCE208: INTRODUCTION TO COMPUTER LAB

List of Practicals

1. Practice on utility commands in DOS.
2. Composing, Correcting, Formatting and Article (Letter/Essay/ Report) on Word Processing tool Word and taking its print out.
3. Creating, editing, modifying tables in Database tool.
4. Creating labels, report, generation of simple forms in Database tool.
5. Creating simple spread sheet, using in built functions in Worksheet tool..
6. Creating simple presentation.
7. Creating mail ID, Checking mail box, sending/replying e-mails.
8. Surfing web sites, using search engines.

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L	T	P
0	0	2

DCIVICE209: CIVIL LAB – I

(Building Material Testing Lab)

LIST OF PRACTICALS:

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.
11. To visit nearby bricks klin/Lime klin/ Cement Industry