EXAMINATION DEPARTMENT
DAYALBAGH EDUCATIONAL INSTITUTE
DAYALBAGH, AGRA-282005

Date: 14-Aug-2023

NOTICE

The Lateral Entry (LE) scheme for admission to second year of B.Tech. is one of the lateral pathways that the Institute offers to its meritorious students of various Diploma level and prescribed B.Voc. Programmes. The students who fulfill the below mentioned eligibility criteria shall be allowed to appear in selection process of the LE scheme for possible upward mobility from Diploma/ Vocational-Diploma/ B.Voc. level programmes (***Source Programme***) to B.Tech. Programme (***Target Programme***).

Eligibility criteria for short listing students from Source Programme:

1. Diploma in Engineering (High school students): Top 20% students as per CGPA of 6 semesters of each centre in the order of merit with a minimum of 6 CGPA.

2. Diploma in Engineering (Intermediate students): Top 20% students as per CGPA of 4 semesters of each centre in the order of merit with a minimum of 6 CGPA.

3. Prescribed B.Voc. Programmes: Top 20% students as per CGPA of 4 semesters of each centre in the order of merit with a minimum of 6 CGPA.

Further, the table below gives details of source and target programme:

UPWARD MOBILITY TO HIGHER PROGRAMMES (2022-23)

Source Programme (Session 2022-23) for upward mobility	Target Programme for upward placement	Total Number of supernumerary seats allocated for LE Scheme
Vocational Diploma and Diploma in Engineering: • ***Pass-outs of three-year course, who were initially admitted with High School Qualification,*** • ***Pass-outs after two years, who were initially admitted with Intermediate Qualification, and*** • ***Pass-outs after two year of B.Voc.**** ***of Science Stream such as*** ***(1) Agriculture Technology*** ***(2) AI & Robotics*** ***(3) Automobile*** ***(4) Dairy Technology*** ***(5) Digital Manufacturing*** ***(6) Greenhouse Technology*** ***(7) Internet of Things*** ***(8) Renewable Energy*** ***(9) Telecommunication*** ***(10) Telematics*** ***(11) Water Sanitation & Waste Mngt.***	Second Year of B.Tech. (four-year course): **Agriculture, Civil, Electrical, Footwear Technology, and Mechanical.**	20% of total sanctioned intake for various Engineering Degree disciplines, by the Regulatory Bodies.

*If selected, the B.Voc. students will be given additional courses related to Engineering Drawing, Workshop (Theory/Practical), Applied Mechanics, etc., during their second year of B.Tech. Programme to bring them at par with other students.

Important Operational Details:

(1) All communication with the eligible students shall happen through email or through website notice. All students must ensure that they have provided correct **email id** on **CMS**.

(2) A provisional list of students eligible for Lateral Entry Scheme is notified on website. In case any student has a query regarding his/her name not appearing in the list may send email on *ardeiexam@dei.ac.in.*

(3) The schedule of **lateral entry test** is given in **Annexure 1** of this notice**.**

(4) All eligible students must attend the online Mathematics coaching as given in the schedule. This shall be organized by the Mathematics Department of Faculty of Science. The Office of Dean, Faculty of Engineering shall send the details of coaching to all the eligible students through email.

(5) The selection process is a 3-phase process. The first phase is Mathematics screening test. This test is a 3-hour subjective test. Qualifying students will be eligible to attempt the second phase which is the LE main test. The LE main test is a 2-hour duration Objective (MCQ) type test. Qualifying students will be eligible for an Interview. After the interview, list of selected candidates to the target programme shall be notified.

(6) The syllabus for the Mathematics screening test and Main lateral entry test is given in **Annexure 2** of this notice**.**

(7) The test shall be conducted at the designated test centres in supervised offline mode. All the eligible students shall get a test link and credentials one day before the scheduled test. The students shall appear in the test from University Main Campus / Information Centres only.

(8) Any students found using any fraudulent means shall be debarred from the selection process.

   The Dean Faculty of Engineering will arrange for Mathematics Coaching (through the Department of Mathematics), conduct lateral entry test, interview, declaration of list of selected students, etc. For the above said purposes he can be contacted on *dean.engg@dei.ac.in.*

Registrar/ Controller of Examinations

Encl.: Annexure 1 & 2

C.C.:
(1) All the Deans
(2) B.Voc. Coordinators & Principal Technical College are requested to inform the students during online classes/ interaction.
(3) Incharge, CART,
(4) Incharge, Mahila Polytechnic
(5) Coordinator, DEP-DEI, Incharge Computer Centre for uploading the notice on DEI website
(6) AO (Computers)
(7) Registrar, DEI.

Copy also to the following for information please:

 (1) The Director, DEI
 (2) The Registrar, DEI

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LATERAL ENTRY TEST SCHEDULE (2022-23)

Date: 14-Aug-2023

#	ACTIVITY	DATE (TIME)	VENUE
	DIPLOMA IN ENGINEERING, VOCATIONAL DIPLOMA, B.VOC. TO B.TECH.		
1	Mathematics Coaching	16-Aug-2023 to 25-Aug-2023	Science Faculty Hall
2	Screening Test	28-Aug-2023 (2:00 pm)	**For Boys** – DEI Technical College and Faculty of Engineering **For Girls** – Faculty of Commerce **Students of Centres** – Centre Concerned
3	Declaration of Screening Test Result	31-Aug-2023 (1:00 pm)	DEI Website
4	Main Written Test	04-Sep-2023 (3:00 pm)	**For Boys** – DEI Technical College and Faculty of Engineering **For Girls** – Faculty of Commerce **Students of Centres** – Centre Concerned
5	Interview	06-07 Sep-2023 (1:00 pm)	To be announced by the Dean Engineering
6	Declaration of Result & Registration	08-Sep-2023 (1:00 pm)	DEI Website
7	Commencement of Classes	09-Sep-2023	To be notified by the Dean Faculty of Engineering

ENGINEERING MATHEMATICS SYLLABUS
FOR SCREENING TEST FOR LATERAL ENTRY TO B.TECH.

Vector Calculus: Differentiation and Integration of vectors, Gradient of a scalar point function, Divergence and curl of a vector point function and their physical meaning, line, surface and volume integrals, Gauss and Stoke's theorems (without proof), Simple applications.

Ordinary & Partial Differential Equations:

(i) **ODE**: Method of variation of parameters, Ordinary differential equations of second order, Solution in series, Legendre's and Bessel's equations and their recurrence relations.

(ii) **PDE**: Simultaneous and total differential equations, elementary partial differential equations of first order, homogeneous and non-homogeneous partial difference equations with constant coefficients. Solution for wave, heat conduction and transmission equations.

Statistics: Moments, Moment generating functions, mathematical expectation, Binomial, Poisson's and Normal distribution, curve fitting, correlation and regression.

SYLLABUS FOR WRITTEN TEST FOR LATERAL ENTRY TO B.TECH.

(1) BASIC ELECTRICAL ENGINEERING

CIRCUIT ANALYSIS: Review of basic concepts of units, voltage, current, energy, etc. R, L, and C - their geometrical, electrical and energy view point. Ohm's law, KVL, KCL, Mesh Analysis and Nodal Analysis. Thevenin's and Norton's Superposition theorem. Maximum Power Transfer Theorem. Star Delta conversion.

AC CIRCUITS: Principles of single phase and three phase generation (qualitative treatment only). Steady state analysis of RC, RL and RLC circuits for sinusoidal excitation. Phasor notation, RMS Values, Power Factor. Resonance. Complex Power, active and reactive power. 3-phase (balanced & unbalanced) system.

MAGNETIC CIRCUITS AND TRANSFORMERS: Ampere's Circuital law and Constant Flux Theorem. B-H curve, Magnetic circuit calculations. Hysteresis and Eddy Current losses. Transformers: construction emf-equation ratings phasor diagram on No-load and Full-load, e.g. circuits, Open circuits and short circuit test, efficiency and regulation operation of auto transformers.

ELECTRICAL MACHINES: Classification, construction, emf and torque production. Characteristics of DC motors and generators, application. Induction motors: revolving magnetic field, principle of torque production, ratings, construction (squirrel cage and would rotor) Torque speed characteristics. Application.

ELECTRICAL MEASUREMENTS: PMMC meters, moving iron ammeter and voltmeter. Dynamometer wattmeter, AC energy meter. Extension of instrument ranges.

(2) ENGINEERING THERMODYNAMICS

Basic Concepts and Definitions: System. Introduction and definition of thermodynamics; Dimensions and units, Microscopic and Macroscopic approaches; System, surroundings and universe, Concept of continuum, Control system boundary, control volume and control surface. Properties and state, Thermodynamic properties, Thermodynamic path, process and cycle, Thermodynamic equilibrium, Reversibility and irreversibility, Quasi static process, Energy and its forms, Work and hear. Gas laws, Idea gas, Specific Heats and their calculations.

Zeroth Law of Thermodynamics: Zeroth law of thermodynamics, Temperature and its measurement, Temperature scales.

First Law of Thermodynamics: Thermodynamic definition or work, Thermodynamic processes, Calculation of work in various processes and sign convention, Non-flow work and flow work, Joules' experiment, First law of thermodynamics, Internal energy and enthalpy, First law of thermodynamics applied to open systems, Steady flow systems and their analysis, Steady flow energy equation, Application of equation to Boiler, Condenser, Evaporator, Turbine, Nozzle, Compressor (Rotary & Reciprocating), Throttling process etc., Introduction to unsteady processes such as filling and evacuation of vessels with and without heat transfer, PMM-I.

Second Law of Thermodynamics: Limitations of first law of thermodynamics, Devices converting heat to work, Thermal reservoir, Heat engines, Efficiency, Devices converting work to heat, Heat pump, refrigerator, Coefficient of Performance, Reversed heat engine, Kelvin's-Plank's statement of second law of thermodynamics, Clausius statement of second law of thermodynamics, Equivalence of two statements of second law of thermodynamics, Reversible and irreversible processes, Carnot cycle and Carnot engine, Carnot theorem and it's corollaries. Thermodynamic temperature scale, PMM-II.

Entropy: Clausius inequality, Concept of Entropy, Entropy change in different thermodynamic processes, Tds equation, Principle of entropy increase, T-S diagram, Statement of the third law of thermodynamics.

Availability and Irreversibility: Available and unavailable energy, Availability and Irreversibility, Second law efficiency.

Properties of Steam: Pure substance, Property of steam, Triple point, Critical point, Sub-cooled liquid, Saturation states, Superheated states, Phase transformation process of water, Graphical representation of pressure, volume and temperature (P-V-T surfaces), P-T & P-V diagrams. T-S and H-S diagrams, use of property diagram. Steam-Tables & Mollier charts, Dryness fraction and its measurement.

Real Gases: Deviation of real gases from ideal gases. Different forms of the equation of state. Reduced properties. Compressibility factors chart. Maxwell relations. Joule-Thomson coefficient, Clapeyron's equation.

Engines: Steam Engines- Constructional details and working.

Introduction of IC Engines: Otto and Diesel cycle (No numerical), Working of compression Ignition engines, spark Ignition engines, 2 stroke and 4 stroke engines, Theoretical & actual indicator diagrams and valve timing diagrams.

(3) ENGINEERING MECHANICS

Vector. Unit vector. Components of a vector. SI units and their notations. Concurrent force system. Resultant & equilibrant.

GENERAL FORCE SYSTEM: Moments of a force and of a couple. Resultant of a coplanar force system. Single force equivalent. Resultant of a general force system. Wrench. Free body diagram. Equilibrium of a rigid body. Static indeterminacy.

STRUCTURES: Trusses. Method of joints. Method of sections. Force analysis of frames and machines.

DISTRIBUTED FORCES: Gravitational forces. Surface loadings.

STATICS OF LIQUIDS: Hydrostatic pressure. Centre of pressure. Bouyancy.

FRICTION: Dry friction. Systems involving sliding or tipping. Wedges. Square threaded screws. Belt friction.

INTERNAL FORCES: Bending of beams. Differential relationships between rate of loading, Shear Force and Bending Moment. Beams and cantilevers. Shear force, bending moment and axial force diagrams for horizontal beams with concentrated (vertical and inclined), uniformly distributed and uniformly increasing loads and moments. Inclined beams. Beams floating on water.

VIRTUAL WORK: Principle of Virtual work Potential energy, Stability.

MOMENTS OF INERTIA: Area moments of inertia. Parallel axis theorem. Transformation of axes.

(4) ENGINEERING MATHEMATICS

Matrices: Adjoint and inverse of a matrix, rank of a matrix, characteristic roots and vectors.

Differential Calculus: Differentiation of a product of two functions, quotient of two functions, function of a function, parametric and implicit functions, logarithmic differentiation.

Application of differential calculus to problems of rate, velocity, acceleration, small errors, gradient and in co-ordinate geometry for tangent, normal, sub-tangent, sub-normal etc.

Successive differentiation, Leibnitz's Theorem, MacLaurin's and Taylor's theorems, Polar coordinates, derivative of an arc, radius of curvature, partial differentiation of functions of two and three variables only. Problems of maximum and minimum values.

Integral Calculus: Formulae for the integration of x^n, e^x, x^{-1}, Sin x, Cos X, $1/\sqrt{(1-x^2)}$, $1/\sqrt{(x^2-1)}$, $1/(1+x^2)$, Sec^2x, $Cosec^2x$

Problems of integration by substitution, by parts and by partial fractions. Definite integrals and Gamma function. Use of the above integration formulae for area, volume, mean values and problems of engineering subjects.

Differential Equations:

1. First-order, variables separable.

2. Homogeneous differential equations

3. First-order linear differential equations

4. Exact differential equations

5. n^{th} order linear differential equations with constant coefficients and homogeneous linear differential equations

Vector Analysis: Definition, representation, mod, null and unit vectors. Addition, subtraction, dot product & cross product of two vectors, application to work, area linear and angular velocity, vector differentiation and integration.

Vector Calculus: Differentiation and Integration of vectors, Gradient of a scalar point function, Divergence and curl of a vector point function and their physical meaning, line, surface and volume integrals, Gauss and Stoke's theorems (without proof), Simple applications.

Ordinary & Partial Differential Equations:

(i) **ODE**: Method of variation of parameters, Ordinary differential equations of second order, Solution in series, Legendre's and Bessel's equations and their recurrence relations.

(ii) **PDE**: Simultaneous and total differential equations, elementary partial differential equations of first order, homogeneous and non-homogeneous partial difference equations with constant coefficients. Solution for wave, heat conduction and transmission equations.

Statistics: Moments, Moment generating functions, mathematical expectation, Binomial, Poisson's and Normal distribution, curve fitting, correlation and regression.