

## Information for BE/BTech-December 2009 Admissions

**Introduction:** Thapar University is conducting an Entrance Test as per following schedule for admission in the first year of UG programme against withdrawals of admissions after August 3, 2009 and non filled seats. The proposed schedule is as under:

Last date of receipt of application forms	November 20, 2009
Date of Entrance Test	December 27, 2009 (10.00 AM to 1.00 PM)
Declaration of the result	January 04, 2010
Counselling for admission & deposit of fee	January 09, 2010

Note: No separate letter for Counselling shall be issued.

**Examination Centre(s):** Thapar University, Patiala. In addition, we may have examination centres at Delhi, Mumbai, Kolkata and Chennai based on sufficient number of options by the candidates. Highest preferred Entrance Test Centre available shall be allocated.

**Structure of the Entrance Test:** It will be of 3 hours duration and shall contain 160 Objective/Multiplie choice questions of 1 mark each. 1/4 mark shall be deducted for every wrong answer. There shall be 20 questions of one mark each on the following topics:

- |    |                                   |                        |
|----|-----------------------------------|------------------------|
| 1  | English                           | } Any four to be opted |
| 2  | Mathematics                       |                        |
| 3  | Physics                           |                        |
| 4  | Chemistry                         |                        |
| 5  | Solid Mechanics                   |                        |
| 6  | Computer Programming              |                        |
| 7  | Electrical and Electronic Science |                        |
| 8  | Engineering Graphics              |                        |
| 9  | Thermodynamics                    |                        |
| 10 | Manufacturing Process             |                        |

**Eligibility:**

- 1 She/He should have been student of first semester of first year of BE/BTech programme of a recognised Institute/University during July- December 2009 and have passed 10+2 or equivalent examination from recognized board and have secured at least 60% (55% for SC/ST candidates) marks in aggregate of Mathematics, Physics and Chemistry/Computer science/Biology/Biotechnology.
- 2 She/He should have appeared in the Entrance Test to be conducted by Thapar University. The cut-off marks in the Entrance test shall be 20% (15% for SC/ST).
- 3 She/he should be a citizen of India.
- 4 She/he should bear a good character and satisfy the prescribed requirements of the University.

**Admission Procedure:**

- 1 Only those candidates shall be considered who shall apply on the prescribed application form on or before the last date.
- 2 Admission shall be made on the merit of the Entrance Test to be conducted by Thapar University.
- 3 Candidate is required to pay tuition fee and other dues at the time of admission.
- 4 There will be only one counselling.
- 5 Candidate leaving after taking admission shall be refunded Caution Money and alumni fee only.
- 6 25% seats shall be reserved for SC/ST category and 3% for physically handicapped category. In case, any seat in reserved category remains vacant, the same shall be converted to the General Category.
- 7 Candidate should bring all the documents in original at the time of Counselling.

- 8 In case, a student of first year gets a seat under this scheme then the seat vacated by such candidate shall be offered to other candidates in the merit list.

**Number of seats available:** Seats available as on October 14, 2009

Branch	No. of vacant seats			
	Gen	SC/ST	PH	Total
Biotechnology	08	03	01	12
Chemical Engineering	02	00	00	2
Civil Engineering	02	00	00	2
Computer Engineering	06	02	00	8
Electronics & Communication Engineering	05	02	00	7
Electronics (Inst & Ctrl) Engineering	05	02	00	7
Electrical Engineering	04	01	00	5
Industrial Engg-MBA*	01	01	00	2
Mechanical Engineering	06	02	01	9
Total	39	13	2	54

\* 5 years integrated degree programme

**Fee and other charges:**

- 1) Cost of application form : Rs 1250/-
- 2) Entrance test fee : Rs 1000/-
- 3) Fee to be paid at the time of admission:

Total in Indian Rupees	Rs 88925 (without Hostel)
Hostel Charges	Rs 15000/- (Shared room) Rs 23500/- (Single room)

**Documents required:**

Candidates must bring with them following original certificates and **a set of attested copies of all the certificates** at the time of admission.

- 10+2 DMC
- Matriculation/Higher Secondary Certificate showing Date of Birth
- Admit Card of Entrance Test
- Character Certificate
- Medical Fitness Certificate
- Proof of admission in first semester of BE/BTech (Recent Bonafide student certificate)
- Affidavit required in case of discontinuity of studies
- Migration Certificate
- Income Certificate

Candidates must be medically fit and must bring along with them a medical fitness certificate signed by a Gazetted Medical Officer at the time of admission on the prescribed proforma as per Annexure-IV of Prospectus.

**REFUND OF FEE:**

In case a seat, vacated by a student, gets filled in the subsequent round(s) of admission, the balance amount after deduction of Rs. 1000/- from the total fee deposited will be refunded, otherwise the university security, caution money and alumni fee will only be refunded. All outstanding dues will, however, be recovered before such refund is made.

## **MODES OF PAYMENT OF APPLICATION FEE, EXAMINATION FEE:**

### **1 BY CASH**

Prospectus along with an application form can be purchased by paying Rs 1250/- in cash at the University Counter.

- 2 Receipts in Any of State Bank of Patiala Branch (Cash/Account-to-account transfer):** It is available in all the branches of State Bank of Patiala. A sample payment pay-in-slip is enclosed. The system generates **Journal Number** which is to be used for linking the payment. The students are instructed to get the 6-10 digit **journal number** from the branch where they have made the payment and feed the same in the web site where the details are captured along with date of payment(By cash Only).

For depositing money through SBOP, a candidate can deposit money in favour of the following account:

Name of Account: **Thapar University**

Account Number: **65051004116**

Account Type: **Savings**

IFSC code : **STBP0000244**

For depositing money through Demand Draft (DD), the DD of requisite amount should be made in favour of the Registrar, Thapar University, Patiala and payable at Patiala.

A candidate must write the Journal Number in the downloaded/ONLINE application form .

# Syllabus of the Entrance Test

## ENGLISH

**Communicative grammar**-Spotting errors related to nouns, pronouns, adjective and adverbs. Changing voice from active to passive and Passive to Active. Idioms and phrases; Words often confused; One word substitutes; Formation of words (suffixes, prefixes and derivatives)

**Written English**- Types of writing (narrative, expository, analytical, descriptive); Structure of a paragraph; Fundamentals of letter writing.

**Reading Skills** –Process of reading; Various types of reading skills; Strategies to become an effective reader.

**Speaking and Listening Skills**-Elements of an effective talk; Oral presentations and designing & using audio visual aids; Process of listening; Recognition of barriers to listening; Developing good listening skills; Role of non verbal cues in speaking and listening.

## Physics

**Electromagnetic Waves:** Introduction, Maxwell's equations in differential and integral forms, Concept of displacement current, Electromagnetic wave equations for free space, Conducting and dielectric medium, Poynting theorem, Concept of wave guides.

**Light Waves:** Interference: thin films, wedge-shaped films, non-reflecting films, Newton rings, Michelson interferometer, Diffraction: single, double and multiple slits, Dispersive and resolving powers. Polarization, its production, and detection.

**Quantum Mechanics:** Origin of quantum hypothesis, de-Broglie hypothesis of matter waves, Uncertainty principle, Wave function and wave mechanics, Schrodinger equation: steady state form, Quantum mechanical operators, Expectation value, One dimensional solutions: zero potential, step potential, potential barrier and potential well.

**Laser and Fiber Optics:** Basic concepts, Laser properties, Laser systems: ruby, Nd:YAG, He-Ne and semiconductor lasers, Optical fiber, Basic theory, Acceptance angle, Numerical Aperture, Normalised Frequency, Mode of propagating ; materials dispersion and pulse dispersion in optical fiber; fiber connectors, splicers and couplers; application of optical fiber.

**Magnetic Materials and superconductivity:** Classification of magnetic materials, Types of magnetism, Magnetic anisotropy and magnetostriction, Magnetic domain, Hard and soft magnetic materials, Ferrites and their applications, Basic ideas of superconductivity, Type I and Type -II superconductors and their applications.

## Chemistry

**Water and its treatment:** Specifications of water for different uses, Water for domestic uses, Different methods of water softening, Boiler feed water, Desalination of water

**Electrochemistry:** Migration of ions, Transference number, Diffusion and ionic mobility, Debye Huckel theory; Types of electrodes, Concentration cells with and without transference, Potentiometric titrations and conductometric titrations.

**Phase Rule:** Definitions of terms, Derivation of phase rule, One component and two component systems.

**Polymers:** Basic concepts, Classification and industrial application.

**Spectroscopic Techniques:** Law of absorption of light, Limitations and applications of Beer's law, Grotthus-Draper Law, Stark Einstein Law; Jablonski diagram, Types of molecular spectra, Introduction to atomic spectroscopy, Principle and applications of atomic absorption spectroscopy, UV/VIS, IR and NMR spectroscopy

**Corrosion and its prevention:** Corrosion, Different types of corrosion, Prevention of corrosion

## MATHEMATICS

**Applications of derivatives:** Mean value theorems and their geometrical interpretation, Cartesian graphing using first and second order derivatives, polar curves, Polar equations for conic sections. Differential calculus of functions of several variables with applications, directional derivative, homogeneous functions and Euler's theorem, Jacobians, maxima and minima of functions of two variables .

**Integral Calculus:** Fundamental theorem of integral calculus applications of definite integral to area and arc length. Double and triple integration , and their applications to areas and volumes.

**Vector Calculus:** Differentiation and integration of vector valued functions, velocity, acceleration, tangent, principle normal and binormal vectors, Curvature and Torsion., Gradient, Divergence and Curl. Line integrals, Work, Circulation and Flux. Green's theorem in Plane

**Infinite Series:** Introduction to sequences and Infinite series, Tests for convergence/divergence. Alternating series, Absolute convergence , conditional convergence, power series and its convergence.

**Matrices:** Rank and inverse of a matrix, Solution of linear system of equations.

**Complex Numbers:** De'Moivre's theorem and its applications.

## SOLID MECHANICS

**Review of Engineering Mechanics:** Concept of force, representation and resolution of forces, free body diagrams, analysis of Pin jointed plane trusses.

**Simple Stresses and Strains:** Stress-strain curves for elastic materials, axial stress and strain, Hooke's law, Young's modulus of elasticity, Bulk modulus of rigidity and Poisson's ratio, relationship between elastic constants, thermal stresses, principal planes and stresses.

**Torsion:** Concept of shear strain, Torsion of circular and hollow shafts, power transmitted.

**Bending Moment and Shear force Diagrams:** Types of beams, supports and loadings, sign conventions, relationship between load, shear force and bending moment, graphical plots of Shear Force and Bending Moments.

**Bending and shear Stresses:** Theory of simple bending, determination of stresses in simple and built-up sections, flitched beams, variation of shear stress across the depth of various beam sections

## **COMPUTER PROGRAMMING**

Introductory Concepts : Elements of Computer Processing, Basic Concepts of Hardware and Software, Problem solving with Algorithms and Flowchart, Types of Programming Languages, Basic DOS and Linux Commands.

C Programming Concepts and Operators, Hierarchy of operators, Header files, Data input and output, Control statements: loops and Decision statements, Preprocessor directives, Storage classes, Array, Strings, Structures, Union, Enumerations, Functions, Fundamentals of pointers, File Handling in C, Command line arguments.

## **ELECTRICAL AND ELECTRONIC SCIENCE**

Basic electrical quantities, electric circuit elements and their V-I relations, KCL, KVL, Ohm's law, combination of circuit elements, temperature dependency of resistance.

Mesh and Nodal Analysis, Star-Delta Transformation, Superposition theorem, Thevenin's and Norton's theorems, Maximum power transfer theorem, Transient (step) response of RL and RC series circuits.

Concept of Phasor, sinusoidal steady state response of RL, RC & RLC series and parallel circuits, power and power factors, resonance in series and parallel circuits, bandwidth, loss tangent and quality factor.

Concepts of magnetic circuits, analogy of magnetic circuit with electric circuit, B-H curve, ampere-turn calculation, constructional features and operating principle of single phase transformer and DC machine, characteristics and applications of DC motor.

Diode applications and characteristics, transistor operating modes and characteristics in various configurations, colour coding of low power resistors.



## **ENGINEERING GRAPHICS**

Introduction and use of drafting tools, Lettering, Dimensions and standards, Projection systems, Orthographic projection of points and lines on reference planes, Auxiliary planes and their applications, Projection of surfaces, Projection and sections of solids, Intersection of solids, Development of surfaces, Orthographic projections from pictorial views, Isometric views. Missing lines and views

## **THERMODYNAMICS**

**Introduction: Basic Concepts** : System, Control Volume, Surrounding, Boundaries, Universe, Types of Systems, Macroscopic and Microscopic viewpoints, Concept of Continuum, Thermodynamic Equilibrium, State, Property, Process: Flow and non flow process, cycle concept of work and heat, Specific heats, Zeroth law, Energy and its form, pure substance, Thermodynamic diagrams, triple point, steam tables and their use.

**First Law of Thermodynamics:** Concept of internal energy & enthalpy, energy equation as applied to a close and open system, PMM of First kind. Transient flow processes. Charging and discharging of tanks.

**Limitations of the First Law** – Thermal Reservoir, Heat Engine, Heat pump, Parameters of performance, Second Law of Thermodynamics, Kelvin-Planck and Clausius Statements and their Equivalence/Corollaries, PMM of Second kind, Carnot's principle, Carnot cycle and its specialties, Thermodynamic scale of Temperature, Second law analysis of control volume.

**Clausius Inequality,** Entropy, Principle of Entropy Increase – Energy Equation.

**Various cycles and systems:** Rankine cycle, vapour compression refrigeration cycle, Air standard cycles: Otto, Diesel, Dual, Brayton cycles.

## **MANUFACTURING PROCESSES**

**Introduction:** Common engineering materials and their important mechanical and manufacturing properties. General classification of manufacturing processes

**Metal Casting:** Principles of metal casting, Patterns, their functions, types, materials and pattern allowances, Characteristics of molding sand, Types of cores, chaplets and chills; their materials and functions.

**Metal Forming And Shearing:** Forging, rolling, drawing, extrusion, bending, spinning, embossing, shearing, piercing and blanking.

**Machining Processes:** Principles of metal cutting, cutting tools, their materials and applications, Geometry of single point cutting tool, Basic machine tools and their applications. Introduction to non-traditional machining processes (EDM, USM, CHM, ECM, and LBM).

**Joining Processes:** Electric arc, Gas, Resistance and Thermit welding, Soldering, Brazing and Braze welding, Adhesive bonding, Mechanical fastening.