

# IPU CET EXAM SYLLABUS GUIDE

Comprehensive structural guide and subject-wise curriculum for Guru Gobind Singh Indraprastha University Common Entrance Test (IPU CET) for technical professional programs.

## 1. B.Tech Biotechnology CET Code 130

<b>Entrance Metric:</b>	Dedicated University CET (Note: General B.Tech relies on JEE Main)
<b>Exam Duration:</b>	150 Minutes (2.5 Hours)
<b>Total Questions:</b>	100 Multiple Choice Questions (MCQs)
<b>Marking Scheme:</b>	+4 for Correct Answer   -1 for Incorrect Answer

### SECTIONAL DISTRIBUTION & WEIGHTAGE

Subject Domain	Weightage	Syllabus Breadth & Core Highlights
<b>Biology &amp; Biotechnology</b>	40%	Biochemistry, Enzymology, Cell Biology, Genetics, Molecular Biology, Microbiology & Immunology. Focuses heavily on standard higher secondary applications and core bioprocess milestones.
<b>Physics</b>	20%	Mechanics, Applied Electromagnetism, Modern Physics, Wave Optics, and Classical Thermodynamics.
<b>Chemistry</b>	20%	General Organic Chemistry (GOC), Physical Chemistry basics, and structural Inorganic Trends.
<b>Mathematics</b>	20%	Higher Algebra, Matrices & Determinants, Vector Calculation, and Elementary Calculus.

## DETAILED SUB-TOPIC BREAKDOWN (CLASS 11 & 12 ADVANCED TIER)

### A. Biology & Biotechnology

- **Biochemistry & Enzymology:** Structures and configurations of crucial bio-macromolecules (proteins, structural lipids, complex nucleic acids); cellular respiration mechanisms including glycolysis, the tricarboxylic acid (TCA) cycle/Krebs cycle; enzyme kinetics and parameters.
- **Cell Biology & Genetics:** Structural eukaryotic and prokaryotic dynamics; cell division phases (mitosis/meiosis); Mendelian inheritance rules, linkage patterns, sex-linked traits, molecular mutagenesis, and chromosomal mapping.
- **Microbiology & Immunology:** Growth patterns of structural bacteria, pure culture methodologies; baseline innate and adaptive immunity, cell-mediated/humoral pathways (T-cells, B-cells), Major Histocompatibility Complex (MHC), antigen-antibody interactions, and assay concepts (ELISA, RIA).
- **Molecular Biology:** Central Dogma pathways; DNA semi-conservative replication, transcription, translational mechanisms, post-transcriptional processing, and prokaryotic/eukaryotic gene regulatory models.

### B. Physics

- **Mechanics:** Kinematics in dimensions, Laws of Motion, Work-Energy-Power vectors, Systems of Particles, Angular Dynamics, Gravitational Fields, and Fluid Statics/Dynamics.
- **Electromagnetism:** Coulomb's law, electrostatic potentials, capacitance networks, active current electricity, magnetic properties of moving charges, Electromagnetic Induction (EMI), and alternating current parameter regulation.
- **Modern Physics & Optics:** Atomic structure models, nuclear radioactive breakdown, dual nature of radiation, solid-state semiconductors, ray tracking, and wave interference/diffraction.
- **Thermodynamics:** Thermal equilibrium equations, fundamental Laws of Thermodynamics, and ideal engine cycles.

## C. Chemistry

- **Organic Chemistry:** Basic principles, IUPAC notation, inductive/electromeric effects, hydrocarbons, functional groups (alcohols, ethers, carbonyl networks), polymer chains, and bio-organic chemistry structures.
- **Inorganic Chemistry:** Periodic classifications, atomic radii patterns, chemical bonding theory (VSEPR, hybridization), molecular orbital configurations, p-block trends, d- and f-block extraction properties, and coordination field configurations.
- **Physical Chemistry:** Ideal gas laws, molecular atomic structures, chemical state equilibria, dynamic kinetics (rate laws), electrochemistry reactions, and stoichiometric mole computations.

## D. Mathematics

- **Algebra & Probability:** Systems of matrices and determinants, complex numbers, permutation/combinatorial structures, and conditional probability fields.
- **Calculus:** Functional limit criteria, differentiation parameters, global maxima/minima, integration bounds (definite and indefinite integrals), and structural differential equations.
- **Coordinate Geometry:** 2D Cartesian straight lines, conic section metrics (parabola, ellipse, hyperbola), and spatial 3D vector computations.

## 2. B.Tech Lateral Entry CET Code 128

*Designed specifically for engineering diploma holders tracking direct lateral entry into the 2nd year (3rd semester) of ongoing university technical tracks.*

**Eligibility Baseline:** Engineering Diploma Qualification (Alternative: B.Sc. Pathway)\*

**Exam Profile:** 100 MCQs | 150 Minutes duration metrics

**Marking Matrix:** +4 for Correct Selection | -1 for Incorrect Penalties

## SYLLABUS DOMAINS & PROPORTIONAL MATRIX (DIPLOMA STREAM)

Core Exam Domain	Relative Proportion	Testing Parameters
Applied Mechanics	25%	Statics, Structural Dynamics, Strengths
Applied Mathematics	25%	Linear Matrices, Differential Calculus, Integration
Computer Awareness & Basic Sciences	25%	Hardware/Logic, Applied Physics, Applied Chemistry
Analytical & Logical Reasoning	25%	Cognitive Reasoning, Mathematical Logic

## COMPREHENSIVE SUB-TOPIC BREAKDOWN (DIPLOMA PATH)

### Domain 1: Applied Mechanics (25%)

- **Statics & Force Vectoring:** Resolution of coplanar forces, equilibrium parameters, Lami's Theorem, couple structures, moment calculations, Center of Gravity (CG), and Moment of Inertia theories including Parallel and Perpendicular Axis Theorems.
- **Frictional Mechanics:** Static and dynamic friction boundaries, dry system friction, sliding wedge computations, simple screw jack models, and wheel/axle efficiency.
- **Kinematics & Dynamics:** Rectilinear and curvilinear paths, projectile motions, application of Newton's laws of motion, Work-Power-Energy equations, impulse transformations, and momentum conservation laws.
- **Strength of Materials (SOM):** Uniaxial stress-strain configurations, hooks relation, volumetric elasticity moduli, processing of Shear Force Diagrams (SFD) and Bending Moment Diagrams (BMD) for cantilever/simplely-supported lines, and basic pure bending equations.

### Domain 2: Applied Mathematics (25%)

- **Matrix Algebra:** Transpose, symmetric, skew-symmetric arrangements, determinant functions, matrix inversions, rank computation, and processing simultaneous linear algebraic equations via Cramer's or Gauss methods.
- **Differential Analysis:** Explicit functional limits, continuous evaluation, higher-order successive differentiation, Taylor series parameters, local optimization (maxima/minima), Rolle's Theorem, and Lagrange Mean Value applications.
- **Integral Computations:** Specialized integration formulas, standard reduction equations, processing definite integrals, area evaluations bounded under functional curves, and volumes of revolution.
- **Differential Formulations:** Standard first-order first-degree linear ordinary differential equations, integrating factor resolutions, and baseline mechanical engineering model mappings.

### Domain 3: Computer Awareness & Fundamental Sciences (25%)

- **Computer Fundamentals:** Functional block configurations of modern Von Neumann architecture, CPU processing, memory tiers (Cache, RAM, ROM, Virtual memory), binary/hexadecimal data representation, fundamental file formatting, operating system frameworks, and discrete Boolean expressions/logic gates (AND, OR, NOT, NAND, NOR, XOR).
- **Engineering Physics:** Standard dimensional systems, error propagation calculations, wave parameters, electromagnetic vector rules (Ohm's and Kirchhoff's loop configurations), and baseline modern atomic physics.
- **Engineering Chemistry:** Atomic shell theories, molecular bonding criteria, periodic trend indices, industrial water purification metrics (treatment types, EDTA configurations, hardness calculation parameters), and standard pH calculations.

### Domain 4: Analytical & Logical Reasoning (25%)

- **Reasoning Foundations:** Numerical progression sequencing, alphanumeric character sequencing, symbolic coding-decoding protocols, bloodline tree relations, syllogisms, and directional map orientation.
- **Data & Structural Logic:** Matrix seating distribution mechanics, criteria-based linear arrangements, statement-premise validations, and analytical chart interpretations (pie graphs, data tables).

**\*Alternative Route Note (B.Sc. Grads):** If matching qualification via a B.Sc. background instead of a professional diploma, the testing metrics shift focus strictly into: B.Sc. Mathematics Tier (40%), Scientific Aptitude Matrix (20%), Analytical Reasoning Loops (20%), and Technical English Competency (20%).