CHAPTER - 3: DETAILS PERTAINING TO GGSIPU CET (COMMON ENTRANCE TESTS)

3.1 Master of Technology (M.Tech.) Common Entrance Test

S. No.	Name of Programme	Programm Code	Subjects of Entrance Test*
1.	MTECH (CSE)	139	As per the Syllabus of GATE -Computer Science & Information Technology
2.	MTECH (ECE)	140	As per the Syllabus of GATE -Electronics & Communication Engineering
3.	MTECH (FPT)	147	See Section 3.2
4.	MTECH (BT)	148	See Section 3.2
5.	MTECH (CE)	152	As per Syllabus of GATE of Chemical Engineering
6.	MTECH (R&AI)	156	See Section 3.3
7.	MS (Packaging Technology)	604	See Section 3.4
8.	M.Des.	611	See Section 3.5

3.1.1 Syllabus for CET for M.Tech. (Biotechnology) Programme Code-148 & M.Tech (FPT) Programme Code-147

Biochemistry and Enzymology: Organization of life; Importance of water; Structure and function of biomolecules: Amino acids, Carbohydrates, Lipids, Proteins and Nucleic acids; Protein structure, folding and function,Metabolic pathways and their regulation: glycolysis, TCA cycle (Krebs' cycle), glycolysis, electron transport chain; gluconeogenesis, glycogen and fatty acid metabolism, Enzyme classification, kinetics including its regulation and inhibition, active sites, Factors influencing enzyme activity, Enzyme assays, cofactors and coenzymes, immobilization of enzymes, enzyme engineering.

Microbiology: Size, shape and arrangement of bacterial cells, Structure of the cell and cell wallNutritional requirements for growth, nutrients uptake by microbial cells, Culture media, Isolation of pure cultures, cultivation and preservation of cultures, Microbial growth Kinetics, Physical and chemical methods of microbial control, Action of microbial control agents and evaluation of effectiveness of antimicrobial agents, Metabolic diversity and pathways of energy use, unique pathways of microbial fermentation and photosynthesis, Microbial diseases and their control, Mechanism of microbial pathogenicity, action of antibiotics and other antimicrobial drugs, Superbugs and opportunistic infections, Biosecurity, Microbiome.

Cell Biology: Cell structure and organelles; Biological membranes; Transport across membranes; Signal transduction; Hormones and neurotransmitters. Prokaryotic and eukaryotic cell structure; Cell cycle, cell division and cell growth control; Cell-Cell communication, Cell signaling and signal transduction.

Molecular Biology and Genetics: Molecular structure of genes and chromosomes; Mutations and mutagenesis; Eukaryotic genome organization and Complexity; Nucleic acid replication, transcription, translation in prokaryotes and eukaryotes; RNA processing, regulation of gene expression, Mendelian inheritance; organization of genome, sex determination and sex linked characteristics, cytoplasmic inheritance, linkage, recombination and mapping of genes in eukaryotes, population genetics. Gene interaction; Complementation; Linkage, recombination and chromosome mapping; Extra chromosomal inheritance; Microbial genetics (plasmids, transformation, transduction, conjugation); Epigenetics.

Immunology: Active and passive immunity; Innate, humoral and cell mediated immunity; Antigen; Antibody structure and function; Molecular basis of antibody diversity; Synthesis of antibody and secretion; Antigen antibody reaction; Complement; Primary and secondary lymphoid organ; B and T cells and macrophages; Major histocompatibility complex (MHC); T cell receptor; Antigen processing and presentation; Polyclonal and monoclonal antibody; Regulation of immune

response; Immune tolerance; Hypersensitivity; Autoimmunity; Graft versus host reaction. Immunological techniques: Immunodiffusion, immunoelectrophoresis, RIA and ELISA, Flow cytometry.
Bioinformatics: Major bioinformatic resources and search tools; Sequence and structure databases**;** Sequence analysis (biomolecular sequence file formats, scoring matrices, sequence alignment, phylogeny).

Recombinant DNA Technology: Restriction and modification enzymes; Vectors-plasmid, bacteriophage and other viral vectors, cosmids, Ti plasmid, yeast artificial chromosome; mammalian and plant expression vectors; cDNA and genomic DNA library; Gene isolation, cloning and expression; Transposons and gene targeting; DNA labeling; DNA fingerprinting; Southern and northern blotting; In-situ hybridization; RAPD, RFLP, AFLP, SSRs, SNPs; Gene transfer techniques; Microarray, PCR, site directed mutagenesis, DNA sequencing; molecular probes, Gene therapy.

Plant and Animal Biotechnology: Totipotency; Regeneration of plants; Tissue culture and Cell suspension culture system; Production of secondary metabolites by plant suspension cultures; transgenic plants; Plant products of industrial importance; Animal cell culture, media composition and growth conditions; Animal cell and tissue preservation; Anchorage and-non anchorage dependent cell culture; Hybridoma technology; Stem cell technology; Animal cloning; Transgenic plants and animals.

Bioprocess Engineering and Process Biotechnology: Upstream production and downstream; Bioprocess design and development from lab to industrial scale; Microbial, animal and plant cell culture platforms, Chemical engineering principles applied to biological system, Principle of reactor design, mass and heat transfer; Media formulation and optimization; Kinetics of microbial growth, substrate utilization and product formation; Sterilization of air and media; Batch, fed-batch and continuous processes; Various types of microbial and enzyme reactors.

Biosafety, Bioethical and Intellectual Property Right Issues in Biotechnology: Biosafety - Concept, Concerns and Regulations; Safety considerations in Laboratories; Ethical issues and conflicts in biotechnology; Kinds of IPR; Protection of traditional knowledge and Genetic Resources; Patents in Biotechnology.

Techniques in Biotechnology: Colorimetry and Spectroscopy, Flow cytometry, Microscopy, Centrifugation, Chromatography, Electrophoresis, X-ray crystallography, Nuclear Magnetic Resonance (NMR) spectra, Magnetic Resonance Imaging (MRI), lasers in biology and medicine, Mass spectrometry.

Environmental Biotechnology: Sewage and waste water treatment, Solid waste management, Biodegradation of xenobiotic compounds, Bioremediation and biorestoration, Natural resource recovery, Environmental biotechnology in agriculture, Biofuel, Environmental genetics.

Biostatistic: Measures of central tendency and dispersal; probability distributions (Binomial,Poisson and normal); Sampling distribution; Difference between parametric andnon-parametric statistics; Confidence Interval; Errors; Levels of significance; Regression and Correlation; t-test; Analysis of variance; Chi squared test; Basic introduction to multivariate statistics, etc.

3.3 Syllabus for CET for M.Tech. (Robotics & Artificial Intelligence) Programme Code-156

Note: Equal weightage would be given to Part-I and Part-II.

Part-I

Probability and Statistics: Counting (permutation and combinations), probability axioms, Sample space, events, independent events, mutually exclusive events, marginal, conditional and joint probability, Bayes Theorem, conditional expectation and variance, mean, median, mode and standard deviation, correlation, and covariance, random variables, discrete random variables and probability mass functions, uniform, Bernoulli, binomial distribution, Continuous random variables and probability distribution function, uniform, exponential, Poisson, normal, standard normal, t-distribution, chi-squared distributions, cumulative distribution function, Conditional PDF, Central limit theorem, confidence interval, z-test, t-test, chi-squared test. Linear

Algebra: Vector space, subspaces, linear dependence and independence of vectors, matrices, projection matrix, orthogonal matrix, idempotent matrix, partition matrix and their properties, quadratic forms, systems of linear equations and solutions; Gaussian elimination, eigenvalues and eigenvectors, determinant, rank, nullity, projections, LU decomposition, singular value decomposition.

Calculus and Optimization: Functions of a single variable, limit, continuity and differentiability, gradient, divergence and curl, directional derivatives, line, surface and volume integrals, applications of Gauss, Stokes and Green's theorems, maxima and minima, optimization involving a single variable.

Numerical Methods: Numerical solutions of linear and non linear algebraic equations; integration by trapezoidal and Simpson's rules; single and multi-step methods for differential equations.

Differential Equations: First order equations (linear and nonlinear); higher order linear differential equations with constant coefficients; Euler-Cauchy equation; initial and boundary value problems, Partial Differential Equations and variable separable method, Laplace transforms.

Complex Variables: Analytic functions, Cauchy's integral theorem and integral formula, Taylor's and Laurent' series, Residue theorem, solution integrals.

Discrete Mathematics: Propositional and first order logic. Sets, relations, functions, partial orders and lattices. Monoids, Groups. Graphs: connectivity, matching, colouring. Combinatorics: counting, recurrence relations, generating functions.

Part-II

Applied Mechanics: Free body diagrams and equilibrium, trusses and frames; virtual work; kinematics and dynamics of particles and of rigid bodies in plane motion, including impulse and momentum (linear and angular) and energy formulations, impact, Lagrange's equation

Strength of materials: stress, strain and their relationship, bending and shear stresses.

Theory of Machines: Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; gears and gear trains; gyroscope, Davis and Ackermann steering gear mechanisms.

Electric Circuits and Fields: Network graph, KCL, KVL, node and mesh analysis, transient response of dc and ac networks.

Electrical Machines: Single phase transformer- equivalent circuit, phasor diagram, tests, regulations and efficiency, DC machines- types, windings, generator characteristics, armature reaction and commutation, starting and speed control of motors; motor starting, characteristics and application; servo and stepper motors.

Electronic Devices: Generation and recombination of carriers. P-n junction diode, Zener diode, BJT, JFET, MOS capacitor, MOSFET, LED, p-I-n and available photo diode, Basics of LASERs. Device technology.

Control System: Principles of feedback, transfer function; block diagrams; steady state errors, Basic control system components; block diagrammatic description, reduction of block diagrams. Open loop and closed loop (feedback) systems and stability analysis of these systems.

Programming, Data Structures and Algorithms: Programming in Python, basic data structures: stacks, queues, linked lists, trees, hash tables; Search algorithms: linear search and binary search, basic sorting algorithms: selection sort, bubble sort and insertion sort; divide and conquer: mergesort, quicksort; introduction to graph theory; basic graph algorithms: traversals and shortest path.

3.4 CET Syllabus for MS (Packaging Technology) Programme Code 604

CHEMISTRY

Basic concept of the chemistry; atomic structure-quantum principles, thermodynamics; Stereochemistry; Surface chemistry; Coordination compounds-complex compounds; Chemical equilibrium; Colligative properties; periodic table; chemical

kinetics; industrial chemistry; solutions; molecular structure; chemical bonds; state of matters;

Atomic Structure and Chemical Bonds: Electronic configuration of atoms, characteristics of the chemical bonds, conjugated bonds, shapes of the molecules, conformation and stereo chemistry, physical properties and molecular structures, chemical reactivity and molecular structures.

Periodic properties: trends in size, electronic affinity, ionization potential and electronegativity; Use of Ellingham diagram and thermodynamics in the extraction of elements; VSEPR theory, structure of boranes, electron counting.

Organometallic Chemistry: metal carbonyls and sandwich complexes bonding aspects, Catalysis: Hydrogenation, hydroformylation, and olefin metathesis; Huckel treatment of ethylene, butadiene and benzenes; Concept of aromaticity; Conformation of alkanes and cycloalkanes; Reactivity of carbonyl group; Functional group interconversions; Reaction types (nucleophilic, electrophilic, free radical reactions); Molecular rearrangements; Synthetic polymers and proteins; Metal organic frameworks.

Thermodynamic: First and second law of thermodynamics, statistical treatment, free energy. The equilibrium constant and free energy changes in chemical system.

Electrochemistry: Definitions. Electrolytes, Electrodes, Anodes, Cathode, Ions, Strong and weak Electrolytes, Electroplating, Faraday's Law, Laws of Chemical Combination.

Kinetic theory of gases, Boyle's law, Charle's law, Avogadre's hypothesis, Graham's law of Diffusion, molecular velocity, gas constant deviations.

Vapour pressure, surface tension - définition, determination of surface tension, effect of temperature.

Viscosity : Definition, determination of viscosity, various viscometers, viscosity and constituents effect of temperature.

PHYSICS:

Optics: Introduction, Interference, Diffraction– basic concepts, diffraction at a straight edge, diffraction at single and multiple slits, Resolving power – Rayleigh's criterion, resolving power of various optical components.

Introduction to Quantum Mechanics: Introduction to quantum physics, blackbody radiation, explanation using the photon concept, photoelectric effect, Compton effect, de Broglie hypothesis, wave-particle duality, verification of matter waves, uncertainty principle.

Lasers and Applications: Introduction to interaction of radiation with matter, principles and working of a Laser– population inversion, pumping, various modes, threshold population inversion, types of Lasers– solid state, semiconductor, gas, applications of Lasers.

Ultrasonics: Generation of ultrasound – mechanical, electromechanical transducers, propagation of ultrasound,attenuation, velocity of ultrasound and parameters affecting it, measurement of velocity, applications of ultrasound.

Crystal Structure: Crystal structure of solids, unit cell, space lattices and Bravais lattices, Miller indices, directions andcrystallographic planes. Cubic crystals– SCC, BCC, FCC, Hexagonal crystals– HCP, atomic radius,packing fraction, Bragg's law, determination of crystal structure using Bragg spectrometer.

Semiconductors: Formation of energy bands in solids, classification of solids conductor, semiconductor and insulator. Intrinsic semiconductor, Effect of doping – extrinsic semiconductors.

Motion, velocity and acceleration: Meaning of velocity, meaning of acceleration, graphical representation, uniform accelerated motion, motion of free falling body.

Force and laws of motion : Causes and result of force, Newton's law of motion, definition of units, force and acceleration, load factor of G' load kinetic and potential energy. Force – deformation curve.

Optics: Introduction, Interference, Diffraction– basic concepts, diffraction at a straight edge, diffraction at single and multiple slits, Resolving power – Rayleigh's criterion, resolving power of various optical components.

Introduction to Quantum Mechanics: Introduction to quantum physics, blackbody radiation, explanation using the photon concept, photoelectric effect, Compton effect, de Broglie hypothesis, wave-particle duality, verification of matter waves, uncertainty principle.

Lasers and Applications: Introduction to interaction of radiation with matter, principles and working of a Laser– population inversion, pumping, various modes, threshold population inversion, types of Lasers– solid state, semiconductor, gas, applications of Laser.

ENGINEERING

Basic concepts, Circuit law, AC Fundamentals, Magnetic Circuit, Electrical Machines, Measurement and Measuring instruments, Synchronous Machines, Fractional Kilowatt Motors and single phase induction Motors, Generation, Basic Electronics, Estimation and Costing, Transmission and Distribution, Utilization and Electrical Energy.

Theory of Machines and Machine Design, 1st Law of Thermodynamics, 2nd Law of Thermodynamics, IC Engine Performance, Air standard Cycles for IC Engines, IC Engines Combustion, Boilers, IC Engine Cooling & Lubrication, Classification, Rankine cycle of System, Specification, Engineering Mechanics and Strength of Materials, Properties of Pure Substances, Air Compressors & their cycles, Fitting & Accessories, Principle of Refrigeration Plant, Nozzles & Steam Turbines, Fluid Statics, Measurement of Flow rate, Refrigeration cycles, Properties & Classification of Fluids, Measurement of Fluid Pressure, Fluid kinematics, Dynamics of Ideal fluids, Hydraulic Turbines, Basic Principles & Classification of steel, Centrifugal Pumps

Building Materials, Surveying, Estimating, Soil Mechanics, Costing and Valuation, Concrete Technology, Irrigation Engineering, Transportation Engineering, Environmental Engineering, RCC Design, Hydraulics, Theory of Structures, Steel Design

MATHEMATICS

Matrices - Introduction, types and operation, inverse, elementary transformations, rank, consistency and solution of system of linear equation, vector spaces. *Differential Calculus* - Derivative of function, higher order derivatives, rate of change of quantities, stationery points, maximum minimum problem and inflexion points. *Differential Theorem* - Taylors Theorem, absolute, relative and percentage errors, partial derivatives, homogenous functions, total derivatives, change of variables, taylor's theorem for function of two variable. *Integral Calculus and Differential Equations* - Methods of integrations, definite integrals, properties of definite integrals, area of curves, length of curves, volume and surface of revolution, formation and solution of first order differential equation.

Algebra - Brief description of algebraic properties of complex numbers, statement of fundamental theorem of algebra, solutions of quadratic equations in the complex number systems, algebraic solutions of linear in equalities in one variable and their representation of the number line, solution of algebraic and transcendental equations, finite differences and interpolation, numerical differentiations and integrations. *Polynomials* - scalar and vector fields, level surfaces, directional derivatives, gradient, curl, divergence, line and surface integrals, theorem of green, polynomials. *Business Mathematics* - Fundamental principles of counting, functional n (n!) permutation and combinations, derivation of formulae and their connections, simple applications, mathematically acceptable statements, uses through variety of examples related to real life and mathematics, numerical based on profit and losses.

Introduction of Statistics: Application of Statistics in packaging, normal distribution, dimensional analysis, measures of central tendency, average, mean, median, mode, standard deviation, standard error. Measures of dispersion coefficient of variation skewness, standard error of mean, simple correlation and regression, multiple regression

Multiple & partial: correlation, variability – range, variance. *Theory of Probability* - equally likely, mutually exclusive events, definition of probability, addition and multiplication theorems of probability and problems on theorems of probability and problems based on them. Design experiment for packaging applications, statistical quality control.

Distance Between 2 Points, 3D Geometry, Differentiation and Integration etc, Probability, Conics, Coordinate Geometry, Vector Algebra, Circles, Permutation and Combination, Functions, Integration, Matrices, Coordinate Geometry, Binomial Theorem, Coordinate Geometry, Integration, Conic Section, Circle and Tangents, Calculus, Mathematical Reasoning, Parabola, Eclipse, Arithmetic, Statistics, Probability, Set and Relation, Sequence and Series, Definite, Binomial, Area Bounded, Differentiation, Complex numbers, Sequence and Series, Algebra, Trigonometry, Integral Calculus.

3.5 Prog. Code 611 Syllabus for MASTER OF DESIGN (M.DES.)

Master of Design (M.DES.)

CET 2026 for USDI, GGSIPU aims to adjudge students for their Aptitude to peruse Design as their profession.

The syllabus for the CET-2026 broadly covers topics to test the aptitude and sensitivity towards Design through a set of questions from varied subjects like understanding of.

- **Analytical and logical reasoning ability-** This section looks into the knowledge of Series and Sequences of numbers, shapes, patterns, figures, and words; Identifying missing numbers, words, or figures; Blood relations; Direction and Distance; Alphabet test; Cause and effect; Clocks and Calendars; Coding and Decoding of Analogy Series; Matrix Completion; Incomplete Pattern; Spotting embedded figures; Classification Rules Detection; Identical figure groupings; Forming figures and analysis.

- **Visual aptitude-** This section would look into the knowledge of Presentation techniques; Diagrammatic Reasoning; Object and Image recognition; Venn figurative Verbal reasoning; Understanding of spatial correlation of 2D shapes and 3D objects; Cutting cubes and dice; Scale and perspective and vanishing point; Water and Mirror images. Projection of Solids, isometric drawing.

- **General awareness-** Design aspirants must have knowledge designed Arts, Artifact, Sculptures, and Literature. of social and cultural connection with the history of the design, environmentally sustainable design response, and socially responsible; implications on the design of products, images, environmental and infrastructure.

3.6 Information Regarding Result Awaited Cases for Engineering & Professional Programmes (Except for NEET based admissions)

1. Result Awaited / Compartment / Supplementary Cases for various Programmes:

i. All such candidates who have appeared in the qualifying examination (irrespective of the outcome of their final result) will be eligible to appear in the CET 2026-27 and all such candidates will be provisionally admitted in the respective programmes;

ii. **The candidate will have to submit the final result of qualifying degree proving his/her eligibility on or before 31st October, 2026 to their concerned Dean/Principal/Director of their respective School/College/Institute where the admission has been granted provisionally. The concerned Dean/Principal/Director must submit the details of these result provisionally admitted students within 7 days i.e. 7th November 2026 to Director Incharge (Academic), GGSIPU, 16-C Dwarka, New Delhi 110078. In case the candidate fails to submit**

his/her final result of qualifying degree in the manner as prescribed above to prove his/her eligibility on or before 31st October 2026, whatsoever, the reason may be, his/her admission will be treated as null and void (cancelled) and the entire fee will be forfeited and under no any circumstances he/she will be allowed to appear in the End Term Exam. No extension beyond 31st October, 2026 shall be allowed by the University. The Dean/Director/Principal will be responsible to ensure that the eligibility of all students are checked by them to ensure correctness of admissions especially in case of provisional students. The provisional admission will automatically stand cancelled if the candidates fail to submit result in time i.e. 31st October, 2026.

Note: Those candidates who are seeking provisional admission due to non-declaration of their final year/final semester (please see Appendix3 of Part F) will however have to provide proof of having passed all papers in all the previous years/ semesters of qualifying degree examinations (whichever relevant). The candidate shall give documentary proof of having appeared in the last semester/year of qualifying examination at the time of Reporting in the allotted College.

The candidate shall undertake that he has appeared in the final semester/final year examination as on date of admission and result of which has not been declared and is expected to be declared latest by 31st October, 2026. He shall further declare that he has no compartment as on this date in his qualifying examination and he is seeking provisional admission only due to non declaration of result of final year/final semester of the qualifying examination by Board/University and not on account of compartment in current or previous years of qualifying degree examination as on date of admission.

2. There will be no rounding off of the percentage of marks of qualifying examination while deciding the basic eligibility of any candidate for admission for e.g. if a candidate obtained 49.9% marks in his/her qualifying examination, then it will not be rounded off to 50%. Therefore, the candidate is not eligible for that programme where the minimum requirement of marks is 50%. In case candidate for any reason fills the minimum% wrongly in Verification Form, he/she shall be solely responsible.

3.7 Age Limit for all programmes (Except PGMC/SSMC)

S.No.	Programme	As on 01.08.2026 candidate should not be beyond
1	For all Postgraduate Programmes where entry qualification is graduation	35 years

Important Note: Information regarding relaxation in Age Limit

1. Candidates desirous of applying for age relaxation as per norms above should apply in writing to **Director Incharge (Academic), Guru Gobind Singh Indraprastha University, Sector 16C, Dwarka, New Delhi-110078**.
2. **Age Relaxation:** The upper age limit may be relaxed upto a maximum of five years in exceptional cases by the Admission Officer (designated) of the concerned programme if he/she is satisfied with the merit of the case. Candidates exceeding the upper age limit upto five years may provisionally apply/ appear in the Common Entrance Test. However, they would be required to submit to the satisfaction of the Admission Officer an explanation regarding the gap period, i.e., the details of the period spent by him/her after passing the qualifying examination to justify the relaxation. Such explanation should be in the form of an application to the concerned Admission Officer along with supporting documents (if any). Any relaxation of age beyond this shall be given by the Registrar of the University. The candidates desirous of applying for age relaxation should apply in writing to Director Incharge (Academic), Guru Gobind Singh Indraprastha University.

3. If a candidate takes admission on the basis of a false age claim, the admission of such a candidate shall be cancelled with forfeiture of entire fees paid, as and when such cases are detected.