

GATE 2025 SYLLABUS:

General Aptitude Section-wise syllabus		
Section	Topic	Subtopics
Verbal Aptitude	Basic grammar	<ul style="list-style-type: none">• Tenses• Articles• Adjectives• Prepositions• Conjunctions• Parts of speech• Verb-noun agreement
	Basic vocabulary	<ul style="list-style-type: none">• Antonyms• Synonyms• Idioms and phrases
	Reading comprehension	<ul style="list-style-type: none">• Reading and comprehension Narrative sequencing
Quantitative Aptitude	Data interpretation	<ul style="list-style-type: none">• Data graphs (Bar, Pie, Histogram, etc.)• 2- and 3- dimensional plots• Maps and tables
	Numerical computation and estimation	<ul style="list-style-type: none">• Ratios• Percentages• Powers

		<ul style="list-style-type: none"> • Exponents and logarithms • Permutations and combinations
	Other	<ul style="list-style-type: none"> • Mensuration • Geometry • Statistics & Probability
Analytical Aptitude	Logic	<ul style="list-style-type: none"> • Deduction and induction • Analogy • Numerical relations • Reasoning
Spatial Aptitude	Transformation of shapes	<ul style="list-style-type: none"> • Translation, rotation & scaling • Mirroring, • Assembling • Grouping paper folding, cutting • Patterns in 2 and 3 dimensions

Engineering Mathematics Section-wise Syllabus*

Section	Topics
Linear Algebra	<ul style="list-style-type: none"> • Matrices and determinants • Caley Hamilton theorem • Eigen values and Eigen vectors • Linear and orthogonal transformations • Solutions of linear equations • Matrix algebra • LU decomposition

Calculus	<ul style="list-style-type: none"> • Limit & functions of a single variable • Continuity and differentiability • Indeterminate forms • Mean value theorems • Evaluation of definite and improper integrals • Taylor series (in one and two variables) • Theorems of integral calculus • Double and triple integrals • Total, partial & directional derivatives • Fourier series • Maxima and minima • Gradient, divergence and curl • Vector identities • Line, surface and volume integrals • Applications of gauss theorem, stokes, and green's theorems (vector analysis)
Differential Equation	<ul style="list-style-type: none"> • First-order equations (linear and nonlinear) • Higher-order linear differential equations • Partial differential equations • Initial and boundary value problems • Method of separation of variables • Euler-Cauchy's equation • Laplace transforms • Solutions of heat, wave and Laplace's equations
Partial Differential Equations	<ul style="list-style-type: none"> • Classification of second-order linear partial differential equations • Method of separation of variables • One-dimensional heat equation • Two dimensional Laplace equation

Complex Variables	<ul style="list-style-type: none"> • Complex number and polar form • Analytic functions • Taylor and Laurent series • Cauchy-Riemann equations • Residue theorem • Cauchy's integral theorem and integral formula
Probability and Statistics	<ul style="list-style-type: none"> • Sampling theorems, conditional probability & Bayes theorem • Median, mean, mode, and random variables • Binomial distributions • Poisson and normal distributions • Discrete and continuous distributions • Linear regression and correlation analysis
Numerical Methods	<ul style="list-style-type: none"> • Matrix inversion • Integration by trapezoidal and Simpson's rules • Numerical solutions of linear and non-linear algebraic equations • Single and multi-step methods for differential equations • Newton-Raphson method • Explicit Euler's method

Aerospace Engineering (AE) Syllabus

Section	Important Topics
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Flight Mechanics	<ul style="list-style-type: none"> • Atmosphere & its components • Airplane performance • Static stability • Dynamic stability
Space Dynamics	<ul style="list-style-type: none"> • Central force motion • Kepler's laws
Aerodynamics	<ul style="list-style-type: none"> • Fluid mechanics • Airfoils & wings • Compressible flows • Wind tunnel testing
Structures	<ul style="list-style-type: none"> • Material strength • Flight vehicle structures • Structural dynamics • Vibration of beams
Propulsion	<ul style="list-style-type: none"> • Thermodynamics • Aerothermodynamics • Aircraft engine performance • Turbomachinery • Rockets
Agricultural Engineering (AG) Syllabus	
Section	Important Topics
Farm Machinery	<ul style="list-style-type: none"> • Machine design • Hitch systems

Farm Power	<ul style="list-style-type: none"> • Sources of power • Tractors and power tillers • Thermodynamic & I.C. Engines
Soil and Water Conservation Engineering	<ul style="list-style-type: none"> • Fluid mechanics • Soil mechanics • Hydrology • Surveying and leveling • Soil and water erosion
Irrigation and Drainage Engineering	<ul style="list-style-type: none"> • Groundwater hydrology • Agricultural drainage • Water requirement of crops • Wells and pumps
Agricultural Process Engineering	<ul style="list-style-type: none"> • Agriculture produce • Evaporation and drying • Material Handling • Storage systems
Dairy and Food Engineering	<ul style="list-style-type: none"> • Heat exchange & energy balance • Food preservation • Pasteurization
Architecture and Planning (AR) syllabus	
Part	Sections

Part A: Common	<ul style="list-style-type: none"> • Planning and Design • Urban Design, Landscape and Conservation • Construction and Management • Services and Infrastructure • Environmental Planning and Design • Housing & Planning Process
Part B1: Architecture	<ul style="list-style-type: none"> • History and Contemporary Architecture • Building Services and Sustainability • Building Construction and Structural systems
Part B2: Planning	<ul style="list-style-type: none"> • Regional and Settlement Planning • Planning Techniques and Management • Infrastructure Planning

Biomedical Engineering (BM) syllabus

Section	Important Topics
Electrical Circuits	<ul style="list-style-type: none"> • Voltage and current sources • Kirchoff's laws • RLC circuits
Signals and Systems	<ul style="list-style-type: none"> • Continuous and discrete • Laplace and fourier transforms
Analog and Digital Electronics	<ul style="list-style-type: none"> • Applications of diode, BJT and MOSFET • Boolean algebra
Measurements and Control Systems	<ul style="list-style-type: none"> • SI units, errors
Sensors and Bioinstrumentation	<ul style="list-style-type: none"> • Sensors & their measurement techniques - ECG, EEG, EMG, ERG, EOG, GSR, PCG

Human Anatomy and Physiology	<ul style="list-style-type: none"> • Cell • Organ systems
Medical Imaging Systems	<ul style="list-style-type: none"> • MRI, ultrasound, x-ray
Biomechanics	<ul style="list-style-type: none"> • Properties of bone • Kinematics of muscles & joints
Biomaterials	<ul style="list-style-type: none"> • Properties of biomaterials • Tissue engineering
Biotechnology (BT) Syllabus	
Section	Topics
General Biology	<ul style="list-style-type: none"> • Biochemistry • Microbiology • Immunology
Genetics, Cellular and Molecular Biology	<ul style="list-style-type: none"> • Genetics and evolution • Cell Biology • Molecular biology
Fundamentals of Biological Engineering	<ul style="list-style-type: none"> • Material and energy balances • Thermodynamics • Transport processes
Bioprocess Engineering and Process Biotechnology	<ul style="list-style-type: none"> • Bioreaction engineering • Upstream and downstream processing • Instrumentation and process control

Plant, Animal and Microbial Biotechnology	<ul style="list-style-type: none"> • Plants: growth, regeneration, roots, seeds • Animal cell and tissue, stem cell • Microbes
Recombinant DNA Technology and Other Tools in Biotechnology	<ul style="list-style-type: none"> • Recombinant DNA technology • Molecular tools • Analytical tools • Computational tools
Civil Engineering (CE) Syllabus	
Section	Topics
Structural Engineering	<ul style="list-style-type: none"> • Solid mechanics • Structural analysis • Construction materials and management • Concrete & steel structures
Geotechnical Engineering	<ul style="list-style-type: none"> • Soil mechanics • Foundation engineering
Water Resources Engineering	<ul style="list-style-type: none"> • Fluid mechanics • Hydraulics & hydrology • Irrigation
Environmental Engineering	<ul style="list-style-type: none"> • Municipal solid wastes • Air pollution • Water quality and treatment
Transportation Engineering	<ul style="list-style-type: none"> • Transportation infrastructure • Highway pavements • Traffic engineering

Geomatics Engineering	<ul style="list-style-type: none"> • Principles of surveying • Photogrammetry and remote sensing
Chemical Engineering (CH) Syllabus	
Section	Important Topics
Process Calculations and Thermodynamics	<ul style="list-style-type: none"> • Thermodynamics • Equation of state • Gibb's phase rule & energy balances
Fluid Mechanics and Mechanical Operations	<ul style="list-style-type: none"> • Fluid statics • Flow of liquid & friction factors • Particle size, shape & classification
Heat Transfer	<ul style="list-style-type: none"> • Heat exchange & energy transfer
Mass Transfer	<ul style="list-style-type: none"> • Fick's laws • HTU & NTU concept • Processes (absorption, diffusion...)
Chemical Reaction Engineering	<ul style="list-style-type: none"> • Theories of reaction rates • Catalyst & reactors
Instrumentation and Process Control	<ul style="list-style-type: none"> • Sensors and transducers • Controller modes (P, PI, and PID) • Cascade and feed-forward control.
Plant Design and Economics	<ul style="list-style-type: none"> • Principles of process economics • Cash flow & ROI

Chemical Technology	<ul style="list-style-type: none"> • Inorganic chemical industries • Petroleum refining and petrochemicals
Computer Science and Information Technology (CS) Syllabus	
Section	Important Topics
Digital Logic	<ul style="list-style-type: none"> • Boolean algebra • Circuits
Computer Organization and Architecture	<ul style="list-style-type: none"> • ALU • I/O interface • Memory hierarchy
Theory of Computation	<ul style="list-style-type: none"> • Automata • Regular expressions • Turing machines
Operating System	<ul style="list-style-type: none"> • System calls, processes, threads • CPU and I/O scheduling
Computer Networks	<ul style="list-style-type: none"> • Concept of layering: OSI and TCP/IP Protocol • Application layer protocols: DNS, SMTP, HTTP, FTP, Email • Routing protocols and IP addressing
Programming and Data Structures	<ul style="list-style-type: none"> • Programming in C.
Algorithms	<ul style="list-style-type: none"> • Searching, sorting, hashing • Graph traversals

Compiler Design	<ul style="list-style-type: none"> • Analysis: Lexical & Liveness • Runtime environments • Intermediate code generation
Databases	<ul style="list-style-type: none"> • ER-model, tuple calculus, SQL • Transactions and concurrency control
Chemistry (CY) Syllabus	
Section	Important Topics
Physical Chemistry	<ul style="list-style-type: none"> • Atomic structure • Group theory • Spectroscopy • Equilibrium states • Kinetics • Surface chemistry
Inorganic Chemistry	<ul style="list-style-type: none"> • Main group elements • Transition elements • Lanthanides & Actinides • Organometallics • Radioactivity • Solids • Bioinorganic chemistry • Instrumental methods of analysis

Organic Chemistry	<ul style="list-style-type: none"> • Stereochemistry • Reaction mechanism • Organic synthesis • Pericyclic reactions and photochemistry • Heterocyclic Compounds • Biomolecules • Experimental Techniques in Organic Chemistry
Data Science and Artificial Intelligence (DA) Syllabus	
Section	Important Topics
Probability and Statistics	<ul style="list-style-type: none"> • Permutation and combinations • Probability • Random variables: Discrete & random • Distribution functions
Linear Algebra	<ul style="list-style-type: none"> • Vectors • Gaussian elimination • Decomposition
Calculus and Optimization	<ul style="list-style-type: none"> • Limit, continuity and differentiability • Maxima and minima
Programming, Data Structures and Algorithms	<ul style="list-style-type: none"> • Programming • Search algorithms • Graph theory
Database Management and Warehousing	<ul style="list-style-type: none"> • ER & Relational model • Data types & transformation

Machine Learning	<ul style="list-style-type: none"> • Supervised Learning • Unsupervised Learning
Artificial Intelligence	<ul style="list-style-type: none"> • Search: informed, uninformed, adversarial. • Inference through variable elimination & sampling.
<h2>Electronics and Communication Engineering (EC) Syllabus</h2>	
Section	Important Topics
Networks, Signals and Systems	<ul style="list-style-type: none"> • Circuit Analysis & RLC circuits • Time Signals: Continuous & Discrete
Electronic Devices	<ul style="list-style-type: none"> • Semiconductors • P/N Carrier Transport
Analog Circuits	<ul style="list-style-type: none"> • Diode Circuits • BJT and MOSFET Amplifiers • Op-amp Circuits
Digital Circuits	<ul style="list-style-type: none"> • Binary, integer and floating-point- numbers • Combinatorial circuits
Control Systems	<ul style="list-style-type: none"> • Feedback principle • Routh-Hurwitz and Nyquist stability criteria • LTI systems
Communications	<ul style="list-style-type: none"> • Random Processes • Analog Communications • Digital Communications

Electromagnetics	<ul style="list-style-type: none"> • Maxwell's Equations • Plane Waves [EMW] • Transmission Lines
Electrical Engineering (EE) Syllabus	
Section	Important Topics
Electric circuits	<ul style="list-style-type: none"> • Network Elements • Network solution methods • Balanced three-phase circuits
Electromagnetic Fields	<ul style="list-style-type: none"> • Electrostatics • Current electricity • Electromagnetic effects
Signals and Systems	<ul style="list-style-type: none"> • Continuous and discrete time signals • Laplace and Fourier transforms
Electrical Machines	<ul style="list-style-type: none"> • Transformers • Induction machines
Power Systems	<ul style="list-style-type: none"> • AC and DC transmission • Bus admittance matrix • Power factor correction • System stability concepts
Control Systems	<ul style="list-style-type: none"> • Stability analysis • LTI systems

Electrical and Electronic Measurements	<ul style="list-style-type: none"> • Measurement of voltage, current, power, energy and power factor
Analog and Digital Electronics	<ul style="list-style-type: none"> • Simple diode circuits • Operational amplifiers • Sequential logic circuits
Power Electronics	<ul style="list-style-type: none"> • Buck-Boost Converters • Thyristor based converters • AC to DC converter

Environmental Science & Engineering (ES) Syllabus

Section	Important Topics
Mathematics Foundation	<ul style="list-style-type: none"> • Linear algebra • Calculus & differential equations • Probability and statistics
Environmental Chemistry	<ul style="list-style-type: none"> • Water chemistry • Soil chemistry • Atmospheric chemistry
Environmental Microbiology	<ul style="list-style-type: none"> • Cell chemistry and cell biology • Microbiology and health • Microbial metabolism • Growth and control of microorganisms
Water Resources and Environmental Hydraulics	<ul style="list-style-type: none"> • Water resources: global, surface & groundwater • Environmental Hydraulics

Water & Wastewater Treatment and Management	<ul style="list-style-type: none"> • Sources of wastewater • Water treatment methods • Industrial effluents
Air and Noise Pollution	<ul style="list-style-type: none"> • Particulate & Gaseous pollutants • Air Quality Management • Noise Pollution.
Solid and Hazardous Waste Management	<ul style="list-style-type: none"> • Integrated solid waste management • Management of biomedical waste, plastic waste and E-waste
Global and Regional Environmental Issues	<ul style="list-style-type: none"> • Global warming • Environmental degradation
Environmental Management and Sustainable Development	<ul style="list-style-type: none"> • Environmental Impact Assessment • Energy-Environment nexus • Sustainable development goals

Ecology and Evolution (EY) Syllabus

Section	Important Topics
Ecology	<ul style="list-style-type: none"> • Fundamental Concept • Interactions • Community Ecology • Ecosystems Structure and Function
Evolution	<ul style="list-style-type: none"> • Evolutionary History • Origin and history of life on earth • Population and quantitative genetics • Molecular evolution and phylogenetics

Mathematics and Quantitative Ecology	<ul style="list-style-type: none"> • Permutations and combinations • Descriptive statistics • Test statistics
Behavioural Ecology	<ul style="list-style-type: none"> • Sensory Ecology • Reproduction • Social Living • Optimal foraging theory.
Applied Ecology & Evolution	<ul style="list-style-type: none"> • Ex-situ & in-situ conservation • Invasive species • zoonotic diseases • Global climate change

Geomatics Engineering (GE) Syllabus

Section	Important Topics
Engineering Mathematics and Basic Geomatics	<ul style="list-style-type: none"> • Engineering Mathematics: Measurement, accuracy, precision & errors.. • Remote sensing: EM spectrum, remote sensing products • GIS: Algorithms, data patterns, databases, spatial analysis
Surveying and Mapping	<ul style="list-style-type: none"> • Mapping • Land Surveying • Aerial photogrammetry
Image Processing and Analysis	<ul style="list-style-type: none"> • Data Quantization and Processing • Digital image processing • Radiometric and Geometric connections • Image enhancement • Image transformation

	<ul style="list-style-type: none"> • Image Segmentation and Classification
Geology and Geophysics (GG) Syllabus	
Section	Important Topics
Part-A: Common Section	<ul style="list-style-type: none"> • Solar system • Earth, plate tectonics, oceanic crust... • Weather & soil • Crystallography • Hydrogeology • Basic physics concepts • Minerals, rocks & other resources

<p>Part-B1: Geology</p>	<ul style="list-style-type: none">• Geomorphology• Structural Geology• Crystallography & mineralogy• Geochemistry• Igneous petrology• Sedimentology• Metamorphic petrology• Paleobiology• Stratigraphy• Resource geology• Global tectonics• Applied geology• Hydrogeology• Basic principle of remote sensing
<ul style="list-style-type: none">• Part-B2: Geophysics	<ul style="list-style-type: none">• Solid-Earth geophysics• Geodesy• Earthquake seismology• Potential & Time varying fields• Gravity methods• Magnetic methods• Electrical methods• Electromagnetic methods• Seismic Methods• Reservoir Geophysics• Geophysical signal processing• Geophysical well logging• Radioactive methods• Geophysical inversion

Instrumentation Engineering (IN) Syllabus

Section	Important Topics
Electricity and Magnetism	<ul style="list-style-type: none">• Electrostatics• Current electricity• Electromagnetic induction
Electrical Circuits and Machines	<ul style="list-style-type: none">• RLC circuits• Voltage and current source• Single phase Transformer
Signals and Systems	<ul style="list-style-type: none">• Periodic & Aperiodic signals• Laplace, Fourier and z-transforms• DFT & FFT
Control Systems	<ul style="list-style-type: none">• Stability analysis• Routh and Nyquist's criteria• P, PI, PID
Analog Electronics	<ul style="list-style-type: none">• Diodes & Transistors• Amplifiers• Rectifiers
Digital Electronics	<ul style="list-style-type: none">• Boolean functions• Converters• Circuits (Sequential, Arithmetic...)• DCS & PLCs

Measurements	<ul style="list-style-type: none"> • SI Units • Errors • Measuring instruments • Schering and Wien for measurement of R, L, C and frequency
Sensors and Industrial Instruments	<ul style="list-style-type: none"> • Hall effect • Transducers • Thermistor, Pyrometer, Semiconductor
Communication & Optical instruments	<ul style="list-style-type: none"> • Modulation & Demodulation • LED, Photo diode, UV-VIS Spectrometers

Mathematics (MA) Syllabus

Section	Important Topics
Calculus	<ul style="list-style-type: none"> • Derivatives • Lagrange's theorem • Maxima & minima • Vector calculus • Integrals • Gauss divergence theorem
Ordinary Differential Equations	<ul style="list-style-type: none"> • First & Second order differential equations • Cauchy-Euler equation • Eigenvalue problems • Linear systems (stationary points) • Lyapunov functions

<p>Partial Differential Equations</p>	<ul style="list-style-type: none"> • First & second order partial differential equations • Laplace equations (cartesian & polar plane) • Wave equation • Heat equation • Laplace and Fourier transform methods.
<p>Real Analysis</p>	<ul style="list-style-type: none"> • Sequences and series of functions • Ascoli-Arzela theorem • Inverse and Implicit function theorems • Fatou's lemma • Monotone & dominated convergence theorem
<p>Complex Analysis</p>	<ul style="list-style-type: none"> • Complex integration • Maximum modulus theorem • Taylor's series and Laurent's series • Schwarz lemma • Mobius transformation • Liouville's theorem
<p>Functional Analysis</p>	<ul style="list-style-type: none"> • Hahn-Banach theorem • Spaces (Banach, linear, inner-product) • Riesz representation theorem • Graph theorems.
<p>Numerical Analysis</p>	<ul style="list-style-type: none"> • Systems of linear equations • Iterative methods • Numerical differentiation and error • Numerical integration • Trapezoidal and Simpson rules

Algebra	<ul style="list-style-type: none"> • Groups (normal, quotient, cyclic....) • Domains (Euclidean, principal ideal, factorization...) • Einstein's Irreducibility criterion & fields
Linear Programming	<ul style="list-style-type: none"> • Linear programming models, methods & solutions. • Transportation problems • Hungarian method
Topology	<ul style="list-style-type: none"> • Types of topology & related factors • Urysohn's lemma

Mechanical Engineering (ME) Syllabus

Section	Important Topics
Applied mechanics	<ul style="list-style-type: none"> • Engineering Mechanics • Mechanics of material • Theory of Mechanics • Vibrations • Machine designs
Fluid mechanics & Thermal sciences	<ul style="list-style-type: none"> • Fluid mechanics • Heat transfer • Thermodynamics • Applications

<p>Material, Manufacturing and Industrial Engineering</p>	<ul style="list-style-type: none"> • Engineering materials • Casting, forming & Joining processes • Machining & machine tool operations • Metrology and inspection • Computer integrated manufacturing • Production planning & control • Inventory control • Operations research
<p>Mining Engineering (MN) Syllabus</p>	
<p>Section</p>	<p>Important Topics</p>
<p>Mining Geology, Mine Development and Surveying</p>	<ul style="list-style-type: none"> • Mineral, rocks & ores • Drilling methods & machines • Blasting devices & design practices • Mechanical cutting system.
<p>Geomechanics and Ground Control</p>	<ul style="list-style-type: none"> • Engineering Mechanics • Geomechanics • Designs of pillars, strata control & supporting
<p>Mining Methods and Machinery</p>	<ul style="list-style-type: none"> • Surface mining • Highwall mining • Underground metal mining • Mining machinery
<p>Surface Environment, Mine Ventilation and Underground Hazards</p>	<ul style="list-style-type: none"> • Pollution, contamination & control • Underground atmosphere, ventilation networks • Mine gases, Safety management plan

Mineral Economics, Mine Planning, Systems Engineering	<ul style="list-style-type: none"> • Mineral resources & valuation • Mine planning & its components • Reliability concepts, network analysis
Metallurgical Engineering (MT) Syllabus	
Section	Important Topics
Metallurgical Thermodynamics	<ul style="list-style-type: none"> • Laws of thermodynamics • Ellingham and phase stability diagram • Electrochemistry
Transport Phenomenon and Rate Process	<ul style="list-style-type: none"> • Momentum, mass & heat transfer • Chemical & electrochemical kinetics
Mineral Processing and Extractive Metallurgy	<ul style="list-style-type: none"> • Metal casting • Hot, warm and cold working of metals • Metal joining • Powder metallurgy • Non-destructive testing (NDT)
Naval Architecture and Marine Engineering (NM) Syllabus	
Section	Important Topics
Applied Mechanics and Structures	<ul style="list-style-type: none"> • Engineering Mechanics • Material Mechanics • Vibrations • Machine design

Fluid Mechanics and Marine Hydrodynamics	<ul style="list-style-type: none"> • Fluid mechanics • Bernoulli's theorem • Boundary layer theory • Vorticity and Kelvin's theorem
Naval Architecture and Ocean Engineering	<ul style="list-style-type: none"> • Ship geometry & fundamentals • Stability & trim of ships • Resistance & Propulsion • Ship maneuvering and motions • Ship structure & strength • Physical Oceanography
Thermodynamics and Marine Engineering	<ul style="list-style-type: none"> • Thermodynamics • Marine diesel engines • Marine steam turbines • Marine boilers • Engine dynamics • Marine auxiliary machinery & systems
Petroleum Engineering (PE) Syllabus	
Petroleum Exploration	Petroleum Formation Evaluation
Oil and Gas Well Drilling Technology	Oil and Gas Well Testing
Reservoir Engineering	Health Safety and Environment in Petroleum Industry
Petroleum Production Operations	Enhanced Oil Recovery Techniques
Offshore Drilling and Production Practices	Latest Trends in Petroleum Engineering

Physics (PH) Syllabus

Mathematical Physics	Classical Mechanics
Electromagnetic Theory	Quantum Mechanics
Thermodynamics and Statistical Physics	Atomic and Molecular Physics
Solid State Physics	Electronics
Nuclear and Particle Physics	

Production and Industrial Engineering (PI) Syllabus

Section	Important Topics
General Engineering	<ul style="list-style-type: none">• Engineering materials• Applied Mechanics• Theory of machine and design• Thermal and fluids engineering
Manufacturing Processes I	<ul style="list-style-type: none">• Casting• Metal forming• Joining of metals• Powder processing• Polymers and composites
Manufacturing Processes II	<ul style="list-style-type: none">• Machining• Machine tools• Advance manufacturing• Computer integrated manufacturing

Quality and Reliability	<ul style="list-style-type: none"> • Metrology and inspection • Quality management • Reliability and maintenance
Industrial Engineering	<ul style="list-style-type: none"> • Product design and development • Work system design • Facility design
Operations research and Operations management	<ul style="list-style-type: none"> • Operations research • Engineering economy and costing • Production control • Project management
Statistics (ST) Syllabus	
Calculus	Estimation
Matrix Theory	Testing of Hypotheses
Probability	Non-parametric Statistics
Standard Discrete and Continuous Univariate Distributions	Multivariate Analysis
Stochastic Processes	Regression Analysis
Textile Engineering and Fibre Science (TF) Syllabus	
Section	Important Topics

Textile Fibres	Natural fibres & fibre forming polymers Fibre architecture & molecular architecture.
Yarn Manufacture, Yarn Structure and Properties	<ul style="list-style-type: none"> • Principle of ginning & combing... • Rover machines & spinning... • Fibre geometry & fibre arrangement
Fabric Manufacture, Structure and Properties	<ul style="list-style-type: none"> • Winding processes • Shedding mechanism • Weft knitting • Warp knitting
Textile Testing	<ul style="list-style-type: none"> • Sampling techniques for fibres • Moisture in textiles
Chemical Processing	<ul style="list-style-type: none"> • Impurities in natural fibre • Classification of dyes • Mechanical finishing of cotton • Methods of printing
Engineering Sciences (XE) Syllabus	
Part	Sections
XE-B Fluid Mechanics	<ul style="list-style-type: none"> • Flow and Fluid Properties • Kinematics of Fluid Motion • Differential Analysis • Integral Analysis for a Control Volume • Dimensional Analysis • Internal Flows • Bernoulli's Equation and its Applications, Potential Flows

	<ul style="list-style-type: none"> • External Flows
XE-C Materials Science	<ul style="list-style-type: none"> • Classification and Structure of Materials • Thermodynamics, Kinetics and Phase Transformations • Properties and Applications of Materials • Characterization and Measurements of Properties • Processing of Materials • Degradation of Materials
XE-D Solid Mechanics	<ul style="list-style-type: none"> • Mechanics of rigid bodies • Mechanics of deformable bodies • Vibrations
XE-E Thermodynamics	<ul style="list-style-type: none"> • Basic Concepts • First Law of Thermodynamics • Second Law of Thermodynamics • Properties of Pure Substances • Thermodynamic Relations • Thermodynamic Cycles • Ideal Gas Mixtures

XE-F Polymer Science and Engineering	<ul style="list-style-type: none"> • Chemistry of High Polymers • Polymer Characterization • Synthesis, Manufacturing and Properties • Polymer Blends and Composites • Polymer Technology • Polymer Processing • Polymer Testing • Polymer Recycling and Waste management
XE-G Food Technology	<ul style="list-style-type: none"> • Food Chemistry and Nutrition • Food Microbiology • Food Products Technology • Food Engineering
XE-H Atmospheric and Oceanic Sciences	<ul style="list-style-type: none"> • Atmospheric Science • Ocean Sciences
Humanities & Social Sciences (XH) Syllabus	
Section	Important Topics
XH-B1 Reasoning and Comprehension	<ul style="list-style-type: none"> • Macroeconomics • Microeconomics • Statistics, Econometrics and Mathematical Economics • International Economics • Public Economics • Development Economics • Indian Economy
XH-C1 Economics	<ul style="list-style-type: none"> • Literature

XH-C2 English	<ul style="list-style-type: none"> • Language and Linguistics • Levels of Grammar and Grammatical Analysis • Historical Linguistics • Sociolinguistics • Areal Typology, Universals, Cross-linguistic Features • Methods of Analysis • Applied Linguistics
XH-C3 Linguistics	<ul style="list-style-type: none"> • Language and Linguistics • Levels of Grammar and Grammatical Analysis • Historical Linguistics • Sociolinguistics • Areal Typology, Universals, Cross-linguistic Features • Methods of Analysis • Applied Linguistics
XH-C4 Philosophy	<ul style="list-style-type: none"> • Classical Indian Philosophy • Contemporary Indian Philosophy • Classical and Modern Western Philosophy • Contemporary Western Philosophy
XH-C5 Psychology	<ul style="list-style-type: none"> • Research Methods and Statistics • Correlational Analysis • Psychometrics • Biological and Evolutionary Basis of Behaviour • Perception, Learning, Memory and Forgetting • Cognition: Thinking, Intelligence and Language • Motivation, Emotion and Stress and Coping • Social Psychology • Applications of Psychology

XH-C6 Sociology	<ul style="list-style-type: none"> • Sociological Theory • Research Methodology and Methods • Sociological Concepts • Social Movements • Sociology of Development
Life Sciences (XL) Syllabus	
Section	Important Topics
XL-P Chemistry	<ul style="list-style-type: none"> • Atomic Structure and Periodicity • Structure and Bonding • s, p and d Block Elements • Chemical Equilibria • Electrochemistry • Reaction Kinetics • Thermodynamics • Structure-Reactivity Correlations and Organic Reaction Mechanisms • Chemistry of Biomolecules
XL-Q Biochemistry	<ul style="list-style-type: none"> • Organization of life • Enzyme kinetics • Biochemical separation techniques • Cell structure and organelles • DNA • Immune System

XL-R Botany	<ul style="list-style-type: none">• Plant Systematics• Plant Anatomy• Plant Development; Cell and Tissue Morphogenesis• Plant Physiology and Biochemistry• Genetics and Genomics• Plant Breeding, Genetic Modification, Genome Editing• Economic and Applied Botany• Plant Pathology• Ecology and Environment
XL-S Microbiology	<ul style="list-style-type: none">• Historical Perspective• Methods in Microbiology• Microbial Taxonomy and Diversity• Prokaryotic Cells: Structure and Function• Microbial Growth, metabolism & genetics• Control of Micro-organisms• Microbial Diseases and Host-Pathogen Interaction• Chemotherapy/Antibiotics
XL-T Zoology	<ul style="list-style-type: none">• Animal diversity & behavior• Evolution• Genetics• Biochemistry and Molecular Biology• Cell Biology• Parasitology and Immunology• Animal Anatomy and Physiology• Development Biology

XL-U Food Technology

- Food Chemistry and Nutrition
- Food Microbiology
- Food Products Technology
- Food Engineering