NATA SYLLABUS

NATA 2020 syllabus will be decided by the Council of Architecture (CoA). The syllabus of NATA remains the same every year apart from a slight change in the number of questions. NATA syllabus will include three sections - engineering mathematics, drawing, and general aptitude.

Physics Syllabus:

- Electrostatics- Electric charges and Fields; Electrostatic Potential and Clearance
- Current Electricity; Magnetic Effects of Current and Magnetism; Moving Charges and magnetism; Magnetism and Matter
- Electromagnetic Induction and Alternating currents- Electromagnetic Induction; Alternating Current
- Optics- Ray optics and optical instruments, Wave Optics
- Dual nature of radiation and Matter
- Atoms and Nuclei- Atoms, Nuclei
- Electronic devices- Semiconductor Electronics, Materials, Devices and Simple circuits

Chemistry Syllabus:

- Some Basic Concepts of Chemistry; Structure of Atom; Classification of Elements and Periodicity in Properties
- Chemical Bonding and Molecular; States of Matter: Gases and Liquids
- Chemical Thermodynamics; Equilibrium; Redox Reactions; Hydrogen; s- Block Elements p - Block Elements
- Organic Chemistry: Some basic Principles and Techniques; Hydrocarbons; Environmental Chemistry

Mathematics Syllabus:

Chapter	Topics
Algebra	Definitions of A. P. and G.P.; General term; Summation of first n-terms of series; Arithmetic/Geometric series, A.M., G.M. and their relation; Infinite G.P. series and its sum
Logarithms	Definition; General properties; Change of base.

Matrices	Concepts of m x n, real matrices, operations of addition, scalar multiplication and multiplication of matrices. Transpose of a matrix. Determinant of a square matrix. Properties of determinants (statement only). Minor, cofactor and adjoint of a matrix. Nonsingular matrix. Inverse of a matrix. Finding area of a triangle. Solutions of system of linear equations. (Not more than 3 variables).
Trigonometry	Trigonometric functions, addition and subtraction formulae, formulae involving multiple and submultiple angles, general solution of trigonometric equations. Properties of triangles, inverse trigonometric functions, and their properties.
Coordinate geometry	Distance formula, section formula, area of a triangle, condition of collinearity of three points in a plane. Polar coordinates, transformation from Cartesian to polar coordinates and vice versa. Parallel transformation of axes, concept of locus, elementary locus problems. The slope of a line. Equation of lines in different forms, angle between two lines. Condition of perpendicularity and parallelism of two lines. Distance of a point from a line. Distance between two parallel lines. Lines through the point of intersection of two lines. Equation of a circle with a given center and radius. Condition that a general equation of second degree in x, y may represent a circle. Equation of a circle in terms of endpoints of a diameter. Equation of tangent, normal and chord. Parametric equation of a circle. The intersection of a line with a circle. Equation of common chord of two intersecting circles.
3-Dimensional Co-ordinate geometry	Direction cosines and direction ratios, distance between two points and section formula, equation of a straight line, equation of a plane, distance of a point from a plane.
Theory of Calculus	Functions, the composition of two functions and inverse of a function, limit, continuity, derivative, chain rule, derivatives of implicit functions and functions defined parametrically. Integration as a reverse process of differentiation, indefinite integral of standard functions. Integration by parts. Integration by substitution and partial fraction. Definite integral as a limit of a sum with equal subdivisions. The fundamental theorem of integral calculus and its applications. Properties of definite integrals. Formation of ordinary differential equations, solution of homogeneous differential equations, separation of variables method,

	linear first-order differential equations.
Application of Calculus	Tangents and normals, conditions of tangency. Determination of monotonicity, maxima, and minima. Differential coefficient as a measure of rate. Motion in a straight line with constant acceleration. Geometric interpretation of definite integral as area, calculation of area bounded by elementary curves and Straight lines. Area of the region included between two elementary curves.
Permutation and combination	Permutation of n different things taken r at a time. Permutation of n things not all different. Permutation with repetitions (circular permutation excluded). Combinations of n different things taken r at a time. Combination of n things not all different. Basic properties. Problems involving both permutations and combinations.
Statistics and Probability	Measure of dispersion, mean, variance and standard deviation, frequency distribution. Addition and multiplication rules of probability, conditional probability and Bayes' Theorem, independence of events, repeated independent trails and Binomial distribution.

General Aptitude Syllabus:

Chapters	Topics
Sets and Relations	Idea of sets, subsets, power set, complement, union, intersection and difference of sets, Venn diagram, De Morgan's Laws, Relation and its properties. Equivalence relation — definition and elementary examples.
Mathematical reasoning	Statements, logical operations like and, or, if and only if, implies, implied by. Understanding of tautology, converse, contradiction, and contrapositive
Objects	Texture related to architecture and built environment. Interpretation of pictorial compositions, Visualizing three-dimensional objects from two-dimensional drawing. Visualizing different sides of 3D objects. Analytical reasoning, mental ability (visual, numerical and verbal), General awareness of national/ international architects and famous

	architectural creations.

Drawing Syllabus:

- Understanding of scale and proportion of objects, geometric composition, shape, building forms and elements, aesthetics, colour texture, harmony, and contrast.
- Conceptualization and Visualization through structuring objects in memory.
- Drawing of patterns - both geometrical and abstract.
- Form transformations in 2D and 3D like union, subtraction, rotation, surfaces, and volumes.
- Generating plan, elevation and 3D views of objects.
- Creating 2D and 3D compositions using given shapes and forms.
- Perspective drawing, Sketching of urban escape and landscape, Common day-to-day life objects like furniture, equipment, etc from memory.