

YOUNG STAR DEFENCE ACADEMY

NDA Syllabus & Booklist

National Defence Academy — Complete Preparation Guide

The Union Public Service Commission (UPSC) prescribes the NDA syllabus in the official notification. Broadly, the syllabus is divided into two parts: **Mathematics** and **General Ability Test (GAT)**. The GAT section covers 6 subjects including English, Physics, Chemistry, General Science, History, Geography and Current Affairs.

SECTION 1: NDA MATHEMATICS SYLLABUS

Candidates are required to know Mathematics up to Class 12th standard. This section tests calculative and analytical skills.

| Mathematics Topic | Topic-wise Syllabus |
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| Algebra | Sets, Venn diagrams, De Morgan laws, Cartesian product, relation, equivalence relation. Real numbers, Complex numbers, Modulus, Cube roots, Binary to Decimal conversions. Arithmetic, Geometric and Harmonic progressions. Quadratic equations, Linear inequations, Permutation and Combination, Binomial theorem and Logarithms. |
| Calculus | Real valued functions, domain, range and graph. Composite, one-to-one, onto and inverse functions. Limits, Continuity, Derivatives — geometrical and physical interpretation. Derivatives of sum, product and quotient; second order derivatives. Increasing/decreasing functions, maxima and minima. |
| Matrices & Determinants | Types of matrices, operations on matrices. Determinants, basic properties, adjoint and inverse. Solution of linear equations by Cramer's rule and Matrix Method. |
| Integral Calculus & Differential Equations | Integration by substitution and by parts; standard integrals. Definite integrals and area under curves. Order and degree of differential equations; general and particular solutions; first order first degree equations; growth and decay problems. |
| Trigonometry | Angles in degrees and radians. Trigonometric ratios and identities. Sum/difference formulae, multiple and sub-multiple angles. Inverse trigonometric functions. Height and distance, properties of triangles. |
| Vector Algebra | Vectors in 2D and 3D, magnitude and direction. Unit and null vectors, addition, scalar multiplication. Dot product and cross product. Applications in work, force and geometry. |
| Analytical Geometry (2D & 3D) | Cartesian coordinates, distance formula, equation of a line. Circles, parabola, ellipse, hyperbola — standard forms, eccentricity. Direction cosines and ratios. Equations of a plane, line and sphere in 3D. |
| Statistics & Probability | Random experiment, sample space, events — mutually exclusive, exhaustive, complementary. Classical and statistical probability. Conditional probability, Bayes' theorem. Binomial distribution. |

SECTION 2: NDA GENERAL ABILITY TEST (GAT) SYLLABUS

The GAT section comprises **English** and **General Knowledge**. The General Knowledge paper covers Physics, Chemistry, General Science, History, Geography and Current Events.

GAT — English

Key topics covered in the English section:

- Vocabulary — synonyms, antonyms, one-word substitutions, homophones/homonyms
- Grammar and Usage — tenses, active/passive voice, direct/indirect speech
- Adjective degree of comparison, prepositions, articles, conjunctions
- Comprehension and cohesion — reading passages and understanding context
- Précis writing and letter writing format

GAT — History

- Forces shaping the modern world — Renaissance, Exploration and Discovery
- French Revolution, Industrial Revolution and Russian Revolution
- War of American Independence
- Broad survey of Indian History with emphasis on Culture and Civilisation
- Freedom Movement in India
- Impact of Science and Technology on Society
- Elementary study of Indian Constitution and Administration
- Concept of one World; United Nations; Panchsheel
- Five Year Plans of India; Panchayati Raj; Democracy, Socialism and Communism
- Role of India in the present world; National Integration and Welfare State
- Bhoodan, Sarvodaya, Co-operatives and Community Development
- Basic Teachings of Mahatma Gandhi

GAT — Geography

- The Earth — its shape, size, movements and their effects
- Latitudes and Longitudes; Concept of time; International Date Line
- Temperature, Atmospheric Pressure, Planetary Winds, Cyclones and Anticyclones
- Humidity, Condensation and Precipitation; Types of Climate
- Ocean Currents, Tides; Atmosphere and its composition
- Major Natural regions of the World
- Regional Geography of India — Climate, Natural vegetation, Mineral and Power resources
- Location and distribution of agricultural and industrial activities
- Origin of Earth; Rocks and their classification
- Weathering — Mechanical and Chemical; Earthquakes and Volcanoes
- Important sea ports and main sea, land and air routes of India
- Main items of Imports and Exports of India

GAT — General Science

- Difference between living and non-living
- Basis of Life — Cells, Protoplasm and Tissues
- Growth and Reproduction in Plants and Animals
- Food — source of energy; Constituents of food; Balanced Diet
- Elementary knowledge of Human Body and its important organs
- Common Epidemics — causes and prevention

- The Solar System — Meteors, Comets, Eclipses
- Achievements of Eminent Scientists

GAT — Chemistry

- Physical and Chemical Changes; Elements, Mixtures and Compounds
- Acids, Bases and Salts; Properties of Air and Water
- Preparation and Properties of Hydrogen, Oxygen, Nitrogen and Carbon Dioxide
- Oxidation and Reduction
- Carbon — different forms
- Atomic structure; Symbols, Formulae and simple Chemical Equations
- Atomic Equivalent and Molecular Weights; Valency
- Law of Chemical Combination (excluding problems)
- Fertilizers — Natural and Artificial
- Materials used in preparing Soap, Glass, Ink, Paper, Cement, Paints, Safety Matches, Gunpowder

GAT — Physics

- Physical Properties and States of Matter; Mass, Weight, Volume
- Motion, Velocity and Acceleration; Newton's Laws of Motion
- Force, Momentum, Parallelogram of Forces; Stability and Equilibrium of bodies
- Gravitation; Elementary ideas of Work, Power and Energy
- Effects of Heat; Modes of transference of Heat; Measurement of Temperature and Heat
- Sound waves and their properties; Simple musical instruments
- Rectilinear propagation, Reflection and Refraction of Light
- Spherical mirrors and Lenses; Human Eye
- Density and Specific Gravity; Principle of Archimedes; Pressure Barometer
- Static and Current Electricity; Conductors and Non-conductors; Ohm's Law
- Simple Electrical Circuits; Heating, Lighting and Magnetic effects of Current
- Measurement of Electrical Power; Primary and Secondary Cells; Use of X-Rays
- Natural and Artificial Magnets; Properties of a Magnet; Earth as a Magnet
- General Principles: Simple Pendulum, Pulleys, Siphon, Levers, Balloon, Pumps, Hydrometer, Pressure Cooker, Thermos Flask, Gramophone, Telegraph, Telephone, Periscope, Telescope, Microscope, Mariner's Compass, Lightning Conductors, Safety Fuses

GAT — Current Affairs

- Important events that have happened in India in recent years
- Prominent personalities at Indian and International level
- Cultural activities and sports events
- Current important world events
- Static GK — Neighbouring countries, highest mountains, longest rivers, Indian ambassadors, Navy chiefs

SECTION 3: RECOMMENDED BOOKS FOR NDA PREPARATION

The following books are highly recommended by our faculty at Young Star Defence Academy for effective NDA exam preparation:

| Subject | Recommended Books |
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| Mathematics | <ul style="list-style-type: none"> • NCERT Mathematics Textbooks — Class 11th & 12th • Pathfinder NDA & NA — Arihant Publications • Mathematics for NDA and NA — R.S. Aggarwal • Chapter-wise & Section-wise Solved Papers NDA/NA — Arihant Publications • 10 Practice Sets for NDA & NA — Arihant Publications |
| General Ability Test | <ul style="list-style-type: none"> • NCERT Textbooks (all subjects) — Class 9th onwards • Latest Manorama Yearbook • Success Series General Knowledge — Sachchida Nand Jha • History of Modern India — Bipan Chandra • Science and Technology in India — Kalpana Rajaram (Spectrum) • Objective General English for Competitive Exams — S.P. Bakshi |

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