

Middle High Reasoning & Aptitude Course

Who should enroll?

This course is designed for students who are:

Preparing for school transfer examinations

Getting ready for Year 9 Mathematics streaming assessments

Starting early preparation for the University Clinical Aptitude Test (UCAT)

Course details :

Class format: Small group instruction

Duration: 2 hours per class

Eligible grades: Years 9-10 only

Prerequisites: Entrance test required for enrollment

Grade restrictions: Students below Year 9 are not eligible

What's included :

Weekly instruction in small group setting

Comprehensive study materials

Weekly practice test

Fees :

Cost per Class: \$100

Full term: \$1,000 (10 classes)

Curriculum :

Grades 9/10 Reasoning & Aptitude	Course outline
Term 1	Abstract Reasoning <ul style="list-style-type: none">- Pattern Recognition: Identifying patterns in shapes, sequences, and visual cues.- Analogies in Non-Verbal Information: Developing skills to understand relationships between objects without verbal prompts.- Series Completion: Determining the next element in visual series.- Spatial Orientation and Visualization: Understanding object rotation, mirror images, and perspectives.- Figure Classification and Categorization: Classifying shapes based on given attributes.- Logical Sequences: Understanding cause-effect patterns in non-verbal setups.
Term 2	Decision Making & Quantitative Reasoning Decision Making <ul style="list-style-type: none">- Evaluating Choices: Techniques for listing, analyzing, and prioritizing options.- Risk Assessment: Basic probability in decision-making contexts.- Cause-Effect Relationships: Identifying outcomes based on specific choices.- Evaluating Arguments and Assumptions: Understanding bias, identifying assumptions in reasoning. Quantitative Reasoning <ul style="list-style-type: none">- Numerical Patterns and Series: Arithmetic, geometric sequences, and missing-number problems.- Ratio and Proportion: Solving real-life problems using proportional reasoning.- Data Interpretation: Understanding charts, graphs, and tables for decision making.- Basic Statistics: Mean, median, mode, and basic probability problems.
Term 3	Verbal Reasoning

	<ul style="list-style-type: none"> - Comprehension and Analysis: Extracting information from texts, summarizing key points. - Analogies and Relationships: Finding connections and relationships between words. - Critical Reading: Identifying the main idea, inferences, and conclusions. - Logical Deductions: Drawing conclusions based on verbal information. - Statement and Assumptions: Differentiating between facts and assumptions in text. - Cause and Effect in Text: Identifying logical connections in verbal arguments.
Term 4	<p>Situational Judgement</p> <ul style="list-style-type: none"> - Ethical Decision-Making: Understanding moral principles in problem-solving. - Behavioral Analysis: Identifying the best response to situational cues. - Interpersonal Judgement: Analyzing social situations and choosing appropriate responses. - Scenario-Based Reasoning: Real-life problem-solving with a focus on empathy, teamwork, and integrity. - Conflict Resolution: Approaches to resolving differences in hypothetical scenarios. - Risk Management in Situations: Judging high-stakes scenarios and mitigating potential outcomes.

Middle High EMS

This program is designed to give students a head start on their Higher School Certificate (HSC) studies. It focuses on advanced Mathematics and Science subjects, which are expected to be chosen for the HSC exams.

What's included:

Class Structure: Small group classes, each lasting 2.5 hours

Weekly study materials: Comprehensive notes for both Maths and Science.

Additional Accelerated Science notes: Concise and fast-tracked notes to help students grasp key concepts quickly.

Weekly trial tests: Practice tests covering Reading, Writing, Mathematics, and Science to assess progress and exam readiness.

Labvision homework modules: Interactive online modules with 10 attempts per term to reinforce learning.

Fees:

\$120 per class

\$1200 per term (based on 10 classes)

Curriculum :

Grade 9 EMS	Literacy	Mathematics	Science
Grade 9 Term 1	Persuasive Writing and Literary Foundations Poetry - "The Road Not Taken" - Robert Frost	Foundations and Core Algebraic Concepts 1. Quadratic Equations - Solving quadratic equations by factorization, completing the	Life Sciences and Human Biology 1. Food and Living Things Nutrients and their functions Balanced diet and nutrition

<p>- "Sonnet 18" - William Shakespeare - "Still I Rise" - Maya Angelou - "If" - Rudyard Kipling</p> <p>Prose - Novel Study: "To Kill a Mockingbird" by Harper Lee - Short Stories: - "The Gift of the Magi" by O. Henry - "The Last Leaf" by O. Henry</p> <p>Writing Skills 1. Persuasive Writing Fundamentals - Understanding argument structure - Developing thesis statements - Using evidence effectively - Counter-arguments and rebuttals</p> <p>2. Grammar and Style - Advanced punctuation - Sentence variety and structure - Transitional phrases - Active vs. passive voice</p>	<p>square, and the quadratic formula - Applications of quadratic equations in word problems</p> <p>2. Trigonometry Review - Basics of trigonometric ratios (sine, cosine, tangent) - Applications in right-angled triangles - Introduction to sine and cosine rules for non-right triangles</p> <p>3. Financial Mathematics - Simple and compound interest calculations - Introduction to annuities and loan amortization - Real-life applications and calculations</p> <p>4. Probability Review - Basic probability rules and concepts - Independent and dependent events - Conditional probability and Venn diagrams</p> <p>5. Further Indices - Laws of indices, fractional indices, and negative indices</p>	<p>Food chains and food webs Energy flow in ecosystems Photosynthesis and cellular respiration</p> <p>2. Sensing the World Around You Structure and function of human sensory organs The nervous system Central and peripheral nervous system Neurons and nerve impulses Stimulus and response Common sensory disorders</p> <p>3. Animal Reproduction Sexual and asexual reproduction Male and female reproductive systems Fertilization and embryo development Reproductive hormones Birth and parental care</p> <p>4. Infectious Diseases Types of pathogens Disease transmission</p>
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		<ul style="list-style-type: none"> - Simplification of algebraic expressions using indices 6. Coordinate Geometry Review <ul style="list-style-type: none"> - Distance between two points and midpoint formulas - Slope of a line and equation of a line - Introduction to parallel and perpendicular lines 	<p>Immune system response Prevention and treatment Vaccines and antibiotics Global health challenges</p>
Grade 9 Term 2	<p>Comparative Studies and Creative Expression</p> <p>Poetry Comparison</p> <ul style="list-style-type: none"> - "Dulce et Decorum Est" - Wilfred Owen - "The Soldier" - Rupert Brooke - "Chicago" - Carl Sandburg - "London" - William Blake <p>Prose</p> <ul style="list-style-type: none"> - Novel Study: "Lord of the Flies" by William Golding - Short Stories: <ul style="list-style-type: none"> - "The Yellow Wallpaper" by Charlotte Perkins Gilman - "The Tell-Tale Heart" by Edgar Allan Poe 	<p>Polynomial Operations and Advanced Geometry</p> <p>1. Factorisation Revision</p> <ul style="list-style-type: none"> - Factorization of algebraic expressions (common factor, grouping, trinomials) - Special factorization techniques: difference of squares, perfect square trinomials <p>2. Polynomials and Further Polynomials</p> <ul style="list-style-type: none"> - Polynomial functions and their graphs - Operations on polynomials (addition, subtraction, multiplication, division) - Remainder theorem and 	<p>Chemistry and Matter</p> <p>1. Chemical Reactions</p> <p>Atomic structure and bonding</p> <p>Types of chemical reactions</p> <ul style="list-style-type: none"> Combination Decomposition Single displacement Double displacement Acid-base reactions <p>Balancing chemical equations</p> <p>Factors affecting reaction rates</p> <p>Energy changes in reactions</p> <p>2. Matter and Materials</p> <p>States of matter</p> <p>Physical and chemical changes</p> <p>Properties of materials</p> <p>Solutions and mixtures</p>

	<p>Writing Skills</p> <p>1. Creative Writing</p> <ul style="list-style-type: none"> - Character development - Setting and atmosphere - Dialogue writing - Narrative perspectives - Descriptive techniques <p>2. Comparative Analysis</p> <ul style="list-style-type: none"> - Theme comparison - Style analysis - Context evaluation - Literary devices 	<p>factor theorem applications</p> <p>3. Advanced Probability</p> <ul style="list-style-type: none"> - Probability distribution, mean, variance, and standard deviation - Probability applications in real-world contexts <p>4. Coordinate Geometry</p> <ul style="list-style-type: none"> - Equation of circles and its properties - Locus of points and geometric proofs <p>5. Further Trigonometry</p> <ul style="list-style-type: none"> - Trigonometric identities and simplifying expressions - Solving trigonometric equations - Applications of trigonometry in 3D problems 	<p>Separation techniques</p> <p>3. Acids, Bases, and Salts</p> <p>Properties and indicators</p> <p>pH scale</p> <p>Neutralization</p> <p>Common acids and bases in daily life</p>
Grade 9 Term 3	<p>Critical Studies and Modernist Poetry</p> <p>Modernist Poetry</p> <ul style="list-style-type: none"> - "The Love Song of J. Alfred Prufrock" - T.S. Eliot - "This Is Just To Say" - William Carlos Williams - "The Red Wheelbarrow" - William Carlos Williams 	<p>Logarithmic and Exponential Functions, Series</p> <p>1. Indices and Logarithms</p> <ul style="list-style-type: none"> - Laws of logarithms and change of base formula - Solving exponential and logarithmic equations - Applications in growth and decay problems 	<p>Earth and Space Sciences</p> <p>1. The Universe</p> <p>Solar system structure</p> <p>Stars and galaxies</p> <p>Light years and astronomical distances</p> <p>Life cycle of stars</p> <p>Origin of the universe</p> <p>Space exploration</p>

	<p>- "Dreams" - Langston Hughes</p> <p>Prose</p> <ul style="list-style-type: none"> - Novel Study: "Of Mice and Men" by John Steinbeck - Short Stories: <ul style="list-style-type: none"> - "The Cask of Amontillado" by Edgar Allan Poe - "The Story of an Hour" by Kate Chopin <p>Writing Skills</p> <ol style="list-style-type: none"> 1. Discursive Writing <ul style="list-style-type: none"> - Balanced arguments - Objective analysis - Research methods - Citation techniques 2. Critical Analysis <ul style="list-style-type: none"> - Literary criticism - Historical context - Author's purpose - Stylistic analysis 	<ol style="list-style-type: none"> 2. Further Logarithmic Applications <ul style="list-style-type: none"> - Real-world applications: pH, Richter scale, population growth - Transformations and graphing of exponential and logarithmic functions 3. Graphs - Applications of Logarithms and Exponents <ul style="list-style-type: none"> - Exponential growth and decay graphs - Logarithmic graphs and their interpretations 4. Arithmetic and Geometric Series <ul style="list-style-type: none"> - Sum of finite arithmetic and geometric series - Infinite geometric series and convergence 5. Application of Series <ul style="list-style-type: none"> - Real-life applications of series (finance, sequences in nature) - Using series in problem-solving contexts 	<ol style="list-style-type: none"> 2. Earth Sciences <ul style="list-style-type: none"> Earth's structure Plate tectonics Earthquakes and volcanoes Rock cycle Minerals and their properties 3. Human Impact on the Biosphere <ul style="list-style-type: none"> Climate change and global warming Pollution types and effects Conservation of resources Biodiversity and extinction Sustainable development
Grade 9 Term 4	Close Reading, Visual Analysis, and Advanced Writing Skills	Functions, Advanced Problem Solving, and Preparation for Further Studies	Physics 1. Wave Motion

	<p>Poetry</p> <ul style="list-style-type: none"> - "Ozymandias" - Percy Bysshe Shelley - "The Tiger" - William Blake - "Mother to Son" - Langston Hughes - "Fire and Ice" - Robert Frost <p>Prose</p> <ul style="list-style-type: none"> - Novel Study: "The Pearl" by John Steinbeck - Short Stories: <ul style="list-style-type: none"> - "The Necklace" by Guy de Maupassant - "The Open Window" by Saki <p>Writing Skills</p> <ol style="list-style-type: none"> 1. Close Reading <ul style="list-style-type: none"> - Detailed textual analysis - Interpretation skills - Evidence-based arguments - Literary devices identification 2. Visual Analysis <ul style="list-style-type: none"> - Media literacy - Visual rhetoric - Advertisement analysis 	<ol style="list-style-type: none"> 1. Functions <ul style="list-style-type: none"> - Definition and types of functions (linear, quadratic, absolute, exponential) - Domain, range, and function notation 2. Inverse Functions & Further Graphs <ul style="list-style-type: none"> - Finding the inverse of a function and graphing inverses - Transformation of graphs (translations, reflections, stretches) 3. Regions and Graphical Solutions <ul style="list-style-type: none"> - Introduction to inequalities in two variables - Shading regions to represent solutions of inequalities 4. The Discriminant <ul style="list-style-type: none"> - Understanding the discriminant in quadratic equations and its significance - Real-life applications and interpretation of roots 5. Simultaneous Equations <ul style="list-style-type: none"> - Solving simultaneous linear and quadratic equations algebraically and graphically 	<p>Types of waves</p> <p>Wave properties</p> <ul style="list-style-type: none"> Amplitude Frequency Wavelength Speed <p>Sound waves</p> <p>Light waves</p> <p>Electromagnetic spectrum</p> <ol style="list-style-type: none"> 2. Forces and Motion <ul style="list-style-type: none"> Newton's laws of motion Types of forces Momentum and impulse Work, energy, and power Simple machines 3. Electricity and Magnetism <ul style="list-style-type: none"> Electric charges and fields Current and voltage Circuits Magnets and magnetic fields Electromagnetic effects
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	<ul style="list-style-type: none">- Film analysis techniques	<p>6. Problem Solving on the Coordinate Plane</p> <ul style="list-style-type: none">- Complex problem-solving involving multiple concepts (geometry, algebra, trigonometry)- Integration of skills learned throughout the year	
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Grade 10 EMS	Literacy	Mathematics	Science
Grade 10 Term 1	<p>Mock HSC Common Module - Richard III</p> <p>Core Text - William Shakespeare's "Richard III"</p> <p>Supporting Materials</p> <p>1. Historical Context - Wars of the Roses - Tudor England - Shakespeare's History Plays</p> <p>2. Poetry Focus: Power and Ambition - "Ozymandias" by Percy Bysshe Shelley - "The Man He Killed" by Thomas Hardy - "The Conquest of Granada" by Lord Byron</p> <p>3. Related Texts - Short Story: "The Cask of Amontillado" by Edgar Allan Poe - Novel Excerpts: "Animal Farm" by George Orwell</p>	<p>Foundations in Trigonometry and Polynomial Analysis</p> <p>Further Trigonometry: Review of basic trigonometric ratios (sine, cosine, tangent) Unit circle definition of trigonometric functions Graphs of trigonometric functions (sine, cosine, tangent) Amplitude, period, phase shift, and vertical shift of trigonometric functions Solving trigonometric equations Applications of trigonometry (e.g., finding angles and sides of triangles, modeling periodic phenomena)</p> <p>Functions Review: Concept of a function Domain and range Function notation Types of functions (linear, quadratic, polynomial, exponential, logarithmic) Inverse functions</p>	<p>Life Sciences - Evolution and Genetics</p> <p>Unit 1: Introduction to Genetics DNA structure and function Genes, alleles, and chromosomes Genotypes and phenotypes</p> <p>Unit 2: Mechanisms of Inheritance Mendelian inheritance patterns (dominant, recessive, codominance, incomplete dominance) Sex-linked inheritance Pedigree analysis Mutations and their effects</p> <p>Unit 3: Evolutionary Theory History of evolutionary thought (Darwin, Lamarck, etc.) Evidence for evolution (fossil record, comparative anatomy, embryology, molecular biology) Natural selection and adaptation Speciation and extinction</p>

	<p>Key Skills Development</p> <ul style="list-style-type: none"> - Character analysis - Understanding dramatic irony - Shakespearean language and devices - Historical context analysis - Comparative analysis of texts 	<p>Polynomials:</p> <p>Polynomial expressions and operations (addition, subtraction, multiplication, division)</p> <p>Factoring polynomials</p> <p>Solving polynomial equations</p> <p>Remainder and Factor Theorems</p> <p>Graphing polynomial functions</p>	
Grade 10 Term 2	<p>Mock HSC Critical Study</p> <p>Core Focus: Poetry Analysis</p> <p>1. Romantic Poetry Collection</p> <ul style="list-style-type: none"> - "The Tyger" by William Blake - "Ode on a Grecian Urn" by John Keats - "I Wandered Lonely as a Cloud" by William Wordsworth - "She Walks in Beauty" by Lord Byron <p>2. Modern Poetry</p> <ul style="list-style-type: none"> - "The Road Not Taken" by Robert Frost - "Do Not Go Gentle Into That Good Night" by Dylan Thomas - "Still I Rise" by Maya Angelou 	<p>Calculus and Logarithmic Concepts</p> <p>Applications of Coordinate Geometry:</p> <p>Distance formula</p> <p>Midpoint formula</p> <p>Slope of a line</p> <p>Equations of lines (slope-intercept, point-slope, standard form)</p> <p>Parallel and perpendicular lines</p> <p>Circles and their equations</p> <p>Limits and First Principles:</p> <p>Concept of a limit</p> <p>Evaluating limits graphically and algebraically</p>	<p>Physical Sciences and Cosmology</p> <p>Unit 1: Structure of Matter</p> <p>Atomic structure (protons, neutrons, electrons)</p> <p>Periodic table trends</p> <p>Isotopes and radioactivity</p> <p>Unit 2: Chemical Reactions</p> <p>Types of chemical bonds (ionic, covalent, metallic)</p> <p>Chemical equations and balancing</p> <p>Reaction rates and factors affecting them</p> <p>Acids, bases, and pH</p>

	<p>Novel Study "To Kill a Mockingbird" by Harper Lee</p> <p>Short Stories 1. "The Yellow Wallpaper" by Charlotte Perkins Gilman 2. "The Tell-Tale Heart" by Edgar Allan Poe</p> <p>Key Skills Development - Critical analysis techniques - Understanding poetic devices - Contextual analysis - Comparative writing - Literary criticism</p>	<p>One-sided limits Limits at infinity Definition of the derivative using first principles</p> <p>Differential Calculus: Rules of differentiation (power rule, sum and difference rule, constant multiple rule) Derivatives of trigonometric functions Chain rule Product rule Quotient rule Applications of Differential Calculus: Rates of change Tangents and normals to curves Increasing and decreasing functions Maximum and minimum values Optimization problems</p> <p>Indices and Logarithms: Laws of indices Exponential functions Logarithmic functions Solving exponential and logarithmic equations</p>	<p>Unit 3: The Big Bang and the Universe Origin and evolution of the universe Formation of stars and galaxies The solar system and its planets</p> <p>Unit 4: Earth Systems Earth's structure and composition Plate tectonics and geological processes The rock cycle</p>
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		Applications of Indices and Logarithms: Compound interest Exponential growth and decay	
Grade 10 Term 3	<p>Mock HSC Reading to Write</p> <p>Creative Writing Focus</p> <p>1. Short Story Writing</p> <ul style="list-style-type: none"> - Study of "The Lottery" by Shirley Jackson - "The Gift of the Magi" by O. Henry - "The Last Leaf" by O. Henry <p>2. Poetry Writing</p> <ul style="list-style-type: none"> - Study of Contemporary Poets - "Morning Song" by Sylvia Plath - "The Colonel" by Carolyn Forché <p>Novel Study</p> <p>"Lord of the Flies" by William Golding</p> <p>Writing Techniques</p> <ul style="list-style-type: none"> - Narrative perspective - Character development 	<p>Probability, Combinatorics, and Advanced Graphing</p> <p>Probability and Set Notation: Basic probability concepts Set notation (union, intersection, complement) Venn diagrams Conditional probability Independent and dependent events</p> <p>Counting Methods and Permutations: Fundamental Counting Principle Permutations Permutations with repetition Circular permutations Further Permutations and Combinations: Combinations Applications of permutations and combinations</p>	<p>Physics and Environmental Science</p> <p>Unit 1: Motion and Forces Describing motion (speed, velocity, acceleration) Newton's laws of motion Types of forces (gravity, friction, etc.)</p> <p>Unit 2: Energy Forms of energy (kinetic, potential, thermal, etc.) Energy transformations and conservation Work and power</p> <p>Unit 3: Energy in Ecosystems Food chains and food webs Energy flow and pyramids Biogeochemical cycles (carbon, nitrogen, water)</p> <p>Unit 4: Global Issues</p>

	<ul style="list-style-type: none"> - Setting and atmosphere - Symbolism and metaphor - Voice and style 	<p>Graphing Absolutes: Graphs of absolute value functions Solving absolute value equations and inequalities</p> <p>Further Non-linear Graphs: Graphs of rational functions Graphs of exponential and logarithmic functions Transformations of graphs (translations, reflections, stretches, compressions)</p>	<p>Climate change Pollution Resource depletion Sustainability</p>
Grade 10 Term 4	<p>Mock HSC Unseen Text Exam Techniques</p> <p>Skills Focus</p> <p>1. Analysis Techniques</p> <ul style="list-style-type: none"> - Quick reading strategies - Annotation methods - Structure identification - Language analysis - Context interpretation <p>2. Response Writing</p> <ul style="list-style-type: none"> - Essay planning under time constraints - Thesis development - Evidence selection 	<p>Geometry, Statistics, and Network Theory</p> <p>Circle Geometry: Parts of a circle (radius, diameter, chord, tangent, secant) Angles in a circle (central angle, inscribed angle, angle between a tangent and a chord) Cyclic quadrilaterals Tangents from an external point</p> <p>Radians: Definition of a radian Converting between degrees</p>	<p>Advanced Physics and Biology (Review and Extension)</p> <p>Unit 1: Motion (Advanced) Projectile motion Circular motion Momentum and collisions</p> <p>Unit 2: Genetics (Advanced) Gene expression and regulation Biotechnology (genetic engineering, cloning) Human genome project</p> <p>Unit 3: Evolution (Advanced) Population genetics (Hardy-</p>

	<p>- Analysis paragraph structure</p> <p>Practice Texts</p> <p>1. Poetry</p> <ul style="list-style-type: none"> - Various unseen poems from different periods - Focus on contemporary poetry <p>2. Prose</p> <ul style="list-style-type: none"> - Short story excerpts - Novel excerpts - Non-fiction articles <p>3. Visual Texts</p> <ul style="list-style-type: none"> - Political cartoons - Advertisements - Photo essays 	<p>and radians</p> <p>Arc length and sector area using radians</p> <p>Statistics:</p> <p>Types of data (categorical, numerical)</p> <p>Measures of central tendency (mean, median, mode)</p> <p>Measures of dispersion (range, interquartile range, standard deviation)</p> <p>Box plots</p> <p>Histograms</p> <p>Discrete Statistics:</p> <p>Discrete random variables</p> <p>Probability distributions</p> <p>Expected value and variance</p> <p>Graphing and Transformations:</p> <p>Review of graphing techniques</p> <p>Transformations of functions (translations, reflections, stretches, compressions)</p> <p>Networks:</p> <p>Basic concepts of networks (nodes, edges, paths, cycles)</p> <p>Trees and their properties</p> <p>Minimum spanning trees</p>	<p>Weinberg equilibrium)</p> <p>Mechanisms of evolution (genetic drift, gene flow, etc.)</p> <p>Human evolution</p>
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		Applications of networks (e.g., transportation networks, social networks)	
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