

Learn what you need... avoid year long tuitions...

Maths, Physics & Chemistry modules for

CBSE, ISC & INTERMEDIATE

Enrol in our proven training programs **score high** in
Boards & aim top **Tech-schools**

Basic modules for **Boards** & advanced training for

IIT-JEE AIEEE BITSAT

25 Students per batch, early morning & evening classes,

Air-conditioned class rooms.

1472 PAGE students got admission offers from top-tech schools like **IITS, NITs, BITS Pilani** and others like Amrita, Dhirubai, Karunya, Kalinga, LNMittal, Manipal, SRM, Symbiosis since year 2004



For complete details contact : Ameerpet Centre

Ph: 040 - 66254179, Mobile: 9246274447

www.pageacademy.com

Smart students seek our services

Modular learning helps student address his/her weak areas and extend flexibility to choose topics without being repetitive after long school or college working hours.

PAGE lends a new dimension to the classroom coaching in terms of flexible, cost effective content delivery to the specific requirements of the students.

Besides giving students a distinct advantage of high scores in **board exams**, the modular learning ensures the right foundation to tackle **admission tests of Top Tech-schools**.

.

Score - Boards

A program for class XII / Senior Inter students

A very basic course aiming at maximum score in Mathematics, Physics and Chemistry in Intermediate, CBSE, ISC board examinations.

It's a unique modular teaching methodology designed exclusively to supplement your school/college studies.

Score - Boards students got admission offers from Anna university, SASTRA, SSN & UPES based on their Board examination performance.

Very High scores in Board Examination matters a lot for students seeking admission in foreign universities.

Features

- 25 students per batch for personalized training.
- Content delivery by senior teachers only.
- Duration of module-35 sessions of each 1 hour duration.
- Air conditioned classrooms.
- Batch timings : 5 pm to 6 pm or 6 pm to 7 pm or 7 pm to 8 pm.

Physics - 2 Modules

Chemistry - 2 Modules

Maths - 4 Modules

1 module Rs.5000/-

More than one Rs.4500/module

All 8 modules Rs.30,000/-

Score board programme is flexible and students can enroll for 1 module / more than 1 module / 4 module at one point of the time.

Multi-Score

It is an advanced integrated training program exclusively designed to tackle admission tests of India's Top-Tech Schools.

But, just incase, you miss to get through one of those highest level ones like IIT-JEE, you definitely have no reason to worry.

Our advanced course is so comprehensive that it covers all the relevant content related to AIEEE, BITSAT and admission tests of Amrita, Dhirubhai Ambani, GITAM, Kalinga, Karunya, LN Mittal, Manipal, SRM, Symbiosis, UPES & VIT.

Batch strength 40 students.

Timing 5:30 am to 7: 30 am.

For CBSE XII / ISC XII / Senior Inter Students only

Course Fee : Rs.30,000

Features :

- 1) 4 level Class Room Practice Sheets Assignments, Chapter wise sheets
- 2) National level Integrated tests
- 3) Mock testsfor IIT - JEE, AIEEE, VIT, AMRITA, SRM.
Manipal & Gitam online tests after respective board exams.
- 4) BITSAT, Logic & Language with 15 online tests
- 5) Top Tech Schools Admission processing & Selection counselling.

FAQs

Why *Score – Boards* program for 10 + 2 students?

Score – Boards programme helps to have a strong foundation at basic level with at most clarity in fundamentals which enhance students descriptive presentation skill to score maximum in respective board exams. Now 10 + 2 is no more a qualifying exam for various tech schools but many top tech schools admit students in Engineering on the basis of 10 + 2 science percentage .

What is the philosophy of *Multi-Score* and how it is planned?

The course philosophy is very simple - focus on the fundamentals.

The *Multi-Score* program goes beyond the limitations of conventional test preparation techniques and challenges the fundamental knowledge base. The sessions take you through the fundamentals of Physics Chemistry and Mathematics through relevant concepts and exercises to reinforce them. Only when you have a firm grasp of the basics do the actual test preparation sessions unfold. At PAGE, each topic is introduced in the depth and width it deserves with respect to its scope in board exams. This is followed by exhaustive numerical problem-solving exercises on these topics. Students are encouraged to first try on their own without the Instructors' assistance.

Are all the Instructors experienced?

At PAGE, it is the people behind the process that add value to your education. At PAGE, you will be trained by people with expertise in relevant subjects and are in tune with the latest exam patterns, they even solve the actual test on the test day, year after year to post them on the Institute's website.

PAGE faculty do much more than teach, they guide and encourage students and help them in realizing their maximum potential.

How often do you evaluate students?

Efficient time-management and smart study, is what matters most in doing well. We have developed efficient evaluation methodology that lets you constantly assess your examination strategies and benchmark your performance at respective board exams.

Part tests

To ensure that you remain totally in tune with class activities at all times, we conduct weekly 90-minute tests. These are based on what was taught in the past week itself. A score less than 65 in any of these 30-part tests imply that preparation at home requires more diligence. Feedback is regularly conveyed to each student

Mock Tests (or) Pre-Board tests

These tests are modelled on the pattern of the respective board exams & competitive exams like IIT-JEE, AIEEE & BITSAT. Results of these model tests give you a very accurate picture of the real thing. Detailed subject-wise analysis is provided to every student, to enhance his or her performance.

Do you counsel students?

Our core teams of teachers discharge the responsibility of counseling students. Counseling enhances the performance of students and gives them that extra edge. Our counselors play a vital role at different phases of a student's preparation. Systematic tracking of performances, re-strategizing and regular reviews empower the students to handle any test taking situation...

MODULES FOR CLASS XII / SENIOR INTER STUDENTS

PHYSICS MODULE – 1

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

➤ **Magnetism**

Concept of magnetic field, Oersted's experiment. Biot – Savart law and its application to current carrying circular loop. Ampere's law and its applications to infinitely long straight wire, force between two parallel current – carrying conductors-definition of ampere, straight and toroidal solenoids. Force on a current-carrying conductor in a uniform magnetic field. Torque experienced by a current loop in uniform magnetic field; moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter. Force on a moving charge in uniform magnetic and electric fields. Cyclotron. **Coulomb's Inverse Square Law** :- Definition of Magnetic Field, Magnetic Lines of Force, Uniform and Non-Uniform Magnetic Fields. **Couple Acting on a Bar Magnet Placed in a Uniform Magnetic Field** :- Definition of Magnetic Moment (M) of a Magnet. **Magnetic Induction Due to a Bar Magnet on its Axial Line** :- Magnetic Induction Due to a Bar Magnet on its Equatorial Line. **Superposition of Magnetic Fields** :- Tangent Law in Magnetism, Deflection Magnetometer. **Comparison of Magnetic Moments** :- Tan A position – Equal Distance Method, Tan A Position – Null Method, Tan B Position – Equal Distance Method, Tan B Position – Null Method, Verification of Inverse Square Law (Gauss Method). **Vibration Magnetometer** :- Experimental determination of M and B_H . **Types of Magnetic materials** :- Dia, Para and Ferromagnetism

➤ **Electrostatics**

Charges – Conservation of Charges, Additive Property of Charge. Coulomb's Law (Inverse Square Law in Electrostatics), Permittivity of Free Space and Permittivity of Medium, The Force between Two Point Charges. **Force due to Multiple Charges – Principle of Superposition. Electric Field** :- Electric Lines of Force, Intensity of Electric field or Electric field strength (E), Intensity of Electric Field (E) due to an Isolated Point Charge, Electric Intensity due to Multiple Charges. Electrostatic Potential – Definition, Electrostatic Potential due to a Single Point Charge, Electrostatic Potential due to Multiple Charge System, Electrostatic Potential Energy of a System of Charges, Relation between Electrostatic Potential (V) and Electric Intensity (E). Electric Flux. **Capacitance** :- Definition of Electrical Capacitance (Capacity) of a Conductor, Definition of Condenser (or Capacitor), Parallel Plate Capacitor : Formula for Capacitance, Dielectric, Dielectric Strength, Effect of Dielectric on the Capacitance of a Capacitor. **Combination of Capacitors : Resultant Capacitance** : Capacitors in Series, Capacitors in Parallel. **Energy Stored in a Capacitor (or Condenser)** :- Effect of Dielectric on the Energy Stored in a Capacitor (or Condenser). **Types of capacitors and their uses.**

➤ **Current Electricity**

Flow of Electric Charges in a Metallic Conductor, Drift Velocity (v_d), Mobility (μ), Relation between Electric Current and Drift Velocity. **Ohm's Law** :- Limitations of Ohm's Law, Ohmic and Non-ohmic Conductors (Devices), Conductance (G). Specific Resistance or Resistivity (ρ), variation of Resistivity with Temperature, Variation of Resistance with Temperature, Thermistor. **Emf of a Cell** :- Internal Resistance, Terminal Voltage (V), Difference between emf and potential difference, Back emf. **Electrical Energy** :- Electrical Power. **Kirchhoff's Laws** :- Applications of Kirchhoff's Laws – Wheatstone Bridge, Metre Bridge : Determination of Resistance of a Conductor, Drawbacks with Metre Bridge. **Potentiometer**:- Comparison of emfs of two cells and determination of emf of a cell, Determination of Internal Resistance of a Cell. **Series and Parallel Combination of Cells** :- Derivation of Equivalent emf for series and Parallel Combination of cells

➤ **Thermoelectricity**

Seebeck Effect : - Thermo emf, Thermoelectric Series. **Peltier Effect** :- Peltier Coefficient (π), Application of Peltier Effect, Thomson Effect, Thomson's Coefficient (σ) **Variation of Thermo emf with Temperature**

➤ **Electromagnetics**

Oersted's Experiment :- Ampere's Law, Intensity of Magnetic Induction (B) near a Long Straight Conductor, Biot – Savart Law, Magnetic Field at the Centre of a Circular Coil Carrying Current, Magnetic Induction 'B' Along the Axis of a Current Carrying Circular Conductor Coil. **Tangent Galvanometer (TG) – Its Principle and Working. Force on a Moving Charge in Magnetic Induction B** :- Force on a Current Carrying Conductor in a Magnetic Field, Fleming's Left Hand Rule, Force between Two Straight Parallel Current Carrying Conductors, Definition of Ampere. **Current Loop as a Magnetic Dipole** :- Magnetic Dipole Moment of a Revolving Electron, Force and Torque on a Current Loop or Coil in a Uniform Magnetic Field. **Principle, Construction and Working of a Moving coil Galvanometer** :- Comparison of Moving Coil Galvanometer with Tangent Galvanometer, Conversion of Moving coil Galvanometer into Ammeter and Voltmeter Conversion of Galvanometer into Ammeter, Conversion of Galvanometer into Voltmeter. **Electromagnetic induction** :- Magnetic Flux, Induced emf – Faraday's and Lenz's Laws, Fleming's Right Hand Rule. **Self Induction** :- Self Inductance, Mutual Induction, Mutual Inductance, Principle of Transformer. **Growth and Decay of Current in an Inductor** :- Growth and Decay of Charge in a Capacitor. **Alternating Current (ac). Alternating Voltage Applied to a pure Resistor, Pure Inductor and Pure Capacitor** :- Through Pure Resistor Only, Through Pure Capacitor Only. **Circuit Containing Capacitance (C) and Resistance (R) in Series** : Through an Inductor and a Resistor in Series, Circuit Containing Inductance (L) Capacitance (C) and Resistance (R) in Series

PHYSICS MODULE – 2

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

➤ **Wave Motion**

Longitudinal and Transverse waves:- Equation for a Progressive wave, Principle of Superposition of waves, Reflection of waves. Formation of waves on a Stretched string:- Laws of Vibrating strings, Experimental verification of the Laws of vibrating strings by Sonometer. Sound:- Speed of Sound in Solids, Liquids and Gases, Free and Forced Vibrations, Resonance, Standing waves in Organ Pipes, Beats, Importance of Beats. Doppler Effect:- Derivation of Relation for Apparent frequency. Echoes:- Absorption of Sound waves, Reverberation, Reverberation Time, Fundamentals of Building Acoustics, Sabine's Formula

➤ **Optics**

Nature of Light:- Newton's Corpuscular Theory of Light, Huygen's Wave theory, Electromagnetic waves, Electromagnetic Spectrum. **Huygens:-** Explanation of Reflection and Refraction of Plane waves at a Plane surface, Explanation of Reflection of a Plane wavefront at a plane surface, Explanation of Refraction of a plane wavefront at a plane surface. **Refraction Through a Prism:-** Derivation of Refractive index of material of Prism for Minimum deviation, Critical Angle, Total Internal Reflection, Application of Total internal Reflection to Optical Fibres. **Defects in Images:-** Spherical Aberration. **Optical Instruments:-** Simple microscope, Compound Microscope, Astronomical Telescope, Terrestrial Telescope. **Construction of Ramsden's and Huygens' Eyepieces with Ray Diagrams:-** Ramsden's Eyepiece, Huygens' Eyepiece. **Dispersion of Light:-** Dispersive power (ω), Pure and impure spectra Conditions for Obtaining Pure Spectrum, Different Kinds of Spectra, Absorption Spectra, Fraunhofer lines and their significance, Significance of Emission and Absorption Spectra

➤ **Dual Nature of Matter and Radiation**

Dual nature of radiation. Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light. Matter waves-wave nature of particles, de Broglie relation. Davisson-Germer experiment. Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron. Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis. Torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid, magnetic field lines; Earth's magnetic field and magnetic elements. Para-, dia – and ferro – magnetic substances, with examples. Electromagnets and factors affecting their strengths. Permanent magnets.

➤ **Atomic Physics**

Discovery of Electron :- Determination of Specific. Charge $\frac{e}{m}$ of an Electron – Thomson

Method, Charge of the Electron – Millikan's Oil Drop Method. **Photoelectric**

Effect – Experimental Study of Photoelectric Effect, Laws of Photoelectric Emission, Einstein's explanation of Photoelectric Effect – Einstein's Photoelectric Equation. **Production of X-rays** :- Coolidge X-ray Tube, X-ray Spectra, Moseley's Law. **Compton Effect. Dual Nature of Matter – de Broglie Hypothesis**

➤ **Nuclear Physics**

Composition of Nucleus – Size of the Nucleus, Mass Defect and Binding Energy, Relation between Mass Defect and Binding Energy, Natural Radioactivity, Alpha Radiation, Gamma Radiation, Properties of Alpha Rays, Properties of Beta Rays, Properties of Gamma Rays, Radioactive Decay Law, Half Life of a Radioactive Substance Average Life of a Radioactive Substance, Nuclear Forces, Artificial Transmutation of Elements, Discovery of Neutron, Radioisotopes and Their Uses. **Nuclear Fission** :- Chain Reaction, Principle and Working of a Nuclear Reactor, Nuclear Radiation Hazards, Protective Shielding, Types of Reactors, Breeder Reactors, Power Reactors, Uses of Nuclear Reactors. **Nuclear Fusion** :- Energy of the Sun and Stars, Carbon – Nitrogen Cycle, Proton – Proton Cycle, Elementary Particles.

➤ **Semiconductor Devices**

Intrinsic Semiconductors :- Extrinsic Semiconductors, n-type Semiconductors, p-type Semiconductors. **Junction Diode** :- p-n Junction – Depletion Layer and Barrier Potential, Forward Bias, Voltage – Current (V-I) Characteristics, Junction Diode as Rectifier, Half Wave Rectifier, Full Wave Rectifier, Zener Diode, Zener Diode as Voltage Regulator. **Transistors** :- p-n-p Transistor, n-p-n Transistor, Transistor Configurations, Transistor Characteristics, Transistor as Amplifier (CE Mode). **Logic Gates** : AND gate, OR Gate, NOT Gate, NOR Gate, NAND Gate.

➤ **Communication System**

Elements of a Communication System. Bandwidth of Signals (speech, TV and digital data). Band width of transmission medium. Propagation of Electromagnetic Waves in the Atmosphere :- Ground Wave, Sky Waves, Space Wave. **Modulation – Need for Modulation**

CHEMISTRY MODULE – 1

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

➤ **Solutions**

Classification of solutions. Dilute solutions, vapour pressure, Raoult's law, Limitations of Raoult's law. Colligative properties. Elevation of Boiling points of solution of non-volatile solution- Its relation to molar mass the solute. Depression of freezing point – of solution of non-volatile solute – Its relation to molar mass. Osmosis and osmotic pressure – theory of dilute solutions. Determination of molar mass at a solute using colligative properties

➤ **Solid State**

Classification of solids based on different binding forces as molecular, ionic, covalent solids, and metallic solids. Treatment of metallic bond (elementary ideas) and metallic solids. Amorphous and crystalline solids. Unit cell in two dimensional and three dimensional lattices. Seven crystal systems, Bravas lattices. Bragg's equation; X-ray study of crystal structure, Bragg's method. Calculation of density of unit cell, packing in solids; voids; number of atoms per unit cell. Point defects – Schottky and Frenkel defects. Electrical and magnetic properties

➤ **Electrochemistry**

Conductance in electrolytic solutions. Specific and molar conductances – variation of conductance with concentration. Kohlrausch's law – application and calculation of equivalent conductance of weak electrolytes. Electrolytes and non-electrolytes, redox, reactions, Electrolysis. Some typical examples of electrolysis. Faraday's laws of electrolysis and applications. Galvanic and voltaic cells. Representation and notation of electrochemical cells with and without salt bridge. Standard hydrogen electrode, electrode potentials, electrochemical series. EMF of the cell. Nernst equation and its application to calculate EMF of electrochemical cells. Primary cell – dry cell/Leclanche cell, secondary cells – fuel cells – H₂, O₂, fuel cell and hydrocarbon – oxygen fuel cell. Corrosion – mechanism, factors to promote corrosion and prevention of corrosion passivity. Lead accumulator

➤ **Chemical Kinetics, Chemical Equilibrium and Acids and Basis**

Concept of reaction rate, factors effecting reaction rates. Rate law, Units of rate constant. Order and molecularity; Methods of determination of order of reaction. Integrated rate equations and half lives for zero and first order reactions. Collision theory of reaction rates (elementary ideas), concepts of activation energy. Equilibrium. Factors affecting equilibrium. Relation between K_p and K_c. Le Chatelier's principle, and its application to Industrial processes synthesis of Ammonia and Sulphur trioxide. Acids and Bases. Lewis theory, limitation of Lewis theory, Ionic equilibrium. Ionization of acids and bases, strong and weak electrolytes degree of ionization, ionic product of water. Concept of pH. Hydrolysis of salts, hydrolysis constant, buffer solutions, solubility product and common ion effect with illustrative examples

➤ **Surface Chemistry**

Adsorption; physical and chemical adsorption, adsorption of gases on solids, factors effecting it – pressure (Langmuir and Freundlich Isotherms) and temperature. Catalysis – types of catalysis, autocatalysis. Colloidal state : colloidal solution, protective collides and Gold number. Emusions, classification of emulsions, micelles, cleansing action of soap. Properties of colloids – Tyndall effect, Brownian movement, Coagulation

➤ **Thermodynamics**

Concepts of system, types of systems, surroundings, work heat, energy, extensive and intensive properties, state functions. First law of thermodynamics. Heat capacity (C) and specific heats. Exothermic and endothermic reactions. Enthalpies of bond dissociation, combustion, neutralization, formation, atomization, sublimation, phase transition, ionization and dilution. Thermo chemical equations. Hess's law of constant heat summation. Driving force for a spontaneous process. Thermodynamic representation of criteria of spontaneous process in terms of entropy. Entropy as a state function. Gibbs free energy, Gibbs free energy change for spontaneous non-spontaneous and equilibrium process

➤ **Polymers**

Classification. Polymerization process. Natural rubber, vulcanization of rubber, synthetic rubber. Molecular weights of polymers – Number average and weight average molecular weights definition only. Biopolymers, biodegradable polymers. Some commercially important polymers

➤ **Biomolecules**

Classification (aldoses and ketoses). Monosaccharides (glucose and fructose). Oligosaccharides (sucrose, lactose, maltose). Polysaccharides (starch cellulose, glycogen). Importance of carbo hydrates. Elementary idea of a – amino acids, peptide bond. Polypeptides, proteins. Structure of proteins (primary, secondary, tertiary and quaternary structures). Denaturation of proteins; enzymes. Classification. Functions in biosystems. Types of nucleic acids, primary building blocks of nucleic acids. Chemical composition of DNA & RNA. Primary structure of DNA and its double helix. Replication. Transscription and protein synthesis. Heridity – the genetic code. Classification and structures of lipids. Functions in biosystems. Classification, structural features of Hormones. General biological functions at animal hormones

➤ **Chemistry in everyday life**

Uses of chemical in medicine. Non-narcotics (Aspirin, Ibuprofen). Antipyretic (Analgin, phenacetin and paracetamal). Tranquilizers (barbituric acid, Luminal, seconal, valium, serotonin). Antiseptics (Chloroxylenol, bithional), disinfectants (formain, Formaldehyde). Antimicrobials (lysozyme, lactic acid, hydrochloric acid in stomach). Anti fertility drugs (oral pills etc). Antibiotics (pencillin, chloramphenical, sulphadiazine). Antiacids (omeprazole, lansoprazole), antihistamines (histidine). Chemicals in food preservatives (sodium benzoate, sulphurdioxide, potassium metabisulphite etc). Artificial sweetening agents (Aspartame, alitane, sucralose)

CHEMISTRY MODULE – 2

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

➤ **p-Block elements : Group 15 Elements : (VA Group elements)**

Occurrence. General characteristics of hydrides, structure of hydrides. General characteristics of oxides. General characteristics of halides. General characteristics of oxoacids of nitrogen. Oxoacids of phosphorus. Preparation and uses of nitric acid and ammonia. Super phosphate of lime

➤ **Group 16 Elements : (VIA Group Elements)**

Occurrence, electronic configuration, oxidation states. Physical states of oxygen and sulphur and their structure, allotropy. General characteristics of hydrides, oxides and halides. Structural aspects of oxyacids of chalcogens. Ozone, uses of ozone. Sodium thiosulphate. Sulphuric acid – industrial process of manufacture

➤ **Group 17 Elements : (VIIA Group Elements)**

Occurrence, electronic configuration and oxidation states. Physical states of halogens. I.P. values, electro negativity and electron affinity, bond energies, chemical reactivity, oxidizing power of fluorine, chlorine. Structural aspects of oxy acids of chlorine. Preparation, properties and uses of fluorine, chlorine and bleaching powder. Interhalogen compounds (structures only)

➤ **Transition Elements**

General introduction, electronic configuration, Occurrence and characteristics of transition metals. General trends in properties of first row transition metals

➤ **Lanthanides**

Electronic configuration, different oxidation states. Chemical reactivity and lanthanide contraction. Co-ordination compounds. Werner's theory of coordination compounds. Valence bond theory – shapes of coordination compounds. IUPAC nomenclature of mono molecular coordination compounds. Bonding, Isomerism, EAN rule. Importance of coordination compounds in qualitative analysis

➤ **Organic Chemistry**

Nomenclature, nature of C-X bond. Ethyl chloride and chloroform : preparation, physical and chemical properties. Mechanism of substitution reactions SN_1 and SN_2 . Nomenclature and Nature of C-X bond. Chlorobenzene substitution reactions (directive influence of halogen for monosubstituted compounds only). Nomenclature, methods of preparation ethyl alcohol. Physical and chemical properties of primary alcohols. Identification of primary, secondary and tertiary alcohols. Mechanism of dehydration. Uses of some important compounds – (methanol and ethanol). Nomenclature, methods of preparation of phenol. Physical and chemical properties. Acidic nature of phenol. Electrophilic substitution reactions of phenols. Uses of phenols. Nomenclature of ethers. Methods of preparation diethyl ether. Physical and chemical properties, uses. Nomenclature of aldehydes and ketones. Nature of carbonyl group. Methods of preparation of acetaldehyde and acetone. Physical and chemical properties. Mechanism of nucleophiles addition reaction of carbonyl compounds. Reactivity of a hydrogen in aldehydes. Nomenclature of carboxylic acids. Acidic nature. Methods of preparation of acetic acid. Physical and chemical properties. Uses of acidic acid. Preparation, properties and uses at nitrobenzene

➤ **Amines**

Nomenclature of amines. Classifications. Structure, methods of preparation of aniline, physical and chemical properties. Uses of Aniline. Identification of primary secondary and tertiary amines. Preparation of diazonium salts. Chemical reactions and importance in synthetic organic chemistry. Azodyes; uses

MATHEMATICS MODULES FOR SENIOR INTER STUDENTS

MODULE – 1

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

➤ **Partial Fractions**

Rational Fractions. Partial Fractions of $\frac{f(x)}{g(x)}$, when $g(x)$ contains non-repeated

linear factors. Partial Fractions of $\frac{f(x)}{g(x)}$, when $g(x)$ contains repeated and non-

repeated linear factors. Partial fractions of $\frac{f(x)}{g(x)}$, when $g(x)$ contains irreducible factors.

➤ **Quadratic Expressions**

Quadratic Expressions, Equations in one Variable. Sign of quadratic expressions, change in signs and maximum and minimum values. Quadratic inequations

➤ **Theory of Equations**

Relation between the roots and the coefficients in an equation. Solving an equation when two or more of its roots are connected by certain relations. Equations with real coefficients – occurrence of complex roots in conjugate pairs and its consequences. Transformations of equations – Reciprocal equations

➤ **Matrices**

Types of matrices. Scalar multiple of a matrix and multiplication of matrices. Transpose of a matrix. Determinants. Adjoint and inverse of a matrix. Solutions of simultaneous linear equations

➤ **Exponential and Logarithmic Series**

Infinite series and power series. Expansion of e^x for real x . Expansion of $\log_e(1+x)$, when

MODULE – 2

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

➤ **Permutations and Combinations**

Linear and circular permutations. Permutations of n dissimilar things taken r at a time. To prove ${}^n P_r = ({}^{n-1} P_r + r \cdot ({}^{n-1} P_{(r-1)})$. Permutations when repetitions are allowed. Circular Permutations. Permutations in which some are alike and the rest are different. Combinations. Certain theorems on combinations

➤ **Binomial Theorem**

Binomial theorem for positive integral index. Binomial theorem for rational index. Approximations using binomial theorem

➤ **Probability**

Random experiments and events. Classical definition of probability, axiomatic approach and addition theorem of probability. Independent and dependent events Conditional probability, Multiplication theorem and Baye's theorem

➤ **Random variables and Probability Distributions**

Random variables. Theoretical discrete distributions : Binomial and Poisson distributions

MODULE – 3

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

➤ **Integration**

Integration as the inverse process of differentiation, standard forms and properties of integrals. Integration by the method of substitution – Integration of algebraic and trigonometric functions. Integration by parts – Integration of exponential, logarithmic and inverse trigonometric functions. Integration of rational functions using partial fractions. Reduction Formulae

➤ **Definite Integration**

The definite integral. Interpretation of definite integral as an area. The fundamental theorem of integral calculus. Properties of definite integrals. Reduction formulae

➤ **Numerical Integration**

Determination of plane areas involving second degree curves. Trapezoidal rule and Simpson's rule – Simple applications

➤ **Differential Equations**

Formation of differential equations – Degree and order of an ordinary differential equation. Solving differential equations

MODULE – 4

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

➤ **Circle**

Equation of a circle. Positions of a point with respect to a circle – Definition of a tangent. Position of a straight line in the plane with respect to a circle. Equation of chord of contact and polar. Relative position of two circles. Sphere (3 dimensions)

➤ **Systems of Circles**

Angle between two intersecting circles. Radical axis of two circles. Coaxial system of circles. Orthogonal system of a coaxial system of circles

➤ **Parabola**

Conic sections. Equation of tangent and normal at a point on the parabola. Pole and Polar

➤ **Ellipse**

Equation of ellipse in standard form, parametric equations. Equation of tangent and normal. Pole and Polar

➤ **Hyperbola**

Equations of hyperbola in standard form – Parametric equations. Certain important properties of a hyperbola

➤ **Polar Coordinates**

Polar coordinates relation between polar and Cartesian coordinates. Polar equations of a straight line.

MATHEMATICS MODULES FOR CBSE CLASS XII STUDENTS

MODULE – 1

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

➤ **Relations and Functions**

Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions. Composite functions, inverse of a function. Binary operations.

➤ **Inverse Trigonometric Functions**

Definition, range, domain principle value branches. Graphics of inverse trigonometric functions. Elementary properties of inverse trigonometric functions.

Algebra

➤ **Matrices**

Concept, notation, order, equality, types of matrices, zero matrix, transpose of a matrix, symmetric and skew symmetric matrices. Addition, multiplication and scalar multiplication of matrices, simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order

➤ **Determinants**

Determinant of a square matrix (up to 3×3 matrices), properties of determinants, minors, co-factors and applications of determinants in finding the area of a triangle. adjoint and inverse of a square matrix. Consistency, inconsistency and number of solutions of system of linear equations by examples, solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.

MODULE – 2

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

Calculus

➤ **Continuity and Differentiability**

Continuity and differentiability, derivative of composite functions, chain rule, derivatives of inverse trigonometric function, derivative of implicit function. Concept of exponential and logarithmic functions and their derivative. Logarithmic differentiation. Derivative of functions expressed in parametric forms. Second order derivatives. Rolle's and Lagrange's Mean Value Theorems (without proof) and their geometric interpretations.

➤ **Applications of Derivatives**

Applications of derivatives : rate of change, increasing/decreasing functions, tangents & normal's, approximation, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).

➤ **Integrals**

Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, only simple integrals of the type to be evaluated. Definite integrals as a limit of a sum, Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals.

➤ **Applications of the Integrals**

Applications in finding the area under simple curves, especially lines, areas of circles/parabolas/ellipses (in standard form only), area between the two above said curves (the region should be clearly identifiable).

➤ **Differential Equations**

Definition, order and degree, general and particular solutions of a differential equation. Formation of differential equation whose general solution is given. Solution of differential equations by method of separation of variables, homogenous differential equations of first order and first degree. Solutions of linear differential equation of the type where p and q are functions of x .

MODULE – 3

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

Vectors and Three-dimensional Geometry

➤ **Vectors**

Vectors and scalars, magnitude and direction of a vectors. Direction cosines/ratios of vectors. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of vector, addition of vectors, multiplication of a vector by a scalar, position dividing a line segment in a given ratio. Scalar (dot) product of vectors, projection of a vector on a line. Vector (cross) product of vectors.

➤ **Three – dimensional Geometry**

Direction cosines/ratios of a line joining two points. Cartesian and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Angle between (i) two lines, (ii) two planes. (iii) a line and a plane. Distance of a point from a plane.

MODULE – 4

Learn what you need - If you have not followed the following topics at your school / college, we extend the flexibility to enrol for this module comprising 35 hours (Fee : Rs.5,000)

➤ **Linear Programming**

Introduction, definition of related terminology such as constraints, objective function, optimization, different types of linear programming (L.P. >0 problems, mathematical formulation of L.P. problems, graphical method of solution for problems in two variables, feasible and infeasible regions, feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints).

➤ **Probability**

Multiplication theorem and probability. Conditional probability, independent events, total probability, Baye's theorem, Random variable and its probability distribution, mean and variance of random variable. Repeated independent (Bernoulli) trials and Binomial distribution.



Ameerpet - F.No. 102, 1st Floor, Pancom Business Centre, Ameerpet 'x' Roads

www.pageacademy.com * www.iitjee.page.com * www.aieeepage.com * www.bitsatpage.com