

# **LOYOLA HIGH SCHOOL, PATNA-800010**

## **SYLLABUS FOR CLASS-12 SCIENCE (2025-2026)**

<b>ENGLISH</b>			
<b>MONTH</b>	<b>Units/Subunits/ Topics/ Chapters to be Covered</b>	<b>Details of Activity/ Practice al / Projects to be given</b>	<b>Unit Tests / Formative/ Tests/ Assignment</b>
APRIL	Literature Flamingo 1. The Last Lesson (Prose) 2. My Mother at Sixty- Six (Poetry) Vistas 1. The Third Level Writing - Notice Writing and its types	1. Write a notice for your school notice- board based on the upcoming events. 2. Write a diary entry sharing your nostalgic experiences.	
MAY	Literature - Flamingo 1. The Lost Spring (Prose) Vistas The Tiger King (Prose) Writing: The letter to the Editor	1. Write an article on the state of Education system in Bihar for your school magazine. 2. Group discussion: on environmental hazards and human threats.	Test 1:- APRIL & MAY (05-05-2025) (Flamingo) 1. The Last Lesson 2. My Mother at Sixty-Six 3. The Lost Spring (Vistas) 1. The Third Level 2. The Tiger King (Writing Section) Notice 1. Writing and its types 2. Letter to the Editor
JUNE	Literature-Flamingo 1. Deep Water (Prose) Vistas 1. Journey to the end of the Earth (Travelogue) Writing- Letter for Job Application	1. Read the autobiographies of prominent writers and share their reviews in class.	
JULY	Flamingo 1. The Rattrap (Prose) 2. Keeping Quiet (Poetry) Vistas 1. The Enemy Invitation Writing and Reply	1. Draft an invitation letter for your school function on A-4 size sheet and submit. 2. Group Discussion: on the environmental hazards and human threats. 3. Write a review of some patriotic films.	Test 2 (21-07-2025) Flamingo 1. Deep water (Prose) 2. Journey to the end of the Earth (Travelogue) 3. Keeping Quiet 4. The Rattrap 5. The Tiger King Writing section 1. Job Application 2. Invitation Writing and Reply
AUG	Flamingo 1. Indigo 2. Poets and Pancakes (Prose) 3. A Thing of Beauty (Poetry) Writing : Article writing	1. Students can prepare a PPT based on Indian National Movement. 2. Students can form groups and enact a scene from the given text	
SEPT	Flamingo 1. The Interview (Prose) 2. A Roadside Stand (Poetry)	1. Conduct an interview session of your most admirable person. 2. Write an article on the struggles of the street vendors.	<b>SENT-UP EXAM:</b> Literature -Flamingo 1. The Last Lesson (Prose) 2. My Mother at Sixty- Six (Poetry) 3. The Lost Spring (Prose) 4. Deep Water (Prose) 5. The Rattrap (Prose) 6. Keeping Quiet (Poetry) 7. Indigo 8. A Thing of Beauty Vistas 1. The Third Level (Prose) 2. The Tiger King (Prose) 3. Journey to the end of the Earth (Prose) 4. The Enemy (Prose) Writing Section Short-Notice Writing, Letter to the Editor, Letter for Job Application, Invitation letter

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			and reply. Article Writing
OCT	Flamingo 1.Going Places (Prose) 2. Aunt Jennifer's Tigers (Poetry) Writing-Report Writing	1. Prepare a report on the recent occurrences or events happening in the society submit it as an assignment.	
NOV	Vistas 1. On the Face of it. 2. Memories of Childhood (Prose) Flamingo 1. Revision Writing Revision	1. Write an narrative or share an anecdote on any positive incident from your life. 2. Make a collage depicting the memories of your childhood and write a paragraph on it.	
DEC	<b>REVISION</b>	PROJECT SUBMISSION	PRE BOARD -1 Entire syllabus
JAN	<b>AISSCE (CBSE) Board's Practical</b>	Conducting practicals ASL	PRE BOARD -2 <b>Whole Syllabus</b>

### PHYSICS

MONTH	Units/Subunits/ Topics/ Chapters to be Covered	Details of Activity /Practical/ Projects to be given	Unit Tests /Formative Tests/Assignment
APRIL	<b>Unit I: Electrostatics</b> <b>Chapter-1: Electric Charges and Fields</b> Electric charges, Conservation of charge, Coulomb's law-force between two- point charges, forces between multiple charges; superposition principle and continuous charge distribution. Electric field, electric field due to a point charge, electric field lines, electric dipole, electric field due to a dipole, torque on a dipole in uniform electric field. Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field inside and outside). <b>Chapter-2: Electrostatic Potential and Capacitance</b> Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges;	PROJECTS ALLOTMENT	PROJECTS (Asper suggested List)
MAY	equipotential surfaces, electrical potential energy of a system of two-point charges and of electric dipole in an electrostatic field. Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarization, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor (no derivation, formulae only). <b>Unit II: Current Electricity</b> <b>Chapter-3: Current Electricity</b> Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, V-I characteristics (linear and non-linear),		<b>MONDAY TEST - 01</b> [05/05/2025] Syllabus:Chapter-1: Electric Charges and Fields
JUNE	electrical energy and power, electrical resistivity and conductivity, temperature dependence of resistance,		
JULY	Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel, Kirchhoff's rules, Wheatstone bridge. <b>Unit III: Magnetic Effects of Current and Magnetism</b> <b>Chapter-4: Moving Charges and Magnetism</b> Concept of magnetic field, Oersted's experiment. Biot - Savart law and its application to current	<b>Expt 1:</b> To determine resistivity of two / three wires by plotting a graph for potential difference versus current. <b>Expt 2:</b> To find resistance of a given wire / standard resistor using metre bridge. Activity 1: To assemble a household circuit comprising three bulbs, three	<b>MONDAY TEST - 02</b> [21/07/2025] Syllabus: <b>Chapter-2:</b> Electrostatic Potential and Capacitance <b>Chapter-3:</b> Current Electricity

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	<p>carrying circular loop. Ampere's law and its applications to infinitely long straight wire. Straight solenoid (only qualitative treatment), force on a moving charge in uniform magnetic and electric fields. Force on a current-carrying conductor in a uniform magnetic field, force between two parallel current-carrying conductors-definition of ampere, torque experienced by a current loop in uniform magnetic field; Current loop as a magnetic dipole and its magnetic dipole moment, moving coil galvanometer- its current sensitivity and conversion to ammeter and voltmeter. <b>Chapter-5:</b> Magnetism and Matter , Bar magnet, bar magnet as an equivalent solenoid (qualitative treatment only),</p>	(on /off) switches, a fuse and a power source.	
AUG	<p>magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis (qualitative treatment only), torque on a magnetic dipole (bar magnet) in a uniform magnetic field (qualitative treatment only), magnetic field lines. Magnetic properties of materials- Para-, dia - and ferro – magnetic substances with examples, Magnetization of materials, effect of temperature on magnetic properties. <b>Unit IV:</b> Electromagnetic Induction and Alternating Currents Chapter-6: Electromagnetic Induction Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Self and mutual induction. <b>Chapter-7:</b> Alternating Current Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LCR series circuit (phasors only), resonance, power in AC circuits, power factor, wattless current. AC generator, Transformer.</p>	<p><b>Expt3.</b> To verify the laws of combination (series/ Parallel) of resistances using a metre bridge. <b>Expt 4.</b> To determine resistance of a galvanometer by half-deflection method and to find its figure of merit. <b>Activity 2:</b> To assemble the components of a given electrical circuit.</p>	
SEPT	<p><b>Unit V: Electromagnetic waves</b> <b>Chapter-8:</b> Electromagnetic Waves Basic idea of displacement current, Electromagnetic waves, their characteristics, their transverse nature (qualitative idea only). Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses. Unit VI: Optics <b>Chapter-9:</b> Ray Optics and Optical Instruments Ray Optics: Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and optical fibers, refraction at spherical surfaces, lenses, thin lens formula, lens maker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism.</p>	<p><b>Expt 5.</b> To find the value of <math>v</math> for different values of <math>u</math> in case of a concave mirror and to find the focal length. <b>Expt6:</b> To find the focal length of a concave lens, using a convex lens. <b>Activity3 :</b> To draw the diagram of a given open circuit comprising at least a battery, Resistor /rheostat, key, ammeter and voltmeter. Mark the components that are not connected in proper order and correct the circuit and also the circuit diagram.</p>	<p>Send UP Examination FROM - 08/09/2025 Syllabus: [Unit I: Electrostatics Unit II: Current Electricity Unit III: Magnetic Effects of Current and Magnetism Unit IV: Electromagnetic Induction and Alternating Currents ]</p>
OCT	<p>Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers. Chapter-10: Wave Optics Wave optics: Wave front and Huygen's principle, reflection and refraction of plane wave at a</p>	<p><b>Expt 7:</b> To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation. <b>Expt 8:</b> To draw the I-V</p>	

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	plane surface using wave fronts. Proof of laws of reflection and refraction using Huygen's principle. Interference, Young's double slit experiment and expression for fringe width (No derivation final expression only), coherent sources and sustained interference of light, diffraction due to a single slit, width of central maxima (qualitative treatment only).	characteristic curve for a p-n junction diode in forward and reverse bias. <b>Activity 4:</b> To identify a diode, an LED, a resistor and a capacitor from a mixed collection of such items.	
NOV	<b>Unit VII:</b> Dual Nature of Radiation and Matter <b>Chapter-11:</b> Dual Nature of Radiation and Matter Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light. Experimental study of photoelectric effect Matter waves-wave nature of particles, de-Broglie relation. <b>Unit VIII: Atoms and Nuclei</b> <b>Chapter-12: Atoms</b> Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom, Expression for radius of nth possible orbit, velocity and energy of electron in nth orbit, hydrogen line spectra (qualitative treatment only). <b>Chapter-13: Nuclei</b> Composition and size of nucleus, nuclear force Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission, nuclear fusion. <b>Unit IX: Electronic Devices</b> <b>Chapter-14:</b> Semiconductor Electronics: Materials, Devices and Simple Circuits Energy bands in conductors, semiconductors and insulators (qualitative ideas only) Intrinsic and extrinsic semiconductors- p and n type, p-n junction Semiconductor diode - I-V characteristics in forward and reverse bias, application of junction diode -diode as a rectifier.	<b>Activity 5 :</b> To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab. <b>Activity 6 :</b> To study the nature and size of the image formed by a (i) convex lens, or (ii) concave mirror, on a screen by using a candle and a screen (for different distances of the candle from the lens/mirror).	
DEC	REVISION - Completion of left over Practicals and PROJECTS , PRE BOARD -1 - [Complete Syllabus]		
JAN-FEB	AISSCE (CBSE) Board's Practical , PRE BOARD -2 - [Complete Syllabus]		
<b>CHEMISTRY</b>			
<b>MONTH</b>	<b>UNITS/SUBUNITS/ TOPICS/ CHAPTERS TO BE COVERED</b>	<b>Details of Activity/Practical/ Projects to be given</b>	<b>Unit Tests /Formative Tests/Assignment</b>
APRIL	<b>UNIT - 1 SOLUTIONS -</b> Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, Raoult's law, colligative properties - relative lowering of vapor pressure, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Van't Hoff factor <b>UNIT - 2 ELECTROCHEMISTRY -</b> Redox reactions, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells		
MAY	Relation between Gibbs energy change and EMF of a cell, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis and law of electrolysis (elementary idea), dry cell-electrolytic cells and Galvanic cells, lead accumulator, fuel cells, corrosion. <b>UNIT - 3 CHEMICAL KINETICS -</b> Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law		MONDAY TEST -01 (12/05/2025) SYLLABUS UNIT-01

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	and specific rate constant.		
JUNE	Integrated rate equations and half-life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment), activation energy, Arrhenius equation. <b>UNIT – 6 Haloalkanes and Haloarenes</b> <b>Haloalkanes</b> - Nomenclature, nature of C–X bond, preparation of Haloalkanes and Haloarenes, physical properties. chemical properties, optical rotation mechanism of substitution reactions.	1. Determination of concentration/ molarity of KMnO <sub>4</sub> solution by titrating it against a standard solution of: 1. Oxalic acid, 2. Ferrous Ammonium Sulphate	
JULY	<b>Haloalkanes</b> - chemical properties, optical rotation mechanism of substitution reactions. <b>Haloarenes:</b> Nature of C–X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only). Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT. <b>UNIT – 7 ALCOHOLS, PHENOLS and ETHER.</b> <b>Alcohols:</b> Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration, uses with special reference to methanol and ethanol <b>Phenols:</b> Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reactions, uses of phenols.	1. Determination of concentration/ molarity of KMnO <sub>4</sub> solution by titrating it against a standard solution of: 1. Oxalic acid, 2. Ferrous Ammonium Sulphate	<b>MONDAY TEST -02 (28/07/2025)</b> SYLLABUS UNIT-02,03 & 06
AUG	<b>Ethers:</b> Nomenclature, methods of preparation, physical and chemical properties, uses <b>UNIT – 8 ALDEHYDES, KETONES and CARBOXYLIC ACIDS.</b> <b>Aldehydes and Ketones:</b> Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses. <b>Carboxylic Acids:</b> Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.	<b>K.Qualitative analysis</b> Determination of one anion and one cation in a given salt Cations: <b>Pb<sup>2+</sup>, Cu<sup>2+</sup>, Al<sup>3+</sup>, Fe<sup>3+</sup>, Mn<sup>2+</sup>, Ni<sup>2+</sup>, Zn<sup>2+</sup>, Co<sup>2+</sup>, Ca<sup>2+</sup>, Sr<sup>2+</sup>, Ba<sup>2+</sup>, Mg<sup>2+</sup>, NH<sup>4+</sup></b> Anions: <b>CO<sub>3</sub><sup>2-</sup>, S<sup>2-</sup>, SO<sub>3</sub><sup>2-</sup>, NO<sub>3</sub><sup>-</sup>, NO<sub>2</sub><sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup>, I<sup>-</sup>, SO<sub>4</sub><sup>2-</sup>, PO<sub>4</sub><sup>3-</sup>, CH<sub>3</sub>COO<sup>-</sup>, C<sub>2</sub>O<sub>4</sub><sup>2-</sup></b>	
SEPT	<b>UNIT – 9 AMINES –</b> <b>Amines:</b> Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.	<b>K.Qualitative analysis</b> Determination of one anion and one cation in a given salt Cations: <b>Pb<sup>2+</sup>, Cu<sup>2+</sup>, Al<sup>3+</sup>, Fe<sup>3+</sup>, Mn<sup>2+</sup>, Ni<sup>2+</sup>, Zn<sup>2+</sup>, Co<sup>2+</sup>, Ca<sup>2+</sup>, Sr<sup>2+</sup>, Ba<sup>2+</sup>, Mg<sup>2+</sup>, NH<sup>4+</sup></b> Anions: <b>CO<sub>3</sub><sup>2-</sup>, S<sup>2-</sup>, SO<sub>3</sub><sup>2-</sup>, NO<sub>3</sub><sup>-</sup>, NO<sub>2</sub><sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup>, I<sup>-</sup>, SO<sub>4</sub><sup>2-</sup>, PO<sub>4</sub><sup>3-</sup>, CH<sub>3</sub>COO<sup>-</sup>, C<sub>2</sub>O<sub>4</sub><sup>2-</sup></b>	<b>Send UP Examination FROM 08/09/2025</b> <b>SYLLBUS: UNIT-01,02,03,06&amp; 07</b>
OCT	<b>Diazonium salts:</b> Preparation, chemical reactions and importance in synthetic organic chemistry. <b>UNIT – 10 BIOMOLECULES –</b> <b>Carbohydrates</b> - Classification (aldoses	<b>H.Tests for the functional groups present in organic compounds</b> Unsaturation, alcoholic, phenolic, aldehydic, ketonic,	

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	and ketoses), monosaccahrides (glucose and fructose), D-L configuration, oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); Importance of carbohydrates. <b>Proteins</b> -Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins; enzymes. Hormones - Elementary idea excluding structure. <b>Vitamins</b> - Classification and functions. <b>Nucleic Acids:</b> DNA and RNA.		
NOV	<b>UNIT – 4 d and f Block Elements</b> General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> and KMnO <sub>4</sub> . <b>Lanthanides</b> - Electronic configuration, oxidation states, chemical reactivity and lanthanide contraction and its consequences. <b>Actinides</b> - Electronic configuration, oxidation states and comparison with lanthanides <b>UNIT – 5 Coordination compounds –</b> Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT; structure and stereoisomerism, importance of coordination compounds (in qualitative analysis, extraction of metals and biological system).	<b>H.Tests for the functional groups present in organic compounds</b> carboxylic and amino (Primary) groups	
DEC	<b>REVISION</b> - Completion of left over Practicals and PROJECTS , PRE BOARD -1		
JAN	<b>AISSCE (CBSE) Board's Practical</b> , PRE BOARD -2		
<b>BIOLOGY</b>			
MONTH	Units/Subunits/Topics/ Chapters to be Covered	Details of Activity/Practical/ Projects to be given	Unit Tests /Formative Tests/Assignment
APRIL	<b>Unit-VII Genetics and Evolution</b> <b>Chapter-4:</b> Principles of Inheritance and Variations. Mendelian inheritance; deviations from Mendelism,linkage and crossing over; Sex determination - in humans, birds and honey bee; Mendelian and chromosomal disorders in humans. <b>Chapter-5:</b> Molecular Basis of Inheritance Search of genetic material, structure of DNA and RNA, Central Dogma of life, DNA replication; transcription.		
MAY	<b>Chapter-5:</b> Molecular Basis of Inheritance Translation, genetic code, gene expression and regulation. Human and rice genome projects; DNA Fingerprinting.		
JUNE	<b>Unit-VI Reproduction</b> <b>Chapter-2:</b> Sexual Reproduction in Flowering Plants Flower structure, Pre Fertilization-structures and events, pollination,		
JULY	post fertilization -structures and events <b>Chapter-2:</b> Human Reproduction	Experiments no-1 Spotting no-1,2,3,4,5,8	UT-1: 14/07/2025.

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	Male and female reproductive systems;gametogenesis, menstrual cycle; fertilization, pregnancy and embryonic development <b>Chapter-3: Reproductive Health</b> Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control methods, infertility and assisted reproductive technologies		Chapter-4,5
AUG	<b>Unit-IX Biotechnology and its Applications</b> <b>Chapter-09:</b> Biotechnology - Principles and Processes Genetic Engineering (RDT) <b>Chapter-10:</b> Biotechnology and its Applications Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy; genetically modified organisms, biopiracy and patents	Experiments no-4,5 Spotting No-6,7	11-08-2025 Chapter – 1 & 2
SEPT	<b>Chapter-6: Evolution</b> Origin of life; biological evolution and evidences for evolution mechanism of evolution, Darwin’s contribution, natural selection, Hardy-Weinberg's principle, human evolution <b>Unit-VIII: Biology and Human Welfare</b> <b>Chapter-7:</b> Human Health and Diseases Human diseases, Pathogens; parasites causing human diseases and their control, immunology, vaccines; cancer, HIV and AIDS; drug alcohol and abuse.	Spotting no-9,11 .	<b>Send UP Exam</b> <b>From- 08/09/2025</b> <b>(Chapter-1,2,3,4,5, ,09,10)</b>
OCT	<b>Chapter-08:</b> Microbes in Human Welfare Microbes in food processing, industrial production Sewage treatment, microbes as bio-control agents and bio-fertilizers. Antibiotics <b>Unit-X Ecology and Environment</b> <b>Chapter-11:</b> Organisms and Populations, Population interactions - population attributes	Experiments no-2,3 Spotting no-10  Preparation of synopsis for project	
NOV	<b>Chapter-12:</b> Ecosystem Patterns, components; energy flow; ecological pyramids <b>Chapter-13:</b> Biodiversity and its conservations Concept, patterns, importance; loss of biodiversity; biodiversity conservation; Hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere Reserves, national parks, wildlife, sanctuaries and Ramsar sites.		
DEC	<b>REVISION</b> Completion of leftover practical and projects , PRE BOARD -1		
JAN	<b>AISSCE (CBSE) Board’s Practical , PRE BOARD -2</b>		
<b>MATHEMATICS</b>			
APRIL	<b>Unit-II: Algebra</b> <b>1. Matrices</b> Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operations on matrices: Addition and multiplication and multiplication with a scalar. 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 2). Invertible matrices and proof of the uniqueness of inverse, if it exists; (Here all matrices will have real entries). <b>2. Determinants</b> Determinant of a square matrix (up to 3 x 3 matrices), 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.		
MAY	<b>UNIT I</b> <b>(relations and functions)</b> Relations and functions	1. To verify that the relation R in the set L of all lines in a plane defined by $R = \{ (l, m) : l \parallel m \}$ is symmetric but	

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	Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and Onto functions. <b>Inverse trigonometric functions:</b> Definition, range, domain, principal value branch. Graphs of inverse trigonometric functions.	<i>neither reflexive nor transitive.</i> 2. To verify that the relation $r$ in the set $l$ of all lines in a plane, defined by $r = \{ (l, m) : l \parallel m \}$ is an equivalence relation.	
JUNE	<b>Unit III-Calculus</b> <b>Continuity And Differentiability:</b> Continuity and differentiability, chain rule, derivatives of inverse trigonometric functions like $\sin^{-1} x$ , $\cos^{-1} x$ and $\tan^{-1} x$ , derivative of implicit functions. Concept of exponential and Logarithmic functions. Derivatives of logarithmic and exponential functions. Logarithmic Differentiation, derivative of functions expressed in parametric forms. Second order derivatives.	3. To demonstrate a function which is not one-one but is onto. 4. To demonstrate a function which is one-one but not onto.	First weekly test Monday 23 <sup>rd</sup> June 2025 Syllabus : 1. determinant 2. Matrices 3. Relations and functions 4. Inverse trigonometric function
JULY	<b>Applications of derivatives:</b> Applications of derivatives: rate of change of quantities, increasing/decreasing functions, 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). <b>Integrals:</b> Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, evaluation Of simple integrals of the following types and problems based on them. $\int \frac{dx}{x^2 \pm a^2}, \int \frac{dx}{\sqrt{x^2 \pm a^2}}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{ax^2 + bx + c}$ $, \int \frac{px + q}{ax^2 + bx + c} dx, \int \sqrt{a^2 \pm x^2} dx, \int \sqrt{x^2 - a^2} dx$ $\int \sqrt{ax^2 + bx + c} dx, \int (px + q)\sqrt{ax^2 + bx + c} dx$	5. to draw the graph of $\sin^{-1} x$ , using the graph of $\sin x$ and demonstrate the concept of mirror reflection (about the line $y = x$ ).  6. To explore the principal value of the function $\sin^{-1} x$ using a unit circle.	
AUG	Indefinite Integral Continued .... Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals. <b>APPLICATIONS OF THE INTEGRALS:</b> Applications in finding the area under simple curves, especially lines, circles/ parabolas/ ellipses (in standard form only).	7. To sketch the graphs of $a^x$ and $\log_a x$ $a > 0, a \neq 1$ and to examine that they are mirror images of each other.	Second Weekly Test Monday 4 <sup>th</sup> August 2025 Syllabus : Unit III 1. Calculus 2. Differential calculus 3. Indefinite and Definite Integral
SEPT	<b>UNIT V</b> <b>LINEAR PROGRAMMING:</b> Introduction, related terminology such as constraints, objective function, optimization, graphical method of solution for problems in two variables, feasible and infeasible regions (bounded or unbounded), feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints). <b>UNIT:IV</b> <b>VECTOR ALGEBRA:</b> Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios	8. To establish a relationship between common logarithm (to the base 10) and natural logarithm (to the base $e$ ) of the number $x$ .	<b>Send UP Exam FROM - 08/09/2025</b> <b>Unit-II: Algebra</b> 1. Matrices 2. Determinants <b>Unit I</b> (relations and functions) Inverse trigonometric functions: <b>Unit III</b> calculus Continuity and differentiability: Applications of derivatives:

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	of a vector. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Definition, Geometrical Interpretation, properties and application of scalar (dot) product of vectors, vector (cross) product of vectors.		Integrals: Applications of the integrals:
OCT	<b>THREE-DIMENSIONAL GEOMETRY:</b> Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, skew lines, shortest distance between two lines. Angle between two lines.	9. To find analytically the limit of a function $f(x)$ at $x = c$ and also to check the continuity of the function at that point.	
NOV	<b>UNIT VI</b> <b>PROBABILITY:</b> Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes theorem, Random variable and its probability distribution, mean of random variable. <b>DIFFERENTIAL EQUATIONS:</b> Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables. Solutions of homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type $\frac{dy}{dx} + py = q$ , where p and q are functions of x or constants. $\frac{dx}{dy} + px = q$ , where p and q are functions of y or constants.	10. To verify that for a function f to be continuous at given point $x_0$ , $\Delta y =  f(x_0 + \Delta x) - f(x) $ is arbitrarily small provided $\Delta x$ is sufficiently small.	
DEC	<b>REVISION</b> , Completion of left over	Practicals and PROJECTS	PRE BOARD -1
JAN	<b>AISSCE (CBSE) Board's Practical</b>		PRE BOARD -2

### **INFORMATICS PRACTICES**

APRIL	<b>Unit 2: Database Query using SQL</b> Math functions: POWER(), ROUND(), MOD() Text functions: UCASE() / UPPER(), LCASE() / LOWER(), MID() / SUBSTRING() / SUBSTR(), LENGTH(), LEFT(), RIGHT(), INSTR(), LTRIM(), RTRIM(), TRIM(). Date-Time Functions: NOW(), DATE(), MONTH(), MONTHNAME(), YEAR(), DAY(), DAYNAME().	Practice of topics and Practical programs. Activities as specified in NCERT Textbook. 1. Create a new database called XII_IP_2022. 2. Open / Select / Load a database called XII_IP_2022. 3. Create a exstudent table with the student id, name, and marks as attributes where the student id is the primary key. 4. Display table structure of student table. 05 . Insert the details of three students in the above table. 06. Display details of all students 07. Delete the details of a student in the above table. 8. Use the select command to get the details of the students with marks more than 480. 9. Find the min, max, sum, and average of the marks in a student	
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# **LOYOLA HIGH SCHOOL, PATNA-800010**

## **SYLLABUS FOR CLASS-12 SCIENCE (2025-2026)**

		marks table. 10. Create table customer (customer ID, customer Name, country) and store few records. 11.Store few records in customer table. 12.Find the total number of customers from each country in the table (customer ID, customer Name, country) using group by. 13.Write a SQL query to order the (student ID, marks) table in descending order of the marks.	
MAY	Aggregate Functions: MAX (), MIN (), AVG (), SUM (), COUNT (), using COUNT (*). Querying and manipulating data using- Group by, Having, and Order by clauses.	The practice of topics and Practical programs. Activities as specified in NCERT Textbook	
JUNE	<b>Unit 1: Data Handling using Pandas and Data Visualization</b> Introduction to Python libraries Pandas & Matplotlib. Data Structures in Pandas- <b>Series:</b> Creation of Series from ndarray, dictionary, scalar value, mathematical operations, Head and Tail functions, Selection, Indexing and Slicing.	The practice of topics and Practical programs and SQL. 1.Write a program to generate a series of float numbers from 10.0 to 50.0 with an increment of 3.5 using user defined function. 2.Write a program to generate a series of 10 numbers with a scalar value of 44 with user defined index 1-10. 3.Create a panda's series of five items from a dictionary, display 2nd and 3rd item and then 1st and 4th item of series. 4.Create a panda's series of five items from an array, display 2nd and 3rd item and then 1st and 4th item of the series. 5.Create a data frame for examination results and display row labels, column labels data types of each column and the dimensions. 6.Create the following DataFrame Sales containing year wise sales figures for five salespersons in INR. Use the years as column labels, and salesperson names as row . 7.Consider above sales dataframe and write code to display the last two rows of Sales dataframe using different method. 8.Consider sales dataframe and write code to display the first two columns of Sales dataframe using different methods.	
JULY	<b>DataFrames:</b> creation from the dictionary of Series, list of dictionaries, Text/CSV files display iteration Operations on rows and columns: add, select, delete, rename Head and Tail functions Indexing using Labels, Boolean Indexing.	9.Use above dataframe sales and do the following: 1. Change the DataFrame Sales such that it becomes its transpose. 2. Display the sales made by all sales persons in the year 2018. 3. Display the sales made by Kapil and Mohini in the year 2019 and 2020. 4. Add data to Sales for salesman Nirali where the sales made are [221,	Monday Test 1 07/07/2025 Unit -1.

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## **SYLLABUS FOR CLASS-12 SCIENCE (2025-2026)**

		178, 165, 177, 210] in the years [2018, 2019, 2020, 2021] respectively. 10. Use above dataframe sales and do the following: 1. Delete the data for the year 2018 from the DataFrame Sales. 2. Delete the data for sales man Shikhar from the DataFrame Sales. 3. Change the name of the salesperson Kamini to Rani and Kapil to Anil. 4. Update the sale made by Mohini in 118 to 150 in 2018.	
AUG	<b>Data Visualization</b> Purpose of plotting; drawing and saving the following Types of plots using Matplotlib lineplot, bargraph, and histogram. Customizing plots: adding labels, titles, and legend in plots.	The practice of topics. and Practical questions on Data Visualization.	Monday Test -2 25/08/25 Unit -2
SEPT	<b>Unit 3: Introduction to Computer Networks</b> Introduction to networks, Types of networks: LAN, MAN, WAN Network Devices: modem, hub, switch, repeater, router, gateway Network Topologies: Star, Bus, Tree, Mesh Introduction to Internet, URL, WWW, and its applications Web, email, Chat, VoIP. Website: Introduction, the difference between website and webpage, static vs dynamic web page, web server, and hosting of a website. Web Browsers: Introduction, commonly used browsers, browser settings, add-ons, plug-ins, cookies.		<b>Send UP Examination FROM 08/09/2025</b> Unit -1,2,4
OCT	<b>Unit 4: Societal Impacts</b> Digital footprint, net, and communication etiquettes, data protection, intellectual property rights (IPR), plagiarism, licensing and copyright, free and open-source software (FOSS), cybercrime and cyber laws, hacking, phishing, cyberbullying, an overview of the Indian IT Act. E-waste: hazards and management. Awareness about health concerns related to the usage of technology.		
NOV	<b>Revision</b>		
DEC	<b>REVISION</b> , Completion of left over, Practical's and PROJECTS, PRE BOARD -1		
JAN	<b>AISSCE (CBSE) Board's Practical</b> , PRE BOARD -2		