



TS DAV PUBLIC SCHOOL, BAHARAGORA

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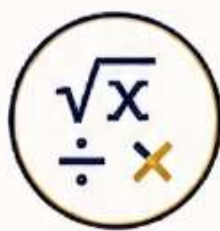
SPLIT-UP SYLLABUS

2026-27

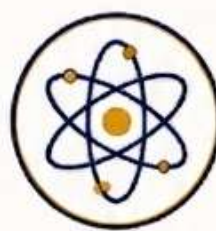
STD. XII



ENGLISH



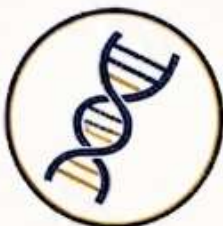
MATHEMATICS



PHYSICS



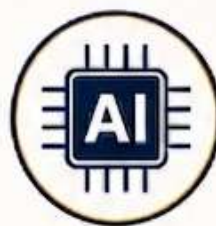
CHEMISTRY



BIOLOGY



COMPUTER
SCIENCE



ARTIFICIAL
INTELLIGENCE



PHYSICAL
EDUCATION

DISCIPLINE • DEDICATION • DETERMINATION

Tarapada Sarangi
DAV Public School, Baharagora

English Core(301)

Prescribed Books:

- ➔ Flamingo
- ➔ Vistas (Supplementary Reader)

Prose Syllabus Track (Flamingo & Vistas)

This track focuses main narrative chapters, highlighting the core character conflicts, structural shifts, and ideological frameworks.

Month	Flamingo (Prose)	Vistas (Supplementary)	Themes & Key Concepts
April	• <i>The Last Lesson</i>	—	• Linguistic Chauvinism: Imposition of a foreign language on a native populace. • Procrastination: The human tendency to delay learning until it is too late. • Key Concept: The sudden realization of the beauty and value of one's mother tongue under political oppression.
May-June	<i>Summer Vacation</i>	<i>Summer Vacation</i>	• Independent self-study, reading endurance, and advanced text navigation.
July	• <i>Lost Spring</i> • <i>Deep Water</i>	• <i>The Third Level</i> • <i>The Tiger King</i>	• Socio-Economic Deprivation: The vicious cycle of poverty and child exploitation (<i>Lost Spring</i>). • Overcoming Fear: Conquering deep-seated phobias through sheer

Month	Flamingo (Prose)	Vistas (Supplementary)	Themes & Key Concepts
			willpower and psychological determination (<i>Deep Water</i>). ▪ Escapism vs. Reality: Seeking refuge from modern anxieties in a romanticized past (<i>The Third Level</i>). ▪ Political Satire & Irony: The arrogance, whims, and ultimate vulnerability of those in absolute power (<i>The Tiger King</i>).
August	▪ <i>Indigo</i>	▪ <i>The Enemy</i> ▪ <i>Journey to the End of the Earth</i>	▪ Grassroots Leadership: How localized legal battles scale up into national movements (<i>Indigo</i>). ▪ Medical Ethics vs. Patriotism: The conflict between humanitarian duty and national loyalty in wartime (<i>The Enemy</i>). ▪ Ecological Consciousness: The Earth's geological past and the real-world impact of global warming (<i>Journey to the End of the Earth</i>).
September	<i>Revision</i>	<i>Revision</i>	▪ Structural text analysis, comparative character mapping, and evaluation review.
October	▪ <i>Poets and Pancakes</i>	▪ <i>On the Face of It</i>	▪ Behind-the-Scenes Satire: Subverting the glamour of the studio era, legal departments, and visiting intellectuals (<i>Poets and Pancakes</i>).

Month	Flamingo (Prose)	Vistas (Supplementary)	Themes & Key Concepts
			• Psychological Isolation: The emotional impact of physical disability and the power of intergenerational empathy (<i>On the Face of It</i>).
November	• <i>The Interview</i> • <i>Going Places</i>	• <i>Memories of Childhood</i>	• Journalistic Integrity: The contrast between celebrity disdain for media exposure and the intellectual utility of an interview (<i>The Interview</i>). • Adolescent Fantasy: Hero-worship and the clash between working-class reality and grandiose dreams (<i>Going Places</i>). • Marginalization & Resistance: Fighting structural racial discrimination and caste untouchability through education and awareness (<i>Memories of Childhood</i>).
December	<i>Consolidation</i>	<i>Consolidation</i>	• Cross-textual synthesis, answering strategies, and theme comparison.
January 2027	<i>Final Review</i>	<i>Final Review</i>	• Extract-based precision, deep-dive inference questions, and final content refinement.

Poetry

This track monitors the poetic syllabus alongside

Month	Flamingo (Poetry)	Themes & Key Concepts
April	• <i>My Mother at Sixty-six</i>	• Universal Ageing: The pain of witnessing a parent's physical decline.

Month	Flamingo (Poetry)	Themes & Key Concepts
		• Literary Devices: Simile (<i>"face ashen like that of a corpse"</i>), juxtaposition of youthful energy vs. old age.
May-June	—	—
July	• <i>Keeping Quiet</i>	• Mindful Introspection: The concept of absolute stillness to foster human solidarity. • Themes: Halting self-destructive wars and environmental harm through silent self-examination.
August	• <i>A Thing of Beauty</i> • <i>Aunt Jennifer's Tigers</i>	• Romantic Transcendentalism: Nature acting as an eternal source of mental healing and joy (<i>A Thing of Beauty</i>). • Patriarchal Oppression: The heavy burden of marital constraints contrasted with art as a vehicle for internal rebellion (<i>Aunt Jennifer's Tigers</i>).

Advanced Writing Skills & Formats

This track targets the mechanics, layouts, and stylistic conventions required to draft concise short compositions and structured long-form arguments.

Month	Writing Skill Topic	Key Concepts & Analytical Focus
April	• Notice Writing • Formal Letter Writing	• Precision & Layout: Adhering strictly to standard formats (sender info, date, subject line). • Information Delivery: Addressing the 5 Ws (What, When, Where, Who, Whom) within a tight 50-word boundary.

Month	Writing Skill Topic	Key Concepts & Analytical Focus
May-June	• Holiday Homework	• Independent Application: Reinforcing vocabulary choices, syntax layout, and independent drafts.
July	• Letter to the Editor • Report Writing	• Civic Advocacy: Articulating public interest arguments with an objective, formal tone. • Factual Reporting: Chronological, third-person formatting of an event using clear headers and explicit data presentation.
August	• Article Writing	• Discursive Construction: Crafting an original argument using cause-and-effect transitions, catchy titles, and balanced conclusions.
September	• Format Check & Practice	• Error Analysis: Correcting structural errors, word-count violations, and expression tone under timed testing conditions.
October	• Invitations & Replies	• Social Etiquette Drafting: Differentiating between card formats (formal) and letter layouts (informal), alongside explicit acceptance/refusal protocols.
November	• CBSE Sample Paper Practice	• Board Pattern Alignment: Speed management, marking-scheme compliance, and choosing options strategically.

Month	Activity	Learning Outcome
April	Introduction to ALS, Project Guidelines, Selection of Topics	Students understand the objectives, assessment criteria, and choose a suitable topic.
May	Literature Review & Data Collection	Collect information through books, internet, interviews, surveys, etc.
July	Questionnaire Preparation / Survey / Interview	Develop communication skills through field work.
August	Analysis of Data and Draft Report	Organise findings using tables, charts, and paragraphs.
September	Submission of First Draft & Teacher Feedback	Improve content, language, and presentation.
October	Final Project Report (800–1000 words), Portfolio Completion	Complete project file with cover page, certificate, acknowledgement, bibliography, photographs (if any), and reflections.
November	ALS Activities (Listening & Speaking Practice), Viva Preparation	Develop fluency, pronunciation, presentation, and confidence.

December	Project Presentation & Viva Voce	Present findings and answer questions based on the project.
January	Internal Assessment & Record Submission	Final evaluation of Project, Portfolio, ALS, and Viva.

Project File Format

1. Cover Page
2. Certificate
3. Acknowledgement
4. Index
5. Objectives
6. Introduction
7. Methodology
8. Survey/Interview/Research Findings
9. Analysis & Interpretation
10. Conclusion
11. Student Reflection
12. Bibliography
13. Annexure (Questionnaire/Photographs, if applicable)

******* End of Syllabus*******

Split-up Syllabus Class XII Session [2026-27]

Subject: Mathematics

Month	Chapter	Topics Covered	No. of Periods
APRIL	MATRICES	• Introduction • Types of Matrices • Operations on Matrices • Multiplication on matrices • Invertible Matrices	12 Periods
	DETERMINANTS	• Introduction • Determinant of a square matrix • Minor and co-factors • Adjoint and inverse of a square matrix • System of solutions of a linear equations	10 Periods
MAY Before Vacation	Relations and Functions	• Definition • Type of Relations • One to one and onto functions	9 Periods
JUNE After Vacation	Inverse Trigonometric Functions	• Definition • range, domain, • Principal value branch • Graphs of inverse trigonometric functions	10 Periods
JULY	Continuity and Differentiability	• Continuity and differentiability • Chain rule, derivative of inverse trigonometric functions. • Concept of exponential and logarithmic functions. • Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms.	16 Periods
	Applications	• Increasing/decreasing functions, maxima and	08 Periods

	of Derivatives	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).	
AUGUST	Integrals Applications of the Integrals	• 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. • Applications in finding the area under simple curves, especially lines, circles/ parabolas/ellipses (in standard form only).	15 Periods 06 Periods
SEPTEMBER		Revision + Half-Yearly Exam	
OCTOBER	Differential Equations	• 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.	10 Periods
NOVEMBER	Vectors	• Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios 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.	12 Periods

	Three - dimensional Geometry Probability	- 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. - Introduction - Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution, mean of random variable.	06 Periods 07 Periods
DECEMBER	Linear Programming Revision	- Introduction - Related terminology such as constraints, objective function, optimization, and graphical method of solution for problems in two variables, feasible and infeasible regions. Case-based Questions + HOTS + PYQs	05 Periods
JANUARY	Revision		

ACTIVITY AND PROJECT WORKS

- To verify that the relation are in the set L of all lines in a plane defined by
 $R = \{(l, m) : l \perp m\}$ is symmetric but neither reflexive nor transitive.
- To demonstrate a function which is not one –one but is onto.
- To demonstrate a function which is one-one but not onto.
- To demonstrate the composition of two functions, with ray diagram.
- 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 the unit circle.
7. To verify that the angle in a semicircle is right angle, using vector method.
8. To sketch the graph of a^x and $\log_a x$, $a > 0, a \neq 1$ and to examine that
They are mirror image of each other.
9. To understand the concept of decreasing and increasing function.
10. To understand the concept of local maxima, local minima and point of inflection.
11. To construct an open box of maximum volume from a given rectangular
Sheet of paper by cutting equal squares from each other.
12. To measure the shortest distance between two skew lines and verify
It analytically.
13. To verify that amongst all the rectangles of the same perimeter, the square has the maximum area.
14. To verify geometrically that $\vec{c} \times (\vec{a} + \vec{b}) = \vec{c} \times \vec{a} + \vec{c} \times \vec{b}$



TARAPADA SARANGI
DAV Public School, Baharagora

Month Wise Split-Up Syllabus

Class – XII

Subject – Physics (042)

Month	Chapter	Topics	No. of Periods
April	<u>Ch.-1:</u> Electric Charges and Fields	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).	23
May	<u>Ch.-2:</u> Electrostatic Potential and Capacitance	Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two-point charges and of electric dipole in an electrostatic field.	12
June	<u>Cont. Ch.-2:</u> Electrostatic Potential and Capacitance	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 (<i>no derivation, formulae only</i>).	9

July	<u>Ch.-3:</u> Current Electricity	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), electrical energy and power, electrical resistivity and conductivity, temperature dependence of resistance, 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.	27
	<u>Ch.-4:</u> Moving Charges And 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. 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.	
	<u>Ch.-5:</u> Magnetism And Matter	Bar magnet, bar magnet as an equivalent solenoid (<i>qualitative treatment only</i>), magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis (<i>qualitative treatment only</i>), torque on a magnetic dipole (bar magnet) in a uniform magnetic field (<i>qualitative treatment only</i>), magnetic field lines. Magnetic properties of materials- Dia, Para, and ferro – magnetic substances with examples, Magnetization of materials, effect of temperature on magnetic properties.	
August	<u>Ch.-6:</u> Electromagnetic Induction	Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Self and mutual induction.	
	<u>Ch.-7:</u> 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.	

	<u>Ch.-8:</u> Electromagnetic Waves	Basic idea of displacement current, Electromagnetic waves, their characteristics, their transverse nature (<i>qualitative idea only</i>). Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.	22
	<u>Ch.-9:</u> Ray Optics and Optical Instruments	Ray Optics: Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and optical fibers	
September	<u>Cont. Ch.-9:</u> Ray Optics and Optical Instruments	Ray Optics: 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. Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers. <i>Revision & Half Yearly Exam</i>	9
October	<u>Ch.-10:</u> Wave Optics	Wave front and Huygen's principle, reflection and refraction of plane wave at a 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 (<i>No derivation final expression only</i>), coherent sources and sustained interference of light, diffraction due to a single slit, width of central maxima (<i>qualitative treatment only</i>).	9
November	<u>Ch.-11:</u> 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.	17
	<u>Ch.-12:</u> Atoms	Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom, Expression for radius of n^{th} possible orbit, velocity and energy of electron in n^{th} orbit, hydrogen line spectra (<i>qualitative treatment only</i>).	

	<u>Ch.-13:</u> Nuclei	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.	
	<u>Ch.-14:</u> Semiconductor Electronics: Materials, Devices and Simple Circuits	Energy bands in conductors, semiconductors and insulators (<i>qualitative ideas only</i>) Intrinsic and extrinsic semiconductors- P and N type, PN junction. Semiconductor diode - I-V characteristics in forward and reverse bias, application of junction diode- diode as a rectifier.	
December	<i>Revision & Pre-board</i>		
January	<i>Revision & Pre-board</i>		
			Total - 128

Marking Scheme

Max. Marks: 70.

Physics (theory) - 042

Time: 3 hrs.

Sl. No.	UNIT	CHAPTERS	MARKS
I.	Electrostatics	Ch.–1: Electric Charges and Fields	16
		Ch.–2: Electrostatic Potential and Capacitance	
II.	Current Electricity	Ch.–3: Current Electricity	
III.	Magnetic Effects of Current and Magnetism	Ch.–4: Moving Charges and Magnetism	17
		Ch.–5: Magnetism and Matter	
IV.	Electromagnetic Induction and Alternating Currents	Ch.–6: Electromagnetic Induction	18
		Ch.–7: Alternating Current	
V.	Electromagnetic Waves	Ch.–8: Electromagnetic Waves	
VI.	Optics	Ch.–9: Ray Optics and Optical Instruments	18
		Ch.–10: Wave Optics	
VII.	Dual Nature of Radiation and Matter	Ch.–11: Dual Nature of Radiation and Matter	
VIII.	Atoms and Nuclei	Ch.–12: Atoms	12
		Ch.–13: Nuclei	
IX.	Electronic Devices	Ch.–14: Semiconductor Electronics: Materials, Devices and Simple Circuits	7
Total			70

PRACTICALS

The record to be submitted by the students at the time of their annual examination has to Include:

- Record of at least 8 Experiments [with 4 from each section], to be performed by the Students.
- Record of at least 6 Activities [with 3 each from section A and section B], to be Performed by the students.
- The Report of the project carried out by the students.

Evaluation Scheme

Max. Marks: 30

Time: 3 hrs.

Topics	Marks
Two experiments one from each section	7+7 Marks
Practical record [experiments and activities]	5 Marks
One activity from any section	3 Marks
Investigatory Project	3 Marks
Viva on experiments, activities and project	5 Marks
Total	30 marks

SECTION–A

Experiments:

1. To determine resistivity of two / three wires by plotting a graph for potential difference Versus current.
2. To find resistance of a given wire / standard resistor using metre bridge.
3. To verify the laws of combination (series) of resistances using a metre bridge.

OR

To verify the laws of combination (parallel) of resistances using a metre bridge.

4. To determine resistance of a galvanometer by half-deflection method and to find its Figure of merit.
5. To convert the given galvanometer (of known resistance and figure of merit) into a Voltmeter of desired range and to verify the same.

OR

To convert the given galvanometer (of known resistance and figure of merit) into an Ammeter of desired range and to verify the same.

6. To find the frequency of AC mains with a sonometer.

Activities:

1. To measure the resistance and impedance of an inductor with or without iron core.
2. To measure resistance, voltage (AC/DC), current (AC) and check continuity of a given Circuit using multimeter.
3. To assemble a household circuit comprising three bulbs, three (on/off) switches, a fuse And a power source.
4. To assemble the components of a given electrical circuit.
5. To study the variation in potential drop with length of a wire for a steady current.
6. 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.

SECTION-B

Experiments:

1. To find the value of v for different values of u in case of a concave mirror and to find the Focal length.
2. To find the focal length of a convex mirror, using a convex lens.
3. To find the focal length of a convex lens by plotting graphs between u and v or between $1/u$ and $1/v$.
4. To find the focal length of a concave lens, using a convex lens.
5. To determine angle of minimum deviation for a given prism by plotting a graph between Angle of incidence and angle of deviation.
6. To determine refractive index of a glass slab using a travelling microscope.
7. To find the refractive index of a liquid using convex lens and plane mirror.
8. To find the refractive index of a liquid using a concave mirror and a plane mirror.
9. To draw the I-V characteristic curve for a p-n junction diode in forward and reverse Bias.

Activities:

1. To identify a diode, an LED, a resistor and a capacitor from a mixed collection of such Items.
2. Use of multimeter to see the unidirectional flow of current in case of a diode and an LED and check whether a given electronic component (e.g., diode) is in working order.
3. To study effect of intensity of light (by varying distance of the source) on an LDR.
3. To observe refraction and lateral deviation of a beam of light incident obliquely on a Glass slab.
4. To observe diffraction of light due to a thin slit.
5. 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).
6. To obtain a lens combination with the specified focal length by using two lenses from The given set of lenses.

Suggested Investigatory Projects:

1. To study various factors on which the internal resistance/EMF of a cell depends.
2. To study the variations in current flowing in a circuit containing an LDR because of a Variation in
 - (a) The power of the incandescent lamp, used to 'illuminate' the LDR (keeping all The lamps at a fixed distance).
 - (b) The distance of an incandescent lamp (of fixed power) used to 'illuminate' the LDR.
3. To find the refractive indices of (a) water (b) oil (transparent) using a plane mirror, an Equiconvex lens (made from a glass of known refractive index) and an adjustable Object needle.
4. To investigate the relation between the ratio of (i) output and input voltage and (ii) Number of turns in the secondary coil and primary coil of a self-designed transformer.
5. To investigate the dependence of the angle of deviation on the angle of incidence Using a hollow prism filled one by one, with different transparent fluids.
6. To estimate the charge induced on each one of the two identical Styrofoam (or pith) Balls suspended in a vertical plane by making use of Coulomb's law.
7. To study the factor on which the self-inductance of a coil depends by observing the Effect of this coil, when put in series with a resistor/(bulb) in a circuit fed up by an A.C. source of adjustable frequency.
8. To study the earth's magnetic field using a compass needle -bar magnet by plotting Magnetic field lines and tangent galvanometer.

T.S.D.A.V. PUBLIC SCHOOL

SYLLABUS

Academic Year: 2026 -2027

Class: XII

Subject: CHEMISTRY

Name of the Text Book: NCERT

Month	Chapters to be taught	Portions for test/Activities to be done
School begins 2nd April Total working days -22	SOLUTIONS , Types of solutions, Raoult's law, colligative properties, depression of freezing point osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, van' Hoff factor .	volumetric analysis-- To prepare 250 ml of 0.1 N oxalic acid solution. To prepare 250 ml of M/20 solution of Mohr's salt.
May Total working days -13	Relation between Gibbs energy change and EMF of a cell, conductance in electrolytic solutions, specific and molar conductivity, variation of conductivity with concentration Kohlrausch's law.	
June Total working days - 9	Law of electrolysis , dry cell- electrolytic cells and Galvanic cells, fuel cells, corrosion.	prepare 0.1 N potassium permanganate solution.
18th May-18th June (Summer Vacation)		
July Total working days -26	Chemical kinetics-- Rate of reaction factors affecting rate of reaction -- electronic configuration , characteristics of transition elements , preparation of potassium permanganate ,	
August Total working days -23	Lanthanoids-- electronic configuration ,chemical reactivity and lanthanoids contraction. Actinoids-- electronic configuration oxidation states and comparison with lanthanoids. Coordination Compounds --- coordination number, colour, magnetic properties and shapes , IUPAC nomenclature of coordination compounds , bonding, Werner's theory, VBT, and CFT,	To estimate the strength of given Mohr's salt solution by titrating against potassium dichromate solution.
September Total working days -24	Importance of coordination compounds , Haloalkanes and Haloarenes-- nomenclature nature C-X bond, physical and chemical properties mechanism of substitution reaction , uses and environmental effects of dichloromethane, trichloromethane , tetrachloromethane , iodoform, freon ,	to estimate the strength of given oxalic acid solution by titrating against potassium permanganate solution.
October Total working days -21	Alcohols --- Nomenclature method of preparation , properties identification of primary, secondary and tertiary alcohols, mechanism of dehydration uses of methanol and ethanol. Phenols-- Nomenclature preparation and properties of phenol,	qualitative analysis. projects given by CBSE.

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SYLLABUS

Academic Year: 2026 -2027

November Total working days -17	Aldehydes and ketones-- nomenclature , preparation and properties of aldehydes and ketones , mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes and uses. Carboxylic acids-- preparation , properties and uses	
December Total working days -19	Amines-- Nomenclature ,classification , methods of preparation , properties uses , identification of primary secondary and tertiary amines. Diazonium salts--- preparation chemical reaction and importance of synthetic organic chemistry	
January Total working days -23	Carbohydrates -- classification (aldoses and ketoses), glucose and fructose, DL configuration (sucrose lactose and maltose), importance of carbohydrate. Proteins--- elementary idea of amino acid peptide Bond polypeptide protein structure of proteins , Harman elementary Idea excluding structure. Vitamins --dharmapura classification and function. Nucleic Acids-- DNA and RNA.	
February Total working days -23	Revision.	

Split- up Syllabus for Biology

Class- XII

Session – 2026-27

MONTH	CHAPTERS	TOPICS TO BE COVERED	MARKS	NO. OF PERIODS
April	Ch-1 Sexual Reproduction in Flowering Plants	• Flower structure development of male and female gametophytes. • Pollination - types, agencies and ; out breeding devices. • Pollen-pistil interaction; • Double fertilization • Development of endosperm and embryo, development of seed and formation of fruit • Special modes- apomixis, parthenocarp, polyembryony.	6 marks	18 Periods
May	Ch-2 Human Reproduction	• Male and female reproductive systems • Gametogenesis - spermatogenesis and oogenesis • Menstrual cycle; fertilisation, embryo development upto blastocyst formation, • Implantation; pregnancy and placenta formation, parturition, lactation.	6 marks	12 Periods
June	Ch-3 Reproductive Health	• Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs) • Birth control – need and methods • Contraception and medical termination of	4 marks	8 Periods

		pregnancy (MTP), amniocentesis infertility. Assisted reproductive technologies – IVF, ZIFT, GIFT.		
July	Ch-4 Principles of Inheritance and Variation	- Mendelian inheritance; incomplete dominance, co-dominance, multiple alleles and inheritance of blood groups, pleiotropy; polygenic inheritance; - chromosome theory of inheritance; chromosomes and genes; - Sex determination - in humans, birds and honey bee; linkage and crossing over; - sex linked inheritance - haemophilia, colour blindness; - Mendelian disorders in humans - thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes. - DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication - Central Dogma; transcription, genetic code, translation - Gene expression and regulation - lac operon - Genome, Human and rice genome projects - DNA fingerprinting.	8 marks	12 Periods

	Ch-5 Molecular Basis Of Inheritance		8 marks	12 Periods
August	Ch-6 Evolution	• Origin of life • Darwin's contribution, modern synthetic theory of evolution; mechanism of evolution - variation (mutation and recombination) • Natural selection with examples, types of natural selection • Gene flow and genetic drift • Hardy- Weinberg's principle; adaptive radiation; human evolution.	4 marks	8 Periods
	Ch-7 Human Health and Disease	• Pathogens; parasites causing human diseases and their control; • Basic concepts of immunology – vaccines; cancer • HIV and AIDS • Adolescence – drug and alcohol abuse.	6 marks	8 Periods

	Ch-8 Microbes in Human Welfare	• Microbes in food processing, industrial production, sewage treatment, energy generation • Microbes as bio-control agents and bio-fertilizers. • Antibiotics- production and judicious use.	6 marks	8 Periods
September	Revision + Half Yearly			
October	Ch- 9 Biotechnology: Principles and Processes	• Genetic Engineering • Recombinant DNA Technology.	6 marks	6 Periods
	Ch- 10 Biotechnology and Its Application	• Application of biotechnology in health and agriculture • Human insulin and vaccine production stem	6 marks	12 Periods

		cell technology, gene therapy • Genetically modified organisms – Bt crops; transgenic animals; biosafety issues, biopiracy and patents.		
November	Ch-11 Organisms and Populations	• Population interactions – mutualism, competition, predation, parasitism. • Population attributes – growth, birth rate and death rate, age distribution.	3 marks	8 Periods
	Ch-12 Ecosystem	• Ecosystems: Patterns, components. • Productivity and decomposition • Energy flow; pyramids of number, biomass, energy.	3 marks	6 Periods
	Ch-13 Biodiversity and Its Conservation	• Biodiversity-Concept, patterns, importance; loss of biodiversity • Biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book.	4 marks	6 Periods
	Revision + Module test + Pre boards			
December	Revision + Module test + Pre boards			
January	Sample Paper + Practicals			
February	Board Examination			

PRACTICALS

Time Allowed – 3 Hours

Max. Marks- 30

EVALUATION SCHEME		MARKS
One Major Experiment	5	5
One Minor Experiment	2 & 3	4
Slide Preparation	1 & 4	5
Spotting		7
Practical Record + Viva Voce	(Credit to the student's work over the academic session may be given)	4
Investigatory Project and its Project Record + Viva Voce		5
TOTAL		30

A. LIST OF EXPERIMENTS

1. Prepare a temporary mount to observe pollen germination.
2. Study the plant population density by quadrat method.
3. Study the plant population frequency by quadrat method.
4. Prepare a temporary mount of onion root tip to study mitosis.
5. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, banana etc.

B. STUDY AND OBSERVE THE FOLLOWING (Spotting):

1. Flowers adapted to pollination by different agencies (wind, insects, birds).
2. Pollen germination on stigma through a permanent slide or scanning Electron micrograph.
3. Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).
4. Meiosis in onion bud cell or grasshopper testis through permanent slides.
5. T.S. of blastula through permanent slides (Mammalian).
6. Mendelian inheritance using seeds of different colour/sizes of any plant.
7. Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, Blood groups, ear lobes, widow's peak and colour blindness.
8. Controlled pollination – emasculation, tagging and bagging.
9. Common disease causing organisms like Ascaris, Entamoeba, Plasmodium, any fungus causing ringworm through permanent slides, models or virtual images or specimens. Comment on symptoms of diseases that they cause.

10. Models specimens showing symbiotic association in lichens, root nodules of leguminous plants, and parasitic mode of nutrition shown by *Cuscuta* on host.
11. Flash cards / models showing examples of homologous and analogous organs.

TS DAV PUBLIC SCHOOL, BAHARAGORA

CLASS XII

SUBJECT COMPUTER SCIENCE (083)

MAX. MARKS: 100 (70 Theory + 30 Practical) Distribution of Marks and Periods		
Unit No	Name of The Chapter/ unit	Marks
I	Computational Thinking and Programming - 2	40
II	Computer Networks	10
III	Database Management	20
	Total	70
	Practical	30
	Grand Total	100

Practical:

S.No	Unit Name	Marks (Total=30)
1	Lab Test: 1. Python program (60% logic + 20% documentation + 20% code quality)	8
	2. SQL queries (4 queries based on one or two tables)	4
2	Report file: • Minimum 15 Python programs. • SQL Queries – Minimum 5 sets using one table / two tables. • Minimum 4 programs based on Python - SQL connectivity	7
3	Project (using concepts learnt in Classes 11 and 12)	8
4	Viva voce	3

Month.	No. of Days	Weightage of Marks	Units/Subunits/Topics/Chapters to be Covered	Details of Activity/Practical/Projects
April/ June	22	40 MARKS	UNIT : 1 Computational Thinking and Programming – 2 Revision of Python topics covered in Class XI. Functions: types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope) Exception Handling: Introduction, handling exceptions using try-except-finally blocks	Revision of all concepts of Python programming taught in class XI i.e. Strings, Conditional statements, iterative statement, list, tuples, dictionaries and Predefined functions in random module, math module etc Python programs to implement Functions, passing parameters and returning values.
JULY	27		Introduction to files: types of files (Text file, Binary file, CSV file), relative and absolute paths Text file: opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text file	Python programs to open and close the file, read write and append to a file. Python program to implement text files and binary files. Projects can be assigned with data file handling.
AUGUST	21		Introduction to files (Continued....) Binary file: basic operations on a binary file: open using file open modes (rb, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load() method, read, write/create, search, append and update operations in a binary file.	Python programs to implement Binary file.

SEPTEMBER	12	10 MARKS	Introduction to files..... cont..... • CSV file: import csv module, open / close csv file, write into a csv file using csv.writer() and read from a csv file using csv.reader() Data Structure: • Stack, operations on stack (push & pop), implementation of stack using list. Unit II: Computer Networks • Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET) • Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching) • Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves), • Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)	Python programs to implement CSV file. Python programs to implement Stack using lists Different Devices used in networking can be shown to the students. Network topologies implemented in the school can be described.
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OCTOBER/NOVEMBER	20	20 MARKS	• Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree) • Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP • Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting Unit III: Database Management Database concepts: introduction to database concepts and its need • Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key) • Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, • data type (char(n), varchar(n), int, float, date), • constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, • operators (mathematical, relational and logical), • aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete Command.	Hands on Networking and various type of topology. Installation of Mysql and hands on practicals on various queries on DDL and DML commands. Demonstrating the students to install a suitable connector for connecting databases with python. Projects can be assigned to students to implement applications mentioned in the practical section below.
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OCTOBER/NOVEMBER		Unit III: Database Management Database concepts: (Continued.....) aggregate functions (max, min, avg, sum, count), group by, having clause Joins: cartesian product on two tables, equi-join and natural join Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications, use of %s format specifier or format() to perform queries	Programs on connecting python with sql and executing the queries through python programs and printing the result with various fetch methods.
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NOTE : 100% Syllabus should be completed by 15.11.2026

Suggested Practical List:

Python Programming

- Read a text file line by line and display each word separated by a #.
- Read a text file and display the number of vowels/consonants/uppercase/lowercase characters in the file.
- Remove all the lines that contain the character 'a' in a file and write it to another file.
- Create a binary file with name and roll number. Search for a given roll number and display the name, if not found display appropriate message.
- Create a binary file with roll number, name and marks. Input a roll number and update the marks.
- Write a random number generator that generates random numbers between 1 and 6 (simulates a dice).
- Write a Python program to implement a stack using list.
- Create a CSV file by entering user-id and password, read and search the password for given user id.

Database Management

- Create a student table and insert data.

Implement the following SQL commands on the student table:

- ALTER table to add new attributes / modify data type / drop attribute
- UPDATE table to modify data
- ORDER By to display data in ascending / descending order
- DELETE to remove tuple(s)
- GROUP BY and find the min, max, sum, count and average
- Similar exercises may be framed for other cases.
- Integrate SQL with Python by importing a suitable module.

Suggested Reading Material

- NCERT Textbook for COMPUTER SCIENCE (Class XII)
- Support Materials on the CBSE website.

Project

- The aim of the class project is to create something that is tangible and useful using Python file handling/ Python-SQL connectivity. This should be done in groups of two to three students and should be started by students at least 6 months before the submission deadline. The aim here is to find a real world problem that is worthwhile to solve. Students are encouraged to visit local businesses and ask them about the problems that they are facing. For example, if a business is finding it hard to create invoices for filing GST claims, then students can do a project that takes the raw data (list of transactions), groups the transactions by category, accounts for the GST tax rates, and creates invoices in the appropriate format. Students can be extremely creative here. They can use a wide variety of Python libraries to create user friendly applications such as games, software for their school, software for their disabled fellow students, and mobile applications, of course to do some of these projects, some additional learning is required; this should be encouraged. Students should know how to teach themselves. The students should be sensitised to avoid plagiarism and violations of copyright issues while working on projects. Teachers should take necessary measures for this.

CBSE | DEPARTMENT OF SKILL EDUCATION

CURRICULUM FOR SESSION 2025-2026

ARTIFICIAL INTELLIGENCE (SUB. CODE - 843)

JOB ROLE: AI Assistant

CLASS – XII

OBJECTIVES OF THE COURSE:

Artificial Intelligence (AI) is a transformative field in computer science that focuses on creating intelligent systems capable of learning, adapting, and self-improving. These systems can process vast amounts of data with remarkable speed and accuracy, surpassing human capabilities in many domains. AI's impact extends across disciplines, offering innovative solutions to some of the world's most pressing challenges. From revolutionizing healthcare with advanced diagnostics and personalized treatments to enhancing agricultural practices and ensuring food security, AI has the power to reshape industries. It can improve access to quality education, and play a pivotal role in protecting and restoring our planet's ecosystems by cleaning our oceans, air, and water. The possibilities for leveraging AI to create a better future are boundless, provided we harness its potential responsibly and ethically.

LEARNING OUTCOMES:

By the end of this course, students will:

1. Develop an informed perspective on Artificial Intelligence (AI), enabling them to think critically about its implications for society and the world.
2. Understand the role of Python in AI development and its practical applications.
3. Harness the power of AI using no-code tools like Orange Data Mining to solve complex problems efficiently.
4. Comprehend the significance of Data Science Methodology in a Capstone Project to address real-world challenges.
5. Explore the fundamentals of computer vision and its applications in processing and analyzing digital images and videos, as well as its role in intelligent machines.
6. Delve into the diverse possibilities of Generative AI, including image generation, text synthesis, audio production, and video creation.
7. Understand the structure and components of neural networks, building a foundational knowledge of deep learning.
8. Appreciate the value of storytelling as a powerful tool to communicate ideas, insights, and solutions effectively in the context of AI.

SCHEME OF UNITS:

This course follows a structured sequence of instructional units designed to develop employability and vocational skills among students. These units are carefully crafted to integrate seamlessly with other educational subjects, fostering a holistic learning experience.

CBSE | DEPARTMENT OF SKILL EDUCATION

ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 843)

CLASS – XII (SESSION 2025-2026)

Total Marks: 100 (Theory-50 + Practical-50)

	UNITS	NO. OF HOURS		MAX MARKS
PART A	EMPLOYABILITY SKILLS			
	Unit 1: Communication Skills-IV	15		2
	Unit 2: Self-Management Skills-IV	10		2
	Unit 3: ICT Skills-IV	15		2
	Unit 4: Entrepreneurial Skills-IV	10		2
	Unit 5: Green Skills-IV	10		2
	TOTAL	60		10
PART B	SUBJECT SPECIFIC SKILLS	Th.	Prac.	
	Unit 1: Python Programming – II*	6	18	(*to be evaluated in practicals only)
	Unit 2: Data Science Methodology: An Analytic Approach to Capstone Project	8	12	8
	Unit 3: Making Machines See	6	12	6
	Unit 4: AI with Orange Data Mining Tool*	4	18	(*to be evaluated in practicals only)
	Unit 5: Introduction to Big Data and Data Analytics	7	12	6
	Unit 6: Understanding Neural Networks	8	12	8
	Unit 7: Generative AI	6	12	7
	Unit 8: Data Storytelling	5	4	5
	TOTAL	50	100	40
PART C	PRACTICAL WORK / PROJECT WORK			
	Capstone Project + Project Documentation (As per the process given in “Project Guidelines”, on page 2 of CBSE IBM Projects Cookbook) - Capstone Project =15 Marks - Project Documentation = 6 Marks - Video= 4 Marks			25
	Practical File			10
	Lab Test (Python and Orange Data Mining)			10
	Viva Voce (based on Capstone Project + Practical File)			5
	TOTAL			50
	GRAND TOTAL (THEORY + PRACTICAL)			100

(NOTE: *marked units/portion is to be evaluated in practicals only)

DETAILED CURRICULUM/TOPICS FOR CLASS XII

Part-A: EMPLOYABILITY SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1: Communication Skills-IV	15
2.	Unit 2: Self-management Skills-IV	10
3.	Unit 3: Information and Communication Technology Skills-IV	15
4.	Unit 4: Entrepreneurial Skills-IV	10
5.	Unit 5: Green Skills-IV	10
	TOTAL	60

NOTE: The detailed curriculum/ topics to be covered under Part A: Employability Skills can be downloaded from the CBSE website.

Part-B - SUBJECT SPECIFIC SKILLS

- ❖ Unit 1: Python Programming – II*
- ❖ Unit 2: Data Science Methodology: An Analytic Approach to Capstone Project
- ❖ Unit 3: Making Machines See
- ❖ Unit 4: AI with Orange Data Mining Tool*
- ❖ Unit 5: Introduction to Big Data and Data Analytics
- ❖ Unit 6: Understanding Neural Networks
- ❖ Unit 7: Generative AI
- ❖ Unit 8: Data Storytelling

(NOTE: *marked units/portion is to be evaluated in practicals only)

UNIT 1: PYTHON PROGRAMMING - II *(to be evaluated in practicals only)

SUB-UNIT	LEARNING OUTCOMES	ACTIVITY/PRACTICALS
- Recap of NumPy library - Recap of Pandas Library - Importing and Exporting Data between CSV Files and DataFrames - Handling missing value - Linear Regression algorithm (**For Advanced Learners)	- Apply the fundamental concepts of the NumPy and Pandas libraries to perform data manipulation and analysis tasks - Import and export data between CSV files and Pandas Data Frames, ensuring data integrity and consistency.	- Import and Export Data between CSV Files and DataFrames - Implement Linear Regression algorithm on Google Colab or any Python IDE. (**For Advanced Learners)

UNIT 2: DATA SCIENCE METHODOLOGY: AN ANALYTIC APPROACH TO CAPSTONE PROJECT

SUB-UNIT	LEARNING OUTCOMES	ACTIVITY/PRACTICALS
- Introduction to Data Science Methodology - Steps for Data Science Methodology - Model Validation Techniques - Model Performance-Evaluation Metrics	- Integrate Data Science Methodology steps into the Capstone Project. - Identify the best way to represent a solution to a problem. - Understand the importance of validating machine learning models - Use key evaluation metrics for various machine learning tasks	- Calculate MSE and RMSE values for the data given using MS Excel - Calculate Precision, Recall, F1 score, and Accuracy from the given confusion matrix - Python Code to Evaluate a Model (*to be evaluated in practicals only)

UNIT 3: MAKING MACHINES SEE

SUB-UNIT	LEARNING OUTCOMES	ACTIVITY/PRACTICALS
- How Machines See - Working of Computer Vision - Computer Vision Process - Applications of Computer Vision - Challenges of Computer Vision - The Future of Computer Vision - Working with OpenCV (**For Advanced Learners)	- Explain computer vision and its significance in visual data analysis. - Understand key stages of computer vision, including acquisition, preprocessing, feature extraction, and analysis. - Identify real-world applications in fields like healthcare, surveillance, and autonomous vehicles. - Analyze challenges such as ethics, privacy, and technical limitations. - Explore future advancements and transformative potential of computer vision. - Develop basic skills in using OpenCV and deploying machine learning models online.	- Binary Art - Recreating Images with 0s and 1s - Creating a Website Containing an ML Model - Working with OpenCV to load, display and resize images (**For Advanced Learners)

UNIT 4: AI WITH ORANGE DATA MINING TOOL (*to be evaluated in practicals only)

SUB-UNIT	LEARNING OUTCOMES	ACTIVITY/PRACTICALS
• What is Data Mining? • Introduction to Orange Data Mining Tool • Beneficiaries of Orange data mining • Getting started with Orange tool • Components of Orange • Default Widget Catalogue • Key domains of AI with ORANGE DATA MINING TOOL	• Develop proficiency in utilizing the Orange Data Mining tool, enabling them to navigate its interface, employ its features, and execute data analysis tasks effectively. • Demonstrate the ability to apply Orange in real-world scenarios across diverse domains of artificial intelligence, including data science, computer vision, and natural language processing (NLP), through hands-on projects and case studies.	• Load and visualize the Iris dataset using Scatter Plot and other widgets. • Use classification widgets • Evaluating the Classification Model with Orange • Computer Vision with Orange • Natural Language Processing with Orange

UNIT 5: INTRODUCTION TO BIG DATA AND DATA ANALYTICS

SUB-UNIT	LEARNING OUTCOMES	ACTIVITY/PRACTICALS
• Introduction to Big Data • Types of Big Data • Advantages and Disadvantages of Big Data • Characteristics of Big Data • Big Data Analytics • Working on Big Data Analytics • Mining Data Streams • Future of Big Data Analytics	• Understanding Big Data, its types, advantages and disadvantages. • Recognize the characteristics of Big Data. • Explain the concept of Big Data Analytics and its significance. • Analyze the future trends in the field of Big Data Analytics. • Understanding the term Mining Data Streams.	*Performing Big Data analytics with Orange Data mining tool. (*to be evaluated in practicals only)

UNIT 6: UNDERSTANDING NEURAL NETWORKS

SUB-UNIT	LEARNING OUTCOMES	ACTIVITY/PRACTICALS
• Parts of a Neural Network • Components of a Neural Network • Working of a Neural Network • Types of Neural Networks • Future of Neural Networks and Societal Impact	• Explain the basic structure and components of a neural network. • Identify different types of neural networks and their respective applications. • Understand machine learning and neural networks through hands-on projects, interactive tools, and Python programming.	• Explore Machine Learning for Kids to create a neural network for identifying animals and birds. • Build a TensorFlow model to convert Celsius to Fahrenheit (*to be evaluated in practicals only) • Use Python Keras to create and train a neural network predicting Fahrenheit from Celsius. (**For Advanced Learners) • Classification problem using TensorFlow playground

UNIT 7: GENERATIVE AI

SUB-UNIT	LEARNING OUTCOMES	ACTIVITY/PRACTICALS
• Introduction to Generative AI • Working of Generative AI • Generative and Discriminative models • Applications of Generative AI • LLM- Large Language Model • Future of Generative AI • Ethical and Social Implications of Generative AI	• How Generative AI works. • Differentiate between Generative AI and Discriminative AI and identify their use cases. • Explore ethical, social, and legal concerns. • Gain hands-on experience using AI tools to generate creative and analytical outputs, such as images, texts, and videos. • Use the Gemini API to design and deploy a functional chatbot.	• Signing up for Canva Activity. • Animaker's AI Video Generation tool. • Use Google Gemini to craft prompts and generate text outputs. • Explore ChatGPT for conversational text generation and creative tasks. • Write Python code to initialize the Gemini API and create a chat bot. (**For Advanced Learners)

UNIT 8: DATA STORYTELLING

SUB-UNIT	LEARNING OUTCOMES	ACTIVITY/PRACTICALS
• Introduction to Storytelling • Elements of a Story • Introduction to Data Storytelling • Why is Data Storytelling Powerful? • Essential Elements of Data Storytelling • Narrative Structure of a Data Story (Freytag's Pyramid) • Types of Data and Visualizations for Different Data • Steps to Create a Story Through Data • Ethics in Data Storytelling	• Understand the benefits of storytelling. • Appreciate the role of data storytelling in data analysis, data science, and AI. • Learn to combine data, visuals, and narrative to present complex information effectively. • Gain skills to draw meaningful insights from data stories.	• Create an effective data story using given data.

****Note- All portions under Advanced Learners are not to be evaluated in Theory or Practical Examinations.**

(NOTE: *marked units/portion is to be evaluated in practicals only)

PART – C:

1. Practical File:

The following are to be included in the Practical File

1. Minimum 6 programs of Python.
2. Minimum 3 programs using Orange Data Mining tool.
3. Minimum 1 problem to create a Data Story using all steps of Data Storytelling.

Optional Programs- for practical File

- Demonstration of train-test split in Linear Regression using Python.
- Chatbot using Google Gemini API.
- Orange Data Mining for Data Analytics.
- Classification problem using TensorFlow playground.
- Regression problem using TensorFlow playground.

(snapshots to be attached)

Sample programs for reference

I. Python

1. Write Python code to create a Pandas DataFrame using any sequence data type.
 - a) Display the DataFrame.
 - b) Display first 5 records.
 - c) Display last 10 records.
 - d) Display the number of missing values in the dataset.
2. Download dataset in the form of CSV from any public open-source website.
 - a) Read CSV File and convert it into Pandas DataFrame.
 - b) Perform statistical functions on the dataset to check the data, checking missing values, filling missing data etc.
3. Python Code to Evaluate a Model.

II. Orange Data Mining

1. Perform step wise procedure of Data Visualization using the Orange Data Mining Tool.
2. Perform Classification with Orange Data Mining.
3. Evaluate the Classification Model with Orange.
4. Perform Image analytics using the Orange data mining tool.
5. Write down steps to visualize word frequencies with Word Cloud using the Orange Data Mining tool.

Note: Snapshots of all the steps and outputs to be taken and pasted in the practical file.

III. Data Storytelling (Sample)

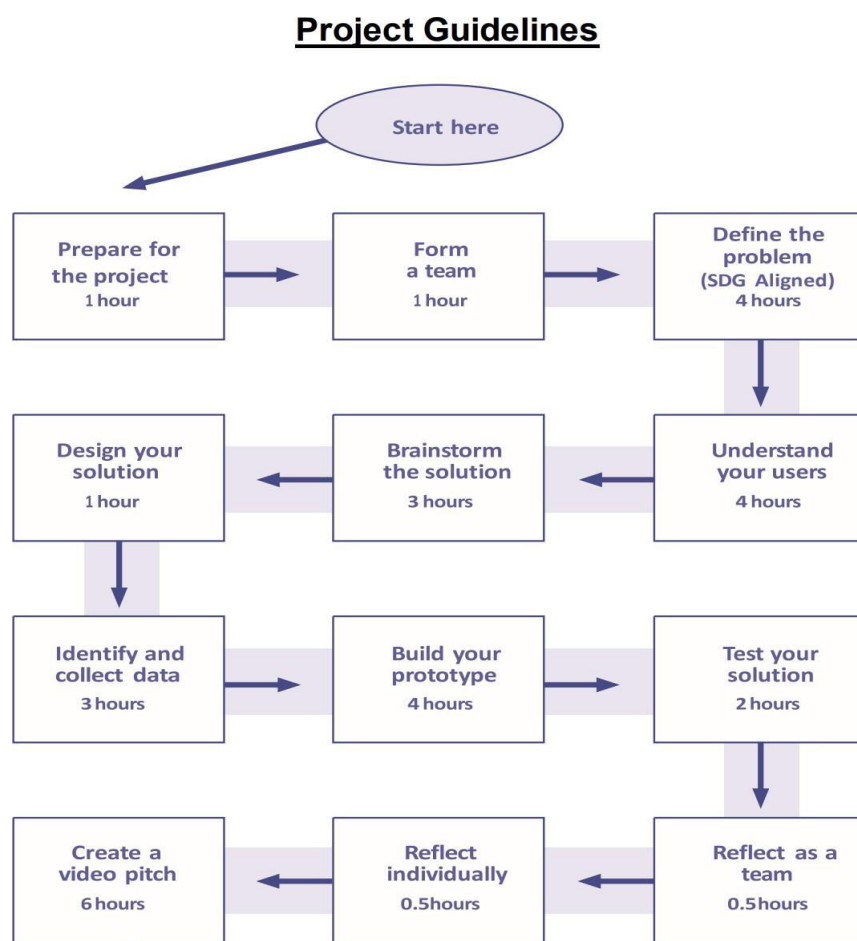
Using available data on student enrollment, attendance, and dropout rates, create a compelling data story that explores the impact of the Mid-Day Meal Scheme (MDMS) since its launch in 1995. Uncover trends, patterns, and correlations in the data to tell a story about how the implementation of the MDMS may have influenced dropout rates in the state over the years. Consider incorporating visualizations, charts, and graphs to effectively communicate your findings. Additionally, analyze any external factors or events that might have played a role in shaping these trends. Your goal is to provide a comprehensive narrative that highlights the relationship between the MDMS and student dropout rates in the state.

2. Capstone Project:

Capstone Project Guidelines:

- In a group, minimum 3 and maximum 5 students are allowed.
- Their projects should be aligned with any of the SDGs.
- Students will complete their Capstone Project in Class XII and complete the project documentation.
- Video of the Capstone Project should be exactly of 3 minutes duration.
- The video will have the following components:
 - a. Problem statement
 - b. To which SDG the project is aligned to
 - c. AI concept/domains/algorithms used
 - d. Working of the project
 - e. Conclusion
 - f. Acknowledgement to the teacher

Please refer to the Project guidelines of [CBSE-IBM AI PROJECT COOKBOOK \(Page -2\)](#)



Note for Educators: Python or No code/low code platforms like Orange Data Mining tool can be chosen by the students for developing their Capstone Projects.

LIST OF EQUIPMENTS/ MATERIALS:

The list given below is suggestive and an exhaustive list should be compiled by the teacher(s) teaching the subject. Only basic tools, equipment and accessories should be procured by the Institution so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

S. NO.	ITEM NAME, DESCRIPTION & SPECIFICATION
A	HARDWARE
1	Computer with latest configuration or minimum core I5 Processor or equivalent with minimum 8 GB RAM, 512 GB SSD, 17" LED Monitor, NIC Card, 3 button Mouse, Camera, 105 keys keyboard, speakers, mic, WiFi / Internet connectivity, Webcam, UPS, Dual Band Wireless Connectivity Min 100 Mbps and integrated graphic cards
2	Fire extinguisher
B	SOFTWARE SPECIFICATIONS
1	Any Operating System with antivirus activated
2	Python IDLE
3	Anaconda Navigator Distribution – Python IDE installed with software: NumPy, Pandas, Matplotlib, Scikit Learn)
4	Productivity Suite: Any (Google+ Suite recommended)
5	Orange Data Mining Tool

Additional Recommendations:

- Ensure regular updates and maintenance for all installed software to benefit from bug fixes, security patches, and new features.
- Provide licenses for commercial software, such as MS Office, as per the school's requirements and budget.
- Encourage teachers and students to stay updated with the latest versions of the software and tools and provide resources for learning and support.
- Consider implementing version control systems (e.g., Git) to facilitate collaborative coding and project management.

TEACHER'S/ TRAINER'S QUALIFICATIONS:

Qualification and other requirements for appointment of teachers/trainers for teaching this subject, on contractual basis should be decided by the State/ UT. The suggestive qualifications and minimum competencies for the teacher should be as follows:

Qualification	Minimum Competencies	Age Limit
Diploma in Computer Science/ Information Technology OR Bachelor Degree in Computer Application/ Science/ Information Technology (BCA, B.Sc. Computer Science/ Information Technology) OR Graduate with PGDCA OR DOEACCA Level Certificate. The suggested qualification is the minimum criteria. However higher qualifications will also be acceptable.	The candidate should have a minimum of 1 year of work experience in the same job role. • S/he should be able to communicate in English and local language. S/he should have knowledge of equipment, tools, material, Safety, Health & Hygiene.	• 18-37 years (as on Jan. 01 (year)) • Age relaxation to be provided as per Govt. rules

Teachers/Trainers form the backbone of Skill (Vocational) Education being imparted as an integral part of Rashtriya Madhyamik Shiksha Abhiyan (RMSA). They are directly involved in teaching of Skill (vocational) subjects and also serve as a link between the industry and the schools for arranging industry visits, On-the-Job Training (OJT) and placement.

These guidelines have been prepared with an aim to help and guide the States in engaging quality Teachers/Trainers in the schools. Various parameters that need to be looked into while engaging the Vocational Teachers/Trainers are mode and procedure of selection of Teachers/ Trainers, Educational Qualifications, Industry Experience, and Certification/ Accreditation.

The State may engage Teachers/Trainers in schools approved under the component of scheme of Vocationalisation of Secondary and Higher Secondary Education under RMSA in following ways:

- (i) Directly as per the prescribed qualifications and industry experience suggested by the PSS Central Institute of Vocational Education (PSSCIVE), NCERT or the respective Sector Skill Council (SSC).

OR

- (ii) Through accredited Vocational Training Providers accredited under the National Quality Assurance Framework (NQAF*) approved by the National Skill Qualification Committee on 21.07.2016. If the State is engaging Vocational Teachers/Trainers through the Vocational Training Provider (VTP), it should ensure that VTP should have been accredited at NQAF Level 2 or higher.

The National Quality Assurance Framework (NQAF) provides the benchmarks or quality criteria which the different organizations involved in education and training must meet in order to be accredited by competent bodies to provide government- funded education and training/skills activities. This is applicable to all organizations offering NSQF-compliant qualifications.

The educational qualifications required for being a Teacher/Trainer for a particular job role are clearly mentioned in the curriculum for the particular NSQF compliant job role. The State should ensure that teachers/ trainers deployed in the schools have relevant technical competencies for the NSQF qualification being delivered. Teachers/Trainers preferably should be certified by the concerned Sector Skill Council for the particular Qualification Pack/Job role which he will be teaching. Copies of relevant certificates and/or record of experience of the teacher/trainer in the industry should be kept as record.

To ensure the quality of the Teachers/Trainers, the State should ensure that a standardized procedure for selection of (Vocational) Teachers/Trainers is followed. The selection procedure should consist of the following:

- (i) Written test for the technical/domain specific knowledge related to the sector;
- (ii) Interview for assessing the knowledge, interests and aptitude of trainer through a panel of experts from the field and state representatives; and
- (iii) Practical test/mock test in classroom/workshop/laboratory.

In case of appointment through VTPs, the selection may be done based on the above procedure by a committee having representatives of both the State Government and the VTP. The State should ensure that the Teachers/ Trainers who are recruited should undergo induction training of 20 days for understanding the scheme, NSQF framework and Vocational Pedagogy before being deployed in the schools. The State should ensure that the existing trainers undergo in-service training of 5 days every year to make them aware of the relevant and new techniques/approaches in their sector and understand the latest trends and policy reforms in vocational education. The Head Master/Principal of the school where the scheme is being implemented should facilitate and ensure that the (Vocational) Teachers/Trainers:

- Prepare session plans and deliver sessions which have a clear and relevant purpose and which engage the students;
- Deliver education and training activities to students, based on the curriculum to achieve the learning outcomes;
- Make effective use of learning aids and ICT tools during the classroom sessions;
- Engage students in learning activities, which include a mix of different methodologies, such as project-based work, team work, practical and simulation-based learning experiences;
- Work with the institution's management to organise skill demonstrations, site visits, on job trainings, and presentations for students in cooperation with industry, enterprises and other workplaces;
- Identify the weaknesses of students and assist them in up-gradation of competency;
- Cater to different learning styles and level of ability of students;
- Assess the learning needs and abilities, when working with students with different abilities
- Identify any additional support the student may need and help to make special arrangements for that support;
- Provide placement assistance

Assessment and evaluation of (Vocational) Teachers/Trainers is very critical for making them aware of their performance and for suggesting corrective actions. The States/UTs should ensure that the performance of the (Vocational) Teachers/Trainers is appraised annually. Performance based appraisal in relation to certain pre-established criteria and objectives should be done periodically to ensure the quality of the (Vocational) Teachers/Trainers.

Following parameters may be considered during the appraisal process:

- Participation in guidance and counseling activities conducted at Institutional, District and State level;
- Adoption of innovative teaching and training methods;
- Improvement in result of vocational students of Class X or Class XII;
- Continuous up-gradation of knowledge and skills related to the vocational pedagogy, communication skills and vocational subject;
- Membership of professional society at District, State, Regional, National and International level;
- Development of teaching-learning materials in the subject area;
- Efforts made in developing linkages with the Industry/Establishments;
- Efforts made towards involving the local community in Vocational Education
- Publication of papers in National and International Journals;
- Organization of activities for promotion of vocational subjects;
- Involvement in placement of students/student support services.

Split-up Syllabus Class XII Session [2026-27]

Subject: Physical Education

Month	Week	Chapter	Topics Covered
APRIL	Week 1	Ch:-1 Management of Sporting Events	Functions of Sports Events Management Various Committees and their responsibilities(pre; during and post)
	Week 2		Fixtures and their Procedures Knock-out(Bye and Seeding) and League(Staircase, Cyclic and Tabular method)
	Week 3		Intramural and Extramural tournaments Community Sports Program
	Week 4		Exercise guidelines of WHO for different age groups
MAY Before Summer Vacation	Week 1	Ch:-2 Children and Women in Sports	Common postural deformities-Knock Knees, Flat Foot, Round Shoulder, Lordosis, Kyphosis, Scoliosis, and Bow Legs
	Week 2		Women's participations in Sports-Physical, Psychological, and social benefits Summer Assignment
JUNE After Summer Vacation	Week 3 (after 18 th June)		Special consideration (menarche and menstrual dysfunction) Female athlete triad(osteoporosis, amenorrhea, eating disorder)
	Week 4		Summer Assignment checking Copy Checking Revision of Ch-1 & 2
JULY	Week 1	Ch:-3 Yoga as Preventive measure for Lifestyle Disease	Obesity, Diabetes, Asthma- Procedures, Benefits and Contraindications
	Week 2		Hypertension, Back Pain and Arthritis –Procedures, Benefits and Contraindications
	Week 3		Organizations promoting Disability Sports(Special Olympics, Paralympics, Deaflympics)
	Week 4		Classification and Divisioning in sports Inclusion in Sports, its need, and importance

		Ch:-4 Physical Education and Sports for CWSN	
AUGUST	Week 1	Ch:-4 continued....	Advantage of Physical Activities for CWSN Strategies to make Physical Activities assessable for CWSN
	Week 2		Balanced Diet and Nutrition Macro and Micro Nutrients: Food sources and functions
	Week 3	Ch:-5 Sports and Nutrition	Nutritive and Non-Nutritive Components of Diet Eating for Weight Control
	Week 4		Importance of Diet in Sports Copy Checking Revision , Q/A doubt session
SEPTEMBER	Week 1	Revision	Ch- 1-5 Q/A Revision Q/A Doubt Session
	Week 2,3 & 4		Half-Yearly Exam Half-Yearly Copy Checking
OCTOBER	Week 1	Ch:-6 Test and Measurement in Sports	Various Fitness Test- SAI Khelo India Fitness Test in School
	Week 2		Measurement of Cardio-Vascular Fitness Computing Basal Metabolic Rate(BMR)
	Week 3(Durga Puja Vacation)		Revision Project work & Practical Notebook
	Week 4		Johnsen- Methney Test of Motor Educability Q/A doubt session
NOVEMBER	Week 1	Ch:-7 Physiology and Injuries in Sports	Components of Physical Fitness Effect of exercise on the Muscular System
	Week 2(Deepawali Vacation)		Revision
	Week 3		Effect of exercise on Cardio-Respiratory System Physiological changes due to aging
	Week 4		Sports Injuries and their classifications(Soft Tissue Injuries & Hard Tissue Injuries)
DECEMBER	Week 1	Ch:-8 Biomechanics and Sports	Newton's Law of Motion and its application in Sports Type of Levers and their application in Sports
	Week 2		Equilibrium- Static and Dynamic Centre of Gravity and its application in Sports
	Week 3		Friction and Sports Projectile in Sports Copy Checking Q/A doubt session
	Week 4		Personality; its definition and types Motivation; its types and techniques

		Ch:-9 Psychology and Sports	
JANUARY	Week 1(Winter Vacation)	Ch:-9 continued...	Revision
	Week 2		Exercise Adherence: Reasons, Benefits and Strategies to enhance it Aggressions in Sports and its types
	Week 3		Psychological Attributes in Sports –Self Esteem, Mental Imagery, Self-Talk, Goal Setting
	Week 4		Talent Identification and Talent Development in Sports Training Cycle- Micro, Meso, Macro Cycle
FEBRUARY	Week 1	Ch:-10 Continued...	Types and Methods to Develop- Strength, Endurance, and Speed
	Week 2		Types and Methods to Develop- Flexibility and Coordinative Abilities Circuit Training
	Week 3(Revision)		Copy Checking Final Revision Q/A Doubt Session
	Week 4(Revision)		Final Revision Q/A Doubt Session