Delhi Board of School Education

Draft Syllabus – Class 11

Academic Year 2024-25

Term 1 & 2

Contents

Syllabus for English

Term 1

Reading

Reading Comprehensions

One unseen passage to assess comprehension, interpretation, analysis, inference and vocabulary. The passage may be factual, descriptive or literary.
One unseen case-based factual passage with verbal/visual inputs like statistical data, charts etc.to assess comprehension, interpretation, analysis, inference and evaluation.
One poem to assess comprehension, interpretation, analysis (literary and figurative), inference and vocabulary.

Multiple Choice Questions / Objective Type Questions will be asked.

Criteria to be Assessed: A

Competencies: Conceptual understanding, decoding, analysing, inferring, interpreting, appreciating, literary, conventions and vocabulary, summarising and using appropriate format/s.

Literature

This section would assess the learners' understanding of the text, language used, setting, style, structure, character, plot, various perspectives, themes explored through the text and the element ofintertextuality within the texts.

- Hornbill: Prose
- The Portrait of a Lady

  Major themes: Evolving human relationships, connection, respect, selflessness and strength of character.
- We are Not Afraid to Die

  Major themes: Importance of family, togetherness in times of hardships, love, bravery, maturity and courage.

  Criteria to be Assessed: A, B, C and D

  Competencies: Recalling, reasoning, appreciating literary convention, inference, analysis, creativitywith fluency, critical thinking.

Hornbill: Poetry

- A Photograph

  Major themes: Love and loss, human bond, nostalgia, impermanence of human beings.
- The Laburnum Top

  Major themes: The symbiotic relationship between the tree and the bird, symbolism and figurative use of language.
- The Voice of the Rain

  Major themes: Importance of cyclic nature of rain, science and poetry as an extension of nature.

Criteria to be Assessed: A, B, C and D

Competencies: Recalling, reasoning, appreciating literary convention, inference, analysis, creativitywith fluency, critical thinking.

Snapshots (Supplementary Reader):

- The Summer of the Beautiful White Horse

  Major themes: Adolescent adventures, honesty, humour, importance of character and family reputation, conflict between feelings and reason,

- The Address

  Major themes: War, loss and human predicament, forced migration, evolution of relationship in timesof crisis.

Criteria to be Assessed: A, B, C and D

Competencies: Recalling, reasoning, appreciating literary convention, inference, analysis, creativitywith fluency, critical thinking.

Writing skills

- Advertisement
- Speech Writing

Criteria to be Assessed: B, C and D

Competencies: Conceptual Understanding, application of rules, analysis, Reasoning, appropriacy ofstyle and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity.

Grammar

- Gap filling – tenses, prepositions
- Reported Speech
- Idioms and Phrasal Verbs

Multiple Choice Questions / Objective Type Questions will be asked.

Competencies: Conceptual Understanding, application of rules, analysis, Reasoning, appropriacy ofstyle and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity.

Term II

Reading

Reading Comprehensions

One unseen passage to assess comprehension, interpretation, analysis, inference and vocabulary. The passage may be factual, descriptive or literary.

One unseen case-based factual passage with verbal/visual inputs like statistical data, charts etc.to assess comprehension, interpretation, analysis, inference and evaluation.

One poem to assess comprehension, interpretation, analysis (literary and figurative), inference and vocabulary.

Multiple Choice Questions / Objective Type Questions will be asked.

Criteria to be Assessed: A

Competencies: Conceptual understanding, decoding, analysing, inferring, interpreting, appreciating, literary, conventions and vocabulary, summarising and using appropriate format/s.

Literature

This section would assess the learners' understanding of the text, language used, setting, style, structure, character, plot, various perspectives, themes explored through the text and the element ofintertextuality within the texts.

- Hornbill: Prose
- Discovering Tut

  Major themes: Use of scientific technology for exploration, history and civilisation, non fictional writing.

- The Adventure

Major themes: Blend of history and science, time travel, catastrophe theory

Criteria to be Assessed: A, B, C and D

Competencies: Recalling, reasoning, appreciating literary convention, inference, analysis, creativitywith fluency, critical thinking.

Hornbill: Poetry

- Childhood

  Major themes: Loss of childhood, individuality, rationalism, nostalgia.

- Father to Son

  Major themes: Father-Son relationship, universality of experiences, generation gap

Criteria to be Assessed: A, B, C and D

Competencies: Recalling, reasoning, appreciating literary convention, inference, analysis, creativitywith fluency, critical thinking.

Snapshots (Supplementary Reader):

- Mother's Day (Play)

  Major themes: Gender inequality, unpaid and unacknowledged labour by mothers and women athome, use of dry humour and satire to bring change.

- Birth (Prose)

  Major themes: Hope in times of despair.

Criteria to be Assessed: A, B, C and D

Competencies: Recalling, reasoning, appreciating literary convention, inference, analysis, creativitywith fluency, critical thinking.

Writing skills

- Poster
- Debate writing

Criteria to be Assessed: B, C and D

Competencies: Conceptual Understanding, application of rules, analysis, Reasoning, appropriacy of style and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity.

Grammar

- Modals

  Transformation of Sentences (Voice)

Multiple Choice Questions / Objective Type Questions will be asked.
Competencies: Conceptual Understanding, application of rules, analysis, Reasoning, appropriacy of style and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity.

Syllabus for Mathematics

Term 1

Unit 1: Sets, Relations, and Functions

- Universal set, Subsets, Intervals.
- Operation on Sets: Union, Intersection, Difference, Complement of a set.
- Properties of Complement.
- Laws of Sets (Only Application): Idempotent, Associative, Commutative, Distributive, De Morgan's Law
- Venn diagrams (Only for 2 and 3 Sets): Representation and Application
- Power set

Unit 2: Linear Inequality

- Algebraic solutions of linear inequalities in one variable and their representation on the number line.
- Graphical solution of linear inequalities in two variables.
- Graphical method of finding a solution of system of linear inequalities in two variables.

Unit 3: Trigonometric Functions

- Trigonometry as a circular function.
- Measurement of angles in Radians and Degrees
- Sign Convention of Trigonometric Functions in all four quadrants
- Graphs of Trigonometric Functions
- Trigonometric Identities of following types:
- Compound Angles $sssn$ $(x \pm y)$, cos$(x \pm y)$, tan$(x \pm y)$
- Transformation Formulae ($sssn\ x \pm sssn\ y$), (cos $x \pm$ cos y)
- Multiples and Submultiples of An Angle $Sssn\ 2x$, $sssn\ 3x$
- Trigonometric Equations: $sssn\ x = 0$, $cos\ x = 0$, $tan\ x = 0$, sin x = sin y , cos x = cos y, $tanx$ = tan y

Unit 4: Sequence and Series

- Difference between Sequence and Series.
- Geometric Progression (G.P.), general term of a G.P.
- Sum of n terms of a G.P.
- Infinite G.P. and its sum
- Arithmetic Progression (A.P.)
- Arithmetic Mean (A.M.)

- Relation between A.M. & G.M.

Unit 5: Quadratic Equations & Complex Numbers

- Need for complex numbers, especially √−1, to be motivated by inability to solve some of the
- quadratic equations.
- Representation of complex numbers in the form a + ib
- Algebraic properties (Conjugate and Modulus) of complex numbers.
- Statement of Fundamental Theorem of Algebra.
- Solution of quadratic equations (with real coefficients) in the complex number system.
- Argument of a complex number.

Internal assessment

1. Mathematical activities published by NCERT aligned with term 1 units or activities devised by the teacher can be considered for internal assessment.

2. At-least two internal non-pen and paper-based assessment are to be conducted by the subject teachers.

3. Internal assessments should be reported to DBSE as score obtained in different criteria adopted by DBSE on or before the dates mentioned in assessment calendar issued by the board.

Term 2

Unit 6: Permutations & Combinations

- Fundamental principle of counting.
- Factorial of a number.
- Permutations & Combinations: definition, derivation of formulae (nPr and nCr), applications.

Unit 7: Binomial Theorem

- History (Pascal's triangle), statement of binomial theorem for positive integral indices.
- General and middle term in binomial expansion, simple applications.

Unit 8: Straight Lines

- Brief recall of two-dimensional geometry from earlier classes.
- Slope of a line and angle between two lines.
- Various forms of equations of a line:
    - General Equation of a Line.
    - Point-Slope Form

- Slope-Intercept Form
- Two-Point Form
- Intercept Form
- Normal Form
- Parallel And Perpendicular to Axes

- Distance of a point from a line.

Unit 9: Conic Sections

- Sections of a cone: A pair of intersecting lines as a degenerated case of a conic section.
- Definition of circles, ellipse, parabola, and hyperbola.
- Standard equation of a circle.

  Standard equations and simple properties of parabola, ellipse, and hyperbola.

Unit 10: Statistics

- Measures of Dispersion: Range, Mean deviation, variance, and standard deviation of ungrouped/grouped data.

Unit 11: Probability

- Events; occurrence of events, ‘not’, ‘and’ and ‘or’ events.
- Exhaustive events, mutually exclusive events.
- Axiomatic (set theoretic) probability, connections with other theories of earlier classes.
- Probability of an event, probability of ‘not’, ‘and’ and ‘or’ events.
- Conditional probability, multiplication theorem on probability, independent events.
- Total probability, Bayes’ theorem.
- Random variable and its probability distribution. Mean of random variable.

Internal assessment

1. Mathematical activities published by NCERT aligned with term 1 units or activities devised by the teacher can be considered for internal assessment.
2. At-least two internal non-pen and paper-based assessment are to be conducted by the subject teachers.
3. Internal assessments should be reported to DBSE as score obtained in different criteria adopted by DBSE on or before the dates mentioned in assessment calendar issued by the board.

Syllabus for Physics

Term 1

Unit 1: Physics and Measurement

Units of measurements, System of Units, S I Units, fundamental and derived units, least count, significant figures, Errors in measurements, Dimensions of Physics quantities, dimensional analysis, and its applications.

Unit 2: Kinematics

The frame of reference, motion in a straight line, Position- time graph, speed and velocity; Uniform and non-uniform motion, average speed and instantaneous velocity, uniformly accelerated motion, velocity-time, position-time graph, relations for uniformly accelerated motion, Scalars and Vectors, Vector. Addition and subtraction, scalar and vector products, Unit Vector, Resolution of a Vector. Relative Velocity, Motion in a plane, Projectile Motion, Uniform Circular Motion.

Unit 3: Laws of Motion

Force and inertia, Newton's First law of motion; Momentum, Newton's Second Law of motion, Impulses; Newton's Third Law of motion. Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces. Static and Kinetic friction, laws of friction, rolling friction. Dynamics of uniform circular motion: centripetal force and its applications: vehicle on
a level circular road, vehicle on a banked road.

Unit 4: Work, Energy, and Power

Work done by a constant force and a variable force; kinetic and potential energies, work-energy theorem, power. The potential energy of spring conservation of mechanical energy, conservative and non-conservative forces; motion in a vertical circle: Elastic and inelastic collisions in one and two dimensions.

Unit 5: Rotational Motion

Centre of the mass of a two-particle system, Centre of the mass of a rigid body; Basic concepts of rotational motion; moment of a force; torque, angular momentum, conservation of angular momentum and its applications; The moment of inertia, the radius of gyration, values of moments of inertia for simple geometrical objects, parallel and perpendicular axes theorems, and their applications. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions.

Term-2

Unit 6: Gravitation

The universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth. Kepler's law of planetary motion. Gravitational potential energy; gravitational potential. Escape velocity, Motion of a satellite, orbital velocity, time period, and energy of satellite.

Unit 7: Properties of Solids and Liquids

Elastic behaviour, Stress-strain relationship, Hooke's Law. Young's modulus, bulk modulus, and modulus of rigidity. Pressure due to a fluid column; Pascal's law and its applications. Effect of gravity on fluid pressure. Viscosity. Stokes' law. terminal velocity, streamline, and turbulent flow. critical velocity. Bernoulli's principle and its applications. Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension - drops, bubbles, and capillary rise. Heat, temperature, thermal expansion; specific heat capacity, calorimetry; change of state, latent heat. Heat transfer- conduction, convection, and radiation.

Unit 8: Thermodynamics

Thermal equilibrium, zeroth law of thermodynamics, the concept of temperature. Heat, work, and internal energy. The first law of thermodynamics, isothermal and adiabatic processes. The second law of thermodynamics: reversible and irreversible processes.

Unit 9: Kinetic Theory of Gases

Equation of state of a perfect gas, work done on compressing a gas, Kinetic theory of gases -assumptions, the concept of pressure. Kinetic interpretation of temperature: RMS speed of gas molecules: Degrees of freedom. Law of equipartition of energy and applications to specific heat capacities of gases; Mean free path. Avogadro's number.

Unit 10: Oscillations and Waves

Oscillations and periodic motion – time period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion (S.H.M.) and its equation; phase: oscillations of a spring -restoring force and force constant: energy in S.H.M. – Kinetic and potential energies; Simple pendulum - derivation of expression for its time period: Wave motion. Longitudinal and transverse waves, speed of the travelling wave. Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves. Standing waves in strings and organ pipes, fundamental mode, and harmonics. Beats.

Criteria D: Physics lab-Experimental skills:

Category A: Observation and inference(for Term - 1 and Term -2)

1. To make a paper scale of given least count, e.g. 0.2cm, 0.5 cm.
2. Metre scale- Determine the mass of a given object by the principle of moments.

Category B: Investigation, Observation and Inference

TERM-1

1. Vernier callipers -its use to measure the internal and external diameter and depth of a vessel.
2. Screw gauge-its use to determine the thickness/ diameter of thin sheet/wire.
3. Simple Pendulum-dissipation of energy by plotting a graph between the square of amplitude and time.
4. Young's modulus of elasticity of the material of a metallic wire.

OR

To find the force constant of a helical spring by plotting a graph between load and extension.

TERM-2

5. To study the effect of detergent on surface tension of water by observing capillary rise.
6. Coefficient of Viscosity of a given viscous liquid by measuring the terminal velocity of a given spherical body,
7. Speed of sound in air at room temperature using a resonance tube,
8. Specific heat capacity of a given (i) solid and (ii) liquid by method of mixtures.

OR

Plotting a cooling curve for the relationship between the temperature of a hot body and time.

Syllabus for Chemistry

Term 1

Unit 1: Some Basic Concepts of Chemistry

General Introduction: Importance and scope of Chemistry, concept of elements, atoms and molecules. Atomic and molecular masses, mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry.

Unit 2: Structure of Atom

Nature of electromagnetic radiation, photo electric effect, spectrum of Hydrogen atom. Bohr's model and its postulates (energy and radii formulae) and its limitations, concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals, rules for filling electrons in orbitals - Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals.

Unit 3: Classification of Elements and Periodicity in Properties

Significance of classification, brief history of the development of periodic table, modern periodic law and the present form of periodic table, s, p, d and f-block elements, periodic trends in properties of elements-atomic radii, ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valency, oxidation state and chemical reactivity.
Nomenclature of elements with atomic number greater than 100.

Unit 4: Chemical Bonding and Molecular Structure

Kossel-Lewis approach to chemical bond formation Valence electrons, ionic bond, factor affecting formation of ionic bond ,lattice enthalpy ,covalent bond, bond parameters, Lewis structure, polar character of covalent bond, dipole moment, covalent character of ionic bond, Fajan`s rule valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridization, involving s, p and d orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules(qualitative idea only), Hydrogen bonding and its application.

Unit 5: Redox Reactions

Concept of oxidation and reduction, types of redox reactions, oxidation number, rules for finding the oxidation number. Balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number, applications of redox reactions.

Term-2

Unit 6: Chemical Thermodynamics

Concepts of System and types of systems, surroundings, work, heat, energy, extensive and intensive properties, state functions. First law of thermodynamics -internal energy and enthalpy, heat capacity and specific heat, measurement of U and H, Hess's law of constant heat summation, enthalpy of bond dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution. Second law of Thermodynamics (brief introduction), Spontaneity of process Introduction of entropy as a state function, Gibb's energy change for spontaneous and non-spontaneous processes, criteria for equilibrium and equilibrium constant.

Unit 7: Equilibrium

Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium -temperature, concentration ,pressure and catalyst Le Ch atelier's principle, ionic equilibrium-various concept of acid and base ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of poly basic acids, acid strength, concept of pH, hydrolysis of salts (elementary idea), buffer solution, Henderson Equation, solubility product, common ion effect (with illustrative examples).

Unit 8: Organic Chemistry-Some Basic Principles and Techniques

General introduction, tetravalency of carbon, classification and IUPAC nomenclature of organic compounds Isomerism and its types. Electronic displacements in a covalent bond: inductive effect, electrometric effect, resonance and hyper conjugation. Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions purification methods. Qualitative analysis and quantitative analysis (basic principles only)

Unit 9: Hydrocarbons

Classification of Hydrocarbons

Alkanes: Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis.

Alkenes: Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markovnikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition polymerization.

Alkynes: Nomenclature, structure of triple bond (ethyne), physical properties, methods of preparation, chemical reactions: acidic character of alkynes, addition reaction of - hydrogen, halogens, hydrogen halides and water.

Aromatic Hydrocarbons: Introduction, IUPAC nomenclature, benzene: resonance, aromaticity, chemical properties: mechanism of electrophilic substitution. Nitration, sulphonation, halogenation, Friedel-Craft's alkylation and acylation, directive influence of functional group in monosubstituted benzene.

Carcinogenicity and toxicity.

PRACTICAL SYLLABUS (For Assessment of Criteria-D)

Term-1

A. Basic Laboratory Techniques

1. Cutting glass tube and glass rod
2. Bending a glass tube
3. Drawing out a glass jet
4. Boring a cork

B. Characterization and Purification of Chemical Substances

1. Determination of melting point of an organic compound.
2. Determination of boiling point of an organic compound.
3. Crystallization of impure sample of any one of the following: Alum, Copper Sulphate, Benzoic Acid.

E. Quantitative Estimation

i. Using a mechanical balance/electronic balance.

ii. Preparation of standard solution of Oxalic acid.

iii. Determination of strength of a given solution of Sodium hydroxide by titrating it against standard solution of Oxalic acid.

iv. Preparation of standard solution of Sodium carbonate.

v. Determination of strength of a given solution of hydrochloric acid by titrating it against standard Sodium Carbonate solution.

Term-2

C. Experiments based on pH

a) Any one of the following experiments:

- Determination of pH of some solutions obtained from fruit juices, solution of known and varied concentrations of acids, bases and salts using pH paper or universal indicator.
- Comparing the pH of solutions of strong and weak acids of same concentration. Study the pH change in the titration of a strong base using universal indicator.

b) Study the pH change by common ion in case of weak acids and weak bases.

D. Chemical Equilibrium One of the following experiments:

a) Study the shift in equilibrium between ferric ions and thiocyanate ions by increasing/decreasing the concentration of either of the ions.

b) Study the shift in equilibrium between $[Co(H_2O)_6]^{2+}$ and chloride ions by changing the concentration of either of the ions.

F. Qualitative Analysis

a) Determination of one anion and one cation in a given salt

Anions- CO_3^{2-}, S^{2-}, NO_2^-, SO_3^{2-}, SO_4^{2-}, NO_3^-, Cl^-, Br^-, I^-, PO_4^{3-}, CH_3COO^-

Cations- NH_4^+, Pb^{2+}

(Note: Insoluble salts excluded)

Evaluation Scheme for Practical Examination (Term-1 & 2)

Experiment	Level
Major Experiment: Volumetric Analysis/Salt Analysis	08
Content Based Experiment	06
Project Work / Practical record	04
Viva based on project work / experiments	04

Syllabus for Biology

Term 1

Chapter-1: The Living World

Diversity in the living world, Conceptual knowledge of taxonomy and systematics, species, taxonomical hierarchy, binomial nomenclature. What are taxonomical aids? Brief discussion of museums, zoological parks, herbaria, botanical gardens, taxonomical keys, manuals and monographs.

Chapter-2: Biological Classification

Two kingdom classification, Five kingdom classification; three domains of life; Salient features (3-5 distinguishing features) and classification of Monera, Protista and Fungi into major groups: Lichens, Viruses, Viroid and Prions. Two examples for each with one disease associated with these groups in both plants and animals.

Chapter-3: Plant Kingdom

Salient features (3-5 distinguishing features) and classification of plants into major groups - Algae, Bryophyta, Pteridophyte, Gymnospermae and Angiospermae; Angiosperms (classification upto class, characteristic features and examples.

Chapter-4: Animal Kingdom

Basis of classification, Salient features (3-5 distinguishing features with two examples each) and classification of animals: non-chordates up to phyla level and chordates up to class level.

**Demonstration and display of live animals is strictly prohibited.

Chapter-5 Morphology of Flowering Plants

Morphology of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed. Description of family Solanaceae

Chapter-6 Anatomy of Flowering Plants

Anatomy and functions of tissue systems in dicots and monocots. (family- Malvaceae, Brassicaceae, Fabaceae, Asteraceae, Poaceae)

Chapter-7: Structural Organisation in Animals

Brief account of different types of animal tissues, Organ and organ system, Frog: Morphology and anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of frog.

Chapter-8: Cell-The Unit of Life

Cell theory and cell as the basic unit of life: Structure of prokaryotic and eukaryotic cells; Plant cell and animal cell; cell envelope; cell membrane, cell wall; ultrastructure and function of different cell organelles and nucleus.

Chapter-9: Biomolecules

Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, nucleic acids; Enzymes- types, properties, enzyme action.

Chapter-10: Cell Cycle and Cell Division

Cell cycle, mitosis, meiosis and their significance

Term 2

Chapter-11: Photosynthesis in Higher Plants

Structure of chloroplast, basic conceptual knowledge about pigments involved in photosynthesis cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis; photorespiration; C3 and C4 pathways; factors affecting photosynthesis. Blackman's law of limiting factors.

Chapter-12: Respiration in Plants

Exchange of gases; cellular respiration - glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); energy relations - number of ATP molecules generated; amphibolic pathways; respiratory quotient.

Chapter-13: Plant - Growth and Development

Seed germination; phases of plant growth and plant growth rate; conditions of growth, differentiation, dedifferentiation and redifferentiation, development-; sequence of developmental processes in a plant cell, growth regulators - auxin, gibberellin, cytokinin, ethylene, ABA; seed dormancy; vernalisation; photoperiodism.

Chapter-14: Breathing and Exchange of Gases

Respiratory system in humans; mechanism of breathing and its regulation in humans - exchange of gases, transport of gases and regulation of respiration, respiratory volume; disorders related to respiration - asthma, emphysema, occupational respiratory disorders.

Chapter-15: Body Fluids and Circulation

Composition of blood, blood groups, coagulation of blood; composition of lymph and its function; human circulatory system - Structure of human heart and blood vessels; cardiac cycle, cardiac output,

ECG; double circulation; regulation of cardiac activity; disorders of circulatory system - hypertension, coronary artery disease, angina pectoris, heart failure

Chapter-16: Excretory Products and Their Elimination

Modes of excretion - ammonotelism, ureotelism, uricotelism; human excretory system – structure and function; urine formation, osmoregulation; regulation of kidney function - renin - angiotensin, atrial natriuretic factor, ADH and diabetes insipidus; role of other organs in excretion; disorders - uraemia, renal failure, renal calculi, nephritis; dialysis and artificial kidney, kidney transplant.

Chapter-17: Locomotion and Movement

Types of movement - ciliary, flagellar, muscular; skeletal muscle- contractile proteins and muscle contraction; Skeletal system and joints, disorders of muscular and skeletal system - myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout.

Chapter-18: Neural Control and Coordination

Neuron and nerves; Nervous system in humans - central nervous system; peripheral nervous system and visceral nervous system; generation and conduction of nerve impulse.

Chapter-19: Chemical Coordination and Integration

Endocrine system and the hormones. Different endocrine glands along with their associated hormones, their function and diseases associated with them if abnormal secretion occurs, basic conceptual knowledge of mechanism of hormone action, role of hormones as messengers and regulators.

Biology lab

Criteria D:

Category A: Dry Lab: Observation and inference

TERM 1

1. Study of the parts of microscope • a dissecting microscope • a compound microscope.
2. Study of the specimens/slides/models and identification with reasons – Bacteria, Oscillatoria, Spirogyra, Rhizopus, mushroom, yeast, liverwort, moss, fern, pine, one monocotyledonous plant, one dicotyledonous plant and one lichen.
3. Study of virtual specimens/slides/models and identification with reasons – Amoeba, Hydra, liver-fluke, Ascaris, leech, earthworm, prawn, silkworm, honeybee, snail, starfish, shark, rohu, frog, lizard, pigeon and rabbit.
4. Study of tissues and diversity in shapes and sizes of plant and animal cells palisade cells, guard cells, parenchyma, collenchyma, sclerenchyma, xylem, phloem, squamous epithelium, muscle fibres and mammalian blood smear through temporary/permanent slides.

5. Study of the different stages of cell division in mitosis from permanent slides.
6. Study of different modifications in (morphology of flowering plants will be delt in practical syllabus)
    - roots
    - stems
    - leaves
    - types of inflorescences
    - cymose: scorpiod, helicoid, cyme
    - racemose: spike, umbel, corymb, raceme

TERM 2

7. Study of imbibition in seeds/raisins.
8. Observation and comments on the experimental set up for showing apical dominance
9. Study of human skeleton and different types of joints with the help of virtual images/models only. Chapter to be dealt in practical only

Category B: Investigation, observation and inference (wet lab and slide preparation)

TERM 1

1. Study and description of two locally available common flowering plants, one from each of the families Solanaceae and Liliaceae or any locally available plant (one from dicot and one from monocot) (morphology of flowering plants will be delt in practical syllabus)
2. Study of different tissues in T.S of (for primary growth only) (Anatomy of flowering plants to be dealt with practical syllabus)
    - Dicot root
    - Dicot stem
    - Monocot root
    - Monocot stem
    - Dicot leaf
    - Monocot leaf
3. Study of osmosis by potato osmometer.
4. Study of plasmolysis in epidermal peels (e.g. Rhoeo leaves).

TERM 2

5. Study of distribution of stomata in the upper and lower surface of leaves.
6. Comparative study of the rates of transpiration in the upper and lower surface of leaves.
7. Test for the presence of sugar, starch, proteins and fats in suitable products.

8. Separation of plant pigments through paper chromatography.
9. Test of urine for the presence of
    - Urea
    - Sugar
    - Albumin

Internal Assessment

- Preparation of herbaria with atleast 10 plants: strict protocols to be followed for preparing herbarium
- Difference in structure of stomata in 10 different locally available plants.
- Study the spores of different types of fungi/mushrooms/spore printing of mushrooms
- Study of photosynthesis in plants in different light conditions
- At-least two internal non-pen and paper-based assessment are to be conducted by the subject teachers.
- Internal assessments should be reported to DBSE as score obtained in different criteria adopted by DBSE on or before the dates mentioned in assessment calendar issued by the board.

Evaluation of lab work

The lab work is to be taken as per term wise syllabus.

The given breakup is for each term

S. No.	Breakup of lab experimentation	Level points	Level description
1.	One wet lab	8	Student can conduct experiments competently, interpret data drawn from a complex data set and is able to demonstrate insight. She/he can draw reasonable conclusions to resolve authentic problems
2.	One slide preparation	8	
3.	Dry lab: Observation and inference	6	Student can observe and interpret data drawn from a complex data set and is able to demonstrate insight. She/he can draw reasonable conclusions
4.	Internal assessment	6	investigations demonstrate an ability to undertake basic investigative approach
5.	Practical record + viva voice	4	investigations demonstrate insight and independence to design and complete innovative practical work and is able to answer

Syllabus for Physical Education

Term 1

UNIT 1: Dimensions of Physical Education

Physical Education programs and professions:

- Careers in Physical Education
- Institutes and programs for Physical Education

Physical Education for CWSN:

- An Introduction to CWSN
- Strategies for Inclusive Physical Education
- Adaptive Physical Education and its importance
- Strategies to make physical education accessible for CWSN

Organisation promoting Adaptive Sports:

- Paralympics
- Special Olympics
- Deaflympics
- Special Olympics Bharat

UNIT 2: Exercise Physiology

General Introduction of the Exercise Physiology

Assessment of Physiological variables:

- Resting Heart Rate (through Radial Pulse Method)
- Resting Breathe Rate
- Breathe hold capacity
- Vital Capacity

Effects of Exercise on different systems:

- Immediate effects of exercise on Musculoskeletal, Circulatory, and Respiratory System
- Long-term effects of exercise on Musculoskeletal, Circulatory, and Respiratory System

Physical Burnout or Overtraining Syndrome (OTS):

- Physical, Physiological and Behavioral

Syllabus for Computer Science

Term 1

UNIT 1: Computer Systems and Organisation

- Basic computer organisation: Introduction to Computer System, hardware, software, input device, output device, CPU, memory (primary, cache and secondary), units of memory (bit, byte, KB, MB, GB, TB, PB)
- Types of software: System software (Operating systems, system utilities, device drivers), programming tools and language translators (assembler, compiler, and interpreter), application software
- Operating System(OS): functions of the operating system, OS user interface
- Boolean logic: NOT, AND, OR, NAND, NOR, XOR, NOT, truth tables and De Morgan's laws, Logic circuits
- Number System: Binary, Octal, Decimal and Hexadecimal number system; conversion between number systems
- Encoding Schemes: ASCII, ISCII, and Unicode (UTF8, UTF32)

UNIT 2: Computational Thinking and Programming - I

- Introduction to Problem-solving: Steps for Problem-solving (Analyzing the problem, developing an algorithm, coding, testing, and debugging), representation of algorithms using flowchart and pseudocode, decomposition
- Familiarization with the basics of Python programming: Introduction to Python, Features of Python, executing a simple "hello world" program, execution modes: interactive mode and script mode, Python character set, Python tokens(keyword, identifier, literal, operator, punctuator), variables, concept of l-value and r-value, use of comments
- Knowledge of data types: Number (integer, floating point, complex), boolean, sequence (string, list, tuple), None, Mapping(dictionary), mutable and immutable data types.
- Operators: arithmetic operators, relational operators, logical operators, assignment operators, augmented assignment operators, identity operators (is, is not), membership operators (in not in)
- Expressions, statement, type conversion, and input/output: precedence of operators, expression, evaluation of an expression, type-conversion (explicit and implicit conversion), accepting data as input from the console and displaying output.
- Errors- syntax errors, logical errors, and run-time errors
- Flow of Control: introduction, use of indentation, sequential flow, conditional and iterative flow

- Conditional statements: if, if-else, if-elif-else, flowcharts, simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number.

Term 2

UNIT 2: Iterative Statement: for loop, range(), while loop, flowcharts, break and continue statements, nested loops, suggested programs: generating pattern, summation of series, finding the factorial of a positive number, etc.

- Strings: introduction, string operations (concatenation, repetition, membership and slicing), traversing a string using loops, built-in functions/methods–len(), capitalize(), title(), lower(), upper(), count(), find(), index(), endswith(), startswith(), isalnum(), isalpha(), isdigit(), islower(), isupper(), isspace(),lstrip(), rstrip(), strip(), replace(), join(), partition(), split()
- Lists: introduction, indexing, list operations (concatenation, repetition, membership and slicing), traversing a list using loops, built-in functions/methods–len(), list(), append(), extend(), insert(), count(), index(), remove(), pop(), reverse(), sort(), sorted(), min(), max(), sum(); nested lists, suggested programs: finding the maximum, minimum, mean of numeric values stored in a list; linear search on list of numbers and counting the frequency of elements in a list.
- Tuples: introduction, indexing, tuple operations (concatenation, repetition, membership and slicing); built-in functions/methods – len(), tuple(), count(), index(), sorted(), min(), max(), sum(); tuple assignment, nested tuple; suggested programs: finding the minimum, maximum, mean of values stored in a tuple; linear search on a tuple of numbers, counting the frequency of elements in a tuple.
- Dictionary: introduction, accessing items in a dictionary using keys, mutability of a dictionary (adding a new term, modifying an existing item), traversing a dictionary, built-in functions/methods – len(), dict(), keys(), values(), items(), get(), update(), del(), del, clear(), fromkeys(), copy(), pop(), popitem(), setdefault(), max(), min(), sorted(); Suggested programs: count the number of times a character appears in a given string using a dictionary, create a dictionary with names of employees, their salary and access them.
- Introduction to Python modules: Importing module using 'import ' and using from statement, importing math module (pi, e, sqrt(), ceil(), floor(), pow(), fabs(), sin(), cos(), tan()); random module (random(), randint(), randrange()), statistics module (mean(), median(), mode()).

UNIT 3: Society, Law and Ethics

- Digital Footprints
- Digital Society and Netizen: net etiquettes, communication etiquettes, social media étiquettes

- Data Protection: Intellectual property rights (copyright, patent, trademark), violation of IPR(plagiarism, copyright infringement, trademark infringement), open source software and licensing (Creative Commons, GPL and Apache)
- Cyber Crime: definition, hacking, eavesdropping, phishing and fraud emails, ransomware, cyber trolls, cyber bullying
- Cyber safety: safely browsing the web, identity protection, confidentiality
- Malware: viruses, trojans, adware
- E-waste management: proper disposal of used electronic gadgets.
- Information Technology Act (IT Act)
- Technology and society: Gender and disability issues while teaching and using computers.