English Core
Code No. 301
Class XI (2021-22)
Term Wise Syllabus

SECTION	TERM I	WEIGHTAGE (IN MARKS)	TERM II	WEIGHTAGE (IN MARKS)
A	**Reading Comprehension**: • Unseen passage (factual, descriptive or literary/ discursive or persuasive) • Case Based Unseen (Factual) Passage	**8 + 5 = 13**	**Reading Comprehension:** • Unseen passage (factual, descriptive or literary /discursive or persuasive) • Unseen passage for Note Making and Summarising	**8 + 5 = 13**
B	**Creative Writing Skills and Grammar**: **Short Writing Tasks** • Notice Writing **Long Writing Tasks** • Business or Official Letters(Making enquiries, registering complaints, asking for or giving information, placing orders and sending replies) • Speech **Grammar** • Determiners • Tenses • Re-ordering of Sentences **{MCQs on Gap filling/ Transformation of Sentences}**	**3 + 5 + 4 = 12**	**Creative Writing Skills and Grammar**: **Short Writing Tasks** • Posters **Long Writing Tasks** • Official Letters: e.g. to school/college authorities (regarding admissions, school issues, requirements / suitability of courses) • Debate **Grammar** • Determiners • Tenses • Re-ordering of Sentences **{MCQs on Gap filling/ Transformation of Sentences }**	**3 + 5 + 4 = 12**
C	**Literature:** Literary-prose/poetry extracts (seen- texts) comprehension and appreciation. **(Two Extracts)** **Questions Based on Texts to assess** comprehension and appreciation, analysis, inference, extrapolation **Book-Hornbill:** • The Portrait of a Lady (*Prose*) • A Photograph (*Poem*) • "We're Not Afraid to Die… if We Can All Be Together" (*Prose*) • Discovering Tut: the Saga Continues • The Laburnum Top (*Poem*) • Landscape of the Soul (Prose) **Book-Snapshots:** • The Summer of the Beautiful White Horse(Prose) • The Address (Prose) • Ranga's Marriage (Prose)	**9 Marks for Hornbill + 6 Marks for Snapshots = 15 Marks**	**Literature:** Questions based on extracts/texts to assess comprehension and appreciation, analysis, inference, extrapolation **Book-Hornbill:** • The Voice of the Rain (Poem) • The Ailing Planet: The Green Movement's Role (*Prose*) • The Browning Version(Play) • Childhood (Poem) • Silk Road (Prose) **Book-Snapshots:** • Albert Einstein at School (Prose) • Mother's Day (Play) • Birth (Prose)	**9 Marks for Hornbill + 6 Marks for Snapshots = 15 Marks**
	TOTAL	**40**	**TOTAL**	**40**
	ASL	**10**	**ASL**	**10**
	GRAND TOTAL	**40 + 10 = 50 MARKS**	**GRAND TOTAL**	**40 + 10 = 50 MARKS**

Prescribed Books

1. **Hornbill:** English Reader published by National Council of Education Research and Training, New Delhi
2. **Snapshots:** Supplementary Reader published by National Council of Education Research and Training, New Delhi

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English Core
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Term Wise Syllabus

SECTION	TERM 1	WEIGHTAGE (IN MARKS)	TERM II	WEIGHTAGE (IN MARKS)
A	**Reading Comprehension**: (Two Passages) • Unseen passage (factual, descriptive or literary/ discursive or persuasive) • Case Based Unseen (Factual) Passage	**14 (8+6 Marks)**	**Reading Comprehension**: (Two Passages) • Unseen passage (factual, descriptive or literary/ discursive or persuasive) • Case Based Unseen (Factual) Passage	**14 (8+6 Marks)**
B	**Creative Writing Skills** : **Short Writing Tasks** • Notice Writing • Classified Advertisements **Long Writing Tasks(One)** • Letter to an Editor (giving suggestions or opinion on issues of public interest) • Article Writing	**3+5 marks** **Total=08**	**Creative Writing Skills** : **Short Writing Tasks** • Formal & Informal Invitation Cards or the Replies to Invitation/s **Long Writing Tasks(One)** • Letter of Application for a Job • Report Writing	**3+5 Marks** **Total=08**
C	**Literature :** Literary-prose/poetry extracts (seen- texts) to assess comprehension and appreciation, analysis, inference, extrapolation **Questions Based on Texts to assess** comprehension and appreciation, analysis, inference, extrapolation **Book- Flamingo (Prose)** • The Last Lesson • Lost Spring • Deep Water **Book-Flamingo (Poetry)** • My Mother at Sixty-Six • An Elementary School Classroom in a Slum • Keeping Quiet **Book-Vistas (Prose)** • The Third Level • The Enemy	**11 Marks for Flamingo + 7 Marks for Vistas = 18 Marks**	**Literature:** Questions based on extracts/texts to assess comprehension and appreciation, analysis, inference, extrapolation **Book-Flamingo (Prose)** • The Rattrap • Indigo **Book-Flamingo (Poetry)** • A Thing of Beauty • Aunt Jennifer's Tigers **Book-Vistas (Prose)** • Should Wizard Hit Mommy? • On the Face of It • Evans Tries an O Level	**11 Marks for Flamingo + 7 Marks for Vistas = 18 Marks**
	TOTAL	**40**	**TOTAL**	**40**
	ASL	**10**	**ASL**	**10**
	GRAND TOTAL	**40 + 10 = 50**	**GRAND TOTAL**	**40 + 10 = 50**

Prescribed Books

1. **Flamingo**: English Reader published by National Council of Education Research and Training, New Delhi
2. **Vistas:** Supplementary Reader published by National Council of Education Research and Training, New Delhi

PHYSICS XI (Code No. 042) COURSE STRUCTURE

Class XI (Theory) Term 1

Time: one and half hours. **Max Marks: 35**

		No. of Periods	Marks
Unit–I	**Physical World and Measurement**	**6**	**20**
	Chapter–1: Physical World		
	Chapter–2: Units and Measurements		
Unit-II	**Kinematics**	**16**	
	Chapter–3: Motion in a Straight Line		
	Chapter–4: Motion in a Plane		
Unit–III	**Laws of Motion**	**10**	
	Chapter–5: Laws of Motion		
Unit–IV	**Work, Energy and Power**	**12**	**15**
	Chapter–6: Work, Energy and Power		
Unit–V	**Motion of System of Particles and Rigid Body**	**16**	
	Chapter–7: System of Particles and Rotational Motion		
Unit-VI	**Gravitation**	**8**	
	Chapter–8: Gravitation		
Total		**68**	**35**

Syllabus assigned for first term

Unit I: Physical World and Measurement **6 Periods**

Chapter–1: Physical World

Physics-scope and excitement; nature of physical laws; Physics, technology and society. (To be discussed as a part of Introduction and integrated with other topics)

Chapter–2: Units and Measurements

Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures.

Dimensions of physical quantities, dimensional analysis and its applications.

Unit II: Kinematics **16 Periods**

Chapter–3: Motion in a Straight Line

Elementary concepts of differentiation and integration for describing motion, uniform and non-uniform motion, average speed and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs.

Relations for uniformly accelerated motion (graphical treatment).

Chapter–4: Motion in a Plane

Scalar and vector quantities; position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors,

relative velocity, Unit vector; resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors.

Motion in a plane, cases of uniform velocity and uniform acceleration-projectile motion, uniform circular motion.

Unit III: Laws of Motion **10 Periods**

Chapter–5: Laws of Motion

*Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. (*Recapitulation only)

Law of conservation of linear momentum and its applications.
Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication.

Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on a banked road).

Unit IV: Work, Energy and Power **12 Periods**

Chapter–6: Work, Energy and Power

Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power.

Notion of potential energy, potential energy of a spring, conservative forces: conservation of mechanical energy (kinetic and potential energies); non-conservative forces: motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.

Unit V: Motion of System of Particles and Rigid Body **16 Periods**

Chapter–7: System of Particles and Rotational Motion

Centre of mass of a two-particle system, momentum conservation and centre of mass motion.
Centre of mass of a rigid body; centre of mass of a uniform rod.
Moment of a force, torque, angular momentum, law of conservation of angular momentum and its applications.

Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions.

Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects (no derivation).

Unit VI: Gravitation **8 Periods**

Chapter–8: Gravitation

Universal law of gravitation. Acceleration due to gravity (recapitulation only) and its variation with altitude and depth.

Gravitational potential energy and gravitational potential, escape velocity, orbital velocity of a satellite, Geo-stationary satellites.

Class XI (Theory) Term II

Time: 2hrs **Max Marks: 35**

Unit		Periods	Marks
Unit–VII	**Properties of Bulk Matter**	**22**	**23**
	Chapter–9: Mechanical Properties of Solids		
	Chapter–10: Mechanical Properties of Fluids		
	Chapter–11: Thermal Properties of Matter		
Unit–VIII	**Thermodynamics**	**10**	
	Chapter–12: Thermodynamics		
Unit–IX	**Behaviour of Perfect Gases and Kinetic Theory of Gases**	**08**	
	Chapter–13: Kinetic Theory		
Unit–X	**Oscillations and Waves**	**23**	**12**
	Chapter–14: Oscillations		
	Chapter–15: Waves		
	Total Marks	63	**35**

Syllabus assigned for Term II

Unit VII: Properties of Bulk Matter **22 Periods**

Chapter–9: Mechanical Properties of Solids

Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus

Chapter–10: Mechanical Properties of Fluids

Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes), effect of gravity on fluid pressure.

Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its applications.

Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise.

Chapter–11: Thermal Properties of Matter

Heat, temperature, (recapitulation only) thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state - latent heat capacity.

Heat transfer-conduction, convection and radiation (recapitulation only), thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law, Greenhouse effect.

Unit VIII: Thermodynamics **10 Periods**

Chapter–12: Thermodynamics

Thermal equilibrium and definition of temperature (zeroth law of thermodynamics), heat, work and internal energy. First law of thermodynamics, isothermal and adiabatic processes.

Second law of thermodynamics: reversible and irreversible processes

Unit IX: Behaviour of Perfect Gases and Kinetic Theory of Gases **08 Periods**

Chapter–13: Kinetic Theory

Equation of state of a perfect gas, work done in compressing a gas.
Kinetic theory of gases - assumptions, concept of pressure. Kinetic interpretation of temperature; rms speed of gas molecules; degrees of freedom, law of equi-partition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.

Unit X: Oscillations and Waves **23 Periods**

Chapter–14: Oscillations

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 loaded spring- restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period. Free, forced and damped oscillations (qualitative ideas only), resonance.

Chapter–15: Waves

Wave motion: Transverse and longitudinal waves, speed of travelling wave, displacement relation for a progressive wave, principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, Beats

PRACTICALS

Syllabus for TERM I **Total Periods: 16**

The record, to be submitted by the students, at the time of their First term examination, has to include:

Record of at least 4 Experiments, to be performed by the students

Record of at least 3 Activities [with 3 each from section A and section B], to be demonstrated by teacher.

Time Allowed: One and half hours **Max. Marks: 30**

Two experiments one from each section	**8Marks**
Practical record (experiment and activities)	2Marks
Viva on experiments, and activities	**5** Marks
Total	**15 Marks**

Syllabus assigned for Practical Term I

Experiments

1. To measure diameter of a small spherical/cylindrical body and to measure internal diameter and depth of a given beaker/calorimeter using Vernier Calipers and hence find its volume.
2. To measure diameter of a given wire and thickness of a given sheet using screw gauge.

OR

To determine volume of an irregular lamina using screw gauge.

3. To determine radius of curvature of a given spherical surface by a spherometer.
4. To determine the mass of two different objects using a beam balance.
5. To find the weight of a given body using parallelogram law of vectors.
6. Using a simple pendulum, plot its L-T^2 graph and use it to find the effective length of second's pendulum.

OR

To study variation of time period of a simple pendulum of a given length by taking bobs of same size but different masses and interpret the result.

7. To study the relationship between force of limiting friction and normal reaction and to find the co- efficient of friction between a block and a horizontal surface.

OR

To find the downward force, along an inclined plane, acting on a roller due to gravitational pull of the earth and study its relationship with the angle of inclination θ by plotting graph between

force and sin θ.

Activities

1. To make a paper scale of given least count, e.g., 0.2cm, 0.5 cm.
2. To determine mass of a given body using a metre scale by principle of moments.
3. To plot a graph for a given set of data, with proper choice of scales and error bars.
4. To measure the force of limiting friction for rolling of a roller on a horizontal plane.
5. To study the variation in range of a projectile with angle of projection.
6. To study the conservation of energy of a ball rolling down on an inclined plane (using a double inclined plane).
7. To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time.

Class XI Syllabus for TERM II **Total Periods: 16**

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

Record of at least 4 Experiments, to be performed by the students

Record of at least 3 Activities [with 3 each from section A and section B], to be demonstrated by teacher.

Time Allowed: One and half hours **Max. Marks: 30**

Two experiments one from each section	**8Marks**
Practical record (experiment and activities)	2Marks
Viva on experiments, and activities	**5** Marks
Total	**15 Marks**

Experiments

1. To determine Young's modulus of elasticity of the material of a given wire.

OR

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

2. To study the variation in volume with pressure for a sample of air at constant temperature by plotting graphs between P and V, and between P and 1/V.
3. To determine the surface tension of water by capillary rise method.

OR

To determine the coefficient of viscosity of a given viscous liquid by measuring terminal velocity of a given spherical body.

4. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.

5. To determine specific heat capacity of a given solid by method of mixtures.

6. To study the relation between frequency and length of a given wire under constant tension using sonometer.

OR

To study the relation between the length of a given wire and tension for constant frequency using sonometer.

7. To find the speed of sound in air at room temperature using a resonance tube by two resonance positions.

Activities

1. To observe change of state and plot a cooling curve for molten wax.
2. To observe and explain the effect of heating on a bi-metallic strip.
3. To note the change in level of liquid in a container on heating and interpret the observations.
4. To study the effect of detergent on surface tension of water by observing capillary rise.
5. To study the factors affecting the rate of loss of heat of a liquid.
6. To study the effect of load on depression of a suitably clamped metre scale loaded at (i) its end (ii) in the middle.
7. To observe the decrease in pressure with increase in velocity of a fluid.

Practical Examination for Visually Impaired Students Class XI

Note: Same Evaluation scheme and general guidelines for visually impaired students as given for Class XII may be followed.

A. Items for Identification/Familiarity of the apparatus for assessment in practicals (All experiments)

Spherical ball, Cylindrical objects, vernier calipers, beaker, calorimeter, Screw gauge, wire, Beam balance, spring balance, weight box, gram and milligram weights, forceps, Parallelogram law of vectors apparatus, pulleys and pans used in the same 'weights' used, Bob and string used in a simple pendulum, meter scale, split cork, suspension arrangement, stop clock/stop watch, Helical spring, suspension arrangement used, weights, arrangement used for measuring extension, Sonometer, Wedges, pan and pulley used in it, 'weights' Tuning Fork, Meter scale, Beam balance, Weight box, gram and milligram weights, forceps, Resonance Tube, Tuning Fork, Meter scale, Flask/Beaker used for adding water.

B. List of Practical's

1. To measure diameter of a small spherical/cylindrical body using vernier calipers.
2. To measure the internal diameter and depth of a given beaker/calorimeter using vernier calipers and hence find its volume.
3. To measure diameter of given wire using screw gauge.
4. To measure thickness of a given sheet using screw gauge.
5. To determine the mass of a given object using a beam balance.
6. To find the weight of given body using the parallelogram law of vectors.
7. Using a simple pendulum plot L-T and L-T^2 graphs. Hence find the effective length of second's pendulum using appropriate length values.
8. To find the force constant of given helical spring by plotting a graph between load and extension.
9. (i) To study the relation between frequency and length of a given wire under constant tension using a sonometer.
   (ii) To study the relation between the length of a given wire and tension, for constant frequency, using a sonometer.
10. To find the speed of sound in air, at room temperature, using a resonance tube, by observing the two resonance positions.

Note: The above practicals may be carried out in an experiential manner rather than recording observations.

Prescribed Books:

1. Physics Part-I, Textbook for Class XI, Published by NCERT
2. Physics Part-II, Textbook for Class XI, Published by NCERT
3. Laboratory Manual of Physics, Class XI Published by NCERT
4. The list of other related books and manuals brought out by NCERT (consider multimedia also).

Physics Class XII (Code N. 042) (2020-21)

Syllabus assigned for Term I (Theory)

Time: 90 Minutes **Max Marks: 35**

		No. of Periods	Marks
Unit–I	**Electrostatics**	**23**	**17**
	Chapter–1: Electric Charges and Fields		
	Chapter–2: Electrostatic Potential and Capacitance		
Unit-II	**Current Electricity**	**15**	
	Chapter–3: Current Electricity		
Unit-III	**Magnetic Effects of Current and Magnetism**	**16**	**18**
	Chapter–4: Moving Charges and Magnetism		
	Chapter–5: Magnetism and Matter		
Unit-IV	**Electromagnetic Induction and Alternating Currents**	**19**	
	Chapter–6: Electromagnetic Induction Chapter 7: Alternating currents		
Total		**73**	**35**

Unit I: Electrostatics **23 Periods**

Chapter–1: 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

Chapter–2: 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. Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, 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.

Unit II: Current Electricity **15 Periods**

Chapter–3: Current Electricity

Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, electrical resistance, 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 laws and simple applications, Wheatstone bridge, metre bridge(**qualitative ideas only).** Potentiometer - principle and its applications to measure potential difference and for comparing EMF of two cells; measurement of internal resistance of a cell **(qualitative ideas only)**

Unit III: Magnetic Effects of Current and Magnetism 16 Periods

Chapter–4: 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 and toroidal solenoids (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; moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.

Chapter–5: Magnetism and Matter

Current loop as a magnetic dipole and its magnetic dipole moment, magnetic dipole moment of a revolving electron, bar magnet as an equivalent solenoid, magnetic field lines; earth's magnetic field and magnetic elements.

Unit IV: Electromagnetic Induction and Alternating Currents 19 Periods

Chapter–6: Electromagnetic Induction

Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Eddy currents. Self and mutual induction.

Chapter–7: Alternating Current

Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series circuit, resonance; power in AC circuits. AC generator and transformer.

Syllabus assigned for Practical for Term I

Total Periods:16

First term practical examination will be organised by schools as per the directions of CBSE. The record to be submitted by the students at the time of first term examination has to include a record of at least 4 Experiments and 3 Activities to be demonstrated by teacher.

Time Allowed: one and half hours **Max. Marks: 15**

Two experiments to be performed by students at time of examination	**8 marks**
Practical record [experiments and activities]	**2 marks**
Viva on experiments, **and** activities	**5 marks**
Total	**15 marks**

Experiments assigned for Term I

1. To determine resistivity of two / three wires by plotting a graph between potential difference versus current.
2. To find resistance of a given wire / standard resistor using metre bridge.

   OR

   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.
3. To compare the EMF of two given primary cells using potentiometer.

   OR

   To determine the internal resistance of given primary cell using potentiometer.
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 assigned for Term I

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.

Class XII Syllabus assigned for Term II (Theory)

Time: 2 Hours **Max Marks: 35**

		No of Periods	Marks
Unit–V	**Electromagnetic Waves**	**02**	**17**
	Chapter–8: Electromagnetic Waves		
Unit–VI	**Optics**	**18**	
	Chapter–9: Ray Optics and Optical Instruments		
	Chapter–10: Wave Optics		
Unit–VII	**Dual Nature of Radiation and Matter**	**07**	**11**
	Chapter–11: Dual Nature of Radiation and Matter		
Unit–VIII	**Atoms and Nuclei**	**11**	
	Chapter–12: Atoms		
	Chapter–13: Nuclei		
Unit–IX	**Electronic Devices**	**07**	**7**
	Chapter–14: Semiconductor -Electronics: Materials, Devices and Simple Circuits		
Total		**45**	**35**

Unit V: Electromagnetic waves **2 Periods**

Chapter–8: Electromagnetic Waves

Electromagnetic waves, their characteristics, their Transverse nature (qualitative ideas only).

Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.

Unit VI: Optics **18Periods**

Chapter–9: Ray Optics and Optical Instruments

Ray Optics: Refraction of light, total internal reflection and its applications, optical fibers, refraction at spherical surfaces, lenses, thin lens formula, lensmaker'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.

Chapter–10: Wave Optics

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, coherent sources and

sustained interference of light, diffraction due to a single slit, width of central maximum

Unit VII: Dual Nature of Radiation and Matter **7 Periods**

Chapter–11: 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

Unit VIII: Atoms and Nuclei **11Periods**

Chapter–12: Atoms

Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.

Chapter–13: Nuclei Composition and size of nucleus Nuclear force Mass-energy relation, mass defect, nuclear fission, nuclear fusion.

Unit IX: Electronic Devices **7 Periods**

Chapter–14: Semiconductor Electronics: Materials, Devices and Simple Circuits Energy bands in conductors, semiconductors and insulators (qualitative ideas only) Semiconductor diode - I-V characteristics in forward and reverse bias, diode as a rectifier; Special purpose p-n junction diodes: LED, photodiode, solar cell.

Syllabus assigned for Practical for Term II

Total Periods: 16

The second term practical examination will be organised by schools as per the directions of CBSE and viva will be taken by both internal and external observers. The record to be submitted by the students at the time of second term examination has to include a record of at least 4 Experiments and 3 Activities to be demonstrated by teacher.

Evaluation Scheme

Time Allowed: one and half hours **Max. Marks: 15**

Two experiments to be performed by students at time of examination	**8 marks**
Practical record [experiments and activities]	**2 marks**
Viva on experiments, **and** activities	**5 marks**
Total	**15 marks**

Experiments assigned for Term-II

1. To find the focal length of a convex lens by plotting graphs between u and v or between 1/u and1/v.
2. To find the focal length of a convex mirror, using a convex lens.

   OR

   To find the focal length of a concave lens, using a convex lens.
3. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.
4. To determine refractive index of a glass slab using a travelling microscope.
5. To find refractive index of a liquid by using convex lens and plane mirror.
6. To draw the I-V characteristic curve for a p-n junction diode in forward bias and reverse bias.

Activities assigned for Term-II

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.
4. To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab.
5. To observe polarization of light using two Polaroids.
6. To observe diffraction of light due to a thin slit.
7. To study the nature and size of the image formed by a (i) convex lens, (ii) concave mirror, on a screen by using a candle and a screen (for different distances of the candle from the lens/mirror).
8. To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses.

Practical Examination for Visually Impaired Students of XII
Evaluation Scheme (Term I and Term II)

Time Allowed: one hour **Max. Marks:15**

Identification/Familiarity with the apparatus	3 marks
Written test (based on given/prescribed practicals)	5 marks
Practical Record	2 marks
Viva	5 marks
Total	**15 marks**

General Guidelines

- The practical examination will be of one hour duration.
- A separate list of ten experiments is included here.
- The written examination in practicals for these students will be conducted at the time of practical examination of all other students.
- The written test will be of 10 minutes duration.
- The question paper given to the students should be legibly typed. It should contain a total of 8 practical skill based very short answer type questions. A student would be required to answer any 5 questions.
- A writer may be allowed to such students as per CBSE examination rules.
- All questions included in the question papers should be related to the listed practicals. Every question should require about two minutes to be answered.
- These students are also required to maintain a practical file. A student is expected to record at least five of the listed experiments as per the specific instructions for each subject. These practicals should be duly checked and signed by the internal examiner.
- The format of writing any experiment in the practical file should include aim, apparatus required, simple theory, procedure, related practical skills, precautions etc.
- Questions may be generated jointly by the external/internal examiners and used for assessment.
- The viva questions may include questions based on basic theory/principle/concept, apparatus/ materials/chemicals required, procedure, precautions, sources of error

Class XII

A. Items for Identification/ familiarity with the apparatus for assessment in practicals (All experiments)

Meter scale, general shape of the voltmeter/ammeter, battery/power supply, connecting wires, standard resistances, connecting wires, voltmeter/ammeter, meter bridge, screw gauge, jockey Galvanometer, Resistance Box, standard Resistance, connecting wires, Potentiometer, jockey, Galvanometer, Lechlanche cell, Daniell cell [simple distinction between the two vis-à-vis their outer (glass and copper) containers], rheostat connecting wires, Galvanometer, resistance box, Plug-in and tapping keys, connecting wires battery/power supply, Diode, Resistor (Wire-wound or carbon ones with two wires connected to two ends), capacitors (one or two types), Inductors, Simple electric/electronic bell, battery/power supply, Plug-in and tapping keys, Convex lens, concave lens, convex mirror, concave mirror, Core/hollow wooden cylinder, insulated wire, ferromagnetic rod, Transformer core, insulated wire.

Experiments assigned for Term-I

1. To determine the resistance per cm of a given wire by plotting a graph between voltage and current.
2. To verify the laws of combination (series/parallel combination) of resistances by Ohm's law.
3. To find the resistance of a given wire / standard resistor using a meter bridge.
4. To compare the e.m.f of two given primary cells using a potentiometer.
5. To determine the resistance of a galvanometer by half deflection method.

Experiments assigned for Term-II

1 To identify a resistor, capacitor, inductor and diode from a mixed collection of such items.

2 To observe the difference between

i. a convex lens and a concave lens

ii. a convex mirror and a concave mirror and to estimate the likely difference between the power of two given convex /concave lenses.

3 To design an inductor coil and to know the effect of

i. change in the number of turns

ii. Introduction of ferromagnetic material as its core material on the inductance of the coil.

4 To design a (i) step up (ii) step down transformer on a given core and know the relation between its input and output voltages.

Note: The above practicals may be carried out in an experiential manner rather than recording observations.

Prescribed Books:

1. Physics, Class XII, Part -I and II, Published by NCERT.
2. Laboratory Manual of Physics for class XII Published by NCERT.
3. The list of other related books and manuals brought out by NCERT (consider multimedia also).

CHEMISTRY (043)

SYLLABUS FOR SESSION 2021-22 CLASS XI Term-I

S	UNIT	Periods	Marks
1	Some Basic Concepts of Chemistry	10	11
2	Structure of Atom	12	
3	Classification of Elements and Periodicity in Properties	6	4
4	Chemical Bonding and Molecular Structure	14	6
5	Redox Reactions	4	
6	Hydrogen	4	5
7	Organic Chemistry: Some basic Principles and Techniques	10	9
	TOTAL	60	35

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

Structure of Atom: Bohr's model 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

Classification of Elements and Periodicity in Properties: Modern periodic law and the present form of periodic table, periodic trends in properties of elements -atomic radii, ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valency. Nomenclature of elements with atomic number greater than 100.

Chemical Bonding and Molecular Structure:
Valence electrons, ionic bond, covalent bond, bond parameters, Lewis structure, polar character of covalent bond, covalent character of ionic bond, 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 bond.

Redox Reactions:
Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number.

Hydrogen: Position of hydrogen in periodic table, occurrence, isotopes, hydrides-ionic covalent and interstitial; physical and chemical properties of water, heavy water, hydrogen as a fuel

Organic Chemistry: Some basic Principles and Techniques: General introduction, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation. Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.

PRACTICALS

Term I: **A 15-mark Practical** would be conducted under the supervision of subject teacher. This would contribute to the overall practical marks for the subject.

OR

In case the situation of lockdown continues until Nov-Dec 2021, a *Practical Based Assessment (pen-paper) of 15 marks* would be conducted at the end of Term I.

Term-I Evaluation Scheme

S. No	Practical	Marks
1.	Volumetric Analysis	8
2.	Content Based experiment	2
3.	Class record and viva(Internal Examiner)	5
TOTAL		15

Micro-chemical methods are available for several of the practical experiments, wherever possible such techniques should be used.

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 of Chemical Substances (2 Marks)**

1. Determination of melting point of an organic compound.
2. Determination of boiling point of an organic compound.

C. **Quantitative Estimation (8 marks)**

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.

SYLLABUS FOR SESSION 2021-22 CLASS XI Term-II

S.No	UNIT	Periods	Marks
1	States of Matter: Gases and Liquids	9	15
2	Chemical Thermodynamics	14	
3	Equilibrium	12	
4	s -Block Elements	5	11
5	Some p -Block Elements	9	
6	Hydrocarbons	10	9
	TOTAL	59	35

States of Matter: Gases and Liquids: Three states of matter, intermolecular interactions, types of bonding, melting and boiling points, role of gas laws in elucidating the concept of the molecule, Boyle's law, Charles law, Gay Lussac's law, Avogadro's law, ideal behaviour, empirical derivation of gas equation, Avogadro's number, ideal gas equation and deviation from ideal behaviour.

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, measurement of ΔU and ΔH, 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)
Introduction of entropy as a state function, Gibb's energy change for spontaneous and non-spontaneous processes.
Third law of thermodynamics (brief introduction).

Equilibrium: Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium - Le Chatelier's principle, ionic equilibrium- ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of poly basic acids, acid strength, concept of pH, buffer solution, solubility product, common ion effect (with illustrative examples).

s -Block Elements: Group 1 and Group 2 Elements -General introduction, electronic configuration, occurrence, anomalous properties of the first element of each group, diagonal relationship, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen, water, hydrogen and halogens, uses.

Some p -Block Elements: General Introduction to p -Block Elements
Group 13 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group, Boron - physical and chemical properties.
Group 14 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first elements. Carbon-catenation, allotropic forms, physical and chemical properties.

Hydrocarbons: Classification of Hydrocarbons Aliphatic Hydrocarbons:
Alkanes - Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions.

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.
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.

PRACTICALS

Term II: At the end of Term II, **a 15-mark Practical** would be conducted under the supervision of subject teacher. This would contribute to the overall practical marks for the subject.
OR

In case the situation of lockdown continues beyond December 2021, a *Practical Based Assessment (pen-paper) of 10 marks and Viva 5 marks* would be conducted at the end of Term II by the subject teacher. This would contribute to the overall practical marks for the subject.

TERM-II Evaluation Scheme

S. No	Practical	Marks
1.	Salt Analysis	8
2.	Content Based Experiment	2
3	Project Work and Viva(Internal)	5
TOTAL		15

A. Qualitative Analysis(Marks 8)

a. Determination of one anion and one cation in a given salt
Cations- Pb^{2+}, Cu^{2+}, As^{3+}, Al^{3+}, Fe^{3+}, Mn^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+
Anions – $(CO_3)^{2-}$, S^{2-} , NO_2^- , SO_3^{2-} , SO_4^{2-} , NO_3^-, Cl^- , Br^- , I^- , PO_4^{3-} , $C_2O_4^{2-}$,CH_3COO^- (Note: Insoluble salts excluded)

b. Detection of -Nitrogen, Sulphur, Chlorine in organic compounds.

B. Crystallization of impure sample of any one of the following: Alum, Copper Sulphate, Benzoic Acid. **(Marks 2)**

PROJECTS scientific investigations involving laboratory testing and collecting information from other sources.

Guidelines on Syllabus for Visually Handicapped students.
Schools are expected to rationalise and divide the syllabus of practicums for visually handicapped students into two halves on the basis of collective guidelines given for the same in the complete syllabus and as per the convenience of their students. This flexibility is given in view of the special

condition of visually handicapped students .They will, however, be assessed on 15 marks in practical examination in both the terms as rest of their peers.

SYLLABUS FOR SESSION 2021-22 CLASS XII Term-I

S.No	UNIT	Periods	MARKS
1	Solid State	8	10
2	Solutions	8	
3	p-Block Elements	7	10
4	Haloalkanes and Haloarenes	9	15
5	Alcohols, Phenols and Ethers	9	
6	Biomolecules	8	
	TOTAL	49	35

Solid State: Classification of solids based on different binding forces: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea). Unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell, point defects.

Solutions: Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, Raoult's law, colligative properties - relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties.

p Block Elements: Group -15 Elements: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; Nitrogen preparation properties and uses; compounds of Nitrogen: preparation and properties of Ammonia and Nitric Acid.
Group 16 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties, dioxygen: preparation, properties and uses, classification of Oxides, Ozone, Sulphur -allotropic forms; compounds of Sulphur: preparation properties and uses of Sulphur-dioxide, Sulphuric Acid: properties and uses; Oxoacids of Sulphur (Structures only).
Group 17 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens, Preparation, properties and uses of Chlorine and Hydrochloric acid, interhalogen compounds, Oxoacids of halogens (structures only).
Group 18 Elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

Haloalkanes and Haloarenes: Haloalkanes: Nomenclature, nature of C–X bond, physical and chemical properties, optical rotation mechanism of substitution reactions.
Haloarenes: Nature of C–X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only).

Alcohols, Phenols and Ethers: Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration.
Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols.
Ethers: Nomenclature, methods of preparation, physical and chemical properties, uses.

Biomolecules: Carbohydrates - Classification (aldoses and ketoses), monosaccahrides (glucose and fructose), D-L configuration
Proteins -Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins.
Nucleic Acids: DNA and RNA

PRACTICALS

Term I: **A 15-mark Practical** would be conducted under the supervision of subject teacher/ internal examiner. This would contribute to the overall practical marks for the subject.
OR

In case the situation of lockdown continues until Nov-Dec 2021, a *Practical Based Assessment (pen-paper) of 15 marks* would be conducted at the end of Term I at the school level and marks would be submitted by the schools to the Board. This would contribute to the overall practical marks for the subject.

Term-I Evaluation Scheme

S. No	Practical	Marks
1.	Volumetric Analysis	4
2.	Salt Analysis	4
3.	Content Based experiment	2
4.	Class record and viva(Internal Examiner)	5
	TOTAL	15

(1) **Volumetric analysis (4 marks)**

Determination of concentration/ molarity of $KMnO_4$ solution by titrating it against a standard solution of:

i. Oxalic acid,
ii. Ferrous Ammonium Sulphate
(Students will be required to prepare standard solutions by weighing themselves).

(2) **Salt analysis (Qualitative analysis) (4 marks)**

Determination of one cation and one anion in a given salt.
Cations- Pb^{2+}, Cu^{2+}, As^{3+}, Al^{3+}, Fe^{3+}, Mn^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+
Anions – $(CO_3)^{2-}$, S^{2-}, NO_2^-, SO_3^{2-}, SO_4^{2-}, NO_3^-, Cl^-, Br^-, I^-, PO_4^{3-}, $C_2O_4^{2-}$, CH_3COO^- (Note: Insoluble salts excluded)

(3) **Content Based Experiments (2 marks)**

A. Chromatography
   i. Separation of pigments from extracts of leaves and flowers by paper chromatography and determination of Rf values.
   ii. Separation of constituents present in an inorganic mixture containing two cations only (constituents having large difference in Rf values to be provided).
B. Characteristic tests of carbohydrates, fats and proteins in pure samples and their detection in given foodstuffs.

SYLLABUS FOR SESSION 2021-22 CLASS XII Term-II

S.No	UNIT	No. of Periods	MARKS
1	Electrochemistry	7	
2	Chemical Kinetics	5	
3	Surface Chemistry	5	13
4	d-and f-Block Elements	7	
5	Coordination Compounds	8	9
6	Aldehydes, Ketones and Carboxylic Acids	10	
7	Amines	7	13
	TOTAL	49	35

Electrochemistry: Redox reactions, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis.

Chemical Kinetics: Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions).

Surface Chemistry: Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids, colloidal state: distinction between true solutions, colloids and suspension; lyophilic, lyophobic, multi-molecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation.

d-and f-Block Elements: General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation.
Lanthanoids - Electronic configuration, oxidation states and lanthanoid contraction and its consequences.

Coordination Compounds: Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT.

Aldehydes, Ketones and Carboxylic Acids: Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses.
Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Amines:

Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.

PRACTICALS

Term II: At the end of Term II, **a 15-mark Practical** would be conducted under the supervision of Board appointed external examiners. This would contribute to the overall practical marks for the subject.

OR

In case the situation of lockdown continues beyond December 2021, a *Practical Based Assessment (pen-paper) of 10 marks and Viva 5 marks* would be conducted at the end of Term II jointly by the external and internal examiners and marks would be submitted by the schools to the Board. This would contribute to the overall practical marks for the subject.

TERM-II Evaluation Scheme

S. No	Practical	Marks
1.	Volumetric Analysis	4
2.	Salt Analysis	4
3	Content Based Experiment	2
4	Project Work and Viva(Internal and External Both)	5
	TOTAL	15

1) **Volumetric analysis (4 marks)**
   Determination of concentration/ molarity of $KMnO_4$ solution by titrating it against a standard solution of:
   i. Oxalic acid,
   ii. Ferrous Ammonium Sulphate
   (Students will be required to prepare standard solutions by weighing themselves).

2) **Salt analysis (Qualitative analysis) (4 marks)**
   Determination of one cation and one anion in a given salt.

   Cations- Pb^{2+}, Cu^{2+}, As^{3+}, Al^{3+}, Fe^{3+}, Mn^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+

   Anions – $(CO_3)^{2-}$, S^{2-} , NO_2^- , SO_3^{2-} , SO_4^{2-} , NO_3^-, Cl^- , Br^- , I^- , PO_4^{3-} , $C_2O_4^{2-}$,CH_3COO^- (Note: Insoluble salts excluded)

3) **Content based experiment**
   A. Preparation of Inorganic Compounds
      Preparation of double salt of Ferrous Ammonium Sulphate or Potash Alum.
      Preparation of Potassium Ferric Oxalate.

   B. Tests for the functional groups present in organic compounds:
      Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (Primary) groups.

Guidelines on Syllabus for Visually Handicapped students.

Schools are expected to rationalise and divide the syllabus of practicums for visually handicapped students into two halves on the basis of collective guidelines given for the same in the complete syllabus and as per the convenience of their students. This flexibility is given in view of the special condition of visually handicapped students .They will, however, be assessed on 15 marks in practical examination in both the terms as rest of their peers.

General Instructions for Investigatory Project

In Chemistry the students of class XI and XII are supposed to conduct a scientific investigations involving laboratory testing and collecting information from other sources. This project is assessed as a part of practical examination at the end of year.

At the outset, teachers must map appropriate competencies or learning outcomes with real world problems (projects) that are age appropriate for their students. Students in consultation with their teacher finally determine the project question for them depending upon their interest and proclivity. A project should ideally arise out of the need felt by the student. Students explore their areas of interest and narrow down their ideas to a testable hypothesis or problem question.

For example: Abdul waits for summers as his favourite fruit watermelon is available in plenty. This year he noticed that every time he bought a watermelon its colour was dark red and was exceptionally sweet from inside. This never happened in earlier years. Some watermelons would be sweet some would not. Abdul were surprised by this observation and worried if the fruit was adulterated. He thought of conducting a test to find out if fruits and vegetables available in his locality were adulterated. He reviewed articles and papers on adulteration and found out simple tests to check adulteration at home. Abdul conducted the test and shared his results with his friend and teacher. He developed a small manual to help other check adulteration in fruits.

There are many issues in our immediate surroundings which need to be addressed. Keen observation will help identify the problem.

Before developing a problem question, students must do research on topics and find out what other people have already done in the selected area to avoid repetition. During this phase, students should be encouraged to record the reference of every bit of information they got from different sources. After developing problem question, students should write down precise testable hypothesis and design an experiment or procedure to test their hypothesis by collecting and analysing the data followed by writing conclusion and limitation of the study. Students must also develop a timeline and checklist about accessibility to resources required, safety of experiment/procedure, harmlessness of experiments to environment, organisms and other people. Teacher must ensure that it is doable within a specified period of time and available resources and is appropriately challenging to a particular student (neither be very complex or longer nor be very easy and short). It should not culminate into finding information from a book or website.

A project could have the following outline:

1. **Statement of Problem-** A clear statement of the problem/need that has given rise to the project

2. **Objectives-**General and specific objectives of topic

3. **Introduction-**The introduction should describe the relevance of problem or why the problem is the most appropriate for your inquiry. It should also describe previously known facts about your problem question with proper bibliography. Introduction towards end briefly includes hypothesis your hypothesis and the method to test it.

4. **Problem question** (specific, concrete questions to which concrete answers can be given) and/ or hypotheses

5. **Methods/Procedures** Methodology (will your research be based on survey, an experimental investigation, historical study, ethnographic study or content analysis).Methods describe the experiments proposed or the observations planned to make and the detailed process of analysis of data/observations. Methods proposed should be feasible and be able to adequately answer problem question.

6. **Materials/Resources required**

7. **Observations/Data gathered**
   Using the procedures mentioned in introduction, experiments should be conducted and data should be recorded. Interesting things that happened during the conduct of experiments should also be recorded.

8. **Analysis of data and discussion of result**
   Data should be interpreted in terms of proposed hypothesis. Data should be tabulated and interpreted with the help of graphs if possible. The interpretation should be done in an honest manner even if it does not support proposed hypothesis.

9. **Conclusion** Reporting and writing up the report
   Discussion of new learning from the study may be covered under conclusion. This may have possible suggestions for future studies.

10. **Limitation of the study**
    The limitations of the study are those features of design or procedure that might have affected the interpretation of the results of study. The limitations are alternatively interpreted as flaws or shortcomings due to flawed methodology, observations, small number of experiments or non-peer reviewed nature of study etc.

11. **Bibliography**

Rubric for Assessment of Project

PARAMETER	Exemplary (4)	Accomplished (3)	Developing (2)	Beginner (1)
Factual information	Content covers the research well	Content from all eras but has few inaccuracies	Content does not cover all eras and has few inaccuracies	Content does not cover all eras and is historically inaccurate
Sources	Multiple sources (6 or more) used (library, books, interview with people, different websites, blogs etc.)	Many sources (4-5) used (Books, websites, blogs)	Few sources used (2-3)	Relied on only one source
Data collection	Collected data from a large random sample (50 people or more from different age group, gender, social status) OR collected data for different samples and at least 5 reading for each set of experiment	Collected data from a fairly large random sample (30 -50 people from different age group, gender, social status) OR collected data for different samples and 3 reading for each set of experiment	Collected data from a small random sample (20 people from different age group, gender, social status) OR collected data for one sample and 3-5 readings	Collected data from a small sample (10 or less people) OR collected data for one sample and 1-2 readings
Interpretations and conclusion	In correlation with data and aim of the project. Clear conclusions based on findings	In correlation with data and aim of the project. Conclusions not based on findings	Not in correlation with data but in correlation with the aim Random conclusions	Not in correlation with data and aim, No conclusions
Journal	Daily entries with details of discussions and brainstorming sessions with the teacher.	Most of the entries done with details of discussions with the teacher	Daily entries without details	Random entries
Project report	Exceptionally attractive, organized sequentially and logically, creatively presented with data and clear conclusions	Attractive, organized sequentially and logically, presented some data and conclusions	Information is organized sequentially and logically but not in an attractive manner. Random Data without conclusions	Presentation is confusing. There is no sequence.
Academic Honesty	Sites all sources and gives due credits	Most of the sources cited	Few sources cited	Uses other people's ideas without giving credit

MATHEMATICS (XI-XII)
(Code No. 041)
Session – 2021-22

The Syllabus in the subject of Mathematics has undergone changes from time to time in accordance with growth of the subject and emerging needs of the society. Senior Secondary stage is a launching stage from where the students go either for higher academic education in Mathematics or for professional courses like Engineering, Physical and Biological science, Commerce or Computer Applications. The present revised syllabus has been designed in accordance with National Curriculum Framework 2005 and as per guidelines given in Focus Group on Teaching of Mathematics 2005 which is to meet the emerging needs of all categories of students. Motivating the topics from real life situations and other subject areas, greater emphasis has been laid on application of various concepts.

Objectives

The broad objectives of teaching Mathematics at senior school stage intend to help the students:

- to acquire knowledge and critical understanding, particularly by way of motivation and visualization, of basic concepts, terms, principles, symbols and mastery of underlying processes and skills.
- to feel the flow of reasons while proving a result or solving a problem.
- to apply the knowledge and skills acquired to solve problems and wherever possible, by more than one method.
- to develop positive attitude to think, analyze and articulate logically.
- to develop interest in the subject by participating in related competitions.
- to acquaint students with different aspects of Mathematics used in daily life.
- to develop an interest in students to study Mathematics as a discipline.
- to develop awareness of the need for national integration, protection of environment, observance of small family norms, removal of social barriers, elimination of gender biases.
- to develop reverence and respect towards great Mathematicians for their contributions to the field of Mathematics.

COURSE STRUCTURE

CLASS XI (2021-22)

TERM - I

One Paper

90 Minutes **Max Marks: 40**

No.	Units	Marks
I.	Sets and Functions	11
II.	Algebra	13
III.	Coordinate Geometry	6
IV.	Calculus	4
V.	Statistics and Probability	6
	Total	40
	Internal Assessment	10
	Total	**50**

*No chapter-wise weightage. Care to be taken to cover all the chapters.

Unit-I: Sets and Functions

1. **Sets**

Sets and their representations. Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of a set of real numbers especially intervals (with notations). Power set. Universal set. Venn diagrams. Union and Intersection of sets.

2. **Relations & Functions**

Ordered pairs. Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the set of reals with itself (R x R only).Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special type of relation. Pictorial representation of a function, domain, co-domain and range of a function. Real valued functions, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum, exponential, logarithmic and greatest integer functions, with their graphs.

Unit-II: Algebra

1. **Complex Numbers and Quadratic Equations**

Need for complex numbers, especially$\sqrt{-1}$, to be motivated by inability to solve some of the quardratic equations. Algebraic properties of complex numbers. Argand plane. Statement of Fundamental Theorem of Algebra, solution of quadratic equations (with real coefficients) in the complex number system.

2. **Sequence and Series**

Sequence and Series. Arithmetic Progression (A. P.). Arithmetic Mean (A.M.) Geometric Progression (G.P.), general term of a G.P., sum of *n* terms of a G.P., infinite G.P. and its sum, geometric mean (G.M.), relation between A.M. and G.M.

Unit-III: Coordinate Geometry

1. 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: parallel to axis, point -slope form, slope-intercept form, two-point form, intercept form and normal form. General equation of a line. Distance of a point from a line.

Unit-IV: Calculus

1. Limits

Intuitive idea of limit. Limits of polynomials and rational functions trigonometric, exponential and logarithmic functions

Unit-V: Statistics and Probability

1. Statistics

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

INTERNAL ASSESSMENT	**10 MARKS**
Periodic Test	5 Marks
Mathematics Activities: Activity file record +Term end assessment of one activity & Viva	5 Marks

Note: For activities NCERT Lab Manual may be referred

TERM - II

One Paper **Max Marks: 40**

No.	Units	Marks
I.	Sets and Functions (Cont.)	8
II.	Algebra (Cont.)	11
III.	Coordinate Geometry (Cont.)	9
IV.	Calculus (Cont.)	6
V.	Statistics and Probability (Cont.)	6
	Total	40
	Internal Assessment	10
	Total	**50**

Unit-I: Sets and Functions

1. **Trigonometric Functions**

Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle. Truth of the identity sin2x + cos2x = 1, for all x. Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing sin (*x*±*y*) and cos (*x*±*y*) in terms of sin*x*, sin*y*, cos*x* & cos*y* and their simple applications. Deducing identities like the following:

$$\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}, \cot(x \pm y) = \frac{\cot x \cot y \mp 1}{\cot y \pm \cot x}$$

$$\sin\alpha \pm \sin\beta = 2\sin\frac{1}{2}(\alpha \pm \beta)\cos\frac{1}{2}(\alpha \mp \beta)$$

$$\cos\alpha + \cos\beta = 2\cos\frac{1}{2}(\alpha + \beta)\cos\frac{1}{2}(\alpha - \beta)$$

$$cos\alpha - cos\beta = -2sin\frac{1}{2}(\alpha + \beta)sin\frac{1}{2}(\alpha - \beta)$$

Identities related to sin2*x*, cos2*x*, tan2 *x*, sin3*x*, cos3*x* and tan3*x*.

Unit-II: Algebra

1. **Linear Inequalities**

Linear inequalities. 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.

2**. Permutations and Combinations**

Fundamental principle of counting. Factorial *n.* (n!) Permutations and combinations, formula for ${}^{n}P_{r}$ and ${}^{n}C_{r}$, simple applications.

Unit-III: Coordinate Geometry

1. Conic Sections

Sections of a cone: circles, ellipse, parabola, hyperbola. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.

2. Introduction to Three-dimensional Geometry

Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula.

Unit-IV: Calculus

1. Derivatives

Derivative introduced as rate of change both as that of distance function and geometrically. Definition of Derivative, relate it to scope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.

Unit-V: Statistics and Probability

1. Probability

Random experiments; outcomes, sample spaces (set representation). Events; occurrence of events, ‘not’, ‘and’ and ‘or’ events, exhaustive events, mutually exclusive events, Probability of an event, probability of ‘not’, ‘and’ and ‘or’ events.

INTERNAL ASSESSMENT	**10 MARKS**
Periodic Test	5 Marks
Mathematics Activities: Activity file record +Term end assessment of one activity & Viva	5 Marks

Note: For activities NCERT Lab Manual may be referred

- Please refer the guidelines given under XII Mathematics Syllabus:

CLASS-XII
MATHEMATICS (2021-22)
TERM - I

One Paper

90 minutes **Max Marks: 40**

No.	Units	Marks
I.	Relations and Functions	08
II.	Algebra	10
III.	Calculus	17
V.	Linear Programming	05
	Total	40
	Internal Assessment	10
	Total	50

Unit-I: Relations and Functions

1. Relations and Functions

Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions.

2. Inverse Trigonometric Functions

Definition, range, domain, principal value branch.

Unit-II: Algebra

1. Matrices

Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operation on matrices: Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices, Invertible matrices; (Here all matrices will have real entries).

2. Determinants

Determinant of a square matrix (up to 3 x 3 matrices), minors, co-factors and applications of determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. Solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.

Unit-III: Calculus

1. Continuity and Differentiability

Continuity and differentiability, derivative of composite functions, chain rule, derivative of inverse trigonometric functions, derivative of implicit functions. Concept of exponential and logarithmic functions.

Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives.

2. Applications of Derivatives

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

Unit-V: Linear Programming

1. Linear Programming

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

INTERNAL ASSESSMENT	**10 MARKS**
Periodic Test	5 Marks
Mathematics Activities: Activity file record +Term end assessment of one activity & Viva	5 Marks

Note: For activities NCERT Lab Manual may be referred

TERM - II

One Paper

Max Marks: 40

No.	Units	Marks
III.	Calculus	18
IV.	Vectors and Three-Dimensional Geometry	14
VI.	Probability	8
	Total	40
	Internal Assessment	10
	Total	**50**

Unit-III: Calculus

1. 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.

$$\int \frac{dx}{x^2 \pm a^{2,}} \int \frac{dx}{\sqrt{x^2 \pm a^2}}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{ax^2 + bx + c}, \int \frac{dx}{\sqrt{ax^{2+bx+c}}}$$

$$\int \frac{px + q}{ax^2 + bx + c} dx, \int \frac{px + q}{\sqrt{ax^{2+}bx + c}} dx, \int \sqrt{a^2 \pm x^2}\, dx, \qquad \int \sqrt{x^2 - a^2} dx$$

Fundamental Theorem of Calculus (without proof).Basic properties of definite integrals and evaluation of definite integrals.

2. Applications of the Integrals

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

3. 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 of the type: $\frac{dy}{dx} = f(y/x)$. Solutions of linear differential equation of the type:

$$\frac{dy}{dx} + py = q, \text{ where p and q are functions of x or constant.}$$

Unit-IV: Vectors and Three-Dimensional Geometry

1. 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. Definition, Geometrical Interpretation, properties and application of scalar (dot) product of vectors, vector (cross) product of vectors.

2. Three - dimensional Geometry

Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Distance of a point from a plane.

Unit-VI: Probability

1. Probability

Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution.

INTERNAL ASSESSMENT	**10 MARKS**
Periodic Test	5 Marks
Mathematics Activities: Activity file record +Term end assessment of one activity & Viva	5 Marks

Note: For activities NCERT Lab Manual may be referred

Assessment of Activity Work:

In first term any 4 activities and in second term any 4 activities shall be performed by the student from the activities given in the NCERT Laboratory Manual for the respective class (XI or XII) which is available on the link : http://www.ncert.nic.in/exemplar/labmanuals.htmla record of the same may be kept by the student. A term end test on the activity is to be conducted.

The weightage are as under:

- The activities performed by the student in each term and record keeping : 3 marks
- Assessment of the activity performed during the term end test and Viva-voce : 2 marks

Prescribed Books:

1) Mathematics Textbook for Class XI, NCERT Publications
2) Mathematics Part I - Textbook for Class XII, NCERT Publication
3) Mathematics Part II - Textbook for Class XII, NCERT Publication
4) Mathematics Exemplar Problem for Class XI, Published by NCERT
5) Mathematics Exemplar Problem for Class XII, Published by NCERT
6) Mathematics Lab Manual class XI, published by NCERT
7) Mathematics Lab Manual class XII, published by NCERT

HOME SCIENCE (Code No. 064)

(CLASS – XI - XII)
(2021-2022)

Preface

The course in Home Science encompasses five areas namely, Foods and Nutrition, Human Development and Family Studies, Fabric and Apparel, Resource Management and Communication and Extension. All these domains have their specific content in focus that contributes to the study of the individual and the family in Indian social cultural context.

The purpose of Home Science is the creation of an environment and outlook to enable learner to live a richer and more purposeful life, become future ready and develop 21st century life skills for work, livelihood and careers. All the domains within the home science discipline provide ample scope for professional avenues of higher education and career opportunities. They range from professions catering to various health and service institutions/agencies, educational organizations, industry and business houses of textiles, garments, food industry, teaching learning materials, ergonomically appropriate equipment and work situations. The subject integrates the application of various sciences and humanities to improve Human Environment, Family Nutrition, Management of Resources and Child Development.

In class XI, the “Self and family” and the “Home” are focal points for understanding the dynamics for individual lives and social interactions.

In class XII, the emphasis is on “Work and careers” through the life span.

Learning Objectives:

The Home Science curriculum at senior secondary level has been framed to enable the learners to:

1. develop an understanding of the self and one’s role and responsibilities as a productive individual and as a member of family, community and society.
2. integrate learning across diverse domains and undertake a critical analysis of issues and concerns specific to family, community and society.
3. appreciate the discipline of Home Science for professional careers.
4. acquaint learners with the basic knowledge specific to five domains

namely, Foods and nutrition, Human Development and Family studies, Fabric and Apparel, Resource Management and Communication and Extension.

5. develop functional skills in the five domains for career and employment.
6. equip learners for enrichment and higher studies.

Learning outcomes:

After undertaking the course students will:

1. function as a productive and responsible individual in relation to self, family, community and society.
2. able to apply the basics of human development with specific reference to self, family and community.
3. able to utilize the skills of judicious management of various resources.
4. will be sensitized to fabric and apparel, their selection and care.
5. inculcate healthy food habits and lifestyle to enable prevention and management of diseases.
6. become alert and aware consumer.
7. appreciate the potential of entrepreneurship and other varied professional opportunities to make informed career choices.

Class XI HOME SCIENCE

Introduction:

In class XI, the “Self and family” and the “Home” are focal points for understanding the dynamics for individual lives and social interactions. The curriculum is divided in five units. Unit I introduces the concept of home science. Unit II begins with the stage of adolescence and related concerns. Unit III deals with the expanding interactions of the adolescent with others in family, school, community and society, and the needs emerging from each of these contexts. Unit IV and V focus on childhood and adulthood respectively.

TERM I

Course Structure: Theory and Practical Theory: 35 Marks

UNIT No.	Units	Marks	No. of Pd.
1.	Introduction to Home Science	02	05
2.	Understanding oneself- Adolescence	18	45
3.	Understanding Family, Community and Society	15	40
	Total	**35**	**90**

TERM II

Course Structure: Theory and Practical Theory: 35 Marks

UNIT No.	UNIT	Marks	No. of Pd.
4.	Childhood	17	45
5.	Adulthood	18	45
	Total	**35**	**90**

CLASS XI HOME SCIENCE
TERM I

Unit I Introduction to Home Science

Unit II: Understanding oneself: Adolescence

Ch.- Understanding the Self.

A. 'Who am I'?

B. Development and Characteristics of the Self(Development characteristics and needs of adolescents)

C. Influences on Identity

Ch.- Food, Nutrition, Health and Fitness

Ch. - Management of Resources
Ch.- Fabric Around us
Ch-Media and Communication Technology

Unit III: Understating family, community and society

Ch. - Concerns and needs in diverse contexts:

a. Nutrition, Health and Hygiene

b. Resources Availability and Management

TERM II

Unit IV: Childhood

Ch.-Survival, Growth and Development
Ch.- Nutrition, Health and Wellbeing
Ch.- Our Apparel

Unit V: Adulthood
Ch.- Health and Wellness
Ch.- Financial Management and planning
Ch.- Care and Maintenance of fabrics

Prescribed textbook: Human Ecology and Family Sciences(For class XI): Part I and Part II

CLASS XI HOME SCIENCE

TERM I

REFERENCE POINTS

UNIT I: INTRODUCTION TO HOME SCIENCE

- What is Home Science
- Areas of Home Science
- Home Science is important for both boys and girls
- Career options of Home Science

UNIT II: UNDERSTANDING ONESELF: ADOLESCENCE

Unit II focus on the stage of adolescence – the stage of life to which you belong at present. This unit deals with understanding your own self in terms of your personal and social identity, your nutritional and health requirements, management of basic resources of time and space, fabrics around you, and your communication skills. The last chapter of the unit situates the adolescent in the context of the family and larger society, thereby linking it to the next unit that deals with the individual in relation to her/his family, school, community and society.

CHAPTER : UNDERSTANDING THE SELF

- What is Self?
  - Personal dimension
  - Social dimension
  - Self- concept
  - Self esteem

- What is Identity?
  - Personal identity
  - Social identity

- Self during Infancy: characteristics
- Self during early childhood: characteristics
- Self during middle childhood: characteristics
- Self during adolescence: characteristics
  - Identity development
  - Identity crisis
  - Real vs Ideal self

- Influences on identity
    - Developing a sense of self and identity
    - Influences on formation of identity
        - Biological and physical changes
        - Socio-cultural context
        - Emotional changes
        - Cognitive changes

CHAPTER : FOOD, NUTRITION, HEALTH AND FITNESS

- Introduction
- Definition of
    - Food
    - Nutrition
    - Nutrients
- Balanced diet
    - Definition
    - RDA
- Health and Fitness
- Using Basic food Groups for planning Balanced Diets
    - Food guide pyramid.
- Vegetarian food Guide
- Dietary patterns in Adolescence
        - Irregular meals and skipping meals
        - Snacking
        - Fast foods
        - Dieting
- Modifying diet related behaviour
        - Diet journal
        - Exercise
        - Substance use and abuse
        - Healthy eating habits
        - Snacks
        - Drinking water
- Factors influencing eating behaviour

- Eating disorders at adolescence

- Key terms and their meaning

CHAPTER : MANAGEMENT OF RESOURCES

- Introduction
- Classification of resources
    - Human /non-human resources
    - Individual / shared resources
    - Natural / community resources
- Human and non-human resources
    - Human resources
        - Knowledge
        - Motivation/ interest
        - Skills/ strength/ aptitude
        - Time
        - Energy
    - Non-human resources
        - Money
        - Material resources
- Individual and shared resources
    - Individual resources
    - shared resources
- Natural and community resources
    - Natural resources
    - community resources
- Characteristics of resources
    - Utility
    - Accessibility
    - Interchangeability
    - Manageable
- Managing Resources
    - Management process
    - Planning
        - Steps in planning
    - Organising
    - Implementing
    - Controlling
    - Evaluation

CHAPTER : FABRIC AROUND US

- Definition of yarns, fibres, textile products, finishing.
- Introduction to fibre properties

- Classification of textile fibres
  - Filament/staple fibres
  - Natural/Manufactured (manmade) fibres
- Types of Natural Fibres
  - Cellulosic fibres
  - Protein fibres
  - Mineral fibres
  - Natural rubber
- Types of Manufactured Fibres
  - Regenerated cellulosic fibres
  - Modified cellulosic fibres
  - Protein fibres
  - Non-cellulosic fibres
  - Mineral fibres
- Some Important fibres and their properties
  - Cotton
  - Linen
  - Wool
  - Silk
  - Rayon
  - Nylon
  - Polyester
  - Acrylic
  - Elastomeric fibres
- Yarns
- Yarn processing
  - Cleaning
  - Making into a sliver
  - Attenuating, drawing out and twisting
- Yarn terminology
  - Yarn number
  - Yarn twist
  - Yarn and thread
- Fabric production
  - Weaving
  - Knitting
  - Braiding
  - Nets
  - Laces
- Textile Finishing
  - Finishing with colour

- Printing

CHAPTER-MEDIA COMMUNICATION TECHNOLOGY

- Communication and Communication Technology
  - What is Communication
  - Classification of communication
  - How does communication takes place
- What is media
  - Media classification and functions
- What is communication technology
  - Classification of communication technologies
  - Modern communication technologies

UNITIII: UNDERSTANDING FAMILY, COMMUNITY AND SOCIETY

The chapters in Unit II were all addressed to you for the understanding of self and of the factors that influence your decision making. Let us now move on to understanding the family, the community and the society that you are a part of. In the first section- the focus will be on relationships and interactions with significant others, i.e. those important to you in these contexts. The second section- will discuss concerns and needs, such as those of health, work, resources, education and textile tradition in the adolescent's diverse social contexts.

CHAPTER : CONCERNS AND NEEDS IN DIVERSE CONTEXTS

A. NUTRITION, HEALTH AND HYGIENE

- Health and its Dimensions
  - Social health
  - Mental health
  - Physical health
- Health care Indicators of Health
- Nutrition and Health
- Importance of nutrients
- Factors affecting nutritional well being
  - Food and nutrient security
  - Care for the vulnerable
  - Good health for all
  - Safe environment

- Nutritional Problems and their consequences
    - Malnutrition
    - Under nutrition
    - Over nutrition
- Hygiene and Sanitation
    - Personal Hygiene
    - Environmental Hygiene
    - Food Hygiene
    - Water safety

B. RESOURCES AVAILABILITY AND MANAGEMENT

- Time Management
    - Definition of time plan
    - How good is your time management (Activity)?
    - Steps in making time plan
    - Tips for effective time management
    - Tools in time management---Peak load period, Work curve, Rest /break periods, Work simplification
- Space Management
    - Space and the home
    - Principles of space planning

TERM II

UNIT IV: CHILDHOOD

The theme of this unit is 'Childhood'. You may wonder why did the book address the adolescent years first and childhood later. Well, it is because if you as an adolescent understand issues about yourself first, it would be easier to grasp the issues that are concerned with the stage of childhood, and later with adulthood. In this unit you will be studying about children's growth and development, critical concerns about their health and nutrition, education and clothing. As we would like children with disabilities to be an inclusive part of our society, the chapters provide us important information on their needs and ways to meet them.

CHAPTER : SURVIVAL GROWTH AND DEVELOPMENT

- The meaning of survival
- Growth and development
- Areas of development

- Physical development
- Motor development
- Cognitive development
- Sensory development
- Language development
- Social development
- Emotional development

- Good Nutrition
- Stages in development
    - Neonate
        - Reflexes
        - Sensory capabilities
- Development across stages from infancy to adolescence
    - Physical and motor development
    - Language development
    - Socio –emotional development
    - Cognitive development
        - Mental processes involved in thinking
        - Stages of cognitive development
            - ❖ Sensory motor stage
            - ❖ Pre-operational stage
            - ❖ Concrete operational stage
            - ❖ Formal operational stage

CHAPTER : NUTRITION, HEALTH AND WELL-BEING

- Introduction
- Nutrition, Health and Well-being during infancy (birth – 12 months)
    - Dietary requirements of infants
    - Breast feeding
        - Benefits of breast feeding
    - Feeding the low birth weight infants
    - Complementary foods
    - Guidelines for complementary feeding
    - Immunization
    - Common health and nutrition problems in infants and young children
- Nutrition, Health and well-being of preschool children (1-6 years)
    - Nutritional needs of preschool children
    - Guidelines for healthy eating for pre-schoolers

- Planning balanced meals for preschool children
- Some examples of low-cost snacks
- Feeding children with specific needs
- Immunization

- Nutrition, Health and well-being of school-age children (7-12 years)
    - Nutritional requirements of school children
    - Planning diets for school-age children
    - Factors that influence diet intake of preschool-age and school-age children
    - Healthy habits
    - Health and nutrition issues of school age children

CHAPTER: OUR APPAREL

- Clothing functions and the selection of clothes
    - Modesty
    - Protection
    - Status and prestige
    - Adornment
- Factors affecting selection of clothing in India
    - Age
    - Climate and season
    - Occasion
    - Fashion
    - Income
- Understanding children's basic clothing needs
    - Comfort
    - Safety
    - Self help
    - Appearance
    - Allowance for growth
    - Easy care
    - Fabrics
- Clothing requirements at different childhood stages
    - Infancy (birth to six months)
    - Creeping age (6 months to one year)
    - Toddlerhood (1-2 years)
    - Preschool age (2-6 years)
    - Elementary school years (5-11 years)
    - Adolescents (11-19 years)

- Clothes for children with special needs

UNIT V: ADULTHOOD

With the advent of adulthood, the adolescent passes through the portal of what may be termed as the "real world". One enters the world of higher education, work and marriage, and gets involved in establishing one's own family. Hence responsibilities of the individual increases manifold. In this unit you will learn about the major factors that play a role in determining the quality of adult life, these being health and wellness, financial planning and management, maintenance of fabrics and apparel that one uses personally as well as in the home, and appreciation of different perspectives in communication. The unit concludes with the chapter on individual responsibilities and rights, not only for one's own self, but also in relation to the family and larger society.

CHAPTER : HEALTH AND WELLNESS

- Importance of health and fitness
- Healthy & Unhealthy diet
- BMI
- Do's and Don'ts for health promoting diets
- Fitness
- Importance of exercise and physical activities in adulthood
- Wellness
- Qualities of a person who is rated high on wellness
- Dimensions of wellness
  - Social aspect
  - Physical aspect
  - Intellectual aspect
  - Occupational aspect
  - Emotional aspect
  - Spiritual aspect
  - Environmental aspect
  - Financial aspect
- Stress and coping with stress
- Simple techniques to cope with stress
  - Relaxation
  - Talking with friends/family
  - Reading

- Spirituality
- Music
- Hobby
- Yoga

CHAPTER : FINANCIAL MANAGEMENT AND PLANNING

- Financial management
- Financial planning
- Management
- Money and its importance
- Family Income
    - Money income
    - Real income: Direct and Indirect income
    - Psychic income
- Income management
- Budget
- Steps in making budget
- Advantages of planning family budgets
- Control in money management
    - Checking to see how well the plan is progressing
        - Mental and mechanical check
        - Records and accounts
    - Adjusting wherever necessary
    - Evaluation
- Savings
- Investment
- Principles underlying sound investments
    - Safety to the principle amount
    - Reasonable rate of interest
    - Liquidity
    - Recognition of effect of world conditions
    - Easy accessibility and convenience
    - Investing in needed commodities
    - Tax efficiency
    - After investment service
    - Time period
    - Capacity
- Savings and investment avenues
    - Post office

- Banks
- Unit Trust of India
- NSC
- Mutual funds
- Provident funds
- Chit fund
- Life insurance and medical insurance
- Pension scheme
- Gold, house, land
- Others (new schemes)

- Credit
- Need of credit
- 4C's of credit: character, capacity, capital means, collateral,

CHAPTER : CARE AND MAINTENANCE OF FABRICS

- Mending
- Laundering
  - Stain removal
    - Vegetable stains
    - Animal stains
    - Oil stains
    - Mineral stains
    - Dye bleeding
  - Techniques of stain removal
    - Scraping
    - Dipping
    - Sponging
    - Drop method
  - Reagent for stain removal
  - Common stains and method of removing
- Removal of dirt: the cleaning process
  - Soaps and detergents
  - Methods of washing: friction, kneading & squeezing, suction, washing by machine
- Finishing
  - Blues and optical brighteners
  - Starches and stiffening agents
- Ironing
- Dry cleaning
- Storage of textile products
- Factors affecting fabric care

- Yarn structure
- Fabric construction
- Colour and finishes

➢ Care label

NOTE:

- **Wherever required latest data/figures to be used.**
- **Latest RDA's to be used.**

CLASS XI HOME SCIENCE
PRACTICALS

TERM I

1. Understanding oneself with reference to:
   a) Physical development in terms of age, height, weight, hip and chest circumference.
   b) Sexual maturity (Age at menarche ,Development of breasts : girls).
   (Growth of beard, change in voice: boys)
2. Observe developmental norms: (Physical, Motor, Language and social -emotional) birth to three years.
3. List and discuss 4-5 areas of agreement and disagreement with
   a) Mother
   b) Father
   c) Siblings/ Friends
   d) Teacher
4. a) Record own diet for a day
   b)Evaluate qualitatively for adequacy
5. a) Record one day's activities relating to time use and work
   b) Prepare a time plan for yourself
6. Preparation of different healthy snacks for an adolescent suitable in her/his context.

TERM II

1. Plan a budget for a given situation/purpose.
2. a)Record the fabrics and apparel used in a day
   b) Categorize them according to functionality
3. Relationship of fibre properties to their usage:
   a) Thermal property and flammability
   b) Moisture absorbency and comfort
4. (a) Analyze label of any one garment with respect to: Clarity, fibre content,
   size and care instructions.
   (b) Prepare one care label of any garment.
   (c) Analyze two different fabric samples for color

SCHEME FOR PRACTICAL EXAMINATION
CLASS XI HOME SCIENCE

TERM I

1.	Observe developmental norms: (Physical, Motor, Language and social emotional) birth to three years **OR** List and discuss 4-5 areas of agreement and disagreement with a) Mother b) Father c) Siblings/ Friends d) Teacher	**5 Marks**
2.	Preparation of healthy snacks for an adolescent	**7 Marks**
3.	Prepare a time plan for yourself	**3 Marks**
	TOTAL	**15 MARKS**

TERM II

1.	Plan a budget for a given situation/purpose	**3 Marks**
2	Relationship of fibre properties to their usage: a) Thermal property and flammability b) Moisture absorbency and comfort **OR** Prepare one care label of any garment.	**5 Marks**
3.	File	**5 Marks**
4.	Viva	**2 Marks**
	TOTAL	**15 MARKS**

Class XII HOME SCIENCE

Introduction:

In class XII, the emphasis is on “Work and careers” through the life span. Within the curriculum the significance and scope of each domain (Foods and Nutrition, Human Development and Family Studies, Fabric and Apparel, Resource Management and Communication and Extension), the multiple thrust areas emerging within them have been emphasized. The units spell out the basic concepts, requisite knowledge and skills in each thrust areas and delineate the career avenues and the preparation required for them in order to make informed career choices.

TERM I

Course Structure: Theory and practical **Theory:35 marks**

UNIT No.	Units	Marks	No. of Periods
1	Work, Livelihood and Career	05	10
2	Nutrition, Food Science and Technology	20	45
3	Human Development and Family Studies	10	35
	THEORY	**35**	**90**

TERM II

Course Structure: Theory and practical **Theory: 35 marks**

No.	Units	Marks	No. of Periods
4	Fabric and Apparel	16	40
5	Resource Management	12	35
6	Communication and Extension	07	15
	THEORY	**35**	**90**

CLASS XII HOME SCIENCE

TERM I

UNIT I:Work,livelihood and Career

Ch. Work, livelihood and Career

UNIT II: Nutrition, Food Science and Technology

Ch. Clinical Nutrition and Dietetics

Ch. Public Nutrition and Health

Ch. Food Processing and Technology

Ch. Food Quality and Food Safety

UNIT III: Human Development and Family Studies

Ch. Early Childhood Care and Education

Ch. Management of Support Services, Institutions and Programmes for Children, Youth and Elderly

TERM II

UNIT IV: Fabric and Apparel

Ch. Design for Fabric and Apparel

Ch. Fashion Design and Merchandising

Ch. Care and Maintenance of Fabrics in Institutions

UNIT V: Resource management

Ch. Hospitality Management

Ch. Consumer Education and Protection

UNIT VI: Communication and Extension

Ch. Development Communication and Journalism

Prescribed textbook: Human Ecology and Family Sciences(For Class XII): Part I and Part II

CLASS XII HOME SCIENCE
TERM I

REFERENCE POINTS

UNIT I WORK ,LIVELIHOOD AND CAREER

Chapter: WORK ,LIVELIHOOD AND CAREER

- Introduction
  - Work and meaningful work
  - Work, careers and livelihood
- Traditional occupation in India
  - Agriculture
  - Handicrafts
  - Indian cuisine
  - Visual arts
- Work ,Age and Gender
  - Gender issues in relation to work
  - Issues and concerns related to women and work
    - ✓ KGBV
    - ✓ Beti bachao ,Beti Padhao Yojana
- Attitudes and approaches to work and life skills for livelihood
- Attitudes and approaches to work
- Life skills for livelihood
- Essential soft skills at workplace
- Ergonomics
- Definition and need for ergonomics
- Benefits of Ergonomics
- Entrepreneurship
- Definition and characteristics

UNIT II NUTRITION, FOOD SCIENCE AND TECHNOLOGY

Chapter: CLINICAL NUTRITION AND DIETETICS

- Introduction

- Nutrition
- Clinical Nutrition

- Significance
- Basic concepts
    - Diet therapy
- Types of diets: Regular Diet and Modified diets
- Changes in consistency
- Feeding routes
- Prevention of chronic diseases
- Preparing for career
- Scope

Chapter: PUBLIC NUTRITION AND HEALTH

- Introduction
- Significance
- Basic concept
    - Public health nutrition
    - Nutritional Problems of India
        - Protein energy malnutrition
        - Micronutrient deficiencies
            - Iron deficiency anemia
            - Vitamin A deficiency
            - Iodine deficiency disorders
- Strategies/Intervention to tackle Nutritional problems
    - Diet or food based strategies
    - Nutrient based strategies
- Nutrition programmes operating in India
    - ICDS
    - Nutrient Deficiency Control Programmes
    - Food Supplementation Programmes
    - Food Security Programme
- Health Care
- Scope

Chapter: FOOD PROCESSING AND TECHNOLOGY

- Introduction
- Significance
- Basic Concepts
    - Food Science

    - Food Processing
    - Food Technology
    - Food Manufacturing
- Development of food processing and technology
- Importance of Food processing and Preservation
- Classification of food on the basis of extent and type of processing
- Preparing for a career
- Scope

Chapter: FOOD QUALITY AND FOOD SAFETY

- Introduction
- Significance
- Basic Concepts
    - Food safety (Toxicity & Hazard)
    - Hazards (Physical, chemical and biological)
    - Food infection
    - Food poisoning
    - Food quality
- Food standards regulation in India-FSSA (2006)(Fruit and vegetable product order, Meat food product order and Vegetable oil products order are not included)
- International Organization and agreements in the area of Food Standards, Quality, Research and Trade
    - Codex Alimentarius Commission
    - International Organization for Standardisation
    - World Trade Organization
- Food Safety Management Systems
    - Good manufacturing practices (GMP)
    - Good handling practices (GHP)
    - Hazard Analysis Critical Control Points (HACCP)
- Scope

UNIT III HUMAN DEVELOPMENT AND FAMILY STUDIES

Chapter: Early Childhood Care and Education

- Significance
- Basic concepts
- Preparing for a career
- Scope

Chapter: Management of support services, Institutions and programmes for children, youth and elderly

- Significance
- Basic concepts
- Why are children vulnerable?
- Institutions, programmes and initiatives for children
    - ICDS
    - SOS Children's Village
    - Children's Homes run by the Government
    - Adoption
- Why are Youth vulnerable?
- Youth programmes in India
- Why are the elderly vulnerable?
- Some programmes for the elderly
- Preparing for a career
- Scope

UNIT IV FABRIC AND APPAREL

Chapter: Design for Fabric and Apparel

- Introduction
- Basic concepts (Design: Structural & Applied)
- Elements of design
    - Colour
    - Texture
    - Line
    - Shapes or form
- Principles of Design
    - Proportion
    - Balance
    - Emphasis
    - Rhythm
    - Harmony
- Preparing for career
- Scope

Chapter: Fashion Design and Merchandising

- Introduction
- Significance
- Basic Concepts

        - Fashion terminology –Fashion ,fads, style, classic
- Fashion Development
        - France-The centre of fashion
        - Fashion Evolution
- Fashion Merchandising
- Fashion Retail Organization
- Preparing For a career
- Scope

Chapter: Care and maintenance of fabrics in Institution

- Introduction
- Basic concepts
    - Washing equipment
    - Drying equipment
    - Ironing/pressing equipment
- Institutions
- Preparing for a career
- Scope

UNIT V RESOURCE MANAGEMENT

Chapter: Hospitality Management

- Introduction
- Significance
- Basic concepts
- Departments involved in hospitality management of an organization
- Scope

Chapter: Consumer Education and Protection

- Introduction
- Significance of consumer education and protection
- Basic concepts
    - Consumer product
    - Consumer behaviour
    - Consumer forum
    - Consumer footfalls
    - Consumer problems
    - Consumer rights
    - Standardized marks (ISI, Wool Mark, Hall Mark, Silk Mark)

    - Protection Councils
    - Consumer Responsibilities
- Scope

UNIT VI COMMUNICATION AND EXTENSION

Chapter: Development communication and Journalism

- Introduction
- Significance
- Basic concepts
    - Development
    - Development journalism
    - Development Communication
- Methods of communication
        - Campaign
        - Radio and television
    - Print media
    - Information and communication technologies
- Knowledge and skills required for a career in this field
- Scope and career avenues in development communication

CLASS XII HOME SCIENCE
PRACTICALS

TERM I

UNIT II NUTRITION, FOOD SCIENCE AND TECHNOLOGY

1. Modification of normal diet to soft diet for elderly person.
2. Development and preparation of supplementary foods for nutrition programme.
3. Planning a menu for a school canteen or mid-day meal in school for a week.
4. Design, prepare and evaluate a processed food product.
5. Qualitative test for food adulteration in: pure ghee, tea leaves, whole black pepper, turmeric powder, milk, asafoetida.

UNIT III HUMAN DEVELOPMENT AND FAMILY STUDIES

6. Preparation and use of any one teaching aid to communicate socially relevant messages for children/ adolescents /adults in the community.

OR

Preparation of any one toy for children (age appropriate) using locally available and indigenous material

TERM II

UNIT IV FABRIC AND APPAREL

1. Preparation of any one article using applied textile design techniques; tie and dye/batik/block printing.
2. Remove different types of stains from white cotton cloth –Ball pen, curry, grease, ink, lipstick, tea and coffee.

UNIT V RESOURCE MANAGEMENT

3. Evaluate any one advertisement for any job position.
4. Develop a leaflet/pamphlet for Consumer Education and Protection on any one of the following-

a) Consumer Protection Act (CPA)
b) Consumer responsibilities
c) Consumer organization
d) Consumer Problems

PROJECT

ANY ONE OF THE FOLLOWING PROJECT MAY BE UNDERTAKEN AND EVALUATED-

1. Study of an integrated community based, nutrition/health programme being implemented in own area, with reference to-

a) Programme objectives

b) Focal Group/Beneficiaries

c) Modalities of implementation

2. Visit to the neighbouring areas and interview two adolescents and two adults regarding their perception of persons with special needs.

3. Profile any two person (child/adult) with special needs to find out their diet, clothing, activities, physical and psychological needs.

4. Planning any five messages for nutrition, health and life skills using different modes of communication for different focal groups.

5. Market survey any five processed foods with their packaging and label information.

SCHEME FOR PRACTICAL EXAMINATION
CLASS XII HOME SCIENCE

TERM I

1.	Project	**5 Marks**
2.	Modification of any one family meal for elderly person. Preparing any one of the modified dish. OR Development and preparation of any one supplementary food for pre-schooler (2-6 years) nutrition programme. OR Planning a menu for school canteen and preparing any one nutritious dish	**5 Marks**
3.	Identify adulterant using chemical test in any one of the following- pure ghee, tea leaves, whole black pepper, turmeric powder, milk, asafoetida.	**2 Marks**
4.	Viva	**3 Marks**
	TOTAL	**15 MARKS**

TERM II

1.	Prepare a sample using applied textile design techniques tie and dye/batik/block printing	**4 Marks**
2.	Remove any one of the stain from white cotton cloth – Ball pen, curry, grease, ink, lipstick, tea, coffee	**2 Marks**
3.	Develop a leaflet/pamphlet for Consumer Education and Protection on any one of the following- (5 marks) a) Consumer Protection Act (CPA) b) Consumer responsibilities c) Consumer organization d) Consumer Problems	**4 Marks**
4.	File	**5 Marks**
	TOTAL	**15 MARKS**

PHYSICAL EDUCATION (048)
DISTRIBUTION OF SYLLABUS – CLASS XII – 2021-2022
TERM - I AND TERM - II

TERM I – THEORY MCQ BASED - 35 MARKS		TERM II – THEORY SHORT/LONG ANSWER – 35 MARKS	
***Unit No.**	**Name**	***Unit No.**	**Name**
1	Planning in Sports • Meaning & Objectives Of Planning • Various Committees & its Responsibilities (pre; during & post) • Tournament – Knock-Out, League Or Round Robin & Combination • Procedure To Draw Fixtures – Knock-Out (Bye & Seeding) & League (Staircase & Cyclic)	**3**	Yoga & Lifestyle • Asanas as preventive measures • Obesity: Procedure, Benefits & contraindications for Vajrasana, Hastasana, Trikonasana, Ardh Matsyendrasana • Diabetes: Procedure, Benefits & contraindications for Bhujangasana, Paschimottasana, Pavan Muktasana, Ardh Matsyendrasana • Asthma: Procedure, Benefits & contraindications for Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottasana, Matsyasana • Hypertension: Tadasana, Vajrasana, Pavan Muktasana, Ardha Chakrasana, Bhujangasana, Sharasana
2	Sports & Nutrition • Balanced Diet & Nutrition: Macro & Micro Nutrients • Nutritive & Non-Nutritive Components Of Diet • Eating For Weight Control – A Healthy Weight, The Pitfalls of Dieting, Food	**4**	Physical Education & Sports for CWSN (Children with Special Needs - DIVYANG) • Concept of Disability & Disorder • Types of Disability, its causes & nature (cognitive disability, intellectual

	Intolerance & Food Myths		disability, physical disability) - Types of Disorder, its cause & nature (ADHD, SPD, ASD, ODD, OCD) - Disability Etiquettes - Strategies to make Physical Activities assessable for children with special need.
5	Children & Women in Sports - Motor development & factors affecting it - Exercise Guidelines at different stages of growth & Development - Common Postural Deformities - Knock Knee; Flat Foot; Round Shoulders; Lordosis, Kyphosis, Bow Legs and Scoliosis and their corrective measures - Sports participation of women in India	**7**	Physiology & Injuries in Sports ● Physiological factor determining component of Physical Fitness ● Effect of exercise on Cardio Respiratory System ● Effect of exercise on Muscular System ● Sports injuries: Classification (Soft Tissue Injuries:(Abrasion, Contusion, Laceration, Incision, Sprain & Strain) Bone & Joint Injuries: (Dislocation, Fractures: Stress Fracture, Green Stick, Communated, Transverse Oblique & Impacted) Causes, Prevention& treatment ● First Aid – Aims & Objectives
6	Test & Measurement in Sports o Motor Fitness Test – 50 M Standing Start, 600 M Run/Walk, Sit & Reach, Partial Curl Up, Push Ups (Boys), Modified Push Ups (Girls), Standing Broad Jump, Agility – 4x10 M Shuttle Run o Measurement of Cardio Vascular Fitness – Harvard Step Test/Rockport Test - $\frac{\text{Duration of the Exercise in Seconds}}{5.5 \times \text{Pulse count of 1-1.5 Min after Exercise}} \times 100$	**9**	Psychology & Sports ● Personality; its definition & types – Trait & Types (Sheldon & Jung Classification) & Big Five Theory ● Motivation, its type & techniques ● Meaning, Concept & Types of Aggressions in Sports

	○ Rikli & Jones - Senior Citizen Fitness Test		
8	Biomechanics & Sports ● Meaning and Importance of Biomechanics in Sports ● Types of movements (Flexion, Extension, Abduction & Adduction) ● Newton's Law of Motion & its application in sports	**10**	Training in Sports ● Strength – Definition, types & methods of improving Strength – Isometric, Isotonic & Isokinetic ● Endurance - Definition, types & methods to develop Endurance – Continuous Training, Interval Training & Fartlek Training ● Speed – Definition, types & methods to develop Speed – Acceleration Run & Pace Run ● Flexibility – Definition, types & methods to improve flexibility ● Coordinative Abilities – Definition & types

TERM I – PRACTICAL		**TERM II – PRACTICAL**	
Project File (About one sport/game of choice)	05 Marks	Project File (Yoga and General Motor Fitness Test)	05 Marks
Demonstration of Fitness Activity	05 Marks	Demonstration of Fitness Activity/Yoga	05 Marks
Viva Voce (From Project File; Fitness)	05 Marks	Viva Voce (From Project File; General Motor Fitness; Yoga)	05 Marks

***For resource material refer Class XII Physical Education Handbook available at Board's Academic website: www.cbseacademic.nic.in**

BIOLOGY

(Code No. 044)

Syllabus for Purpose of Examination 2021-22

CLASS – XI and XII (2021-22)

The present curriculum provides the students with updated concepts along with an extended exposure to contemporary areas of the subject. The curriculum also aims at emphasizing the underlying principles that are common to animals, plants and microorganisms as well as highlighting the relationship of Biology with other areas of knowledge. The format of the curriculum allows a simple, clear, sequential flow of concepts. It relates the study of biology to real life through the use of technology. It links the discoveries and innovations in biology to everyday life such as environment, industry, health and agriculture. The updated curriculum focuses on understanding and application of scientific principles, while ensuring that ample opportunities and scope for learning and appreciating basic concepts continue to be available within its framework. The curriculum is expected to:

- promote understanding of basic principles of Biology
- encourage learning of emerging knowledge and its relevance to individual and society
- promote rational/scientific attitude towards issues related to population, environment and development
- enhance awareness about environmental issues, problems and their appropriate solutions
- create awareness amongst the learners about diversity in the living organisms and developing respect for other living beings
- appreciate that the most complex biological phenomena are built on essentially simple processes

It is expected that the students would get an exposure to various branches of Biology in the curriculum in a more contextual and systematic manner as they study its various units.

BIOLOGY (Code No. 044)
COURSE STRUCTURE
CLASS XI (2021 -22)

EVALUATION SCHEME		
Theory		
Units	**Term – I**	**Marks**
I	Diversity of Living Organisms: Chapter - 1, 2, 3 and 4	15
II	Structural Organization in Plants and Animals: Chapter – 5 and 7	08
III	Cell: Structure and Function: Chapter – 8 and 9	12
Units	**Term - II**	**Marks**
III	Cell: Structure and Function: Chapter - 10	05
IV	Plant Physiology: Chapter - 13,14 and 15	12
V	Human Physiology: Chapter –17, 18, 19, 20, 21 and 22	18
Total Theory (Term – I and Term – II)		**70**

Practicals Term – I	**15**
Practicals Term – II	**15**
Total	**100**

THEORY

Term – I

Unit-I Diversity of Living Organisms

Chapter-1: The Living World

What is living? Biodiversity; Need for classification; three domains of life; concept of species and taxonomical hierarchy; binomial nomenclature.

Chapter-2: Biological Classification

Five kingdom classification; Salient features and classification of Monera, Protista and Fungi into major groups; Lichens, Viruses and Viroids.

Chapter-3: Plant Kingdom

Salient features and classification of plants into major groups - Algae, Bryophyta, Pteridophyta and Gymnospermae. (salient and distinguishing features and a few examples of each category).

Chapter-4: Animal Kingdom

Salient features and classification of animals, non-chordates up to phyla level and chordates up to class level (salient features and distinguishing features of a few examples of each category). (No live animals or specimen should be displayed.)

Unit-II Structural Organization in Animals and Plants

Chapter-5: Morphology of Flowering Plants

Morphology of inflorescence and flower, Description of 01 family: Solanaceae or Liliaceae (to be dealt along with the relevant experiments of the Practical Syllabus).

Chapter-7: Structural Organization in Animals

Animal tissues.

Unit-III Cell: Structure and Function

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; cell organelles - structure and function; endomembrane system, endoplasmic reticulum, golgi bodies, lysosomes, vacuoles, mitochondria, ribosomes, plastids, microbodies; cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); nucleus.

Chapter-9: Biomolecules

Chemical constituents of living cells: biomolecules, structure and function of proteins,

carbohydrates, lipids, nucleic acids; Enzymes- types, properties, enzyme action.

Term – II

Unit-III Cell: Structure and Function

Chapter-10: Cell Cycle and Cell Division

Cell cycle, mitosis, meiosis and their significance

Unit-IV Plant Physiology

Chapter-13: Photosynthesis in Higher Plants

Photosynthesis as a means of autotrophic nutrition; site of photosynthesis, pigments involved in photosynthesis (elementary idea); photochemical and biosynthetic phases of photosynthesis; cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis; photorespiration; C3 and C4 pathways; factors affecting photosynthesis.

Chapter-14: 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-15: Plant - Growth and Development

Growth regulators - auxin, gibberellin, cytokinin, ethylene, ABA.

Unit-V Human Physiology

Chapter-17: Breathing and Exchange of Gases

Respiratory organs in animals (recall only); 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-18: 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-19: 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 - uremia, renal failure, renal calculi, nephritis; dialysis and artificial kidney, kidney transplant.

Chapter-20: Locomotion and Movement

Skeletal muscle, contractile proteins and muscle contraction.

Chapter-21: 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-22: Chemical Coordination and Integration

Endocrine glands and hormones; human endocrine system - hypothalamus, pituitary, pineal, thyroid, parathyroid, adrenal, pancreas, gonads; mechanism of hormone action (elementary idea); role of hormones as messengers and regulators, hypo - and hyperactivity and related disorders; dwarfism, acromegaly, cretinism, goiter, exophthalmic goiter, diabetes, Addison's disease.

Note: Diseases related to all the human physiological systems to be taught in brief.

PRACTICALS

Max. Marks: 15 for each Term

Evaluation Scheme			
	TERM-I	**TERM - II**	**MARKS**
Part A			
One Major Experiment	Experiment No. - 1	Experiment No. –3, 4	**4**
One Minor Experiment	Experiment No. - 2	Experiment No. - 5, 6, 7	**3**
Part B			
Spotting (3 Spots of 1 mark each)	B.1, 2, 3	B.4, 5	**3**
Practical Record + Investigatory Project& Record + Viva Voce			**5**
Total			**15**

Practicals should be conducted alongside the concepts taught in theory classes.

A: List of Experiments

TERM -I:

1. Study and describe a locally available common flowering plant, from any one family: Solanaceae or Liliaceae (Poaceae, Asteraceae or Brassicaceae can be substituted in case of particular geographical location) including dissection and display of floral whorls, anther and ovary to show number of chambers (floral formulae and floral diagrams).
2. Study of osmosis by Potato osmometer.

TERM -II:

3. Separation of plant pigments through paper chromatography.
4. Study of distribution of stomata in the upper and lower surfaces of leaves.
5. Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.
6. Test for presence of sugar in urine.
7. Test for presence of albumin in urine.

B. Study/Observation of the following (spotting):

TERM - I:

B.1 Parts of a compound microscope.
B.2 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.
B.3 Virtual specimens/slides/models and identifying features of - *Amoeba*, *Hydra*,liverfluke, *Ascaris*, leech, earthworm, prawn, silkworm, honeybee, snail, starfish, shark, rohu, frog, lizard, pigeon and rabbit.

TERM- II :

B.4 Tissues and diversity in shape and size of animal cells (squamous epithelium, smooth, skeletal and cardiac muscle fibers and mammalian blood smear) through temporary/permanent slides.
B.5 Mitosis in onion root tip cells and animal cells (grasshopper) from permanent slides.

Practical Examination for Visually Impaired Students Class XI

Note: The 'Evaluation schemes' and 'General Guidelines' for visually impaired students as given for Class XII may be followed.

Practicals should be conducted alongside the concepts taught in theory classes.

A. **Items for Identification/Familiarity with the apparatus /equipments/animal and plant material / chemicals etc. for assessment in practicals (All experiments)**

TERM - I:

- Plants of Solanaceae - Brinjal, Petunia, any other or Liliaceae- Any of the Lilies.
- **Compound microscope, Test tube, Petridish, Beaker, Scalpel.**

TERM - II:

- Mushroom, Succulents such as *Aloe vera*/*Kalanchoe*, Raisins, Potatoes.
- Honey comb, Mollusc shell, Model of cockroach, Pigeon and Star fish.
- Chromatography paper, Chromatography chamber, Alcohol.

B. **List of Practicals:**

TERM - I:

1. Study one locally available common flowering plants of the family – Solanaceae or Liliaceae and identify inflorescence/flower.
2. Study the parts of a compound microscope- eye piece and objective lens, mirror, stage, coarse and fine adjustment knobs.

TERM - II:

3. Identify the given specimen of a fungus – Mushroom, gymnosperm- pine cone
4. Study honey-bee/butterfly, snail shell, Starfish, Pigeon (through models).

Note: The above practicals may be carried out in an experiential manner rather than recording observations.

Prescribed Books:

1. Biology Class-XI, Published by NCERT
2. Other related books and manuals brought out by NCERT (including multimedia)

BIOLOGY
(Code No. 044)
COURSE STRUCTURE
CLASS XII (2021 - 22)

EVALUATION SCHEME		
Theory		
Units	**Term – I**	**Marks**
VI	Reproduction: Chapter - 2, 3 and 4	15
VII	Genetics and Evolution: Chapter – 5 and 6	20
Units	**Term - II**	**Marks**
VIII	Biology and Human Welfare: Chapter – 8 and 10	14
IX	Biotechnology and its Applications: Chapter – 11 and 12	11
X	Ecology and Environment: Chapter – 13 and 15	10
Total Theory (Term – I and Term – II)		**70**
Practicals Term – I		**15**
Practicals Term – II		**15**
Total		**100**

THEORY

TERM - I

Unit-VI Reproduction

Chapter-2: Sexual Reproduction in Flowering Plants

Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; outbreeding devices; pollen-pistil interaction; double fertilization; post fertilization events - development of endosperm and embryo, development of seed and formation of fruit; special modes- apomixis, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation.

Chapter-3: Human Reproduction

Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis - spermatogenesis and oogenesis; menstrual cycle; fertilisation, embryo development upto blastocyst formation, implantation; pregnancy and placenta formation (elementary idea); parturition (elementary idea); lactation (elementary idea).

Chapter-4: Reproductive Health

Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control - need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT (elementary idea for general awareness).

Unit-VII Genetics and Evolution

Chapter-5: Principles of Inheritance and Variation

Heredity and variation: Mendelian inheritance; deviations from Mendelism – incomplete dominance, co-dominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance; chromosome theory of inheritance; chromosomes and genes; Sex determination - in human being, 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.

Chapter-6: Molecular Basis of Inheritance

Search for genetic material and 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.

TERM - II

Unit-VIII Biology and Human Welfare

Chapter-8: Human Health and Diseases

Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse.

Chapter-10: Microbes in Human Welfare

Microbes in food processing, industrial production, sewage treatment, energy generation and microbes as bio-control agents and bio-fertilizers. Antibiotics; production and judicious use.

Unit-IX Biotechnology and its Applications

Chapter-11: Biotechnology - Principles and Processes

Genetic Engineering (Recombinant DNA Technology).

Chapter-12: Biotechnology and its Application

Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy; genetically modified organisms - Bt crops; transgenic animals; biosafety issues, biopiracy and patents.

Unit-X Ecology and Environment

Chapter-13: Organisms and Populations

Organisms and environment: Habitat and niche, population and ecological adaptations; population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution.

Chapter-15: Biodiversity and its Conservation

Biodiversity - Concept, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites.

PRACTICALS

Max. Marks: 15 for each Term

Evaluation Scheme			
	TERM - I	**TERM - II**	**MARKS**
Part A			
One Major Experiment	Experiment No. – 1	Experiment No. - 3	**4**
One Minor Experiment	Experiment No. - 2	Experiment No. – 4, 5	**3**
Part B			
Spotting (3 Spots of 1 mark each)	B.1, 2, 3, 4, 5	B.6, 7, 8	**3**
Practical Record + Investigatory Project &Record + Viva Voce			**5**
Total			**15**

Practicals should be conducted alongside the concepts taught in theory classes.

A. List of Experiments

TERM - I:

1. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.
2. Prepare a temporary mount to observe pollen germination.

TERM - II:

3. Prepare a temporary mount of onion root tip to study mitosis.
4. Collect water from two different water bodies around you and study them for pH, clarity and presence of any living organism
5. Collect and study soil from at least two different sites and study them for texture, moisture content, pH and water holding capacity. Correlate with the kinds of plants found in them.

B. Study/observation of the following (Spotting)

TERM - I:

B.1 Flowers adapted to pollination by different agencies (wind, insects, birds).

B.2 Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).

B.3 Meiosis in onion bud cell or grasshopper testis through permanent slides.

B.4 T.S. of blastula through permanent slides (Mammalian).

B.5 Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes, widow's peak and colourblindness.

TERM – II:

B.6 Common disease - causing organisms like *Ascaris, Entamoeba, Plasmodium*, any fungus causing ringworm through permanent slides, models or virtual images. Comment on symptoms of diseases that they cause.

B.7 Two plants and two animals (models/virtual images) found in xeric conditions. Comment upon their morphological adaptations.

B.8 Two plants and two animals (models/virtual images) found in aquatic conditions. Comment upon their morphological adaptations.

Practical Examination for Visually Impaired Students of Classes XI and XII

Evaluation Scheme

Max. Marks: 15 for each Term

Topic	Marks
Identification/Familiarity with the apparatus	5
Written test (Based on given/prescribed practicals)	5
Practical Records and Viva	5
Total	**15**

General Guidelines

- The practical examination will be of one-hour duration.
- The written examination in practicals for these students will be conducted at the time of practical examination of all other students.
- The written test will be of 30 minutes duration.
- The question paper given to the students should be legibly typed. It should contain a total of 8 practical skill based very short answer type questions. A student would be required to answer any 5 questions.
- A writer may be allowed to such students as per CBSE examination rules.
- All questions included in the question paper should be related to the listed practicals. Every question should require about two minutes to be answered.
- These students are also required to maintain a practical file. A student is expected to record the listed experiments Term -wise as per the specific instructions for each subject. These practicals should be duly checked and signed by the internal examiner.
- The format of writing any experiment in the practical file should include aim, apparatus

required, simple theory, procedure, related practical skills, precautions etc.

- Questions may be generated jointly by the external/internal examiners and used for assessment.
- The viva questions may include questions based on basic theory/principle/concept, apparatus/materials/chemicals required, procedure, precautions, sources of error etc.

Class XII

Practicals should be conducted alongside the concepts taught in theory classes.

A. Items for Identification/ familiarity with the apparatus for assessment in practicals (All experiments)

TERM -I:

- Beaker, flask, petri plates, test tubes, aluminium foil, paint brush, bunsen burner/spirit lamp/water bath.
- Starch solution, iodine, ice cubes.
- Developmental stages of frog highlighting morula and blastula.

TERM -II:

- Soil from different sites- sandy, clayey, loamy; Small potted plants, Cactus/*Opuntia* (model), Large flowers, Maize inflorescence.
- Model of *Ascaris*

B. List of Practicals

TERM -I:

1. Study of flowers adapted to pollination by different agencies (wind, insects).
2. Identification of T.S of morula or blastula of frog (model).
3. Preparation of pedigree charts of genetic traits such as rolling of tongue, colour blindness.

TERM -II:

4. Study of the soil obtained from at least two different sites for their texture.
5. Identify common disease-causing organisms like *Ascaris (Model)* and learn some common symptoms of the disease that they cause.
6. Comment upon the morphological adaptations of plants found in xerophytic conditions.

Note: The above practicals may be carried out in an experiential manner rather than recording observations.

Prescribed Books:

1. Biology, Class-XII, Published by NCERT
2. Other related books and manuals brought out by NCERT (including multimedia)
3. Biology Supplementary Material (Revised). Available on CBSE website.

Assessment Areas (Theory) 2021-22
Class XII
Biology (044)

Competencies	
Demonstrate Knowledge and Understanding	50%
Application of Knowledge / Concepts	30%
Analyse, Evaluate and Create	20%

Note:

- Internal choice would be provided.

Suggestive verbs for various competencies

- **Demonstrate, Knowledge and Understanding**
  State, name, list, identify, define, suggest, describe, outline, summarize, etc.
- **Application of Knowledge/Concepts**
  Calculate, illustrate, show, adapt, explain, distinguish, etc.
- **Analyze, Evaluate and Create**

  Interpret, analyse, compare, contrast, examine, evaluate, discuss, construct, etc.

Computer Science
CLASS - XI
Code No. 083
2021-22

1. Learning Outcomes

Student should be able to

a) develop basic computational thinking
b) explain and use data types
c) appreciate the notion of algorithm
d) develop a basic understanding of computer systems - architecture, operating system and cloud computing
e) explain cyber ethics, cyber safety and cybercrime
f) Understand the value of technology in societies along with consideration of gender and disability issues

2. Distribution of Marks

Unit No.	Unit Name	Marks	Periods	
			Theory	Practical
I	Computer Systems and Organisation	10	10	5
II	Computational Thinking and Programming - 1	45	50	35
III	Society, Law and Ethics	15	20	----
	Total	70	80	40

		Term-1	Term-2
		Marks	Marks
I	Computer Systems and Organisation	10	---
II	Computational Thinking and Programming - 1	25	20
III	Society, Law and Ethics	---	15
		35	35

3. Unit wise Syllabus

TERM 1:

Unit I: 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 & interpreter), application software
- Operating system (OS): functions of operating system, OS user interface
- Boolean logic: NOT, AND, OR, NAND, NOR, XOR, truth table, De Morgan's laws and logic circuits
- Number system: Binary, Octal, Decimal and Hexadecimal number system; conversion between number systems.
- Encoding schemes: ASCII, ISCII and UNICODE (UTF8, UTF32)

Unit II: Computational Thinking and Programming – 1

- Introduction to problem solving: Steps for problem solving (analysing the problem, developing an algorithm, coding, testing and debugging). representation of algorithms using flow chart and pseudo code, decomposition
- Familiarization with the basics of Python programming: Introduction to Python, features ofPython, 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 operator, augmented assignment operators, identity operators (is, is not), membership operators (in, not in)
- Expressions, statement, type conversion & input/output: precedence of operators, expression, evaluation of expression, python statement, type conversion (explicit & implicit conversion), accepting data as input from the console and displaying output
- Errors: syntax errors, logical errors, runtime errors
- Flow of control: introduction, use of indentation, sequential flow, conditional and iterative flow control
- Conditional statements: if, if-else, if-elif-else, flowcharts, simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number
- Iterative statements: for loop, range function, 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, indexing, string operations (concatenation, repetition, membership & slicing), traversing a string using loops, built-in functions: len(), capitalize(), title(), lower(), upper(), count(), find(), index(), endswith(), startswith(), isalnum(), isalpha(), isdigit(), islower(), isupper(), isspace(), lstrip(), rstrip(), strip(), replace(), join(), partition(), split()

TERM 2:

Unit II: Computational Thinking and Programming – 1

- Lists: introduction, indexing, list operations (concatenation, repetition, membership & slicing), traversing a list using loops, built-in functions: 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 & slicing), built-in functions: 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 dictionary (adding a new item, modifying an existing item), traversing a dictionary, built-in functions: len(), dict(), keys(), values(), items(), get(), update(), del(), clear(), fromkeys(), copy(), pop(), popitem(), setdefault(), max(), min(), count(), sorted(), copy(); 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 <module>' 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 III: Society, Law and Ethics

- Digital Footprints
- Digital society and Netizen: net etiquettes, communication etiquettes, social media etiquettes
- Data protection: Intellectual Property Right (copyright, patent, trademark), violation of IPR (plagiarism, copyright infringement, trademark infringement), open source softwares and licensing (Creative Commons, GPL and Apache)
- Cyber-crime: definition, hacking, eavesdropping, phishing and fraud emails, ransomware, preventing cyber crime
- Cyber safety: safely browsing the web, identity protection, confidentiality, cyber trolls and bullying.
- Safely accessing web sites: malware, viruses, Trojans, adware
- E-waste management: proper disposal of used electronic gadgets
- Indian Information Technology Act (IT Act)
- Technology & Society: Gender and disability issues while teaching and using computers

4. Practical

S.No.		Marks (Total=30)	Term-1 (15 Marks)	Term-2 (15 Marks)
1.	Python program	12	6	6
2.	Report file: Minimum 20 Python programs Term- 1 : Minimum 10 programs based on Term – 1 syllabus Term- 2 : Minimum 10 programs based on Term – 2 syllabus	7	4	3
	Viva voce	3	2	1
3.	Project + Viva voce Term – 1 : Synopsis of the project to be submitted by the students (documentation only) Term - 2 : Final coding + Viva voce (Student will be allowed to modify their Term 1 document and submit the final executable code.)	8	3	5

5. Suggested Practical List

Term - 1

Input a welcome message and display it.

- Input two numbers and display the larger / smaller number.
- Input three numbers and display the largest / smallest number.
- Generate the following patterns using nested loop.

Pattern-1	Pattern-2	Pattern-3
*	1 2 3 4 5	A
**	1 2 3 4	AB
***	1 2 3	ABC
****	1 2	ABCD
*****	1	ABCDE

- Write a program to input the value of x and n and print the sum of the following series:
  - $1+x+x^2+x^3+x^4+. \ldots\ldots\ldots x^n$
  - $1-x+x^2-x^3+x^4 \ldots\ldots\ldots\ldots x^n$
  - $x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \ldots\ldots\ldots\ldots \frac{x^n}{n}$
  - $x + \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} \ldots\ldots\ldots\ldots \frac{x^n}{n!}$
- Determine whether a number is a perfect number, an armstrong number or a palindrome.
- Input a number and check if the number is a prime or composite number.

- Display the terms of a Fibonacci series.
- Compute the greatest common divisor and least common multiple of two integers.
- Count and display the number of vowels, consonants, uppercase, lowercase characters in string.
- Input a string and determine whether it is a palindrome or not; convert the case of characters in a string.

Term - 2

- Find the largest/smallest number in a list/tuple
- Input a list of numbers and swap elements at the even location with the elements at the odd location.
- Input a list/tuple of elements, search for a given element in the list/tuple.
- Input a list of numbers and find the smallest and largest number from the list.
- Create a dictionary with the roll number, name and marks of n students in a class and display the names of students who have scored marks above 75.

6. Suggested Reading Material

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

Computer Science
CLASS-XII
Code No. 083
2021-22

1. Prerequisites

Computer Science- Class XI

2. Learning Outcomes

Student should be able to

a) apply the concept of function.

b) explain and use the concept of file handling.

c) use basic data structure: Stacks.

d) explain basics of computer networks.

e) use Database concepts, SQL along with connectivity between Python and SQL.

3. Distribution of Marks:

Unit No.	Unit Name	Marks	Periods	
			Theory	Practical
I	Computational Thinking and Programming - 2	40	50	25
II	Computer Networks	10	10	---
III	Database Management	20	20	15
	Total	70	80	40

Unit No	Unit Name	Term-1	Term-2
I	Computational Thinking and Programming - 2	35	5
II	Computer Networks	---	10
III	Database Management	---	20
	Total	35	35

4. Unit wise Syllabus

TERM 1:

Unit I: 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)
- 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
- 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
- CSV file: import csv module, open / close csv file, write into a csv file using csv.writerow() and read from a csv file using csv.reader( )

TERM 2:

Unit I: Computational Thinking and Programming – 2

- 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)
- 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

- 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

5. Practical

S.No		Marks (Total 30)	Term-1 (15 Marks)	Term-2 (15 Marks)
1	**Lab Test:** 1. Python program	**8**	**6**	**2**
	2. 3 SQL Queries based on one/two table(s), 2 output questions based on SQL queries	**4**	**---**	**4**
2	Report file: Term – 1 : Minimum 15 Python programs based on Term - 1 Syllabus Term – 2 : • Minimum 3 Python programs based on Term-2 Syllabus • SQL Queries – Minimum 5 sets using one table / two tables. • Minimum 2 programs based on Python - SQL connectivity.	**7**	**4**	**3**
3	Project (using concepts learnt in Classes 11 and 12) Term – 1 : Synopsis of the project to be submitted by the students (documentation only, may not submit the code during Term - 1) Term - 2 : Final coding + Viva voce (Student will be allowed to modify their Term 1 document and submit the final executable code.)	**8**	**3**	**5**
4	Viva voce	**3**	**2**	**1**

6. Suggested Practical List:

Term-1

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).
- Create a CSV file by entering user-id and password, read and search the password for given user-id.

Term-2

Python Programming

- Write a Python program to implement a stack using list.

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
    - Joining of two tables.
- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing suitable module.

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 exercise may be framed for other cases.
- Integrate SQL with Python by importing suitable module.

7. Suggested Reading Material

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

8. 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.