ANNUAL CURRICULUM PLAN

CLASS XI SCIENCE

(SESSION: 2016-17)

Abraham Lincoln's letter to his son's teacher

My son will have to learn, I know,
That all men are not just,
all men are not true.
But teach him also that
for every scoundrel there is a hero;
that for every selfish politician,
there is a dedicated leader.

Teach him for every enemy there is a friend.
Teach him to learn to lose and also enjoy winning.
Steer him away from envy, if you can.
Teach him the secret of quiet laughter.

Let him learn early that
the bullies are the easiest to lick.
Teach him, if you can,
the wonder of books…
but also give him quiet time
to ponder the eternal mystery of birds in the sky,
bees in the sun, and the flowers on a green hillside.

In school teach him
it is far more honourable to fail than to cheat.
Teach him to have faith in his own ideas,
even if everyone tells him they are wrong.
Teach him to be gentle with gentle people,
and tough with the tough.

Try to give my son
the strength not to follow the crowd
when everyone is getting on the band wagon.
Teach him to listen to all men
but teach him also to filter all he hears on a screen of truth,
and take only the good that comes through.

Teach him if you can,
how to laugh when he is sad.
Teach him there is no shame in tears.
Teach him to scoff at cynics
and to beware of too much sweetness.
Teach him to sell his brawn
and brain to the highest bidders but never to put a price-tag
on his heart and soul.

Teach him to close his ears
to a howling mob,
and to stand and fight if he thinks he's right.
Treat him gently; but do not cuddle him,
because only the test of fire makes fine steel.

Let him have the courage to be impatient;
let him have the patience to be brave.
Teach him always to have sublime faith in himself,
because then he will have sublime faith in mankind.

This is a big order;
but see what you can do.
He is such a fine little fellow, my son!

Abraham Lincoln

SCHOOL CURRICULUM GOALS

The Curriculum will adopt the following goals:

- To create a connect between learners' spiritual, ethical, social, cognitive, mental and physical growth and development;
- To nurture individuality and thus enhance one's innate potentials;
- To foster constitutional literacy and tolerance for different cultures;
- To develop scientific outlook and transformative competences, in order to meet the demands of changing society. The aim of education is not just to let learners obtain basic knowledge but to make them life-long learners. It is to nurture future citizens who are mentally and physically robust, assertive, confident, empathetic and helpful to the community, intellectually inquisitive and reflective, tolerant and with creative vision and global perspective. Schools will accomplish such standards through the promotion of value based learning activities which emphasize humanity, practicality, individuality, inclusiveness and modernity. Such activities involve collaborations between oneself and others, individuals and the community, as well as humans and nature.

To achieve this, we must guide our learners to achieve the following curriculum goals:

- To enhance self-awareness and explore innate potential;
- To develop creativity and the ability to appreciate art and showcase one's own talents;
- To promote capabilities related to goal setting, decision making and lifelong learning;
- To nurture assertive communication and interpersonal skills;
- To learn to be empathetic towards others, display dignity and respect to the opposite gender, to contribute for the community and focus on preserving environment;
- To foster cultural learning and international understanding in an interdependent society;
- To strengthen knowledge and attitude related to livelihood skills;
- To acquire the ability to utilize technology and information for the betterment of humankind;
- To inspire the attitude of functional and participatory learning; and
- To develop abilities related to thinking skills and problem solving.

Main Pedagogical Outcomes for Curriculum Learning Areas:

- Learners use language to comprehend, acquire and communicate ideas and information and to interact with others.
- Learners identify, integrate and apply numerical and spatial concepts and techniques. They have clarity of concepts and are able to connect them to the real world.
- Learners understand and appreciate the physical, biological and technological world and have the knowledge, attitude, skills and values to make rational decisions in relation to it.

- Learners understand their cultural, geographical and historical milieus and have the knowledge, attitude, skills and values necessary to bring about transformation for a better India.
- Learners recognize the requirement of information, locate and resource it from a range of data available and evaluate, use and collaborate it with others.
- Learners identify, select, use technologies and are able to synthesize, innovate and discover newer technologies as required.
- Learners rationalize and reason about pre-defined arrangements, norms and relationships in order to comprehend, decode, validate and develop more relevant patterns.
- Learners think laterally, critically, identify opportunity, challenge their potential and are open to challenges. They are aware of consequences and take ownership of their deeds.
- Learners interact harmoniously with people and cultures from across the globe and are tolerant and empathetic towards others.
- Learners involve themselves in cultural pursuits as well as appreciate, respect and acknowledge the artistic, cultural and intellectual work of others.
- Learners value and engage in practices that promote personal, physical as well as mental and cognitive development and well-being.

EXAMINATION SCHEDULE

AUGUST EXAMINATION SCHEDULE

Date	Subject
02.08.2016	Computer Science/ Physical Education Practical
03.08.2016	Biology Practical
04.08.2016	Chemistry Practical
06.08.2016	Physics Practical
08.08.2016	Physics
10.08.2016	Maths/ Biology
12.08.2016	Computer Science/ Physical Education
16.08.2016	Chemistry
19.08.2016	English

DECEMBER EXAMINATION SCHEDULE

Date	Subject
05.12.2016	Computer Science/ Physical Education Practical
06.12.2016	Biology Practical
07.12.2016	Chemistry Practical
08.12.2016	Physics Practical
13.12.2016	Physics
15.12.2016	Maths/ Biology
17.12.2016	Computer Science/ Physical Education
19.12.2016	Chemistry
21.12.2016	English

ANNUAL EXAMINATION SCHEDULE

Date	Subject
20.02.2017	Computer Science/ Physical Education Practical
21.02.2017	Biology Practical
22.02.2017	Chemistry Practical
23.02.2017	Physics Practical
27.02.2017	Physics
01.03.2017	Maths/ Biology
03.03.2017	Computer Science/ Physical Education
06.03.2017	Chemistry
08.03.2017	English

DETAILED SYLLABUS OF ENGLISH

OBJECTIVES

The general objectives at this stage are:

- To listen and comprehend live as well as record in writing oral presentations on a variety of topics.
- To develop greater confidence and proficiency in the use of language skills necessary for social and academic purpose.
- To participate in group discussions, interviews by making short oral presentation on given topics.
- To perceive the overall meaning and organisation of the text (i.e., the relationships of the different "chunks" in the text to each other
- To identify the central/main point and supporting details, etc., to build communicative competence in various registers of English
- To promote advanced language skills with an aim to develop the skills of reasoning, drawing inferences, etc. through meaningful activities
- To translate texts from mother tongue(s) into English and vice versa
- To develop ability and knowledge required in order to engage in independent reflection and enquiry

At the end of this stage learners will be able to do the following:

- Read and comprehend extended texts (prescribed and non-prescribed) in the following genres: science fiction, drama, poetry, biography, autobiography, travel and sports literature, etc.
- text-based writing (i.e., writing in response to questions or tasks based on prescribed or unseen texts)
- Understand and respond to lectures, speeches, etc.
- Write expository / argumentative essays, explaining or developing a topic, arguing a case, etc.
- Write formal/informal letters and applications for different purposes
- Write items related to the workplace (minutes, memoranda, notices, summaries, reports etc. filling up of forms, preparing CV, e mail messages, making notes from reference materials, recorded talks etc. The core course should draw upon the language items suggested for class IX-X and delve deeper into their usage and functions. Particular attention may, however, be given to the following areas of grammar: The use of passive forms in scientific and innovative writings. Converting one kind of sentence/clause into a different kind of structure as well as other items to exemplify stylistic variations in different discourses modal auxiliaries-uses based on semantic considerations.

Specific Objectives of Reading:

Students are expected to develop the following study skills:

a. Refer to dictionaries, encyclopedia, thesaurus and academic reference material
b. Select and extract relevant information, using reading skills of skimming and scanning
c. Understand the writer's attitude and bias
d. Comprehend the difference between what is said and what is implied
e. Understand the language of propaganda and persuasion
f. Differentiate between claims and realities, facts and opinions
g. Form business opinions on the basis of latest trends available
h. Comprehend technical language as required in computer related fields
i. Arrive at personal conclusion and comment on a given text specifically
j. Develop the ability to be original and creative in interpreting opinion
k. Develop the ability to be logically persuasive in defending one's opinion
l. Making notes based on a text Develop literary skills as enumerated below:
    - Personally respond to literary texts
    - Appreciate and analyze special features of languages that differentiate literary texts from non-literary ones
    - Explore and evaluate features of character, plot, setting, etc.
    - Understand and appreciate the oral, mobile and visual elements of drama
    - Identify the elements of style such as humour, pathos, satire and irony, etc.
    - Make notes from various resources for the purpose of developing the extracted ideas into sustained pieces of writing

Specific Objectives of Writing

- To write letters to friends, pen friends, relatives, etc.
- To write business and official letters.
- To send faxes, e-mails [formal].
- To open accounts in post offices and banks.
- To fill in railway/airline reservation forms.
- To write on various issues to institutions seeking relevant information, lodge complaints, express thanks or tender apology.
- To write applications, fill in application forms; prepare a personal bio-data for admission into colleges, universities, entrance tests and jobs.
- To write informal reports as part of personal letters on functions, programmes and activities held in school (morning assembly, annual day, sports day etc.)
- To write formal reports for school magazines / events / processes / or in local newspapers about events or occasions.
- To express opinions, facts, arguments in the form a speech or debates.
- To draft papers to be presented in symposia.
- To take down notes from talks and lectures.
- To write examination answers according to the requirement of various subjects.
- To summarize a text.

ENGLISH CORE

SECTION-A

Reading Comprehension

- **Very short answer and MCQ type questions:**
  Two unseen passages (including poems) with a variety of questions including 04 marks for vocabulary such as word formation and inferring meaning. The total range of the 2 passages including a poem or a stanza should be around 900-1000 words.
  1. 550-600 words in length(for note-making and summarising)   **8M**

  2. 350-400 words in length(to test comprehension , interpretation and inference)   **12 M**

An unseen poem of about 28-35 lines.

The passages could be of any one of the following types:

- Factual passages e.g. illustrations, description, reports

- Discursive passages involving opinion, e.g. argumentative, persuasive

- Literary passages e.g. extracts from fiction, biography, autobiography, travelogue, etc.

- In the case of a poem, the text may be shorter than the prescribed word limit.

SECTION B

Writing Skills and Grammar
WRITING

- **Short Answer Questions**: Based on notice/poster/advertisement/ invitation/reply   **4M**
- **Long Answer Questions**: Letters based on verbal / visual input. It would cover all types of letters.   **6M**

Letter types may include:
  a) Business or official letters(for making enquiries, registering complaints , asking   for and giving information, placing orders and sending replies)
  b) Letters to the editor (giving suggestions on an issue)
  c) Application for a job with a bio-data or resume
  d) Letter to the school or college authorities, regarding admissions, school issues, requirements/suitability of courses, etc.

- **Very Long Answer Question:** Composition in the form of article, speech, report writing or a narrative.   **10 M**

  Grammar
  - Different grammatical structures in meaningful contexts will be tested. Item types will include gap filling, sentence re-ordering, dialogue completion and sentence transformation. The grammar syllabus will include determiners, tenses, clauses, modals and change of Voice. These grammar areas will be tested using the following short answer type and MCQ type questions:
  - Error Correction, editing tasks.
  - Re-ordering of sentences,
  - Transformation of sentences

SECTION C

Literature and Long Reading Texts
Questions to test comprehension at different levels: literals, inferential and evaluative

1. **Hornbill** : Textbook published by NCERT, New Delhi

2. **Snapshots**: Supplementary Reader published by NCERT, New Delhi

The following have been deleted:

Textbooks	Name of the lessons deleted
Hornbill	1. Landscape of the soul
	2. The Adventure
	3. Silk Road
	4. The Laburnum Top (Poetry)
Snapshots	5. The Ghat of the only World

- **Very Short Answer Questions**-Based on an extract from poetry to test reference to context comprehension and appreciation. **4M**
- **Short Answer Questions**-Based on prose, poetry and plays from both the texts. **2M**
- **Long Answer Question**-Based on prescribed texts to test global comprehension and extrapolation beyond the texts to bring out the key messages and values. **6M**

  Long Answer Questions- Based on theme, plot, incidents or event from the prescribed novels. **6M**
- **Long Answer Questions**-Based on understanding appreciation, analysis and interpretation of the characters. **6M**

Note: Values –based questions may be given as long answer in the writing or literature sections.

Long Reading Texts (Any one)
With a view to inculcate the habit of reading among the students, CBSE has introduced compulsory reading of a Long Reading Text -Novel in the English Core Course and will be evaluated in the Term end Assessments. Schools can opt for either one of the texts.

NOVEL	AUTHOR
The Canterville Ghost	Oscar Wilde (Unabridged 1906 Edition)
Up from Slavery	Booker T. Washington (unabridged 2000 Edition)

QUESTION PAPER DESIGN

CLASS-XI   ENGLISH CORE   CODE-301

Typology	Typology of questions/learning outcomes	MCQ 1 mark	VSAQ 1 mark	Short answer Question 3 marks	Short answer Question 4 marks	Long Answer-I 80-100 words 5 marks	Long Answer-2 Question 120-150 words 6 marks	Very long answer 150-200 words (HOTS) 10 marks	Total Marks	Over all %
Reading Skills	Conceptual understanding, decoding, analysing, inferring, interpreting appreciating. Literary conventions and vocabulary, summarising and using appropriate format/s	6	6	1	---	1	____	____	20	20
Writing Skills and Grammar	Reasoning, appropriacy of style and tone, using appropriate format and fluency inference, analysis, evaluation and creativity, appreciation applying of language conventions, comprehension using structures with accuracy and fluency.	--	10	---	01	____	01	1	30	30
Literary Text books And long reading text	Recalling, reasoning , appreciating a literary conventions, inference, analysis, evaluation, creativity with fluency	3	____	3	____	____	3	____	30	30
Assessment of speaking and Listening Skills	Interaction , reasoning, diction, articulation, clarity, pronunciation and overall fluency		____		____	10+10 (L + S)			20	20
TOTAL		9x1=9	16x1=16	4x3=12	1x4=4	1x5=5	4x6=24	1x10=10	80	100

ANNUAL SYLLABUS BREAK UP

APRIL

S. No.	Name of the Books	Topics
1	Horn Bill	Lesson 1: The Portrait of a Lady
2	The Snapshots	Lesson 1: The Summer of the Beautiful White Horse
3	Writing Skills	Report (for Newspaper & School Magazines)
4	Grammar	Tenses
5	Novel (The Canterville Ghost)	Introduction & Discussion of Plot, Theme, Settings and main characters, Lesson 1
6	Reading Skills	Unseen Passage

MAY

S. No.	Name of the Books	Topics
1	Horn Bill	Poem 1: A Photograph
2	The Snapshots	Lesson 2: The Address
3	Writing Skills	Letters (Formal)
4	Grammar	Determiners
5	Novel	Discussion of Lesson 2
6	Reading Skills	Unseen Passage / Note Making

JUNE

S. No.	Name of the Books	Chapters
1	Horn Bill	Lesson 2: We're Not Afraid to die…If We Can All Be Together
2	Reading Skills	Note Making

JULY

S. No.	Name of the Books	Topics
1	Horn Bill	Lesson 3: Discovering Tut: the Saga Continues Poem 2: The Voice of the Rain
2	Writing Skills	Article, Notice, Advertisement
3	Grammar	Active & Passive Voice
4	Novel	Discussion of Lesson 3

AUGUST

REVISION FOR AUGUST EXAMINATION

SEPTEMBER

S. No.	Name of the Books	Topics
1	The Snapshots	Lesson 3: Ranga's Marriage
2	Horn Bill	Poem 3: Childhood
3	Writing Skills	Speech
4	Grammar	Clauses
5	Novel	Discussion of Lesson 4
6	Reading Skills	Unseen Passage

OCTOBER

S. No.	Name of the Books	Topics
1	Horn Bill	Lesson 5: The Ailing Planet: the Green Movement's Role.
2	The Snapshots	Lesson 4: Albert Einstein at School
3	Writing Skills	Debate
4	Grammar	Modals
5	Novel	Discussion of Lesson 5 and Lesson 6
6	Reading Skills	Unseen Passage / Note Making

NOVEMBER

S.NO.	Name of the Books	Topics
1	Horn Bill	Lesson 5: Father to Son
2	Grammar	Editing, Gap Filling
3	Novel	Discussion of Lesson 7
4	Grammar	1.Omitting 2. Sentence Transformation

DECEMBER

S.NO.	Name of the Books	Topics
1	Horn Bill	Lesson 6: The Browning Version
2	Snapshots	Lesson 5: Mother's Day
3	Novel	Discussion of Entire Novel

JANUARY

S.NO.	Name of the Books	Topics
1	Snapshots	Lesson 7: Birth Lesson 8: The Tale of Melon City
2	Writing Skills	Situational Description

EXAMINATION SYLLABUS

AUGUST EXAMINATION

Hornbill:
The Portrait of a Lady
A Photograph
We're Not Afraid to die… If We Can all Be Together
Discovering Tut: the Saga Continues

Snapshots:
The Summer of the Beautiful White Horse
The Address
Ranga's Marriage

Poetry:
The Voice of the Rain
Childhood

Novel:
The Canterville Ghost (Lesson 1, 2, and 3).

Writing Skills:
Report (for Newspaper & School Magazines)
Letters (Formal)
Article, Notice, Advertisement

Grammar:
Tenses
Determiners
Active & Passive Voice

Reading Skills:
Unseen Passage
Note Making

DECEMBER EXAMINATION

FULL SYLLABUS

FEBRUARY EXAMINATION

FULL SYLLABUS

NOTE: There will be a class test and an assignment after every lesson.
Movie on the Novel (The Canterville Ghost) to be shown to the students.

DETAILED SYLLABUS OF MATHEMATICS

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

One Paper　　　　　**Three Hours**　　　　　**Max.Marks:100**

Units		Marks	No. of Periods
I.	Sets and Functions	29	60
II.	Algebra	37	70
III.	Coordinate Geometry	13	40
IV.	Calculus	06	30
V.	Mathematical Reasoning	03	10
VI.	Statistics and Probability	12	30
	Total	100	240

QUESTION PAPER DESIGN

S.No.	Typology of questions	Learning Outcomes and Testing Competencies	Very Short Answer (1 mark)	Long Answer I (4 Marks)	Long Answer II (6 marks)	Marks	% Weightage
1	**Remembering-** **(Knowledge based** simple recall questions, to know specific facts, terms, concepts, principles, or theories, Identify, define, or recite, information)	● **Reasoning** ● **Analytical Skills** ● **Critical thinking** ● **Derivative**	2	3	1	20	20%
2	**Understanding-** **(Comprehension –** to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase information)		2	2	1	16	16%
3	**Application** (Use abstract information in concrete situation, to apply knowledge to new situations, Use given content to interpret a situation, provide an example, or solve a problem)		1	3	2	25	25%
4	**High Order Thinking skills** (Analysis & Synthesis- Classify , compare, contrast or differentiate between different pieces of information, Organize and /or integrate unique pieces of information from a variety of sources)		1	2	2	21	21%
5	**Evaluation and Multi-Disciplinary-** (Appraise, judge, and / or justify the value or worth of a decision or outcome, or to predict outcomes based on values)		--	2+1 (Values based)	1	18	18%
	TOTAL		6x1=6	13x4=52	7x6=42	100	100%

ANNUAL SYLLABUS BREAK UP

APRIL

Chapter 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. Difference of sets. Complement of a set. Properties of Complement Sets. Practical Problems based on sets.

Chapter 2: Relations and Functions

Ordered pairs, Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the sets of real (upto R x R).Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. 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 and greatest integer functions, with their graphs. Sum, difference, product and quotients of functions.

Video on 'Relations and Functions'

Chapter 12: Introduction to 3D Geometry

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

Video on '3D Geometry'

MAY

Chapter 3: Trigonometric Functions

Positive and negative angles. Measuring angles in radians and in degrees and conversion of one into other. Definition of trigonometric functions with the help of unit circle. Truth of the $\sin^2 x + \cos^2 x = 1$, for all x. Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing sin ($x \pm y$) and cos ($x \pm y$) in terms of sin$x$, sin$y$, cos$x$ & cos$y$ and their simple application. Deducing identities like the following:

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

$$\sin x + \sin y = 2\sin\frac{x+y}{2}\cos\frac{x-y}{2}, \cos x + \cos y = 2\cos\frac{x+y}{2}\cos\frac{x-y}{2},$$

$$\sin x - \sin y = 2\cos\frac{x+y}{2}\sin\frac{x-y}{2}, \cos x - \cos y = -2\sin\frac{x+y}{2}\sin\frac{x-y}{2}.$$

Identities related to sin $2x$, cos$2x$, tan $2x$, sin$3x$, cos$3x$ and tan$3x$. General solution of trigonometric equations of the type sin q= sin a, cos y = cos a and tan q= tan a. Proof applications of sine and cosine formulae.

Chapter 4: Mathematical Induction

Process of the proof by induction, motivating the application of the method by looking at natural numbers as the least inductive subset of real numbers. The principle of mathematical induction and simple applications.

JUNE

Chapter 16: Probability

Random experiments, outcomes, sample spaces (set representation). Events, occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events, Axiomatic (set theoretic) probability, connections with the theories of earlier classes. Probability of an event, probability of 'not', 'and' and 'or' events.

Videos on 'Probability'

JULY

Chapter 5: Complex Numbers and quadratic Equations

Need for complex numbers, especially $\sqrt{-1}$, to be motivated by inability to solve some of the quadratic equations. Algebraic properties of complex numbers. Arg and plane and polar representation of complex numbers. Statement of Fundamental Theorem of Algebra, solution of quadratic equations in the complex number system. Square root of a complex number.

Chapter 6: Linear Inequalities

Linear in equalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Graphical solution of system of linear inequalities in two variables.

Video on 'Linear Equations'

Chapter 7: Permutation and combination

Fundamental principle of counting. Factorial *n.* (*n!*) Permutations and combinations, derivation of formulae and their connections, simple applications.

AUGUST

REVISION FOR AUGUST EXAMINATION

SEPTEMBER

Chapter 8: Binomial Theorem

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

Chapter 9: Sequences 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., Arithmetic and Geometric series infinite G.P. and its sum, geometric mean (G.M.), relation between A.M. and G.M. Sum to n terms of the special series.

$$\sum_{k=1}^{n} k, \sum_{k=1}^{n} k^2 \text{ and } \sum_{k=1}^{n} k^3$$

OCTOBER

Chapter 10: Straight Lines

Brief recall of two dimensional geometry from earlier classes. Shifting of origin. 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. Equation of family of lines passing through the point of intersection of two lines. Distance of a point from a line.

Video on 'Straight Lines'

Chapter 14: Mathematical Reasoning

Mathematically acceptable statements. Connecting words/ phrases - consolidating the understanding of "if and only if (necessary and sufficient) condition", "implies", "and/or", "implied by", "and", "or", "there exists" and their use through variety of examples related to

real life and Mathematics. Validating the statements involving the connecting words difference between contradiction, converse and contrapositive.

NOVEMBER

Chapter 11: Conic Sections

Sections of a cone: circles, ellipse, parabola, hyperbola; a point, a straight line and a pair of intersecting lines as a degenerated case of a conic section. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.

Video on 'Conic Sections'

Chapter 13: Limits and Derivatives

Derivative introduced as rate of change, both as that of distance function and geometrically. Intuitive idea of limit. Limits of polynomials and rational functions, trigonometric, exponential and logarithmic functions. Definition of derivative, relate it to slope of tangent of a curve, derivative of sum, difference, product and quotient of functions. The derivative of polynomial and trigonometric functions.

DECEMBER

REVISION FOR DECEMBER EXAMINATION

JANUARY

Chapter 15: Statistics

Measures of dispersion; mean deviation, variance and standard deviation of ungrouped/ grouped data. Analysis of frequency distributions with equal means but different variances.

Revision

EXAMINATION SYLLABUS

AUGUST EXAMINATION

Chapters 1 to 7, 12 and 16**.**

DECEMBER EXAMINATION

Chapters 1 to 14 and 16.

FEBRUARY EXAMINATION

Full Syllabus

NOTE: There will be a class test and assignment after every chapter.

DETAILED SYLLABUS OF PHYSICS

OBJECTIVES

Senior Secondary stage of school education is a stage of transition from general education to discipline-based focus on curriculum. The present updated syllabus keeps in view the rigour and depth of disciplinary approach as well as the comprehension level of learners. Due care has also been taken that the syllabus is comparable to the international standards. Salient features of the syllabus include:

- Emphasis on basic conceptual understanding of the content.
- Emphasis on use of SI units, symbols, nomenclature of physical quantities and formulations as per international standards.
- Providing logical sequencing of units of the subject matter and proper placement of concepts with their linkage for better learning.
- Reducing the curriculum load by eliminating overlapping of concepts/content within the discipline and other disciplines.
- Promotion of process-skills, problem-solving abilities and applications of Physics concepts.

Besides, the syllabus also attempts to

- Strengthen the concepts developed at the secondary stage to provide firm foundation for further learning in the subject.
- Expose the learners to different processes used in Physics-related industrial and technological applications.
- Develop process-skills and experimental, observational, manipulative, decision making and investigatory skills in the learners.
- Promote problem solving abilities and creative thinking in learners.
- Develop conceptual competence in the learners and make them realize and appreciate the interface of Physics with other disciplines.

PHYSICS (CODE 042)
COURSE STRUCTURE

Time: 3 hrs.   **Max Marks: 70**

UNITS	No. of Periods	Marks
Unit I Physical World and Measurement	10	
Unit II Kinematics	24	23
Unit III Laws of Motion	14	
Unit IV Work, Energy and Power	12	
Unit V Motion of System of Particles and Rigid Body	18	17
Unit VI Gravitation	12	
Unit VII Properties of Bulk Matter	24	
Unit VIII Thermodynamics	12	20
Unit IX Behaviour of Perfect Gases and Kinetic Theory of gases	08	
Unit X Oscillations and Waves	26	10
Total	**160**	**70**

PRACTICALS

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

- Record of at least 15 Experiments [with a minimum of 8 from section A and 7 from section B], to be performed by the students.
- Record of at least 5 Activities [with a minimum of 2 each from section A and section B], to be performed by the students.
- Report of the project to be carried out by the students.

EVALUATION SCHEME

Two experiments one from each section	8+8 marks
Practical record(experiment and activities)	6 marks
Investigatory Project	3 marks
Viva on experiments, activities and project	5 marks
Total	**30 Marks**

QUESTION WISE BREAK UP

Total no. of Questions	Marks(s) per Question	Total No. of Questions	Total Marks
VSA	1	5	05
SA – I	2	5	10
SA – II	3	12	36
VBQ	4	1	04
LA	5	3	15
Total		26	70

1. Internal Choice: There is no overall choice in the paper. However, there is an internal choice in one question of 2 marks weightage, one question of 3 marks weightage and all the three questions of 5 marks weightage.

2. The above template is only a sample. Suitable internal variations may be made for generating similar templates keeping the overall weightage to different form of questions and typology of questions same.

QUESTION PAPER DESIGN

Time 3 Hours   **Max. Marks: 70**

S.No.	Typology of questions	Very Short Answer(VSA) I mark	Short Answer-I 2marks	Short Answer-II 3 marks	Value Based Questions 4 marks	Long Answer (5 marks)	Total marks	% Weightage
1	**Remembering - (Knowledge** based simple recall questions, to know specific facts, terms, concepts, principles, or theories, Identify, define, or recite, information)	2	1	1	-	-	7	10%
2	**Understanding- (Comprehension –** to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase information)	-	2	4	-	1	21	30%
3	**Application** (Use abstract information in concrete situation, to apply knowledge to new situation, Use given content to interpret a situation, provide an example, or solve a problem)	-	2	4	-	1	21	30%
4	**High Order Thinking skills (Analysis & Synthesis-**Classify, compare, contrast or differentiate between different pieces of information, Organize and /or integrate unique pieces of information from a variety of sources)	2	-	1	-	1	10	14%
5	**Evaluation and Multi-Disciplinary-** (Appraise, judge, and / or justify the value or worth of a decision or outcome, or to predict outcomes based on value)	1	-	2	1	-	11	16%
	TOTAL	5x1=5	5x2=10	12x3=36	1x4=4	3x5=15	70(26)	100%

ANNUAL SYLLABUS BREAK UP

APRIL

Unit I: Physical World and Measurement

Physics - scope and excitement; nature of physical laws; Physics, technology and society. 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.

Videos : Physics scope and excitement, Applications of dimensional analysis.

PRACTICALS:

- To measure diameter of a small spherical/cylindrical body and to measure internal diameter and depth of a given beaker/calorimeter using Vernier Callipers and hence find its volume.
- To measure diameter of a given wire and thickness of a given sheet using screw gauge.
- To determine volume of an irregular lamina using screw gauge.
- To determine radius of curvature of a given spherical surface by a spherometer.

MAY-JUNE

Unit II: Kinematics

Frame of reference, Motion in a straight line: Position-time graph, speed and velocity. 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).

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.

Video: Types of vectors, Relative velocity, Projectile motion, Circular motion.

PRACTICALS:

- To determine the mass of two different objects using a beam balance.
- To find the weight of a given body using parallelogram law of vectors.
- Using a simple pendulum, plot L-T and L-T^2 graphs. Hence find the effective length of second's pendulum using appropriate graph.
- To study variation of time period of a simple pendulum by changing its length and taking bobs of different masses independently and interpret the result.

JULY

Unit III: 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. 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 banked road).
Videos: Conservation of momentum and its applications, Friction, Examples of circular motion.

PRACTICAL:
- To study the relationship between force of limiting friction and normal reaction and to find the coefficient of friction between a block and a horizontal surface.

Unit IV: 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.
Videos: Conservation of mechanical energy, Collisions and its types.

AUGUST
REVISION FOR AUGUST EXAMINATION

SEPTEMBER

Unit V: Motion of System of Particles and Rigid Body
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, laws 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).Statement of parallel and perpendicular axes theorems and their applications.
Videos: Conservation of angular momentum and its applications, Moment of Inertia.

Unit VI: Gravitation
Kepler's laws of planetary motion. The universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth.
Gravitational potential energy and gravitational potential. Escape velocity. Orbital velocity of a satellite. Geo-stationary satellites.
Videos: Kepler's laws of planetary motion, Satellites.

PRACTICAL:
- 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.

OCTOBER

Unit VII: Properties of Bulk Matter
Elastic behaviour, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity, Poisson's ratio; elastic energy. 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.
Videos: Types of Modulus, Pascal's law and its applications, Surface energy and Surface tension, Capillarity.

PRACTICALS:
- To determine Young's modulus of elasticity of the material of a given wire.
- To find the force constant of a helical spring by plotting a graph between load and extension.
- To determine the surface tension of water by capillary rise method.
- 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 I/V.

NOVEMBER

Unit VII: Properties of Bulk Matter (Contd..)
Heat, temperature, 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, thermal conductivity, Qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law, Greenhouse effect.
Videos: Heat transfer and its types, Blackbody radiation, Greenhouse effect.

PRACTICALS:
- To determine the coefficient of viscosity of a given viscous liquid by measuring terminal velocity of a given spherical body.
- To study the relationship between the temperature of a hot body and time by plotting a cooling curve.
- To determine specific heat capacity of a given (i) solid, (ii) liquid, by method of mixtures.

Unit VIII: 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. Heat engine and refrigerator.
Videos: Isothermal and Adiabatic processes, Heat engine and refrigerator.

DECEMBER

REVISION FOR DECEMBER EXAMINATION

Unit IX: Behaviour of Perfect Gases and Kinetic Theory of Gases
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.
Videos: Degrees of freedom, Mean free path.

JANUARY

Unit X: Oscillations and Waves
Periodic motion - time period, frequency, displacement as a function of time. Periodic functions.
Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a spring-restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period. Free, forced and damped oscillations (qualitative ideas only), resonance. Wave motion. Transverse and longitudinal waves, speed of wave motion. Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect.
Videos: Free, forced and damped oscillations, Resonance, Transverse and Longitudinal waves, Beats and Doppler effect.

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

PRACTICALS

The record, to be submitted by the students, at the time of their annual examination, has to include:
1. Record of at least 15 Experiments [with a minimum of 8 from section A and 7 from section B], performed by the students.
2. Record of at least 5 Activities [with a minimum of 2 each from section A and section B], performed by the students.
3. Report of the project to be carried out by the students.

SECTION–A
(APRIL-JULY)
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.

SECTION–B
(SEPTEMBER-DECEMBER)
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 meter scale loaded at
   (i)   its end   (ii) in the middle.
7. To observe the decrease in pressure with increase in velocity of a fluid.

EXAMINATION SYLLABUS

AUGUST EXAMINATION
Units 1 to 4

DECEMBER EXAMINATION
Units 1 to 8

FEBRUARY EXAMINATION
Full Syllabus

NOTE: There will be a class test and assignment after every chapter.

DETAILED SYLLABUS OF CHEMISTRY

OBJECTIVES

The broad objectives of teaching Chemistry at Senior Secondary Stage are:
- To promote understanding of basic facts and concepts in chemistry while retaining the excitement of chemistry.
- To make students capable of studying chemistry in academic and professional courses (such as medicine, engineering, technology) at tertiary level.
- To expose the students to various emerging new areas of chemistry and apprise them with their relevance in future studies and their application in various spheres of chemical sciences and technology.
- To equip students to face various challenges related to health, nutrition, environment, population, weather, industries and agriculture.
- To develop problem solving skills in students.
- To expose the students to different processes used in industries and their technological applications to apprise students with interface of chemistry with other disciplines of science such as physics, biology, geology, engineering etc.
- To acquaint students with different aspects of chemistry used in daily life.
- To develop an interest in students to study chemistry as a discipline.

CHEMISTRY (COURSE STRUCTURE)

Time: 3 Hours   **Theory**   **Total Marks: 70**

Unit No.	Title	Marks	No. of Periods
Unit I	Some Basic Concepts of Chemistry	11	12
Unit II	Structure of Atom		14
Unit III	Classification of Elements and Periodicity in Properties	04	08
Unit IV	Chemical Bonding and Molecular Structure		14
Unit V	States of Matter :Gases and Liquids		12
Unit VI	Thermodynamics	21	16
Unit VII	Equilibrium		14
Unit VIII	Redox Reactions		06
Unit IX	Hydrogen		08
Unit X	s-Block Elements	16	10
Unit XI	Some p-Block Elements		14
Unit XII	Organic Chemistry: Some basic Principles and Techniques		14
Unit XIII	Hydrocarbons		12
Unit XIV	Environmental Chemistry	18	06
	Total	**70**	**160**

PRACTICALS

Evaluation Scheme for Examination	Marks
Volumetric Analysis	8
Salt Analysis	8
Content Based Experiment	6
Project Work	4
Class record and viva	4
Total	**30**

QUESTION WISE BREAK UP

Type of Question(s)	Marks(s) per Question	Total No. of Questions	Total Marks
VSA	1	5	05
SA - I	2	5	10
SA – II	3	12	36
VBQ	4	1	04
LA	5	3	15
Total		26	70

QUESTION WISE BREAK UP

1. Internal Choice: There is no overall choice in the paper. However, there is an internal choice in one question of 2 marks weightage, one question of 3 marks weightage and all the three questions of 5 marks weightage.

2. The above template is only a sample. Suitable internal variations may be made for generating similar templates keeping the overall weightage to different form of questions and typology of questions same.

QUESTION PAPER DESIGN

S. No.	Typology of questions	Very Short Answer (VSA) 1 mark	Short Answer -I 2marks	Short Answer-II 3marks	Value Based Questions 4marks	Long Answer (L.A.) 5marks	Total marks	% Weightage
1	**Remembering-** (Knowledge based simple recall questions, to know specific facts , terms, concepts, principles, or theories, identify, define, or recite information)	2	1	1	-	-	7	10%
2	**Understanding-** (Comprehension –to be familiar with meaning and to understand conceptually, interpret , compare, contrast, explain, paraphrase information)	-	2	4	-	1	21	30%
3	**Application** (Use abstract information in concrete situation , to apply knowledge to new situations , Use given content to interpret a situation , provide an example , or solve a problem)	-	2	4	-	1	21	30%
4	**High Order Thinking skills** (Analysis & Synthesis- classify, compare, contrast or differentiate between different pieces of information, organize and /or integrate unique pieces of information from a variety of sources	2	-	1	-	1	10	14%
5	**Evaluation and Multi-Disciplinary-** (Appraise, judge, and / or justify the value or worth of a decision or outcome , or to predict outcomes based on values	1	-	2	1	-	11	16%
	TOTAL	5x1=5	5x2=10	12x3=36	1x4=4	3x5=15	70(26)	100%

ANNUAL SYLLABUS BREAK UP

APRIL

Unit I: Some Basic Concepts of Chemistry

General Introduction: Importance and scope of Chemistry.

Nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules.

Atomic and molecular masses, mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry.

Videos to show laws of chemical combination.

Unit II: Structure of Atom

Discovery of Electron, Proton and Neutron, atomic number, isotopes and isobars. Thomson's model and its limitations. Rutherford's model and its limitations, 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.

Video to show discovery of Electron, Proton and Neutron.

PRACTICAL:

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

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

MAY

Unit III: Classification of Elements and Periodicity in Properties

Significance of classification, brief history of the development of periodic table, modern periodic law and the present form of periodic table, 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.

Unit IV: 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.

Video to show molecular orbital theory of homonuclear diatomic molecules.

PRACTICAL:
E. Quantitative Estimation
  1. Using a chemical balance.
  2. Preparation of standard solution of Oxalic acid.
  3. Determination of strength of a given solution of Sodium Hydroxide by titrating it against standard solution of Oxalic acid.
  4. Preparation of standard solution of Sodium Carbonate.
  5. Determination of strength of a given solution of Hydrochloric acid by titrating it against standard Sodium Carbonate solution.

JUNE

Unit XIV: Environmental Chemistry

Environmental pollution - air, water and soil pollution, chemical reactions in atmosphere, smog, major atmospheric pollutants, acid rain, ozone and its reactions, effects of depletion of ozone layer, greenhouse effect and global warming- pollution due to industrial wastes, green chemistry as an alternative tool for reducing pollution, strategies for control of environmental pollution.

Videos to show use of green chemistry, acid rain and ozone depletion.

JULY

Unit V: 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.

Deviation from ideal behaviour, liquefaction of gases, critical temperature, kinetic energy and molecular speeds (elementary idea), Liquid State- vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations).

Videos to show viscosity and surface tension.

Unit VI: Chemical Thermodynamics

Concept of System and types of system, surroundings, work, heat, energy, extensive and intensive properties, state functions.

First law of thermodynamics -internal energy and enthalpy, heat capacity and specific heat, measurement of 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, criteria for equilibrium.

Third law of thermodynamics (brief introduction).

AUGUST
REVISION FOR AUGUST EXAMINATION

Unit VIII: 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, applications of redox reactions.

Unit X: s-Block Elements (Alkali and Alkaline Earth Metals)
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.
Preparation and Properties of Some Important Compounds:
Sodium Carbonate, Sodium Chloride, Sodium Hydroxide and Sodium Hydrogen Carbonate, Biological importance of Sodium and Potassium.
Calcium Oxide and Calcium Carbonate and their industrial uses, biological importance of Magnesium and Calcium.
Video to show diagonal relationship.
Unit XI: 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 elements of the group, Boron - physical and chemical properties, some important compounds, Borax, Boric acid, Boron Hydrides, Aluminum: Reactions with acids and alkalies, uses.
PRACTICAL
F. Qualitative Analysis
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+}
Anions - CO_3^{2-} , S^{2-} , SO_3^{2-} , SO_4^{2-} , NO_2^- , 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.

OCTOBER
Unit XI: Some p -Block Elements (Contd.)
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, uses of some important compounds, oxides; Important compounds of Silicon and a few uses: Silicon Tetrachloride, Silicones, Silicates and Zeolites, their uses.
Video to show uses of Zeolites.
Unit IX: Hydrogen
Position of hydrogen in periodic table, occurrence, isotopes, preparation, properties and uses of hydrogen, hydrides-ionic, covalent and interstitial; physical and chemical properties of water, heavy water, hydrogen peroxide -preparation, reactions and structure and use; hydrogen as a fuel.
Videos to show methods to remove hardness of water.
PRACTICAL
C. Experiments based on pH
(a) Any one of the following experiments:
1. Determination of pH of some solutions obtained from fruit juices, solution of known and varied concentrations of acids, bases and salts using pH paper or universal indicator.
2. Comparing the pH of solutions of strong and weak acids of same concentration.
3. Study the pH change in the titration of a strong base using universal indicator.
(b) Study the pH change by common-ion in case of weak acids and weak bases.

NOVEMBER

Unit XII: Organic Chemistry -Some Basic Principles and Techniques

General introduction, methods of purification, qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond: inductive effect, electrometric effect, resonance and hyperconjugation.

Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.

Videos to show electronic displacement in a covalent bond.

Unit XIII: Hydrocarbons

Classification of Hydrocarbons

Aliphatic Hydrocarbons: Alkanes - Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis. Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markownikov'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 halidesand 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.

DECEMBER

REVISION FOR DECEMBER EXAMINATION

JANUARY

Unit VII: 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, Henderson Equation, hydrolysis of salts (elementary idea), buffer solution, solubility product, common ion effect (with illustrative examples).

Video to show common ion effect.

PRACTICAL

D. Chemical Equilibrium

One of the following experiments:

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

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

EXAMINATION SYLLABUS

AUGUST EXAMINATION

Units 1 to 6 and 14.

DECEMBER EXAMINATION

Units 1 to 6, 8 to 12 and 14.

FEBRUARY EXAMINATION

Full Syllabus

NOTE: There will be a class test and assignment after every chapter.

DETAILED SYLLABUS OF BIOLOGY

OBJECTIVES

The prescribed syllabus 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 to 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.

COURSE STRUCTURE
(THEORY)

Time: 3 Hours   **Max. Marks: 70**

Unit	Title	Marks	No. of Periods
1.	Diversity of Living Organism	07	23
2.	Structural Organisations in Plants and Cell :	11	22
3.	Structure and Function	15	35
4.	Plant Physiology	17	40
5.	Human Physiology	10	
	OTBA	10	40
	Total	**70**	**160**

PRACTICALS

Evaluation Scheme	Maximum Marks : 30
One Major Experiment	5 marks
One Minor Experiment	4 marks
Slide Preparation	5 marks
Spotting	7 marks
Practical record + viva Voce	4 marks
Project record + viva Voce	5 marks
Total	**30 marks**

QUESTION PAPER DESIGN

Time 3 Hours   **Max. Marks :70**

S.No.	Typology of questions	Very Short Answer (VSA) I mark	Short Answer-I 2 marks	Short Answer-II 3 marks	Value Based Questions 4 marks	Long Answer 5 marks	Total marks	% Weightage
1	Remembering- (Knowledge based simple recall questions to know specific facts, terms, concepts, principles theories, identify, define or recite, information)	2	1	1	-	-	7	10%
2	**Understanding- (Comprehension** – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase information)	-	2	4	-	1	21	30%
3	**Application** (Use abstract information in concrete situation, to apply knowledge to new situations, use given content to interpret a situation, provide an example or solve a problem)	-	2	4	-	1	21	30%
4	**High Order Thinking skills** (Analysis & Synthesis-Classify, compare, contrast or differentiate between different pieces of information, Organize and or integrate unique pieces of information from a variety of sources)	2	-	1	-	1	10	14%
5	**Evaluation and Multi-Disciplinary-** (Appraise, judge or justify the value or worth of a decision or outcome or to predict outcomes based on values)	1	-	2	1	-	11	16%
	TOTAL	5x1=5	5x2=10	12x3=36	1x4=4	3x5=15	70 (26)	100%

Note: The question paper will include a Section of Open Text Book Assessment in which two case studies of 5 marks each from the syllabus, a total of 10 marks. The case studies will be supplied to students in advance. These case studies are designed to test the analytical and higher order thinking skills of students.

ANNUAL SYLLABUS BREAK UP

APRIL

Unit I: Diversity of Living Organisms
Chapter 1: **The Living World**
What is living? Biodiversity: Need for classification, three domains of life, taxonomy and systematic, concept of species and taxonomical hierarchy, binomial nomenclature, tools for study of taxonomy- Museums, zoological parks, herbaria, botanical gardens.

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, Gymnosperms and Angiosperms (three to five salient and distinguishing features and at least two 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 (three to five salient features and at least two examples of each category).
(No live animals or specimen should be displayed.)

Practicals:
- Study the parts of compound microscope.
- Study of the specimens and identification – bacteria, oscillatoria, spirogyra, rhizopus, mushroom, yeast, liverwort, moss, fern, pinus, one monocotyledon, one dicotyledon and lichen.

MAY-JUNE

Unit 2: Structural Organisation in Animals and Plants
Chapter 5: Morphology of flowering Plants
Morphology and modifications, tissues, anatomy and functions of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed (to be dealt along with the relevant practical of the Practical Syllabus).

Chapter 6: Anatomy of Flowering Plants
The tissues, tissues systems, anatomy of dicotyledonous and monocotyledonous plants, secondary growth.
A brief account only. (To be dealt along with the relevant practical of the Practical Syllabus).

Chapter 7: Structural organization in Animals
Animal tissues, Morphology, anatomy and functions of different systems (Digestive, Circulatory, Respiratory, Nervous and Reproductive) of an insect (cockroach).

Practicals:
- Study and describe three common flowering plants (Solanaceae, Fabaceae & Liliaceae)
- Preparation and study of T.S. of dicot and monocot roots and stems.
- Study of different modifications in root stem and leaves.
- Study and identify different types of inflorescence.
- Study of tissue and diversity in shapes and sizes for plant and animal cells. (e.g. Palisade cells, guard cells, parenchyma, collenchyma, sclerenchyma, xylem, phloem, Squamous epithelium, muscle fibers and mammalian blood smear) through Temporary/permanent slides.

JULY

Unit 3: 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, nuclear membrane, chromatin, nucleolus.
Video on cell and its structure.

Chapter 9: Biomolecules
Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, nucleic acids, enzymes, types, properties, enzyme action.
Video on enzymes (properties and working)

Chapter 10: Cell Cycle and Cell Division
Cell cycle, Mitosis, Meiosis and their significance.
Video on cell division

Practical:
- Study of mitosis in onion root tips and meiosis in grasshopper testes from permanent slides.
- Study of external morphology of Earthworm, Cockroach & Frog through models or specimens.

AUGUST
REVISION FOR AUGUST EXAMINATION

Unit 4: Plant Physiology

Chapter 11: Transport in plants
Movement of water, gases and nutrients; cell to cell transport, Diffusion, facilitated diffusion, active transport; plant-water relations, imbibition, water potential, osmosis, plasmolysis

Unit 4: Plant Physiology

Chapter 11: Transport in plants (Contd.)
Long distance transport of water - Absorption, apoplast, symplast, transpiration pull, root pressure and guttation; transpiration, opening and closing of stomata, Uptake and translocation of mineral nutrients - Transport of food, phloem transport, mass flow hypothesis, diffusion of gases.

Chapter 12: Mineral nutrition
Essential minerals, macro and micronutrients and their role, deficiency symptoms, mineral toxicity, elementary idea of hydroponics as a method to study mineral nutrition, nitrogen metabolism, nitrogen cycle, biological nitrogen fixation.
Video on nitrogen cycle

Chapter 13: Photosynthesis in higher plants
Photosynthesis as a mean 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.

Practical:
- Study of osmosis by potato osmometer.
- Study of plasmolysis in epidermal peels (e.g. Rheo leaves)
- Study of distribution of stomata in upper and lower surface of leaves and calculate the stomatal index. Stomatal index = No. of stomata/(no. of stomata +no. of epidermal cells) x 100
- Comparative study of the rate of transpiration in the lower and upper surface of leaves.

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

Practical:
- Test for the presence of sugar, starch, proteins and fats in food material.
- To detect them in suitable plant and animal materials.
- Separation of plant pigments through paper chromatography.
- Study the rate of respiration in flower bud/leaf tissues and germinating seeds.

Unit 5: Human Physiology
Chapter 16: Digestion and absorption
Alimentary canal and digestive glands, role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats, calorific values of proteins, carbohydrates and fats, egestion, nutritional and digestive disorders - PEM, indigestion, constipation, vomiting, jaundice, diarrhoea.
Video on working of digestive system

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
Video on cardiovascular disorders.

Practical:
   * To study the effect of different temperature on the activity of salivary amylase on starch.
   * To test the presence of urea, albumin, sugar and bile salts in urine.

DECEMBER
REVISION FOR DECEMBER EXAMINATION

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 - uraemia, renal failure, renal calculi, nephritis; dialysis and artificial kidney.

JANUARY

Chapter 20: Locomotion and movement
 Types of movement - ciliary, flagellar, muscular; skeletal muscle- contractile proteins and muscle contraction; skeletal system and its functions; joints; disorders of muscular and skeletal system - myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout.

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, reflex action, sensory perception, sense organs, elementary structure and functions of eye and ear.
Video on reflex action.

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, goitre, exophthalmic goitre, diabetes, Addision's disease.

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

Practical:
- Study of imbibition in seeds/ raisins.
- Observation and comment on the experimental setup anaerobic respiration, phototropism, apical bud removal, suction due to transpiration.
- Study of human skeleton and different types of joints.

EXAMINATION SYLLABUS

AUGUST EXAMINATION

Chapters 1 to 10

DECEMBER EXAMINATION

Chapters 1 to 18

FEBRUARY EXAMINATION

Full syllabus

NOTE: There will be a class test and assignment after every chapter.

DETAILED SYLLABUS OF COMPUTER SCIENCE

OBJECTIVES

1. To understand basics of computers.

2. To develop logic for Problem Solving.

3. To develop problem solving skills and their implementation through **Python (version: 2.7)**

4. To understand and implement the concept of Object Oriented Methodology.

5. To understand the concept of working with Relational Database.

6. To understand the basic concept of Computing Logic.

7. To understand the basic concepts of Communication and Networking technologies.

8. To understand Open Source Software.

COURSE STRUCTURE

Unit No.	Unit Name	Marks	Periods	
			Theory	**Practical**
1	**Computer Fundamentals**	**10**	**18**	**6**
2	**Programming Methodology**	**12**	**28**	**10**
3	**Introduction to Python**	**18**	**44**	**36**
4	**Programming with Python**	**30**	**50**	**48**
	Total	**70**	**140**	**100**

ANNUAL SYLLABUS BREAK UP

APRIL

UNIT - 1: COMPUTER FUNDAMENTALS
Chapter 1- Computer Fundamentals
Classification of computers: Basics of computer and its operation; Functional Components and their interconnections, concept of Booting.
Chapter 2- Software Concepts
Types of Software - System Software, Utility Software and Application Software.
System Software: Operating System, Complier, Interpreter and Assembler.
Operating System: Need for an Operating System, Functions of Operating System (Processor Management, Memory Management, File Management and Device Management), Types of Operating System interactive (GUI based), Time Sharing, Real Time and Distributed, Commonly used operating systems: UNIX, LINUX, Windows, Solaris, BOSS (Bharat Operating System Solutions); Mobile OS - Android, Symbian.
Utility Software: Anti-Virus, File Management tools, Compression tools and Disk Management tools (Disk Cleanup, Disk Defragmenter, Backup).
Open Source Concepts: Open Source Software, Freeware, Shareware, Proprietary Software.
Application Software: Office Tools - Word Processor, Presentation Tool, Spreadsheet Package, Database Management System; Domain Specific tools - School Management System, Inventory Management System, Payroll System, Financial Accounting, Hotel Management, Reservation System and Weather Forecasting System.
PPT on Software
Chapter 3- Data Representation in Computers
Number System: Binary, Octal, Decimal, Hexadecimal and conversion between two different number systems.
Internal Storage encoding of Characters: ASCII, ISCII (Indian scripts Standard Code for Information Interchange), and UNICODE (for multilingual computing).
PPT on Number System
Chapter 4- Microprocessor and Memory Concepts
Microprocessor: Basic concepts, Clock speed (MHz, GHz), 16 bit, 32 bit, 64 bit processors; 128 bit processors; Types - CISC Processors (Complex Instruction Set computing), RISC Processors (Reduced Instruction Set Computing), and EPIC (Explicitly Parallel Instruction computing).
Memory Concepts: Units: Byte, Kilo Byte, Mega Byte, Giga Byte, Tera Byte, Peta Byte, Exa Byte, Zetta Byte, Yotta Byte.
Primary Memory: Cache, RAM, ROM
Secondary Memory: Fixed and Removable storage - Hard Disk Drive, CD/DVD Drive, Pen Drive, Blue Ray Disk.
Input Output Ports/ Connections: Serial, Parallel and Universal Serial Bus, PS-2 port, Infrared port, Bluetooth, Firewire.
Video on Identifying Motherboard components
PPT on ports

MAY

UNIT - 2: PROGRAMMING METHODOLOGY
Chapter 1- Algorithms and Flowcharts

JULY

Chapter 2- Programming Methodology

General Concepts: Modular Approach, Clarity and Simplicity of Expressions, Use of proper names for Identifiers, Comments, Indentation; Documentation and Program Maintenance; Running and Debugging programs, Syntax Errors, Run-Time Errors, Logical Errors

Problem solving Methodologies: Understanding of the problem, solution for the problem, identifying minimum number of inputs required for output, writing code to optimizing execution time and memory storage, step by step solution for the problem, breaking down solution into simple steps (modular approach), identification of arithmetic and logical operations required for solution; Control Structure: conditional control and looping (finite and infinite).

UNIT - 3: INTRODUCTION TO PYTHON

Chapter 1- Getting Started: Introduction to Python - an integrated high level language, interactive mode and script mode. Data types – Number (Integer – boolean, decimal, octal, hexadecimal; Floating point; Complex), none, Sequence (String, Tuples, List) Sets, Mapping. Mutable and Immutable Variables

Variables, Expressions and Statements: Values, Variables and Keywords; Operators and Operands in Python: (Arithmetic, Relational and Logical operators), Operator precedence, Expressions and Statements (Assignment statement); Taking input (using raw_input( ) and input( ) and displaying output (print statement); (single and multiple line) prints with escape sequence and various formats; Putting Comments.

AUGUST

REVISION FOR AUGUST EXAMINATION

SEPTEMBER

Chapter 2- Functions: Importing Modules (entire module or selected objects), invoking built in functions, functions from math module (e.g. ceil, floor, fabs, exp, log, log10, pow, sqrt, cos, sin, tan, degrees, radians, factorial, trunc, fmod), functions from random module (uniform, random, randint choice shuffle). Function from datetime module (date, time, datetime, timedate), functions from remodule (compile, match, group, start, end, span, search, findall, finditer), composition.

Defining functions, invoking functions, arguments and parameters, scope (local and global), passing parameters (default parameter values, keyword arguments), scope of variables, void functions and functions returning values, flow of execution, recursion.

Chapter 3- Conditional and looping construct: if else statement, while, for (range function), break, continue, else, pass, nested if, nested loops, use of compound expression in conditional and looping construct.

OCTOBER

UNIT - 4: PROGRAMMING WITH PYTHON

Chapter 1- Strings: Creating, initializing and accessing the elements; String operators: +, *, in, not in, slice [n:m]; Comparing strings using relational operators; String functions & methods: len( ), capitalize( ), find( ), isalnum( ), isalpha( ), isdigit( ), lower( ), islower( ), isupper( ), upper( ), lstrip( ), rstrip( ), isspace( ), istitle( ), partition( ), replace ( ), join( ),

spilt(), count( ), decode( ), encode( ), swapcase( ), String( ), constants, Regular Expressions and Pattern Matching.

Chapter 2- Lists: Concept of mutable lists, creating, initializing and accessing the elements, traversing, appending, updating and deleting elements, composition, lists as arguments.

List operations: Joining, slicing, +, *, in, not in.

List functions and methods: len( ), insert( ), append( ), extend( ), sort( ), remove( ), reverse( ), pop( ), list( ), count( ), extend( ), index( ), cmp( ), max( ), min( ).

NOVEMBER

Chapter 3- Dictionaries: Concept of key-value pair, creating, initializing and accessing the elements in a dictionary, traversing, appending, updating and deleting elements.

Dictionary functions and methods: cmp ( ), len( ), clear( ), get( ), has_key( ), items( ), key( ), update( ), values( ), pop( ), fromkeys( ), dict( ).

DECEMBER

DECEMBER EXAMINATION

JANUARY

Chapter 4- Tuples: Immutable concept, creating, initializing and accessing elements in a tuple, Tuple assignment, Tuple slices, Tuple indexing.

Tuple Functions: cmp( ), len( ), max( ), min( ), tuple( ), index( ), count( ), sum( ), any( ), all(), sorted( ), reversed( ).

Project Work

EXAMINATION SYLLABUS

AUGUST EXAMINATION

UNIT - 1: COMPUTER FUNDAMENTALS
        Chapter 1: Computer Fundamentals
        Chapter 2: Software Concepts
        Chapter 3: Data Representation in Computers
        Chapter 4: Microprocessor and Memory Concepts

UNIT - 2: PROGRAMMING METHODOLOGY
        Chapter 1: Algorithms and Flowcharts
        Chapter 2: Programming Methodology

UNIT - 3: INTRODUCTION TO PYTHON
        Chapter 1: Getting Started

DECEMBER EXAMINATION

UNIT - 1: COMPUTER FUNDAMENTALS
        Chapter 1: Computer Fundamentals
        Chapter 2: Software Concepts
        Chapter 3: Data Representation in Computers
        Chapter 4: Microprocessor and Memory Concepts

UNIT - 2: PROGRAMMING METHODOLOGY
        Chapter 1: Algorithms and Flowcharts
        Chapter 2: Programming Methodology

UNIT - 3: INTRODUCTION TO PYTHON
        Chapter 1: Getting Started
        Chapter 2- Functions
        Chapter 3- Conditional and looping construct

UNIT - 4: PROGRAMMING WITH PYTHON
        Chapter 1- Strings
        Chapter 2- Lists
        Chapter 3- Dictionaries
        Chapter 4- Tuples

FEBRUARY EXAMINATION

Full syllabus

NOTE: There will be a class test and assignment after every chapter.

DETAILED SYLLABUS OF PHYSICAL EDUCATION

THEORY

                                                                        MM 70

Unit 1:   Physical Fitness, Wellness and Life Style

Unit 2:   Changing Trends and Career in Physical Education

Unit 3:   Olympic Movement

Unit 4:   Yoga

Unit 5:   Doping

Unit 6:   Management of Injuries

Unit 7:   Test and Measurement in Sports

Unit 8:   Fundamentals of Anatomy and Physiology

Unit 9:   Biomechanics and Sports

Unit 10:   Psychology and Sports

Unit 11:   Training in Sports

PRACTICAL   **MM: 30**

1. Physical Fitness   [5 marks]

2. Athletics – any two events – Sprints and Jumps   [5 marks]

3. Health and fitness activities – Medicine Ball/Thera tube/Pilates/Rope Skipping
   (any one)   [5 marks]

4. Skill on any one individual game of choice from given list- Badminton, Judo,
   Swimming, Table Tennis, Taekwondo and Tennis   [5 marks]

5. Viva   [5 marks]

6. Record file   [5 marks]

ANNUAL SYLLABUS BREAK UP

APRIL

CHAPTER 1: PHYSICAL FITNESS, WELLNESS AND LIFESTYLE
- Meaning and importance of Physical Fitness, Wellness and Lifestyle
- Factors affecting Physical Fitness and Wellness
- **{Video on the topic factors affecting physical fitness and wellness}**
- Indicators of Health - Physical and Psychological
- Preventing Health Threats through Lifestyle Change
- Components of positive lifestyle

MAY –JUNE
CHAPTER 2:CHANGING TRENDS AND CAREER IN PHYSICAL EDUCATION
- Define Physical Education, its Aims and Objectives
- Development of Physical Education - Post Independence
- Concept and Principles of Integrated Physical Education
- Concept and Principles of Adaptive Physical Education
- Career Options in Physical Education
- **{Video on the topic career options in physical education}**

CHAPTER 3: OLYMPIC MOVEMENT
- Ancient and Modern Olympics
- **{Video on the topic origin of modern and ancient olympic games}**
- Olympic Symbols, Ideals, Objectives and Values
- International Olympic Committee
- Indian Olympic Association
- Dronacharya Award, Arjuna Award and Rajiv Gandhi Khel Ratna Award
- Organisational set-up of CBSE Sports and Chacha Nehru Sports Award

JULY
CHAPTER 4: YOGA
- Meaning and Importance of Yoga
- Yoga as an Indian Heritage
- **{video on the topic History of yoga in India}**
- Elements of Yoga
- Introduction to - Asanas, Pranayam, Meditation and Yogic Kriyas
- Prevention and Management of Common Lifestyle Diseases; Obesity, Diabetes, Hyper- Tension and Back-Pain
CHAPTER 5: DOPING
- Meaning and types of Doping
- **{Video on the topic meaning and types of doping}**
- Prohibited substances and methods
- Athletes responsibilities
- Testing - in competition and Oideut-of-Competition
- Side effects of prohibited substances

AUGUST
REVISION FOR AUGUST EXAMINATION

SEPTEMBER

CHAPTER 6: MANAGEMENT OF INJURIES
- Common sports injuries of soft Tissues, Joints and Bones
- First-Aid in Common Sports Injuries
- **{video on the topic :Contusion ,strain ,sprain ,abrasion}**
- Prevention of Sports injuries
- Rehabilitation through Massage and Exercise

CHAPTER 7: TEST AND MEASUREMENT IN SPORTS
- Define Test and Measurement
- Importance of Test and Measurement in Sports
- Calculation of BMI and Waist - Hip Ratio
- **{video on the topic BMI and Waist – Hip Ratio}**
- Somato Types (Endomorphy, Merasiosomorphy and Ectomorphy)
- Procedures of Anthropromatric Measurement - Height, Weight, Arm and Leg Length and Skin Fold

OCTOBER
CHAPTER 8: FUNDAMENTALS OF ANATOMY AND PHYSIOLOGY
- Define Anatomy, Physiology and its importance
- Function of skeleton system, Classification of bones and types of joints
- Function and structure of muscles
- Function and structure of Respiratory System
- Structure of Heart and introduction to Circulatory System
- **{Video on the topic structure and function of the heart}**

NOVEMBER
CHAPTER 9 : BIOMECHANICS AND SPORTS
- Meaning and Importance of Biomechanics in Physical Education and Sports
- Newton's Law of Motion and its application in sports
- Levers and its types and its application in Sports
- Equilibrium - Dynamic and Static and Centre of Gravity and its application in sports
- Force - Centrifugal and Centripetal and its application in Sports
- **{Video on the topic Centrifugal ad centripetal force}**

DECEMBER

REVISION FOR DECEMBER EXAMINATION

CHAPTER 10: PSYCHOLOGY AND SPORTS
- Definition and importance of Psychology in Physical Education and Sports
- Define and differentiate between 'Growth and Development'
- Developmental characteristics at different stage of development
- Adolescent problems and their management
- **{Video on the topic : Adolescent problems and their management}**
- Define Learning, Laws of Learning and transfer of Learning

JANUARY

CHAPTER 11: TRAINING IN SPORTS
- Meaning and Concept of Sports Training
- Principles of Sports Training
- Warming up and limbering down
- **{Video on the topic Importance of warming up and cooling down in physical education}**
- Load, Adaptation and Recovery
- Skill, Technique and Style.

EXAMINATION SYLLABUS

AUGUST EXAMINATION

Chapters 1 to 5

DECEMBER EXAMINATION

Chapters 1 to 10

FEBRUARY EXAMINATION

Full Syllabus

NOTE: There will be a class test and assignment after every chapter.