COMPUTER APPLICATIONS
CLASS IX (Code 165)
(2022-23)

Learning Outcomes

1. Ability to familiarise with basics of computers.

2. Ability to navigate the file system.

3. Ability to create and edit documents, spread sheets, and presentations.

4. Ability to perform basic data manipulation using spread sheets and use Indian languages in documents.

5. Ability to send and receive emails, follow email etiquette, and communicate over the internet.

6. Ability to create and upload videos.

7. Ability to safely and correctly use websites, social networks, chat sites, and email.

Distribution of Marks and Periods

Unit No.	Unit Name	Marks	Periods	
			Theory	Practical
1.	Basics of Information Technology	20	20	05
2.	Cyber safety	15	10	05
3.	Office Tools	15	20	55
4.	Lab Exercises	50	-	-
	Total	100	50	70

Unit 1: Basics of Information Technology

- Computer Systems: characteristics of a computer, components of a computer system – CPU, memory, storage devices and I/O devices

- Memory: primary (RAM and ROM) and secondary memory

- Storage devices: hard disk, CD ROM, DVD, pen/flash drive, memory stick

- I/O devices: keyboard, mouse, monitor, printer, scanner, web camera

- Types of software: system software (operating system, device drivers), application software including mobile applications

- Computer networking: Type of networks: PAN, LAN, MAN, WAN, wired/wireless communication, Wi-Fi, Bluetooth, cloud computers
  (Private/public)

- Multimedia: images, audio, video, animation

Unit 2: Cyber-safety

- Safely browsing the web and using social networks: identity protection, proper usage of passwords, privacy, confidentiality of information, cyber stalking, reporting cybercrimes
- Safely accessing websites: viruses and malware , adware

Unit 3: Office tools

- Introduction to a word processor: create and save a document.
- Edit and format text: text style (B, I, U), font type, font size, text colour, alignment of text. Format paragraphs with line and/or paragraph spacing. Add headers and footers, numbering pages, grammar and spell check utilities, subscript and superscript, insert symbols, use print preview, and print a document.
- Insert pictures, change the page setting, add bullets and numbering, borders and shading, and insert tables – insert/delete rows and columns, merge and split cells.
- Use auto-format, track changes, review comments, use of drawing tools, shapes and mathematical symbols.
- Presentation tool: understand the concept of slide shows, basic elements of a slide, different types of slide layouts, create and save a presentation, and learn about the different views of a slide set – normal view, slide sorter view and hand-outs.
- Edit and format a slide: add titles, subtitles, text, background, and watermark, headers and footers, and slide numbers.
- Insert pictures from files, create animations, add sound effects, and rehearse timings.
- Spreadsheets: concept of a worksheet and a workbook, create and save a worksheet.
- Working with a spreadsheet: enter numbers, text, date/time, series using auto fill; edit and format a worksheet including changing the colour, size, font, alignment of text; insert and delete cells, rows and columns. Enter a formula using the operators (+,-,*, /), refer to cells, and print a worksheet.
- Use simple statistical functions: SUM (), AVERAGE (), MAX (), MIN (), IF () (without compound statements); embed charts of various types: line, pie, scatter, bar and area in a worksheet.

4. Lab Exercises

- Browser settings for a secure connection
- Working with the operating system: Navigation of the file system using a mouse and keyboard.
- Word processing: create a text document; create a letter, report, and greeting card.
- Create a text document with figures in it. It should describe a concept taught in another course.
- Discuss the following in a text document about the basic organisation of a computer: CPU, memory, input/output devices, hard disk.
- Create a text document in an Indian language other than English.
- Create a presentation.
- Create a presentation with animation.
- Include existing images/ pictures in a presentation.
- Animate pictures and text with sound effects in a presentation
- Create a simple spreadsheet and perform the following operations: min, max, sum, and average.
- Create different types of charts using a spreadsheet: line, bar, area and pie.

Breakup of marks for the Practicals:

S.No.	Unit Name	Marks
1.	Lab Test **(30 marks)**	
	Word processing	10
	Handling spreadsheets	10
	Creating presentations	10
2.	Report File + viva **(10 marks)**	
	Report file: • 4 documents each with a word processor, spreadsheet, and presentation tool	8
	Viva voce (based on the report file)	2
3.	Project (that uses most of the concepts that have been learnt) **(10 marks)**	
	Total Marks	**50**

Computer Applications
CLASS X (Code 165)
(2022-23)

Learning Outcomes

Ability to create a simple website

1. Ability to embed images, audio and video in an HTML page
2. Ability to use style sheets to beautify the web pages.
3. Ability to Interface a web site with a web server and record the details of a user's request.
4. Ability to follow basic cyber ethics
5. Ability to familiarize with network concepts.

Distribution of Marks and Periods

Unit No.	Unit Name	Marks	Periods	
			Theory	Practical
1.	Networking	15	17	05
2.	HTML	25	30	50
3.	Cyber ethics	10	08	10
4.	Practicals	50	-	-
	Total	100	55	65

Unit 1: Networking
* Internet: World Wide Web, web servers, web clients, web sites, web pages, web browsers, blogs, news groups, HTML, web address, e-mail address, downloading and uploading files from a remote site. Internet protocols: TCP/IP, SMTP, POP3, HTTP, HTTPS. Remote login and file transfer protocols: SSH, SFTP, FTP, SCP, TELNET, SMTP, TCP/IP.
* Services available on the internet: information retrieval, locating sites using search engines and finding people on the net;
* Web services: chat, email, video conferencing, e-Learning, e-Banking, eShopping, e-Reservation, e-Governance, e-Groups, social networking.
* Mobile technologies: SMS, MMS, 3G, 4G.

Unit 2: HTML
* Introduction to web page designing using HTML: create and save an HTML document, access a web page using a web browser.

- HTML tags: html, head, title, body, (attributes: text, background, bgcolor, link, vlink, alink), *br (break), hr(horizontal rule), inserting comments, h1..h6 (heading), p (paragraph), b (bold), i (italics), u (underline), ul (unordered list), ol (ordered list), and li (list item). Description lists: dl, dt and dd. Attributes of ol (start, type), ul (type).*
- Font tags (attributes: face, size, color).
- Insert images: img (attributes: src, width, height, alt), sup (super script), sub (subscript).
- HTML Forms: Textbox, radio buttons, checkbox, password, list, combobox.
- Embed audio and video in a HTML page.
- Create a table using the tags: table, tr, th, td, rowspan, colspan
- Links: significance of linking, anchor element (attributes: href, mailto), targets.
- Cascading style sheets: colour, background-colour, border-style, margin, height, width, outline, font (family, style, size), align, float.

Unit 3: Cyber ethics

- Netiquettes.
- Software licenses and the open source software movement.
- Intellectual property rights, plagiarism and digital property rights.
- Freedom of information and the digital divide.
- E-commerce: Privacy, fraud, secure data transmission.

4. Lab Exercises

- Create static web pages.
- Use style sheets to enforce a format in an HTML page (CSS).
- Embed pictures, audio and videos in an HTML page.
- Add tables and frames in an HTML page.
- Decorate web pages using graphical elements.
- Create a website using several webpages. Students may use any open source or proprietary tool.
- Work with HTML forms: text box, radio buttons, checkbox, password, list, combo box.
- Write a blog using HTML pages discussing viruses, malware, spam and antiviruses

- Create a web page discussing plagiarism. List some reported cases of plagiarism and the consequent punishment meted out. Explain the nature of the punishment in different countries as per their IP laws.

Breakup of marks for the practicals:

S. No.	Unit Name	Marks
1.	Lab Test (**20 marks**)	
	HTML (design one web page based on a diagram)	20
2.	Report File + viva (**20 marks**)	
	Report file: At least 10 HTML pages, and at least 5 Scratch/Python programs.	15
	Viva voce (based on the report file)	5
3.	Project (that uses most of the concepts that have been learnt) (**10 marks**)	
	Total (**50 marks**)	

ENGLISH LANGUAGE AND LITERATURE

Code No. 184

(2022-23)

1. Background

At the secondary stage of English language learning the textual materials and other resources should represent a wide range of learning experience. Literature has always played a significant role in learning language. However it is felt that pupils should be apprised with contemporary issues, read authentic literature and experiences of people to reflect and build their personality traits.

While there is a trend for inclusion of a wider range of contemporary and authentic texts, accessible and culturally appropriate pieces of literature should play a pivotal role at the secondary stage of education. The English class is meant for reading literature from different perspectives and to engage in activities for developing communicative competence, creativity and enrichment of language skills It should not be seen as a place merely to read poems and stories in, but an area of activities to develop the learner's imagination as a major aim of language study, and to equip the learner with communicative skills to perform various language functions through speech and writing.

2. Objectives:

Objectives of the course are to enable learners to:

- build greater confidence and proficiency in oral and written communication

- develop the ability and knowledge required in order to engage in independent reflection and inquiry
- make appropriate usage of English language

- to communicate in various social settings

- equip learners with essential language skills to question and to articulate their point of view

- build competence in the different aspects of the Language

- develop sensitivity to, and appreciation of world literature representing varieties of English and cultures embedded in lt.

- enable the learner to access knowledge and information through reference skills (consulting a dictionary / thesaurus, library, internet, etc.)

- develop curiosity and creativity through extensive reading

- facilitate self-learning to enable them to become independent learners

- review, organise and edit their own work and work done by peers

- integrate listening and speaking skills in the curriculum.

- give a brief oral description of events / incidents of topical interest

- retell the contents of authentic audio texts (weather reports, public announcements, simple advertisements, short interviews, etc.)

- participate in conversations, discussions, etc., on topics of mutual interest in non-classroom

situations

- narrate a story which has been depicted pictorially or in any other non-verbal mode
- respond, in writing, to business letters, official communications email etc.
- read and identify the main points / significant details of texts like scripts of audio-video interviews, discussions, debates, etc.
- write without prior preparation on a given topic and be able to defend or explain the stand taken / views expressed in the form of article, speech, or a debate
- write a summary of short lectures on familiar topics by making / taking notes
- write an assessment of different points of views expressed in a discussion / debate
- read poems effectively (with proper rhythm and intonation)
- transcode information from a graph / chart to a description / report and write a dialogue, short story or report
- Develop appreciation for Indian languages(multilingualism), translations and Indian Literature.

3. Language Items

In addition to consolidating the grammatical items practised earlier, the courses at thesecondary level seek to reinforce the following explicitly:

- sequence of tenses
- reported speech in extended texts
- modal auxiliaries (those not covered at upper primary)
- non-finites (infinitives, gerunds, participles)
- conditional clauses
- complex and compound sentences
- phrasal verbs and prepositional phrases
- cohesive devices
- punctuation (semicolon, colon, dash, hyphen, parenthesis or use of brackets and exclamation mark)

4. Methods and Techniques

The methodology is based on a multi-skill, activity-based, learner-centered approach. Care istaken to fulfill the functional (communicative), literary (aesthetic) and cultural (sociological) needs of the learner. In this situation, the teacher is the facilitator of learning, She/hepresents language items, create situations which motivates the child to use English for thepurposes of communication and expression. Aural-oral teaching and testing is an integral feature of the teaching-learning process. The electronic and print media could be used extensively. A few suggested activities are:

- Role play
- Simulating real life situations
- Dramatising and miming

- Problem solving and decision making

- Interpreting information given in tabular form and schedule

- Using newspaper clippings as a resource for comprehending and analysing issues.

- Borrowing situations and registers from the world around the learners, from books and from otherdisciplines

- Using language games, riddles, puzzles and jokes

- Interpreting pictures / sketches / cartoons

- Debating and discussing

- Narrating and discussing stories, anecdotes, etc.

- Reciting poems
- Working in pairs and groups

- Using media inputs - computer, television, video cassettes, tapes, software packages

ENGLISH LANGUAGE AND LITERATURE (Code No. 184)
SYLLABUS CLASS – IX (2022-23)

Sections	
A	Reading Skills (40periods)
B	Writing Skills with Grammar (40 periods)
C	Literature Textbooks and SupplementaryReading Text (50 periods)

Section A

Reading Skills

Reading Comprehension through Unseen Passage   **20 Marks**

I. Discursive passage of 400-450 words.   **(10 marks)**

II. Case-based passage (with visual input- statistical data, chart etc.) of 200-250 words.

                                                                                                    (**10 marks)**

(Total length of two passages to be 600-700 words)

Multiple Choice Questions / Objective Type Questions will be asked to assess inference, analysis, interpretation, evaluation and vocabulary.

Section B

III Grammar   **10 Marks**

- Tenses
- Modals
- Subject – verb concord
- Reported speech
    - Commands and requests
    - Statements
    - Questions
    - Determiners

The courses at the secondary level seek to cement high professional grasp of grammatical items and levels of accuracy. Accurate use of spelling, punctuation and grammar will be assessed through Gap Filling/ Editing/Transformation exercises. Ten out of 12 questions will be attempted.

IV Creative Writing Skills   **10 marks**

This section will have short as well as long writing tasks including compositions.

I. Writing a Descriptive Paragraph (word limit 100-120 words) on a person/event/situation based on visual or verbal cue/s. One out of two questions is to be answered**.**   **5 marks**

II. Writing a Diary Entry/ Story on a given title in 100-120 words. One out of two questions is to be answered**.**   **5 marks**

Section C

V. Reference to the Context   **40 Marks**

I. One extract out of two from Drama / Prose.
II. One extract out of two from poetry.   **(5+5 = 10 Marks)**

Multiple Choice Questions / Objective Type Questions will be asked to assess inference, analysis, interpretation, evaluation and vocabulary.

VI. Short & Long Answer Questions

I. Three out of Four Short Answer Type Questions to be answered in 40-50 words from the book BEEHIVE.   **3x3=9 marks**

II. Two out of Three Short Answer Type Questions to be answered in 40-50 words from the book MOMENTS.   **3x3=9 marks**

III. One out of two Long Answer Type Questions from BEEHIVE to be answered in about 100-120 words to assess creativity, imagination and extrapolation beyond the text and across the texts. This can also be a passage-based question taken from a situation/plot from the texts.   **6 marks**

IV. One out of two Long Answer Type Questions from MOMENTS on theme or plot involving interpretation, extrapolation beyond the text and inference or character sketch to be answered in about 100-120 words. **6 marks**

Prescribed Books: Published by NCERT, New Delhi

Beehive

Prose

1. The Fun They Had
2. The Sound of Music
3. The Little Girl
4. A Truly Beautiful Mind
5. The Snake and the Mirror
6. My Childhood
7. Reach For The Top
8. Kathmandu
9. If I were You

Poems-

1. The Road Not taken
2. Wind
3. Rain on The Roof
4. The Lake Isle of Innisfree
5. A Legend of The Northland
6. No Men Are Foreign
7. On killing a tree
8. A Slumber Did My Spirit Seal

Moments

1. The Lost Child
2. The adventures of Toto
3. Iswaran the Storyteller
4. In the kingdom of fools
5. The Happy Prince
6. The Last Leaf
7. A House is not a Home
8. The Beggar

3. WORDS AND EXPRESSIONS – II (WORKBOOK FOR CLASS X) – Units 1 to 6 and Units 8, 10 & 11

- **NOTE: Teachers are advised to:**

(i) encourage classroom interaction among peers, students and teachers through activitiessuch as role play, group work etc.

(ii) reduce teacher-talk time and keep it to the minimum,

(iii) take up questions for discussion to encourage pupils to participate and to marshal theirideas and express and defend their views.

Besides measuring learning outcome, texts serve the dual purpose of diagnosing mistakesand areas of non-learning. To make evaluation a true index of learners' knowledge, each language skill is to be assessed through a judicious mixture of different types of questions.

INTERNAL ASSESSMENT

Listening and Speaking Competencies   **30 Periods**

Assessment of Listening and Speaking Skills will be for 05 marks.

It is recommended that listening and speaking skills should be regularly practiced.

Art-integrated projects based on activities like Role Play, Skit, Dramatization etc. must be used. Please refer to the Circular no. Acad-33/2020 dated 14ᵗʰ May 2020 at the http://cbseacademic.nic.in/web_material/Circulars/2020/33_Circular_2020.pdf for details.

Guidelines for the Assessment of Listening and Speaking Skills are given at Annexure I.

ENGLISH LANGUAGE AND LITERATURE (Code No. 184)

CLASS – IX (2022 – 23)   **Marks-80**

Sections	Competencies	Total marks
Reading Comprehension	Conceptual understanding, decoding, analyzing, inferring, interpreting and vocabulary	20
Writing Skill and Grammar	Creative expression of an opinion, reasoning, justifying, illustrating, appropriacy of style and tone, using appropriate format and fluency. Applyingconventions, using integrated structures with accuracy and fluency	20
Language Through Literature	Recalling, reasoning, appreciating, applying literary conventions illustrating and justifying etc. Extract relevant information, identifying the central theme and sub-theme, understanding the writers' message and writing fluently.	40
Total		**80**

For the details of Internal Assessment of 20 marks, please refer to the circular no.

Acad-11/2019, dated March 06, 2019.

ENGLISH LANGUAGE AND LITERATURE (Code No. 184)

CLASS – X (2022-23)

SECTION - WISE WEIGHTAGE

Sections		
A	Reading Skills	(40 periods)
B	Writing Skills with Grammar	(40 periods)
C	Literature Textbooks and Supplementary Reading Text (50 periods)	

Section A

Reading Skills

Reading Comprehension through Unseen Passage   **20 Marks**

I. Discursive passage of 400-450 words.   **(10 marks)**

II. Case-based passage (with visual input- statistical data, chart etc.) of 200-250 words.

                                                                                                                                                        (**10 marks**)

(**Total length of two passages to be 600-700 words)**

Multiple Choice Questions / Objective Type Questions will be asked to assess inference, analysis, interpretation, evaluation and vocabulary.

Section B

III Grammar   **10 Marks**

- Tenses
- Modals
- Subject – verb concord
- Reported speech
  - o   Commands and requests
  - o   Statements
  - o   Questions
  - o   Determiners

The courses at the secondary level seek to cement high professional grasp of grammatical items and levels of accuracy. Accurate use of spelling, punctuation and grammar in context will be assessed through Gap Filling/ Editing/Transformation exercises. Ten out of 12 questions will have to be attempted.

IV Creative Writing Skills   **10 marks**

This section will have short as well as long writing tasks including compositions.

I. Formal Letter based on a given situation in 100-120 words. One out of two questions is to be
      answered**.**   **5 marks**

II. Writing an Analytical Paragraph (100-120 words) on a given Map / Chart / Graph /
       Cue/s. One out of two questions is to be answered**.**   **5 marks**

                                            Section C   **40 Marks**

V. Reference to the Context

I. One extract out of two from Drama / Prose.
II. One extract out of two from poetry.   **(5+5 = 10 Marks)**

Multiple Choice Questions / Objective Type Questions will be asked to assess inference, analysis, interpretation, evaluation and vocabulary.

VI. Short & Very Long Answer Questions   **30 Marks**

I. Four out of Five Short Answer Type Questions to be answered in 40-50 words from the book
    FIRST FLIGHT   **4x3=12 marks**

II. Two out of Three Short Answer Type Questions to be answered in 40-50 words each from
     FOOTPRINTS WITHOUT FEET.   **2x3=6 marks**

III. One out of two Long Answer Type Questions from FIRST FLIGHT to be answered in about 100-120
     words each to assess creativity, imagination and extrapolation beyond the text and across the texts. This can
     be a passage-based question taken from a situation/plot from the texts.   **6 marks**

IV. One out of two Long Answer Type Questions from FOOTPRINTS WITHOUT FEET on theme or plot
      involving interpretation, extrapolation beyond the text and inference or character sketch to be
      answered in about 100-120 words.   **6 marks**

Prescribed Books: Published by NCERT, New Delhi

First Flight
Prose
1. A letter to God
2. Nelson Mandela - Long Walk to Freedom
3. Two Stories About Flying
4. From the Diary of Anne Frank
5. Glimpses of India
6. Mijbil the Otter
7. Madam Rides the Bus
8. The Sermon at Benares
9. The Proposal (Play)

Poems
1. Dust of Snow
2. Fire and Ice
3. A tiger in the Zoo
4. How to Tell Wild Animals
5. The Ball Poem
6. Amanda!
7. The Trees
8. Fog
9. The Tale of Custard the Dragon
10. For Anne Gregory

FOOTPRINTS WITHOUT FEET

1. A triumph of Surgery
2. The Thief's Story
3. The Midnight Visitor
4. A Question of Trust
5. Footprints Without Feet
6. The making of a Scientist
7. The necklace
8. Bholi
9. The Book That Saved the Earth

3. WORDS AND EXPRESSIONS – II (WORKBOOK FOR CLASS X) – Units 1 to 4 and Units 7 to 11

Note: Teachers are advised to:

(i) encourage interaction among peers, students and teachers through activities such as roleplay, discussions, group work etc.

(ii) reduce teacher-talking time and keep it to the minimum,

(iii) take up questions for discussion to encourage pupils to participate and to marshal theirideas and express and defend their views, and

(iv) follow the Speaking and Listening activities given in the NCERT books.

Besides measuring learning outcome, texts serve the dual purpose of diagnosing mistakesand areas of non-learning. To make evaluation a true index of learners' knowledge, each language skill is to be assessed through a judicious mixture of different types of questions.

INTERNAL ASSESSMENT

Listening and Speaking Competencies   **30 Periods**

Assessment of Listening and Speaking Skills will be for 05 marks.

It is recommended that listening and speaking skills should be regularly practiced .

Art-integrated projects based on activities like Role Play, Skit, Dramatization etc. must be used. Please refer to the Circular no. Acad-33/2020 dated 14th May 2020 at the http://cbseacademic.nic.in/web_material/Circulars/2020/33_Circular_2020.pdf for details

Guidelines for the Assessment of Listening and Speaking Skills are given at Annexure I.

ENGLISH LANGUAGE AND LITERATURE
Code no. (184)

CLASS - X (2022-23)   **Marks 80**

Sections	Competencies	Total marks
Reading Comprehension	Conceptual understanding, decoding, analyzing, inferring, interpreting and vocabulary	20
Writing Skill and Grammar	Creative expression of an opinion, reasoning, justifying, illustrating, appropriacy of style and tone, using appropriate format and fluency. Applying conventions, using integrated structures with accuracy and fluency	20
Language through Literature	Recalling, reasoning, appreciating, applying literary conventions illustrating and justifying etc. Extract relevantinformation, identifying the central theme and sub-theme, understanding the writers' message and writing fluently.	40
Total		**80**

For the details of Internal Assessment of 20 marks, please refer to the circular no.

Acad-11/2019, dated March 06, 2019.

Guidelines for Assessment of Listening and Speaking Skills (ALS)

ALS is a component of the Subject Enrichment Activity under Internal Assessment. ALS must be seen as an integrated component of all four language skills rather than a compartment of two. Suggested activities, therefore, take into consideration an integration of the four language skills but during assessment, emphasis will be given to speaking and listening, since reading and writing are already being assessed in the written exam.

Assessment of Listening and Speaking Skills: (5 Marks)

i. **Activities:**

- Subject teachers must refer to books prescribed in the syllabus.
- In addition to the above, teachers may plan their own activities and create their own material for assessing the listening and speaking skills.

ii. **Parameters for Assessment:** The listening and speaking skills are to be assessed on the following parameters:

a. Interactive competence (Initiation & turn taking, relevance to the topic)

b. Fluency (cohesion, coherence and speed of delivery)

c. Pronunciation

d. Language (grammar and vocabulary)

A suggestive rubric is given below:

	1.	**2.**	**3.**	**4.**	**5.**
Interaction	• Contributions are mainly unrelated to those of other speakers • Shows hardly any initiative in the development of conversation • Very limited interaction	• Contributions are often unrelated to those of the other speaker • Generally passive in the development of conversation	• Develops interaction adequately, makes however minimal effort to initiate conversation • Needs constant prompting to take turns	• Interaction is adequately initiated and develop • Can take turn but needs little prompting	• Can initiate & logically develop simple conversation on familiar topics • Can take turns appropriately
Pronunciation	• Insufficient accuracy in pronunciation; many grammatical errors • Communication is severely affected	• Frequently unintelligible articulation • Frequent phonological errors • Major communication problems	• Largely correct pronunciation & clear articulation except occasional errors • Some expressions cause stress without compromising with understanding of spoken discourse.	• Mostly correct pronunciation & clear articulation • Can be clearly understood most of the time; very few phonological errors	• Can pronounce correctly & articulate clearly • Is always comprehensible; uses appropriate intonation

	1.	2.	3.	4.	5.
Fluency & Coherence	• Noticeably/ long pauses; rate of Speech is slow • Frequent repetition and/or self- correction • Links only basic sentences; breakdown of coherence evident	• Usually fluent; produces simple speech fluently, but loses coherence in complex communication • Often hesitates and/or resorts to slow speech • Topics partly developed; not always concluded logically	• Is willing to speak at length, however repetition is noticeable • Hesitates and/or self corrects; occasionally loses coherence • Topics mainly developed, but usually not logically concluded	• Speaks without noticeable effort, with a little repetition • Demonstrates hesitation to find words or use correct grammatical structures and/or self-correction • Topics not fully developed to merit	• Speaks fluently almost with no repetition & minimal hesitation • Develops topic fully & coherently
Vocabulary & Grammar	• Demonstrates almost no flexibility, and mostly struggles for appropriate words • Uses very basic vocabulary to express view-points.	• Communicates with limited flexibility and appropriacy on some of the topics • Complex forms and sentence structures are rare; exhibits limited vocabulary to express new ideas	• Communicates with limited flexibility and appropriacy on most of the topics • Sometimes uses complex forms and sentence structures; has limited vocabulary to describe/ express new points	• Can express with some flexibility and appropriacy on most of the topics • Demonstrates ability to use complex forms and sentence structures most of the time; expresses with adequate vocabulary	• Can express with some flexibility and appropriacy on a variety of topics such as family, hobbies, work, travel and current events • Frequently uses complex forms and sentence structures; has enough vocabulary to express himself/ herself

iii. Schedule:

- The practice of listening and speaking skills should be done throughout the academic year.
- The final assessment of the skills is to be done as per the convenience and schedule of the school.

MATHEMATICS (IX-X)
(CODE NO. 041)
Session 2022-23

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. The present revised syllabus has been designed in accordance with National Curriculum Framework 2005 and as per guidelines given in the Focus Group on Teaching of Mathematics which is to meet the emerging needs of all categories of students. For motivating the teacher to relate the topics to real life problems and other subject areas, greater emphasis has been laid on applications of various concepts.

The curriculum at Secondary stage primarily aims at enhancing the capacity of students to employ Mathematics in solving day-to-day life problems and studying the subject as a separate discipline. It is expected that students should acquire the ability to solve problems using algebraic methods and apply the knowledge of simple trigonometry to solve problems of height and distances. Carrying out experiments with numbers and forms of geometry, framing hypothesis and verifying these with further observations form inherent part of Mathematics learning at this stage. The proposed curriculum includes the study of number system, algebra, geometry, trigonometry, mensuration, statistics, graphs and coordinate geometry, etc.

The teaching of Mathematics should be imparted through activities which may involve the use of concrete materials, models, patterns, charts, pictures, posters, games, puzzles and experiments.

Objectives

The broad objectives of teaching of Mathematics at secondary stage are to help the learners to:

- consolidate the Mathematical knowledge and skills acquired at the upper primary stage;
- acquire knowledge and understanding, particularly by way of motivation and visualization, of basic concepts, terms, principles and symbols and underlying processes and skills;
- develop mastery of basic algebraic skills;
- develop drawing skills;
- feel the flow of reason while proving a result or solving a problem;
- apply the knowledge and skills acquired to solve problems and wherever possible, by more than one method;
- to develop ability to think, analyze and articulate logically;
- 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 necessary skills to work with modern technological devices and mathematical software's.
- to develop interest in mathematics as a problem-solving tool in various fields for its beautiful structures and patterns, etc.
- to develop reverence and respect towards great Mathematicians for their contributions to the field of Mathematics;
- 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.

COURSE STRUCTURE CLASS –IX

Units	Unit Name	Marks
I	NUMBER SYSTEMS	10
II	ALGEBRA	20
III	COORDINATE GEOMETRY	04
IV	GEOMETRY	27
V	MENSURATION	13
VI	STATISTICS & PROBABILITY	06
	Total	80

UNIT I: NUMBER SYSTEMS

1.   REAL NUMBERS   (18) Periods

1. Review of representation of natural numbers, integers, and rational numbers on the number line. Rational numbers as recurring/ terminating decimals. Operations on real numbers.

2. Examples of non-recurring/non-terminating decimals. Existence of non-rational numbers (irrational numbers) such as $\sqrt{2}$, $\sqrt{3}$ and their representation on the number line. Explaining that every real number is represented by a unique point on the number line and conversely, viz. every point on the number line represents a unique real number.

3. Definition of nth root of a real number.

4. Rationalization (with precise meaning) of real numbers of the type
$\frac{1}{a+b\sqrt{x}}$ and $\frac{1}{\sqrt{x}+\sqrt{y}}$ (and their combinations) where x and y are natural number and a and b are integers.

5. Recall of laws of exponents with integral powers. Rational exponents with positive real bases (to be done by particular cases, allowing learner to arrive at the general laws.)

UNIT II: ALGEBRA

1.   POLYNOMIALS   (26) Periods

Definition of a polynomial in one variable, with examples and counter examples. Coefficients of a polynomial, terms of a polynomial and zero polynomial. Degree of a polynomial. Constant, linear, quadratic and cubic polynomials. Monomials, binomials, trinomials. Factors and multiples. Zeros of a polynomial. Motivate and State the Remainder Theorem with examples. Statement and proof of the Factor Theorem. Factorization of $ax^2 + bx + c$, $a \neq 0$ where a, b and c are real numbers, and of cubic polynomials using the Factor Theorem.

Recall of algebraic expressions and identities. Verification of identities:
$(x + y + z)^2 = x^2 + y^2 + z^2 + 2xy + 2yz + 2zx$
$(x \pm y)^3 = x^3 \pm y^3 \pm 3xy (x \pm y)$
$x^3 \pm y^3 = (x \pm y) (x^2 \mp xy + y^2$
$x^3 + y^3 + z^3 - 3xyz = (x + y + z) (x^2 + y^2 + z^2 - xy - yz - zx)$
and their use in factorization of polynomials.

2. LINEAR EQUATIONS IN TWO VARIABLES   (16) Periods

Recall of linear equations in one variable. Introduction to the equation in two variables.
Focus on linear equations of the type $ax + by + c=0$.Explain that a linear equation in two variables has infinitely many solutions and justify their being written as ordered pairs of real numbers, plotting them and showing that they lie on a line.

UNIT III: COORDINATE GEOMETRY

COORDINATE GEOMETRY   (7) Periods

The Cartesian plane, coordinates of a point, names and terms associated with the coordinate plane, notations.

UNIT IV: GEOMETRY

1. INTRODUCTION TO EUCLID'S GEOMETRY   (7) Periods

History - Geometry in India and Euclid's geometry. Euclid's method of formalizing observed phenomenon into rigorous Mathematics with definitions, common/obvious notions, axioms/postulates and theorems. The five postulates of Euclid. Showing the relationship between axiom and theorem, for example:

(Axiom) 1. Given two distinct points, there exists one and only one line through them.
(Theorem) 2. (Prove) Two distinct lines cannot have more than one point in common.

2. LINES AND ANGLES   (15) Periods

1. (Motivate) If a ray stands on a line, then the sum of the two adjacent angles so formed is 180° and the converse.
2. (Prove) If two lines intersect, vertically opposite angles are equal.

3. (Motivate) Lines which are parallel to a given line are parallel.

3. TRIANGLES   (22) Periods

1. (Motivate) Two triangles are congruent if any two sides and the included angle of one triangle is equal to any two sides and the included angle of the other triangle (SAS Congruence).

2. (Prove) Two triangles are congruent if any two angles and the included side of one triangle is equal to any two angles and the included side of the other triangle (ASA Congruence).

3. (Motivate) Two triangles are congruent if the three sides of one triangle are equal to three sides of the other triangle (SSS Congruence).

4. (Motivate) Two right triangles are congruent if the hypotenuse and a side of one triangle are equal (respectively) to the hypotenuse and a side of the other triangle. (RHS Congruence)

5. (Prove) The angles opposite to equal sides of a triangle are equal.

6. (Motivate) The sides opposite to equal angles of a triangle are equal.

4.   QUADRILATERALS   (13) Periods

1. (Prove) The diagonal divides a parallelogram into two congruent triangles.

2. (Motivate) In a parallelogram opposite sides are equal, and conversely.

3. (Motivate) In a parallelogram opposite angles are equal, and conversely.

4. (Motivate) A quadrilateral is a parallelogram if a pair of its opposite sides is parallel and equal.

5. (Motivate) In a parallelogram, the diagonals bisect each other and conversely.

6. (Motivate) In a triangle, the line segment joining the mid points of any two sides is parallel to the third side and in half of it and (motivate) its converse.

5.   CIRCLES   (17) Periods

1. (Prove) Equal chords of a circle subtend equal angles at the center and (motivate) its converse.

2. (Motivate) The perpendicular from the center of a circle to a chord bisects the chord and conversely, the line drawn through the center of a circle to bisect a chord is perpendicular to the chord.

3. (Motivate) Equal chords of a circle (or of congruent circles) are equidistant from the center (or their respective centers) and conversely.

4. (Prove) The angle subtended by an arc at the center is double the angle subtended by it at any point on the remaining part of the circle.

5. (Motivate) Angles in the same segment of a circle are equal.

6. (Motivate) If a line segment joining two points subtends equal angle at two other points lying on the same side of the line containing the segment, the four points lie on a circle.

7. (Motivate) The sum of either of the pair of the opposite angles of a cyclic quadrilateral is 180° and its converse.

UNIT V: MENSURATION

1.   AREAS   (5) Periods

Area of a triangle using Heron's formula (without proof)

2.   SURFACE AREAS AND VOLUMES   (17) Periods

Surface areas and volumes of spheres (including hemispheres) and right circular cones.

UNIT VI: STATISTICS & PROBABILITY

STATISTICS   (15) Periods

Bar graphs, histograms (with varying base lengths), and frequency polygons.

MATHEMATICS
QUESTION PAPER DESIGN
CLASS – IX (2022-23)

Time: 3 Hrs.   **Max. Marks: 80**

S. No.	Typology of Questions	Total Marks	% Weightage (approx.)
1	**Remembering:** Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding:** Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	43	54
2	**Applying:** Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	19	24
3	**Analysing :** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations. **Evaluating:** Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. **Creating:** Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions	18	22
	Total	80	100

INTERNAL ASSESSMENT	20 MARKS
Pen Paper Test and Multiple Assessment (5+5)	10 Marks
Portfolio	05 Marks
Lab Practical (Lab activities to be done from the prescribed books)	05 Marks

COURSE STRUCTURE CLASS –X

Units	Unit Name	Marks
I	NUMBER SYSTEMS	06
II	ALGEBRA	20
III	COORDINATE GEOMETRY	06
IV	GEOMETRY	15
V	TRIGONOMETRY	12
VI	MENSURATION	10
VII	STATISTICS & PROBABILTY	11
	Total	**80**

UNIT I: NUMBER SYSTEMS

1. REAL NUMBER   (15) Periods

Fundamental Theorem of Arithmetic - statements after reviewing work done earlier and after illustrating and motivating through examples, Proofs of irrationality of $\sqrt{2}, \sqrt{3} \sqrt{5}$

UNIT II: ALGEBRA

1.   POLYNOMIALS   (8) Periods

Zeros of a polynomial. Relationship between zeros and coefficients of quadratic polynomials.

2.   PAIR OF LINEAR EQUATIONS IN TWO VARIABLES   (15) Periods

Pair of linear equations in two variables and graphical method of their solution, consistency/inconsistency.

Algebraic conditions for number of solutions. Solution of a pair of linear equations in two variables algebraically - by substitution, by elimination. Simple situational problems.

3.   QUADRATIC EQUATIONS   (15) Periods

Standard form of a quadratic equation $ax^2 + bx + c = 0, (a \neq 0)$. Solutions of quadratic equations (only real roots) by factorization, and by using quadratic formula. Relationship between discriminant and nature of roots.

Situational problems based on quadratic equations related to day to day activities to be incorporated.

4.   ARITHMETIC PROGRESSIONS   (10) Periods

Motivation for studying Arithmetic Progression Derivation of the nth term and sum of the first n terms of A.P. and their application in solving daily life problems.

UNIT III: COORDINATE GEOMETRY

Coordinate Geometry   (15) Periods

Review: Concepts of coordinate geometry, graphs of linear equations. Distance formula. Section formula (internal division).

UNIT IV: GEOMETRY

1.   TRIANGLES   (15) Periods

Definitions, examples, counter examples of similar triangles.

1. (Prove) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.
2. (Motivate) If a line divides two sides of a triangle in the same ratio, the line is parallel to the third side.
3. (Motivate) If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar.
4. (Motivate) If the corresponding sides of two triangles are proportional, their corresponding angles are equal and the two triangles are similar.
5. (Motivate) If one angle of a triangle is equal to one angle of another triangle and the sides including these angles are proportional, the two triangles are similar.

2.   CIRCLES   (10) Periods

Tangent to a circle at, point of contact

1. (Prove) The tangent at any point of a circle is perpendicular to the radius through the point of contact.
2. (Prove) The lengths of tangents drawn from an external point to a circle are equal.

UNIT V: TRIGONOMETRY

1. INTRODUCTION TO TRIGONOMETRY   (10) Periods

Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence (well defined); motivate the ratios whichever are defined at $0_{\circ}$ and $90_{\circ}$. Values of the trigonometric ratios of 30^0, 45^0 and 60^0. Relationships between the ratios.

2. TRIGONOMETRIC IDENTITIES   (15) Periods

Proof and applications of the identity $sin^2A + cos^2A = 1$. Only simple identities to be given.

3. HEIGHTS AND DISTANCES: Angle of elevation, Angle of Depression. (10)Periods

Simple problems on heights and distances. Problems should not involve more than two right triangles. Angles of elevation / depression should be only 30°, 45°, and 60°.

UNIT VI: MENSURATION

1. AREAS RELATED TO CIRCLES   (12) Periods

Area of sectors and segments of a circle. Problems based on areas and perimeter / circumference of the above said plane figures. (In calculating area of segment of a circle, problems should be restricted to central angle of 60°, 90° and 120° only.

2. SURFACE AREAS AND VOLUMES   (12) Periods

Surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones.

UNIT VII: STATISTICS AND PROBABILITY

1. STATISTICS   (18) Periods

Mean, median and mode of grouped data (bimodal situation to be avoided).

2. PROBABILITY   (10) Periods

Classical definition of probability. Simple problems on finding the probability of an event.

MATHEMATICS-Standard
QUESTION PAPER DESIGN
CLASS – X (2022-23)

Time: 3 Hours   **Max. Marks: 80**

S. No.	Typology of Questions	Total Marks	% Weightage (approx.)
1	**Remembering:** Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding:** Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	43	54
2	**Applying:** Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	19	24
3	**Analysing :** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations **Evaluating:** Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. **Creating:** Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions	18	22
	Total	80	100

INTERNAL ASSESSMENT	20 MARKS
Pen Paper Test and Multiple Assessment (5+5)	10 Marks
Portfolio	05 Marks
Lab Practical (Lab activities to be done from the prescribed books)	05 Marks

MATHEMATICS-Basic
QUESTION PAPER DESIGN
CLASS – X (2022-23)

Time: 3Hours   **Max. Marks: 80**

S. No.	Typology of Questions	Total Marks	% Weightage (approx.)
1	**Remembering:** Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding:** Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	60	75
2	**Applying:** Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	12	15
3	**Analysing :** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations **Evaluating:** Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. **Creating:** Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions	8	10
	Total	80	100

INTERNAL ASSESSMENT	20 MARKS
Pen Paper Test and Multiple Assessment (5+5)	10 Marks
Portfolio	05 Marks
Lab Practical (Lab activities to be done from the prescribed books)	05 Marks

PRESCRIBED BOOKS:

1.   Mathematics - Textbook for class IX - NCERT Publication

2.   Mathematics - Textbook for class X - NCERT Publication

3.   Guidelines for Mathematics Laboratory in Schools, class IX - CBSE Publication

4.   Guidelines for Mathematics Laboratory in Schools, class X - CBSE Publication

5.   Laboratory Manual - Mathematics, secondary stage - NCERT Publication

6.   Mathematics exemplar problems for class IX, NCERT publication.

7.   Mathematics exemplar problems for class X, NCERT publication.

(B) PAINTING (Code No.: 049)
Classes IX-X (2022-23)

"The secondary stage is apt for refining aesthetic sensibilities and promoting social values through projects on conservation of the natural and cultural heritage and through opportunities for studying Indian culture, working with artists/artisans of the community, organizing festivals and celebrations of the community at large, display of physical environment and surrounding landscape and their exploration; projects to promote creative expression and exhibition of works in visual and verbal forms" is one of the recommendations of the National Curriculum Framework 2005.

This is the stage where students have already gained the skill of drawing and painting to an extent to create and communicate through simple images and colours. The focus of the painting curriculum should be to provide students with an opportunity to explore natural and man made objects, situations and subjects to learn about the elements and principles of painting while enjoying their creative expression through different mediums and techniques. The course consists of (i) Painting theory and (ii) Painting practicals. Theory and Practice are co-related and complement each other by application of medium and technique. Theory can make students understand the medium they are practicing with all its beauty and meaning. Theory provides knowledge and enhances the value of the practical.

Learning outcomes:

Students after studying 'Painting' as additional subject will be able to:

- Enjoy paintings as a medium of expressions
- Appreciate the beauty in lines, forms and colours
- Know the fundamentals of Painting (Elements and Principles) and apply them in their creations.
- Use painting tools and materials appropriately.
- Apply pencil colours, oil pastels, poster colours, water colours etc. as a painting medium.
- Differentiate between 'opaque' and 'transparent' colours as a technique.

- Refine memory and observation power through study / still life and painting composition.
- Maintain his/her painting tools, materials appropriately.
- Display his/her paintings aesthetically and will learn to store them.
- Apply the artistic skills of composition in day-to-day life at home and in the school.

Suggested Teaching Learning Strategies - IX :

i.   Still Life (Study of simple objects) Study of a group of two or three objects from a fixed point of view in colours. Group may include vegetables, fruits, foliage, book, drapery, and simple objects of daily use.

ii.   Simple compositions based on any one form of Folk Art such as Madhubani, Warli, Alpana, Rangoli, Mandana etc.

iii. Field visits to Art Galleries, Museum/s, National Bal Bhawan or similar organisations, Artist's studios or Artisan's workshops etc.

iv.   Sketches from Life and Nature in pencil and ink.

v.   Teacher can tell story of Indian Art in a story telling manner. This can also be audio/video recorded and shared with students.

vi.   Display of reproductions of master's work in school corridors.

vii. Submission of portfolio consisting of six (3 Still Life and 3 Composition) selected works done during the year.

(B) PAINTING
Theory
Code No.: 049
Class IX

Time allowed: 3 hours   **Maximum Marks: 30**

UNIT- I : Fundamentals of Visual Arts (The Elements)   **10 Marks**

UNIT-II : Methods and Materials of Painting   **10 Marks**

Understanding and appropriate use of:

(i) Tools,

(ii) Painting Materials - Poster Colours, Water Colours, Oil Pastels and Pencils

UNIT-III: Story of Indian Art   **10 Marks**

(i) Appreciation of Indian Art covering selected paintings, sculptures

and architectural glimpses:

a) Paintings :

(i) Ulizard's Dance (Bhimbethaka)

b) Sculptures

(i) Yaksha – Yakshi at R.B.I. New Delhi(done by Ramkinker Vaij)

C) Architecture

(i) Sun Temple (Konark, Odisha)

(ii) Indian Folk Art – Paintings

(Floor decoration) Alpana, Rangoli and Mandana

Practical

Time allowed: 3 hours   **Maximum Marks: 70**

Assessment for Practical: **50 marks**

Still Life

(a) Accurate drawing with proper composition of objects.   15 marks
(b) Compositional arrangement with due emphasis on the subject-matter.   15 marks
(c) Treatment of medium with an appropriate colour scheme in still life. 10 marks
(d) Originality, creativity and overall expression.   10 marks

Internal Assessment :   **20 marks**

It includes

(i) Periodic Tests -there will be three periodic tests in a year, out which the   **10 marks**

   best two will be assessed.

(ii) Portfolio -Portfolio will consist of 10 best work of sketches, still life   **10 marks**

   and painting compositions done during the year.

(B) PAINTING
Theory
Code No.: 049
Class - X

Time allowed: 3 hours   **Maximum Marks: 30**

UNIT- I : Fundamentals of Visual Arts   **10 Marks**

      (The Elements and Principals)

UNIT-II : Methods and Materials of Painting   **10 Marks**

Understanding and appropriate use of:

                        (i) Tools

      (ii) Painting Materials - Poster Colours, Water Colours, Oil Pastels and Pencils

    UNIT-III: Story of Indian Art   **10 Marks**

  (i) Appreciation of Indian Art covering selected paintings, sculptures and architectural glimpses.

(a) Paintings   (i) Bodhisattava Padmapani (Ajanta)

(b) Sculpture   (i) Ashokan Lion capital (Mauryan Period)

(c) Architecture   (i) Kailashnatha Temple, (Ellora, Maharashtra)

(ii) Indian Folk Art – Paintings: Madhubani and Warli

Practical

Time allowed: 3 hours   **Maximum Marks: 70**

External Assessment for Practical   **50 marks**

Painting-Composition

Painting from Memory – Simple composition in water/poster/pastel colours on given subjects based on sketching from life and nature. It may also be in abstract/semi-abstract/folk art forms.

a)	Compositional-arrangement including emphasis on the subject	15 marks
b)	Treatment of media with an appropriate colour scheme	15 marks
c)	Originality and creativity	10 marks
d)	Overall impression	10 marks

Internal Assessment :   **20 marks**

It includes;

(i) **Periodic Tests** -there will be three periodic tests in a year, out which   10 marks
                 the best two will be assessed.
(ii) **Project work** - Portfolio will consist of 10 best work of colour sketches, 10 marks
                 Painting compositions in water colors, poster colors,
                 oil pastels and in pencil colors done during the year.

Suggested Teaching Learning Strategies - X :

I. Starting with simple composition based on nature such as landscapes, seascapes, compositions to show seasons, moods of nature etc. from life or from imagination. Students should be exposed to relevant work of art by masters.

II. Figurative and abstract compositions from imagination of ones own experiences

III. Compositions based on any one folk painting style of India.

IV. Encourage students to explore regional methods and materials of painting, wall paintings, murals etc).

V. Field visits to Art Galleries, Museum(s), National Bal Bhawan /similar institutions, Artist studios, Artisan workshops etc.

VI. Teacher must tell story of Indian Art in a story telling manner. This can also be audio/video recorded and shared with students.

VII. Display of reproductions of master's work in school corridors.

VIII. Organise interactions with Artists and Artisans in the school and otherwise.

IX. Sketches from Life and Nature in pencil and ink should be encouraged as a routine.

X. Protect work can be given in a team of two for better results. Some ideas for the project can be; collection of 'Images of heritage crafts of my state', 'Types of trees flora and fauna found in my village/town/city', 'Celebration of festivals', 'Games we like to play', 'Historical Sites' etc. Project can consist of 5 compositions on the selected topic.

XI. Encourage students to display their work in school. Help them organize painting exhibition(s) etc.

SCIENCE
(Code No. 086)
Classes: IX and X (2022-23)

The subject of Science plays an important role in developing well-defined abilities in cognitive, affective and psychomotor domains in children. It augments the spirit of enquiry, creativity, objectivity and aesthetic sensibility.

Upper primary stage demands that a number of opportunities should be provided to the students to engage them with the processes of Science like observing, recording observations, drawing, tabulation, plotting graphs, etc., whereas the secondary stage also expects abstraction and quantitative reasoning to occupy a more central place in the teaching and learning of Science. Thus, the idea of atoms and molecules being the building blocks of matter makes its appearance, as does Newton's law of gravitation.

The present syllabus has been designed around seven broad themes viz. Food; Materials; The World of The Living; How Things Work; Moving Things, People and Ideas; Natural Phenomenon and Natural Resources. Special care has been taken to avoid temptation of adding too many concepts than can be comfortably learnt in the given time frame. No attempt has been made to be comprehensive.

At this stage, while Science is still a common subject, the disciplines of Physics, Chemistry and Biology begin to emerge. The students should be exposed to experiences based on hands on activities as well as modes of reasoning that are typical of the subject.

General Instructions:

1. There will be an Annual Examination based on the entire syllabus.
2. The Annual Examination will be of 80 marks and 20 marks weightage shall be for Internal Assessment.
3. For Internal Assessment:
   a. There will be Periodic Assessment that would include:
      - For 5 marks- Three periodic tests conducted by the school. Average of the best two tests to be taken that will have a weightage of 05 marks towards the final result.
      - For 5 marks- Diverse methods of assessment as per the need of the class dynamics and curriculum transaction. These may include - short tests, oral test, quiz, concept maps, projects, posters, presentations and enquiry based scientific investigations etc. and use rubrics for arguing them objectively. This will also have a weightage of 05 marks towards the final result.
   b. Practical / Laboratory work should be done throughout the year and the student should maintain record of the same. Practical Assessment should be continuous. There will be weightage of 5 marks towards the final result. All practicals listed in the syllabus must be completed.
   c. Portfolio to be prepared by the student- This would include classwork and other sample of student work and will carry a weightage of 5 marks towards the final results.

COURSE STRUCTURE
CLASS IX
(Annual Examination)   Marks: 80

Unit No.	Unit	Marks
I	Matter - Its Nature and Behaviour	25
II	Organization in the Living World	22
III	Motion, Force and Work	27
IV	Food; Food Production	06
	Total	**80**
	Internal assessment	**20**
	Grand Total	**100**

Theme: Materials

Unit I: Matter-Nature and Behaviour

Definition of matter; solid, liquid and gas; characteristics - shape, volume, density; change of state-melting (absorption of heat), freezing, evaporation (cooling by evaporation), condensation, sublimation.

Nature of matter: Elements, compounds and mixtures. Heterogeneous and homogenous mixtures, colloids and suspensions. Physical and chemical changes (excluding separating the components of a mixture).

Particle nature and their basic units: Atoms and molecules, Law of Chemical Combination, Chemical formula of common compounds, Atomic and molecular masses.

Structure of atoms: Electrons, protons and neutrons, Valency, Atomic Number and Mass Number, Isotopes and Isobars.

Theme: The World of the Living

Unit II: Organization in the Living World

Cell - Basic Unit of life : Cell as a basic unit of life; prokaryotic and eukaryotic cells, multicellular organisms; cell membrane and cell wall, cell organelles and cell inclusions; chloroplast, mitochondria, vacuoles, endoplasmic reticulum, Golgi apparatus; nucleus, chromosomes - basic structure, number.

Tissues, Organs, Organ System, Organism:

Structure and functions of animal and plant tissues (only four types of tissues in animals; Meristematic and Permanent tissues in plants).

Theme: Moving Things, People and Ideas

Unit III: Motion, Force and Work

Motion: Distance and displacement, velocity; uniform and non-uniform motion along a straight line; acceleration, distance-time and velocity-time graphs for uniform motion and uniformly accelerated motion, elementary idea of uniform circular motion.

Force and Newton's laws : Force and Motion, Newton's Laws of Motion, Action and Reaction forces, Inertia of a body, Inertia and mass, Momentum, Force and Acceleration.

Gravitation: Gravitation; Universal Law of Gravitation, Force of Gravitation of the earth (gravity), Acceleration due to Gravity; Mass and Weight; Free fall.

Floatation: Thrust and Pressure. Archimedes' Principle; Buoyancy.

Work, Energy and Power: Work done by a Force, Energy, power; Kinetic and Potential energy; Law of conservation of energy (excluding commercial unit of Energy).

Sound: Nature of sound and its propagation in various media, speed of sound, range of hearing in humans; ultrasound; reflection of sound; echo.

Theme: Food

Unit IV: Food Production

Plant and animal breeding and selection for quality improvement and management; Use of fertilizers and manures; Protection from pests and diseases; Organic farming.

Note for the Teachers:

1. The chapter Natural Resources (NCERT Chapter 14) will not be assessed in the year-end examination. However, learners may be assigned to read this chapter and encouraged to prepare a brief write up on any concept of this chapter in their Portfolio. This may be for Internal Assessment and credit may be given for Periodic Assessment/Portfolio.

2. The NCERT text books present information in boxes across the book. These help students to get conceptual clarity. However, the information in these boxes would not be assessed in the year-end examination.

PRACTICALS

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

(LIST OF EXPERIMENTS)

1. Preparation of: **Unit-I**

   a) a true solution of common salt, sugar and alum

   b) a suspension of soil, chalk powder and fine sand in water

   c) a colloidal solution of starch in water and egg albumin/milk in water and distinguish between these on the basis of

- transparency
- filtration criterion
- stability

2. Preparation of **Unit-I**

   a) A mixture

   b) A compound

   using iron filings and sulphur powder and distinguishing between these on the basis of:

   (i) appearance, i.e., homogeneity and heterogeneity

   (ii) behaviour towards a magnet

   (iii) behaviour towards carbon disulphide as a solvent

   (iv) effect of heat

3. Perform the following reactions and classify them as physical or chemical changes: **Unit-I**

   a) Iron with copper sulphate solution in water

   b) Burning of magnesium ribbon in air

   c) Zinc with dilute sulphuric acid

   d) Heating of copper sulphate crystals

   e) Sodium sulphate with barium chloride in the form of their solutions in water

4. Preparation of stained temporary mounts of (a) onion peel, (b) human cheek cells & to record observations and draw their labeled diagrams. **Unit-II**

5. Identification of Parenchyma, Collenchyma and Sclerenchyma tissues in plants, striped, smooth and cardiac muscle fibers and nerve cells in animals, from prepared slides. Draw their labeled diagrams. **Unit-II**

6. Determination of the melting point of ice and the boiling point of water. **Unit-I**

7. Verification of the Laws of reflection of sound. **Unit-III**

8. Determination of the density of solid (denser than water) by using a spring balance and a measuring cylinder. **Unit-III**

9. Establishing the relation between the loss in weight of a solid when fully immersed in **Unit-III**

   a) Tap water

   b) Strongly salty water with the weight of water displaced by it by taking at least two different solids.

10. Determination of the speed of a pulse propagated through a stretched string/slinky (helical spring). **Unit-III**

11. Verification of the law of conservation of mass in a chemical reaction. **Unit-III**

COURSE STRUCTUR
CLASS X
(Annual Examination)

Marks: 80

Unit No.	Unit	Marks
I	Chemical Substances-Nature and Behaviour	25
II	World of Living	25
III	Natural Phenomena	12
IV	Effects of Current	13
V	Natural Resources	05
	Total	**80**
	Internal assessment	**20**
	Grand Total	**100**

Theme: Materials

Unit I: Chemical Substances - Nature and Behaviour

Chemical reactions: Chemical equation, Balanced chemical equation, implications of a balanced chemical equation, types of chemical reactions: combination, decomposition, displacement, double displacement, precipitation, endothermic exothermic reactions, oxidation and reduction.

Acids, bases and salts: Their definitions in terms of furnishing of H+ and OH– ions, General properties, examples and uses, neutralization, concept of pH scale (Definition relating to logarithm not required), importance of pH in everyday life; preparation and uses of Sodium Hydroxide, Bleaching powder, Baking soda, Washing soda and Plaster of Paris.

Metals and nonmetals: Properties of metals and non-metals; Reactivity series; Formation and properties of ionic compounds; Basic metallurgical processes; Corrosion and its prevention.

Carbon compounds: Covalent bonding in carbon compounds. Versatile nature of carbon. Homologous series. Nomenclature of carbon compounds containing functional groups (halogens, alcohol, ketones, aldehydes, alkanes and alkynes), difference between saturated hydro carbons and unsaturated hydrocarbons. Chemical properties of carbon compounds (combustion, oxidation, addition and substitution reaction). Ethanol and Ethanoic acid (only properties and uses), soaps and detergents.

Theme: The World of the Living

Unit II: World of Living

Life processes: 'Living Being'. Basic concept of nutrition, respiration, transport and excretion in plants and animals.

Control and co-ordination in animals and plants: Tropic movements in plants; Introduction of plant hormones; Control and co-ordination in animals: Nervous system; Voluntary, involuntary and reflex action; Chemical co-ordination: animal hormones.

Reproduction: Reproduction in animals and plants (asexual and sexual) reproductive health - need and methods of family planning. Safe sex vs HIV/AIDS. Child bearing and women's health.

Heredity and Evolution: Heredity; Mendel's contribution- Laws for inheritance of traits: Sex determination: brief introduction: (topics excluded - evolution; evolution and classification and evolution should not be equated with progress).

Theme: Natural Phenomena

Unit III: Natural Phenomena

Reflection of light by curved surfaces; Images formed by spherical mirrors, centre of curvature, principal axis, principal focus, focal length, mirror formula (Derivation not required),magnification. Refraction; Laws of refraction, refractive index.

Refraction of light by spherical lens; Image formed by spherical lenses; Lens formula(Derivation not required); Magnification. Power of a lens.

Functioning of a lens in human eye, defects of vision and their corrections, applications of spherical mirrors and lenses.

Refraction of light through a prism, dispersion of light, scattering of light, applications in dailylife (excluding colour of the sun at sunrise and sunset).

Theme: How Things Work

Unit IV: Effects of Current

Electric current, potential difference and electric current. Ohm's law; Resistance, Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors and its applications in daily life. Heating effect of electric current and its applications in daily life. Electric power, Interrelation between P, V, I and R. **Magnetic effects of current :** Magnetic field, field lines, field due to a current carryingconductor, field due to current carrying coil or solenoid; Force on current carrying conductor,Fleming's Left Hand Rule, Direct current. Alternating current: frequency of AC. Advantage of AC over DC. Domestic electric circuits.

Theme: Natural Resources

Unit V: Natural Resources

Our environment: Eco-system, Environmental problems, Ozone depletion, waste production and their solutions. Biodegradable and non-biodegradable substances.

Note for the Teachers:

1. The chapter Management of Natural Resources (NCERT Chapter 16) will not be assessed in the year-end examination. However, learners may be assigned to read this chapter and encouraged to prepare a brief write up to any concept of this chapter in their Portfolio. This

may be for Internal Assessment and credit may be given Periodic Assessment/Portfolio).

2. The NCERT text books present information in boxes across the book. These help students to get conceptual clarity. However, the information in these boxes would not be assessed in the year-end examination.

PRACTICALS

Practical should be conducted alongside the concepts taught in theory classes

LIST OF EXPERIMENTS

1.   A. Finding the pH of the following samples by using pH paper/universal indicator: **Unit-I**
    (i)   Dilute Hydrochloric Acid
    (ii)   Dilute NaOH solution
    (iii)   Dilute Ethanoic Acid solution
    (iv)   Lemon juice
    (v)   Water
    (vi)   Dilute Hydrogen Carbonate solution

    B. Studying the properties of acids and bases (HCl & NaOH) on the basis of their reaction with:

                                                                                                        Unit-I

    a)   Litmus solution (Blue/Red)
    b)   Zinc metal
    c)   Solid sodium carbonate

2.   Performing and observing the following reactions and classifying them into: **Unit-I**
    A.   Combination reaction
    B.   Decomposition reaction
    C.   Displacement reaction
    D.   Double displacement reaction
        (i)   Action of water on quicklime
        (ii) Action of heat on ferrous sulphate crystals
        (iii) Iron nails kept in copper sulphate solution
        (iv) Reaction between sodium sulphate and barium chloride solutions

3.   Observing the action of Zn, Fe, Cu and Al metals on the following salt solutions: **Unit-I**
        i) $ZnSO_4$(aq)
        ii) $FeSO_4$(aq)
        iii) $CuSO_4$(aq)
        iv) $Al_2(SO_4)_3$(aq)

    Arranging Zn, Fe, Cu and Al (metals) in the decreasing order of reactivity based on the above result.

4.   Studying the dependence of potential difference (V) across a resistor on the current (I) passing through it and determine its resistance. Also plotting a graph between V and I.   **Unit-IV**

5.   Determination of the equivalent resistance of two resistors when connected in series and parallel.   **Unit-IV**

6.   Preparing a temporary mount of a leaf peel to show stomata.   **Unit- II**

7. Experimentally show that carbon dioxide is given out during respiration. **Unit-II**

8. Study of the following properties of acetic acid (ethanoic acid): **Unit- I**

   i) Odour
   ii) solubility in water
   iii) effect on litmus
   iv) reaction with Sodium Hydrogen Carbonate

9. Study of the comparative cleaning capacity of a sample of soap in soft and hard water. **Unit- I**

10. Determination of the focal length of: **Unit-III**

    i) Concave mirror
    ii) Convex lens

    by obtaining the image of a distant object.

11. Tracing the path of a ray of light passing through a rectangular glass slab for different angles of incidence. Measure the angle of incidence, angle of refraction, angle of emergence and interpret the result. **Unit - III**

12. Studying (a) binary fission in *Amoeba,* and (b) budding in yeast and Hydra with the help of prepared slides. **Unit-II**

13. Tracing the path of the rays of light through a glass prism. **Unit-III**

14. Identification of the different parts of an embryo of a dicot seed (Pea, gram or red kidney bean). **Unit-II**

PRESCRIBED BOOKS:

- Science-Textbook for class IX-NCERT Publication
- Science-Text book for class X- NCERT Publication
- Assessment of Practical Skills in Science-Class IX - CBSE Publication
- Assessment of Practical Skills in Science- Class X- CBSE Publication
- Laboratory Manual-Science-Class IX, NCERT Publication
- Laboratory Manual-Science-Class X, NCERT Publication
- Exemplar Problems Class IX – NCERT Publication
- Exemplar Problems Class X – NCERT Publication

Theory (80 marks)　　　　　　**Question Paper Design**

(Class X)

Subject: Science

Competencies	Total
Demonstrate Knowledge and Understanding	46 %
Application of Knowledge/Concepts	22 %
Formulate, Analyze, Evaluate and Create	32 %
	100%

Note:
- Typology of Questions: VSA including objective type questions, Assertion – Reasoning type questions; SA; LA; Source-based/ Case-based/ Passage-based/ Integrated assessment questions.
- An internal choice of approximately 33% would be provided.

Internal Assessment (20 Marks)
- **Periodic Assessment** - 05 marks + 05 marks
- **Subject Enrichment** (Practical Work) - 05 marks
- **Portfolio** - 05 marks

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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.
- **Formulate, Analyze, Evaluate and Create**
- Interpret, analyze, compare, contrast, examine, evaluate, discuss, construct, etc.

SOCIAL SCIENCE
CLASS IX-X (2022-23)
(CODE NO. 087)

Rationale

Social Science is a compulsory subject up to secondary stage of school education. It is an integral component of general education because it helps the learners in understanding the environment in its totality and developing a broader perspective and an empirical, reasonable and humane outlook. This is of crucial importance because it helps them grow into well-informed and responsible citizens with necessary attributes and skills for being able to participate and contribute effectively in the process of development and nation-building.

The Social Science curriculum draws its content mainly from History, Geography, Political Science and Economics. Some elements of Sociology and Commerce are also included. Together they provide a comprehensive view of society over space and time, and in relation to each other. Each subject's distinct methods of enquiry help the learners to understand society from different angles and form a holistic view.

Objectives

The main objectives of this syllabus are to:

- develop an understanding of the processes of change and development-both in terms of time and space, through which human societies have evolved
- make learners realize that the process of change is continuous and any event or phenomenon or issue cannot be viewed in isolation but in a wider context of time and space
- develop an understanding of contemporary India with its historical perspective, of the basic framework of the goals and policies of national development in independent India, and of the process of change with appropriate connections to world development
- deepen knowledge about and understanding of India's freedom struggle and of the values and ideals that it represented, and to develop an appreciation of the contributions made by people of all sections and regions of the country
- help learners understand and cherish the values enshrined in the Indian Constitution and to prepare them for their roles and responsibilities as effective citizens of a democratic society
- deepen the knowledge and understanding of India's environment in its totality, their interactive processes and effects on the future quality of people's lives

- facilitate the learners to understand and appreciate the diversity in the land and people of the country with its underlying unity
- develop an appreciation of the richness and variety of India's heritage-both natural and cultural and the need for its preservation
- promote an understanding of the issues and challenges of contemporary India-environmental, economic and social, as part of the development process
- help pupils acquire knowledge, skills and understanding to face the challenges of contemporary society as individuals and groups and learn the art of living a confident and stress-free life as well as participating effectively in the community
- develop scientific temperament by promoting the spirit of enquiry and following a rational and objective approach in analysing and evaluating data and information as well as views and interpretations
- develop academic and social skills such as critical thinking, communicating effectively both in visual and verbal forms - cooperating with others, taking initiatives and providing leadership in solving others' problems
- develop qualities clustered around the personal, social, moral, national and spiritual values that make a person humane and socially effective.

COURSE STRUCTURE
CLASS IX (2022-23)

Theory Paper

Time: 3 Hrs.			Max. Marks: 80
No.	**Units**	**No. of Periods**	**Marks**
I	India and the Contemporary World – I	60	20
II	Contemporary India – I	55	20
III	Democratic Politics - I	50	20
IV	Economics	50	20
Total		**215**	**80**

COURSE CONTENT

Unit 1: India and the Contemporary World – I	60 Periods
Themes	**Learning Objectives**
Section 1: Events and Processes: (All the three themes are compulsory)	In each of the themes in this unit students would get familiarized with distinct ideologies, extracts of speeches, political declarations, as well as the politics of caricatures, posters and engravings. Students

	would learn how to interpret these kinds of historical evidences.
I. The French Revolution: • French Society During the Late Eighteenth Century • The Outbreak of the Revolution • France Abolishes Monarchy and Becomes a Republic • Did Women have a Revolution? • The Abolition of Slavery • The Revolution and Everyday Life	• Familiarize with the names of people involved, the different types of ideas that inspired the revolution, the wider forces that shaped it. • Know the use of written, oral and visual material to recover the history of revolutions.
II. Socialism in Europe and the Russian Revolution: • The Age of Social Change • The Russian Revolution • The February Revolution in Petrograd • What Changed after October? • The Global Influence of the Russian Revolution and the USSR	• Explore the history of socialism through the study of Russian Revolution. • Familiarize with the different types of ideas that inspired the revolution.
III. Nazism and the Rise of Hitler: • Birth of the Weimar Republic • Hitler's Rise to Power • The Nazi Worldview • Youth in Nazi Germany • Ordinary People and the Crimes Against Humanity	• Discuss the critical significance of Nazism in shaping the politics of modern world. • Get familiarized with the speeches and writings of Nazi Leaders.
Section 2: Livelihoods, Economies and Societies: **IV. Forest Society and Colonialism:** • Why Deforestation? • The Rise of Commercial Forestry • Rebellion in the Forest • Forest Transformations in Java	• Discuss the social and cultural world of forest communities through the study of specific revolts. • Understand how oral traditions can be used to explore tribal revolts.

	• Highlight varying patterns of developments within pastoral societies in different places. • Analyze the impact of colonialism on forest societies, and the implication of scientific forestry. • Show the different processes through which agrarian transformation may occur in the modern world.
V. Pastoralists in the Modern World: • Pastoral Nomads and their Movements • Colonial Rule and Pastoral Life • Pastoralism in Africa	• Analyze the impact of modern states, marking of boundaries, processes of sedentarization, contraction of pastures, and expansion of markets on pastoralism in the modern world.

Unit 2: Contemporary India – I	**55 Periods**
Themes	**Learning Objectives**
1. India • Location • Size • India and the World • India's Neighbours	• Identify the location of India in the Indian subcontinent.
2. Physical Features of India: • Major Physiographic Divisions – Himalayan Mountains, Northern Plains, Peninsular Plateau, Indian Desert, Coastal Plains, Islands	• Understand the major landform features and the underlying geological structure; their association with various rocks and minerals as well as nature of soil types.
3. Drainage: • Concept • Drainage Systems in India • The Himalayan Rivers - Ganga and Brahmaputra River System	• Identify the river systems of the country and explain the role of rivers in the human society.

• The Peninsular Rivers- Narmada Basin, Tapti Basin, Godavari Basin, Mahanadi Basin, Krishna Basin, Kaveri Basin • Lakes • Role of Rivers in the Economy • River Pollution **4. Climate:** • Concept • Climatic Controls • Factors influencing India's climate – Latitude, Altitude, Pressure and Winds (excluding Jet Streams and Western Cyclonic Disturbances and related figures) • The Seasons – Cold Weather Season, Hot Weather Season, Advancing Monsoon, Retreating/Post Monsoons • Distribution of Rainfall • Monsoon as a unifying bond **5. Natural Vegetation and Wild Life:** • Types of Vegetation – Tropical Evergreen Forests, Tropical Deciduous Forests, Thorn Forests and Shrubs, Montane Forests, Mangrove Forests • Wild Life **6. Population:** • Population Size and Distribution – India's Population Size and Distribution by Numbers, India's Population Distribution by Density • Population Growth and Processes of Population Change – Population Growth, Processes of Population Change/Growth	 • Identify various factors influencing the climate and explain the climatic variation of our country and its impact on the life of the people. • Explain the importance and unifying role of monsoons. • Explain the nature of diverse flora and fauna as well as their distribution. • Develop concern about the need to protect the biodiversity of our country. • Analyse the uneven nature of population distribution and show concern about the large size of our population.

Unit 3: Democratic Politics – I	50 Periods
Themes	**Learning Objectives**
1. What is Democracy? Why Democracy? • What is Democracy? • Features of Democracy • Why Democracy? • Broader Meanings of Democracy	• Develop conceptual skills of defining democracy. • Understand how different historical processes and forces have promoted democracy. • Develop a sophisticated defense of democracy against common prejudices. • Develop a historical sense of the choice and nature of democracy in India.
2. Constitutional Design: • Democratic Constitution in South Africa • Why do we need a Constitution? • Making of the Indian Constitution • Guiding Values of the Indian Constitution	• Understand the process of Constitution making. • Develop respect for the Constitution and appreciation for Constitutional values. • Recognize Constitution as a dynamic and living document.
3. Electoral Politics: • Why Elections? • What is our System of Elections? • What makes elections in India democratic?	• Understand representative democracy via competitive party politics. • Familiarize with Indian electoral system. • Reason out for the adoption of present Indian Electoral System. • Develop an appreciation of citizen's increased participation in electoral politics. • Recognize the significance of the Election Commission.
4. Working of Institutions: • How is the major policy decision taken?	• Get an overview of central governmental structures.

• Parliament • Political Executive • The Judiciary	• Identify the role of Parliament and its procedures. • Distinguish between political and permanent executive authorities and functions. • Understand the parliamentary system of executive's accountability to the legislature. • Understand the working of Indian Judiciary.
5. Democratic Rights: • Life without Rights • Rights in a Democracy • Rights in the Indian Constitution • Expanding scope of rights	• Recognize the need for rights in one's life. • Understand the availability /access of rights in a democratic system/government. • Identify and be able to comprehend the Fundamental Rights given by the Indian Constitution to its citizens. • Create awareness regarding the process of safeguarding rights.

Unit 4: Economics	**50 Periods**
Themes	**Objectives**
1. The Story of Village Palampur: • Overview • Organization of Production • Farming in Palampur • Non-farm activities in Palampur	• Familiarize with basic economic concepts through an imaginary story of a village.
2. People as Resource: • Overview • Economic Activities by Men and Women • Quality of Population • Unemployment	• Understand the demographic concepts. • Understand how population can be an asset or a liability for the nation.
3. Poverty as a Challenge: • Overview • Two typical cases of Poverty	

● Poverty as seen by Social Scientists ● Poverty Estimates ● Vulnerable Groups ● Interstate Disparities ● Global Poverty Scenario ● Causes of Poverty ● Anti-Poverty measures ● The Challenges Ahead	• Understand poverty as a challenge. • Identify vulnerable group and interstate disparities. • Appreciate the initiatives of the government to alleviate poverty.
4. Food Security in India: ● Overview ● What is Food Security? ● Why Food Security? ● Who are food insecure? ● Food Security in India ● What is Buffer Stock? ● What is the Public Distribution System? ● Current Status of Public Distribution System ● Role of Cooperatives in food security	• Understand the concept of food security. • Appreciate and analyse the role of government in ensuring food supply.

PROJECT WORK
CLASS IX (2022-23)

05 Periods	05 Marks

1. Every student has to compulsorily undertake *one project on Disaster Management*

2. **Objectives:** The main objectives of giving project work on Disaster Management to the students are to:

     a. create awareness in them about different disasters, their consequences and management

     b. prepare them in advance to face such situations

     c. ensure their participation in disaster mitigation plans

     d. enable them to create awareness and preparedness among the community.

3. The project work should also help in enhancing the Life Skills of the students.

4. If possible, various forms of art may be integrated in the project work.

5. In order to realize the expected objectives completely, it would be required of the Principals / teachers to muster support from various local authorities and organizations like the Disaster Management Authorities, Relief, Rehabilitation and the Disaster Management Departments of the States, Office of the District Magistrate/ Deputy Commissioners, Fire Service, Police, Civil Defense etc. in the area where the schools are located.

6. The *distribution of marks* over different aspects relating to Project Work is as follows:

S. No.	Aspects	Marks
a	Content accuracy, originality and analysis	**2**
b	Presentation and creativity	**2**
c	Viva Voce	**1**

7. The project carried out by the students should subsequently be shared among themselves through interactive sessions such as exhibitions, panel discussions, etc.

8. All documents pertaining to assessment under this activity should be meticulously maintained by the schools.

9. A Summary Report should be prepared highlighting:

- objectives realized through individual work and group interactions;
- calendar of activities;
- innovative ideas generated in the process;
- list of questions asked in viva voce.

10. It is to be noted here by all the teachers and students that the projects and models prepared should be made from eco-friendly products without incurring too much expenditure.

11. The Project Report can be handwritten or digital.

12.   The Project Work needs to enhance cognitive, affective and psychomotor skills of the learners. It will include self-assessment and peer assessment, and progress of the child in project-based and inquiry-based learning, art integrated activities, experiments, models, quizzes, role plays, group work, portfolios, etc., along with teacher assessment. (NEP-2020)

(The Project work can culminate in the form of Power Point Presentation/Exhibition/Skit/albums/files/song and dance or culture show /story

telling/debate/panel discussion, paper presentation and whichever is suitable to **Visually Impaired Candidates**.)

13. The record of the project work (internal assessment) should be kept for a period of three months for verification, if any.

QUESTION PAPER DESIGN
CLASS IX (2022-23)

Time: 3 Hours		Maximum Marks: 80	
Sr. No.	**Competencies**	**Total Marks**	**% Weightage**
1	**Remembering and Understanding:** Exhibiting memory of previously learned material by recalling facts, terms, basic concepts, and answers; Demonstrating understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions and stating main ideas	28	35%
2	**Applying:** Solving problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way	15	18.75%
3	**Formulating, Analyzing, Evaluating and Creating:** Examining and breaking information into parts by identifying motives or causes; Making inferences and finding evidence to support generalizations; Presenting and defending opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria; Compiling information together in a different way by combining elements in a new pattern or proposing alternative solutions.	32	40%
4	**Map Skill**	5*	6.25%
		80	**100%**

Note: Teachers may refer 'Learning Outcomes' published by NCERT for developing Lesson Plans, Assessment Framework and Questions.

* 02 Items from History Map List and 03 from Geography Map List

INTERNAL ASSESSMENT: 20 MARKS

	Marks	Description
Periodic Assessment	10 Marks	<table><tr><td>Pen Paper Test</td><td>**5 marks**</td></tr><tr><td>Assessment using multiple strategies For example, Quiz, Debate, Role Play, Viva, Group Discussion, Visual Expression, Interactive Bulletin Boards, Gallery Walks, Exit Cards, Concept Maps, Peer Assessment, Self-Assessment, etc.</td><td>**5 marks**</td></tr></table>
Portfolio	5 Marks	• Classwork • Work done (Activities / Assignments) • Reflections, Narrations, Journals, etc. • Achievements of the student in the subject throughout the year • Participation of the student in different activities like Heritage India Quiz
Subject Enrichment Activity	5 Marks	• Project Work

LIST OF MAP ITEMS
CLASS IX (2022-23)

SUBJECT - HISTORY

Chapter-1: The French Revolution
Outline Political Map of France (For locating and labeling / Identification)
- Bordeaux
- Nantes
- Paris
- Marseilles

Chapter-2: Socialism in Europe and the Russian Revolution
Outline Political Map of World (For locating and labeling / Identification)
- Major countries of First World War

(Central Powers and Allied Powers)
Central Powers - Germany, Austria-Hungary, Turkey (Ottoman Empire)
Allied Powers - France, England, Russia, U.S.A.

Chapter-3: Nazism and Rise of Hitler

Outline Political Map of World (For locating and labeling / Identification)

- Major countries of Second World War
  Axis Powers – Germany, Italy, Japan
  Allied Powers – UK, France, Former USSR, USA
- Territories under German expansion (Nazi Power)
  Austria, Poland, Czechoslovakia (only Slovakia shown in the map), Denmark, Lithuania, France, Belgium

SUBJECT – GEOGRAPHY (Outline Political Map of India)

Chapter -1: India-Size and Location

- India-States with Capitals, Tropic of Cancer, Standard Meridian (Location and Labelling)

Chapter -2: Physical Features of India

- Mountain Ranges: The Karakoram, The Zasker, The Shivalik, The Aravali, The Vindhya, The Satpura, Western & Eastern Ghats
- Mountain Peaks – K2, Kanchan Junga, Anai Mudi
- Plateau - Deccan Plateau, Chotta Nagpur Plateau, Malwa Plateau
- Coastal Plains - Konkan, Malabar, Coromandal & Northern Circar (Location and Labelling)

Chapter -3: Drainage

- Rivers: (Identification only)
  - *The Himalayan River Systems*-The Indus, The Ganges, and The Satluj
  - *The Peninsular Rivers*-The Narmada, The Tapi, The Kaveri, The Krishna, The Godavari, The Mahanadi
- Lakes: Wular, Pulicat, Sambhar, Chilika

Chapter - 4: Climate

- Areas receiving rainfall less than 20 cm and over 400 cm (Identification only)

Chapter - 5: Natural Vegetation and Wild Life

- Vegetation Type: Tropical Evergreen Forest, Tropical Deciduous Forest, Thorn Forest, Montane Forests and Mangrove- For identification only
- National Parks: Corbett, Kaziranga, Ranthambor, Shivpuri, Kanha, Simlipal & Manas
- Bird Sanctuaries: Bharatpur and Ranganthitto
- Wild Life Sanctuaries: Sariska, Mudumalai, Rajaji, Dachigam (Location and Labelling)

Chapter - 6: Population (location and labelling)

- The state having highest and lowest density of population

PRESCRIBED BOOKS:

1. India and the Contemporary World - I (History) - Published by NCERT
2. Contemporary India - I (Geography) - Published by NCERT
3. Democratic Politics - I Published by NCERT
4. Economics - Published by NCERT
5. Together, Towards a Safer India - Part II, a textbook on Disaster Management for Class IX - Published by CBSE

Note: Please procure latest reprinted edition (2021) of prescribed NCERT textbooks.

COURSE STRUCTURE
CLASS X (2022-23)

Theory Paper

Time: 3 Hrs.		Max. Marks: 80	
No.	**Units**	**No. of Periods**	**Marks**
I	India and the Contemporary World – II	60	20
II	Contemporary India – II	55	20
III	Democratic Politics - II	50	20
IV	Understanding Economic Development	50	20
	Total	**215**	**80**

COURSE CONTENT

Unit 1: India and the Contemporary World – II	60 Periods
Themes	**Learning Objectives**
Section 1: Events and Processes: **1. The Rise of Nationalism in Europe:** • The French Revolution and the Idea of the Nation • The Making of Nationalism in Europe • The Age of Revolutions: 1830-1848 • The Making of Germany and Italy • Visualizing the Nation • Nationalism and Imperialism	• Enable the learners to identify and comprehend the forms in which nationalism developed along with the formation of nation states in Europe in the post-1830 period. • Establish the relationship and bring out the difference between European nationalism and anti-colonial nationalisms. • Understand the way the idea of nationalism emerged and led to the formation of nation states in Europe and elsewhere.
2. Nationalism in India: • The First World War, Khilafat and Non - Cooperation • Differing Strands within the Movement • Towards Civil Disobedience • The Sense of Collective Belonging	• Recognize the characteristics of Indian nationalism through a case study of Non-Cooperation and Civil Disobedience Movement. • Analyze the nature of the diverse social movements of the time. • Familiarize with the writings and ideals of different political groups and individuals.

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	• Appreciate the ideas promoting Pan Indian belongingness.
Section 2: Livelihoods, Economies and Societies:	
3. The Making of a Global World:	• Show that globalization has a long history and point to the shifts within the process.
• The Pre-modern world • The Nineteenth Century (1815-1914) • The Inter war Economy • Rebuilding a World Economy: The Post-War Era	• Analyze the implication of globalization for local economies. • Discuss how globalization is experienced differently by different social groups.
4. The Age of Industrialization:	• Familiarize with the Pro- to-Industrial phase and Early – factory system.
• Before the Industrial Revolution • Hand Labour and Steam Power • Industrialization in the Colonies • Factories Come Up • The Peculiarities of Industrial Growth • Market for Goods	• Familiarize with the process of industrialization and its impact on labour class. • Enable them to understand industrialization in the colonies with reference to Textile industries.
Section 3: Everyday Life, Culture and Politics:	
5. Print Culture and the Modern World:	• Identify the link between print culture and the circulation of ideas.
• The First Printed Books • Print Comes to Europe • The Print Revolution and its Impact • The Reading Mania • The Nineteenth Century • India and the World of Print • Religious Reform and Public Debates • New Forms of Publication • Print and Censorship	• Familiarize with pictures, cartoons, extracts from propaganda literature and newspaper debates on important events and issues in the past. • Understand that forms of writing have a specific history, and that they reflect historical changes within society and shape the forces of change.

Unit 2: Contemporary India – II	55 Periods
Themes	**Learning Objectives**

1. **Resources and Development:**
  • Concept
  • Development of Resources
  • Resource Planning - Resource Planning in India, Conservation of Resources
  • Land Resources
  • Land Utilization
  • Land Use Pattern in India
  • Land Degradation and Conservation Measures
  • Soil as a Resource - Classification of Soils, Soil Erosion and Soil Conservation (excluding Box Information on State of India's Environment)
	• Understand the value of resources and the need for their judicious utilization and conservation.

2. **Forest and Wildlife**
  • Conservation of forest and wildlife in India
  • Types and distribution of forests and wildlife resources
  • Community and Conservation
	• Understand the importance of forests and wild life.
	• Understand the ability and knowledge of how forest and wildlife conservation and management relate to the economy and environment, both currently and in the future.

3. **Water Resources**:
  • Water Scarcity and The Need for Water Conservation and Management
  • Multi-Purpose River Projects and Integrated Water Resources Management
  • Rainwater Harvesting
	• Comprehend the importance of water as a resource as well as develop awareness towards its judicious use and conservation.

4. **Agriculture:** • Types of Farming – Primitive Subsistence, Intensive Subsistence, Commercial	• Explain the importance of agriculture in national economy.

• Cropping Pattern – Major Crops, Food Crops other than Grains, Non Food Crops, Technological and Institutional Reforms • Food Security (excluding impact of globalization on agriculture)	• Identify various types of farming and discuss the various farming methods; describe the spatial distribution of major crops as well as understand the relationship between rainfall regimes and cropping pattern. • Explain various government policies for institutional as well as technological reforms since independence.
5. Minerals and Energy Resources • What is a mineral? • Mode of occurrence of Minerals - Where are these minerals found?, Ferrous Minerals, Non-Ferrous Minerals, Non-Metallic Minerals, Rock Minerals • Conservation of Minerals • Energy Resources - Conventional Sources of Energy, Non-Conventional Sources of Energy • Conservation of Energy Resources	• Identify different types of minerals and energy resources and places of their availability. • Feel the need for their judicious utilization.
6. Manufacturing Industries: • Importance of Manufacturing - Industrial Location (excluding Industry Market Linkage), Agro based Industry (excluding Cotton Textiles, Jute Textiles, Sugar Industry), Mineral based Industries (excluding Iron Steel Industry, Cement Industry), Industrial Pollution and Environmental Degradation, Control of Environmental Degradation	• Bring out the importance of industries in the national economy as well as understand the regional disparities which resulted due to concentration of industries in some areas. • Discuss the need for a planned industrial development and debate over the role of government towards sustainable development.
7. Life Lines of National Economy: • Roadways • Railways	• Explain the importance of transport and communication in the ever-shrinking world.

• Pipelines • Waterways • Major Seaports • Airways • Communication • International Trade • Tourism as a Trade	• Understand the role of trade and tourism in the economic development of a country.

Unit 3: Democratic Politics – II	**50 Periods**
Themes	**Learning Objectives**

1. **Power Sharing:**
  • Belgium and Sri Lanka
  • Majoritarianism in Sri Lanka
  • Accommodation in Belgium
  • Why power sharing is desirable?
  • Forms of Power Sharing
	• Familiarize with the centrality of power sharing in a democracy.
	• Understand the working of spatial and social power sharing mechanisms.

2. **Federalism:**
  • What is Federalism?
  • What make India a Federal Country?
  • How is Federalism practiced?
  • Decentralization in India
	• Analyze federal provisions and institutions.
	• Explain decentralization in rural and urban areas.

4. **Gender, Religion and Caste:**
 	
  • Gender and Politics - Public/Private division, Women's political representation
  • Religion, Communalism and Politics – Communalism, Secular State (excluding image on page 46, 48, 49 of NCERT Textbook – Democratic Politics –II - reprinted edition 2021)
  • Caste and Politics - Caste inequalities, Caste in politics, Politics in caste
	• Identify and analyze the challenges posed by communalism to Indian democracy.
	• Recognize the enabling and disabling effects of caste and ethnicity in politics.
	• Develop a gender perspective on politics.

6. **Political Parties:** • Why do we need Political Parties? – Meaning, Functions, Necessity	• Analyze party systems in democracies.

• How many parties should we have? • National Parties • State Parties • Challenges to Political Parties • How can Parties be reformed? **7. Outcomes of Democracy:** • How do we assess democracy's outcomes? • Accountable, responsive and legitimate government • Economic growth and development • Reduction of inequality and poverty • Accommodation of social diversity • Dignity and freedom of the citizens	• Introduction to major political parties, challenges faced by them and reforms in the country. • Evaluate the functioning of democracies in comparison to alternative forms of governments. • Understand the causes for continuation of democracy in India. • Distinguish between sources of strengths and weaknesses of Indian democracy.

Unit 4: Understanding Economic Development	50 Periods
Themes	**Objectives**
1. **Development:** • What Development Promises - Different People, Different Goals • Income and Other Goals • National Development • How to compare different countries or states? • Income and other criteria • Public Facilities • Sustainability of Development	• Familiarize with concepts of macroeconomics. • Understand the rationale for overall human development in our country, which includes the rise of income, improvements in health and education rather than income. • Understand the importance of quality of life and sustainable development.
2. **Sectors of the Indian Economy**: • Sectors of Economic Activities • Comparing the three sectors • Primary, Secondary and Tertiary Sectors in India • Division of sectors as organized and unorganized	• Identify major employment generating sectors. • Reason out the government investment in different sectors of economy.

• Sectors in terms of ownership: Public and Private Sectors	
3. **Money and Credit:** • Money as a medium of exchange • Modern forms of Money • Loan activities of Banks • Two different Credit situations • Terms of Credit • Formal Sector Credit in India • Self Help Groups for the Poor	• Understand money as an economic concept. • Understand the role of financial institutions from the point of view of day-to- day life.
4. **Globalization and the Indian Economy:** • Production across countries • Interlinking production across countries • Foreign Trade and integration of markets • What is Globalization? • Factors that have enabled Globalization • World Trade Organization • Impact of Globalization in India • The Struggle for a fair Globalization	• Explain the working of the Global Economic phenomenon.
5. **Consumer Rights:** **To be used only for Project Work**	• Gets familiarized with the rights and duties as a consumer; and legal measures available to protect from being exploited in markets.

PROJECT WORK
CLASS X (2022-23)

05 Periods	**05 Marks**

1. *Every student* has to compulsorily undertake *any one project* on the following topics:

Consumer Awareness

OR

Social Issues

OR

Sustainable Development

2. **Objective:** The overall objective of the project work is to help students gain an insight and pragmatic understanding of the theme and see all the Social Science disciplines from interdisciplinary perspective. It should also help in enhancing the Life Skills of the students.

Students are expected to apply the Social Science concepts that they have learnt over the years in order to prepare the project report.

If required, students may go out for collecting data and use different primary and secondary resources to prepare the project. If possible, various forms of art may be integrated in the project work.

3. The distribution of marks over different aspects relating to Project Work is as follows:

S. No.	Aspects	Marks
a.	Content accuracy, originality and analysis	2
b.	Presentation and creativity	2
c.	Viva Voce	1

4. The projects carried out by the students in different topics should subsequently be shared among themselves through interactive sessions such as exhibitions, panel discussions, etc.

5. All documents pertaining to assessment under this activity should be meticulously maintained by concerned schools.

6. A Summary Report should be prepared highlighting:

- objectives realized through individual work and group interactions;
- calendar of activities;
- innovative ideas generated in the process ;
- list of questions asked in viva voce.

7. It is to be noted here by all the teachers and students that the projects and models prepared should be made from eco-friendly products without incurring too much expenditure.

8. The Project Report can be handwritten/digital.

9. The Project Work needs to enhance cognitive, affective, and psychomotor skills of the learners. It will include self-assessment and peer assessment, and progress of the child in project-based and inquiry-based learning, art integrated activities, experiments, models, quizzes, role plays, group work, portfolios, etc., along with teacher

assessment. (NEP-2020)

(The Project work can culminate in the form of Power Point Presentation/Exhibition/Skit/albums/files/song and dance or culture show /story telling/debate/panel discussion, paper presentation and whichever is suitable to **Visually Impaired Candidates**.)

10. Records pertaining to projects (internal assessment) of the students will be maintained for a period of three months from the date of declaration of result for verification at the discretion of Board. Subjudiced cases, if any or those involving RTI / Grievances may however be retained beyond three months.

QUESTION PAPER DESIGN
CLASS X

Time: 3 Hours		Maximum Marks : 80	
Sr. No.	Competencies	Total Marks	% Weightage
1	**Remembering and Understanding:** Exhibiting memory of previously learned material by recalling facts, terms, basic concepts, and answers; Demonstrating understanding of facts and ideas by organizing, translating, interpreting, giving descriptions and stating main ideas.	28	35%
2	**Applying:** Solving problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	15	18.75%
3	**Formulating, Analyzing, Evaluating and Creating:** Examining and breaking information into parts by identifying motives or causes; Making inferences and finding evidence to support generalizations; Presenting and defending opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria; Compiling information together in a different way by combining elements in a new pattern or proposing alternative solutions.	32	40%
4	**Map Skill**	5	6.25%
		80	**100%**

Note: 1. Teachers may refer 'Learning Outcomes' published by NCERT for developing lesson plans, assessment framework and questions.
2. 02 Items from History Map List and 03 Items from Geography Map List

INTERNAL ASSESSMENT: 20 MARKS

	Marks	Description
Periodic Assessment	10 Marks	<table><tr><td>Pen Paper Test</td><td>**5 marks**</td></tr><tr><td>Assessment using multiple strategies For example, Quiz, Debate, Role Play, Viva, Group Discussion, Visual Expression, Interactive Bulletin Boards, Gallery Walks, Exit Cards, Concept Maps, Peer Assessment, Self-Assessment, etc.</td><td>**5 marks**</td></tr></table>
Portfolio	5 Marks	• Classwork • Work done (Activities / Assignments) • Reflections, Narrations, Journals, etc. • Achievements of the student in the subject throughout the year • Participation of the student in different activities like Heritage India Quiz
Subject Enrichment Activity	5 Marks	• Project Work

LIST OF MAP ITEMS
CLASS X (2022-23)

A. **HISTORY (**Outline Political Map of India)

Chapter - 3 Nationalism in India – (1918 – 1930) for locating and labelling / Identification

1. **Indian National Congress Sessions:**
    a. Calcutta (Sep. 1920)
    b. Nagpur (Dec. 1920)
    c. Madras (1927)
2. **Important Centres of Indian National Movement**
    a. Champaran (Bihar) - Movement of Indigo Planters
    b. Kheda (Gujarat) - Peasant Satyagrah
    c. Ahmedabad (Gujarat) - Cotton Mill Workers Satyagraha
    d. Amritsar (Punjab) - Jallianwala Bagh Incident
    e. Chauri Chaura (U.P.) - Calling off the Non-Cooperation Movement

f. Dandi (Gujarat) - Civil Disobedience Movement

B. GEOGRAPHY (Outline Political Map of India)

Chapter 1: Resources and Development (Identification only)

a. Major soil Types

Chapter 3: Water Resources (Locating and Labelling)

Dams:

a. Salal
b. Bhakra Nangal
c. Tehri
d. Rana Pratap Sagar
e. Sardar Sarovar
f. Hirakud
g. Nagarjuna Sagar
h. Tungabhadra

Chapter 4: Agriculture (Identification only)

a. Major areas of Rice and Wheat
b. Largest / Major producer states of Sugarcane, Tea, Coffee, Rubber, Cotton and Jute

Chapter 5: Minerals and Energy Resources

Minerals (Identification only)

a. Iron Ore mines

- Mayurbhanj
- Durg
- Bailadila
- Bellary
- Kudremukh

b. Coal Mines

- Raniganj
- Bokaro
- Talcher
- Neyveli

c. Oil Fields

- Digboi
- Naharkatia
- Mumbai High
- Bassien
- Kalol
- Ankaleshwar

Power Plants

(Locating and Labelling only)

a. Thermal

- Namrup
- Singrauli
- Ramagundam

b. Nuclear

- Narora
- Kakrapara

- Tarapur
- Kalpakkam

Chapter 6: Manufacturing Industries (Locating and Labelling Only)

Software Technology Parks:

a. Noida
b. Gandhinagar
c. Mumbai
d. Pune

e. Hyderabad
f. Bengaluru
g. Chennai
h. Thiruvananthapuram

Chapter 7: Lifelines of National Economy

Major Ports: (Locating and Labelling)

a. Kandla
b. Mumbai
c. Marmagao
d. New Mangalore
e. Kochi

f. Tuticorin
g. Chennai
h. Vishakhapatnam
i. Paradip
j. Haldia

International Airports:

a. Amritsar (Raja Sansi - Sri Guru Ram Dass jee)
b. Delhi (Indira Gandhi)
c. Mumbai (Chhatrapati Shivaji)

d. Chennai (Meenam Bakkam)
e. Kolkata (Netaji Subhash Chandra Bose)
f. Hyderabad (Rajiv Gandhi)

Note: Items of Locating and Labelling may also be given for Identification.

PRESCRIBED BOOKS:

1. India and the Contemporary World-II (History) - Published by NCERT
2. Contemporary India II (Geography) - Published by NCERT
3. Democratic Politics II (Political Science) - Published by NCERT
4. Understanding Economic Development - Published by NCERT
5. Together Towards a Safer India - Part III, a textbook on Disaster Management - Published by CBSE

Note: Please procure latest reprinted edition (2021) of prescribed NCERT textbooks.

CBSE | DEPARTMENT OF SKILL EDUCATION

CURRICULUM FOR SESSION 2022-2023

ARTIFICIAL INTELLIGENCE (SUB. CODE 417)
CLASS – IX & X

OBJECTIVES OF THE COURSE:

The objective of this module/curriculum - which combines both Inspire and Acquire modules is to develop a readiness for understanding and appreciating Artificial Intelligence and its application in our lives. This module/curriculum focuses on:

1. Helping learners understand the world of Artificial Intelligence and its applications through games, activities and multi-sensorial learning to become AI-Ready.
2. Introducing the learners to three domains of AI in an age-appropriate manner.
3. Allowing the learners to construct meaning of AI through interactive participation and engaging hands-on activities.
4. Introducing the learners to AI Project Cycle.
5. Introducing the learners to programming skills - Basic python coding language.

LEARNING OUTCOMES:

Learners will be able to

1. Identify and appreciate Artificial Intelligence and describe its applications in daily life.
2. Relate, apply and reflect on the Human-Machine Interactions to identify and interact with the three domains of AI: Data, Computer Vision and Natural Language Processing and Undergo assessment for analysing their progress towards acquired AI-Readiness skills.
3. Imagine, examine and reflect on the skills required for futuristic job opportunities.
4. Unleash their imagination towards smart homes and build an interactive story around it.
5. Understand the impact of Artificial Intelligence on Sustainable Development Goals to develop responsible citizenship.
6. Research and develop awareness of skills required for jobs of the future.
7. Gain awareness about AI bias and AI access and describe the potential ethical considerations of AI.
8. Develop effective communication and collaborative work skills.
9. Get familiar and motivated towards Artificial Intelligence and Identify the AI Project Cycle framework.
10. Learn problem scoping and ways to set goals for an AI project and understand the iterative nature of problem scoping in the AI project cycle.

11. Brainstorm on the ethical issues involved around the problem selected.

12. Foresee the kind of data required and the kind of analysis to be done, identify data requirements and find reliable sources to obtain relevant data.

13. Use various types of graphs to visualize acquired data.

14. Understand, create and implement the concept of Decision Trees.

15. Understand and visualize computer's ability to identify alphabets and handwritings.

16. Understand and appreciate the concept of Neural Network through gamification and learn basic programming skills through gamified platforms.

17. Acquire introductory Python programming skills in a very user-friendly format.

SKILLS TO BE DEVELOPED:
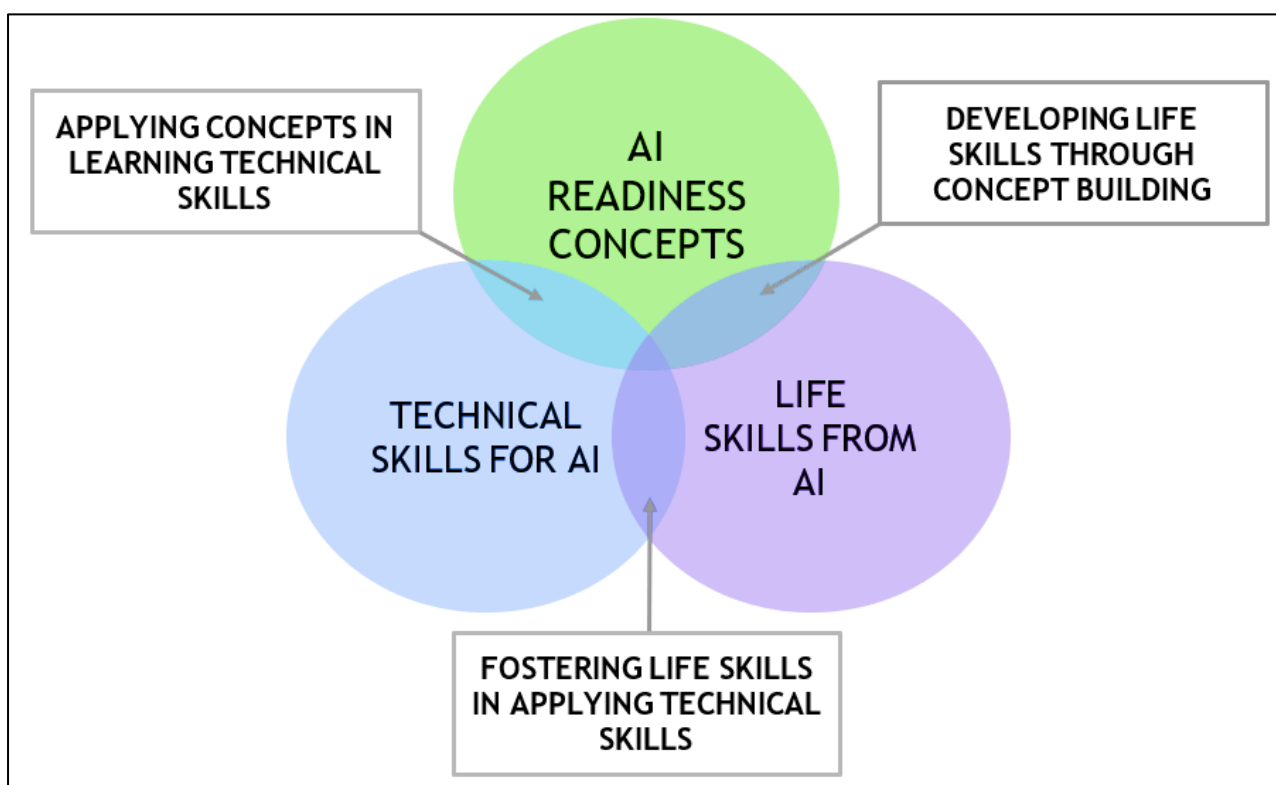
SCHEME OF STUDIES:

This course is a planned sequence of instructions consisting of units meant for developing employability and vocational competencies of students of Class IX opting for skill subject along with other education subjects.

The unit-wise distribution of hours and marks for class IX & X is as follows:

ARTIFICIAL INTELLIGENCE (SUBJECT CODE 417)
CLASS – IX (SESSION 2022-2023)
Total Marks: 100 (Theory-50 + Practical-50)

	UNITS	NO. OF HOURS for Theory and Practical	MAX. MARKS for Theory and Practical
PART A	**Employability Skills**		
	Unit 1: Communication Skills-I	10	2
	Unit 2: Self-Management Skills-I	10	2
	Unit 3: ICT Skills-I	10	2
	Unit 4: Entrepreneurial Skills-I	15	2
	Unit 5: Green Skills-I	05	2
	Total	**50**	**10**
PART B	**Subject Specific Skills**		
	Unit 1: Introduction to Artificial Intelligence (AI)		10
	Unit 2: AI Project Cycle		15
	Unit 3: Neural Network		5
	Unit 4: Introduction to Python		10
	Total		**40**
PART C	**Practical Work**		
	Unit 4: Introduction to Python **Practical File (minimum 15 programs)**		15
	Practical Examination • Simple programs using input and output function • Variables, Arithmetic Operators, Expressions, Data Types • Flow of control and conditions • Lists ***Any 3 programs based on the above topics**		15
	Viva Voce		5
	Total		**35**
PART D	**Project Work / Field Visit / Student Portfolio** *** relate it to Sustainable Development Goals**		15
	Total		**15**
	GRAND TOTAL	**200**	**100**

DETAILED CURRICULUM/TOPICS FOR CLASS IX:

PART-A: EMPLOYABILITY SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1: Communication Skills-I	10
2.	Unit 2: Self-management Skills-I	10
3.	Unit 3: Information and Communication Technology Skills-I	10
4.	Unit 4: Entrepreneurial Skills-I	15
5.	Unit 5: Green Skills-I	05
	TOTAL	**50**

NOTE: **Detailed curriculum/ topics to be covered under Part A: Employability Skills can be downloaded from CBSE website**.

PART-B – SUBJECT SPECIFIC SKILLS

- ❖ Unit 1: Introduction to Artificial Intelligence (AI)
- ❖ Unit 2: AI Project Cycle
- ❖ Unit 3: Neural Network
- ❖ Unit 4: Introduction to Python

UNIT 1: INTRODUCTION TO ARTIFICIAL INTELLIGENCE (AI)

SUB-UNIT	LEARNING OUTCOMES	SESSION / ACTIVITY / PRACTICAL
Excite	To identify and appreciate Artificial Intelligence and describe its applications in daily life.	Session: Introduction to AI and setting up the context of the curriculum
		Ice Breaker Activity: Dream Smart Home idea • Learners to design a rough layout of floor plan of their dream smart home.
	To relate, apply and reflect on the Human-Machine Interactions. To identify and interact with the three domains of AI: Data, Computer Vision and Natural Language Processing.	Recommended Activity: The AI Game • Learners to participate in three games based on different AI domains. – Game 1: Rock, Paper and Scissors (based on data) – Game 2: Mystery Animal (based on Natural Language Processing - NLP) – Game 3: Emoji Scavenger Hunt (based on Computer Vision - CV)
	To undergo an assessment for analysing progress towards acquired AI-Readiness skills.	Recommended Activity: • AI Quiz (Paper Pen/Online Quiz)
	To imagine, examine and reflect on the skills required for futuristic job opportunities.	Recommended Activity: To write a letter. Writing a Letter to one's future self • Learners to write a letter to self-keeping the future in context. They will describe what they have learnt so far or what they would like to learn someday

SUB-UNIT	LEARNING OUTCOMES	SESSION / ACTIVITY / PRACTICAL
Relate	Learners to relate to application of Artificial Intelligence in their daily lives.	Video Session: To watch a video • Introducing the concept of Smart Cities, Smart Schools and Smart Homes
	To unleash their imagination towards smart homes and build an interactive story around it. To relate, apply and reflect on the Human-Machine Interactions.	Recommended Activity: Write an Interactive Story • Learners to draw a floor plan of a Home/School/City and write an interactive story around it using Story Speaker extension in Google docs.
Purpose	To understand the impact of Artificial Intelligence on Sustainable Development Goals to develop responsible citizenship.	Session: • Introduction to UN Sustainable Development Goals
		Recommended Activity: Go Goals Board Game • Learners to answer questions on Sustainable Development Goals
Possibilities	To research and develop awareness of skills required for jobs of the future. To imagine, examine and reflect on the skills required for the futuristic opportunities. To develop effective communication and collaborative work skills.	Session: Theme-based research and Case Studies • Learners will listen to various case-studies of inspiring start-ups, companies or communities where AI has been involved in real-life. • Learners will be allotted a theme around which they need to search for present AI trends and have to visualise the future of AI in and around their respective theme.
		Recommended Activity: Job Ad Creating activity • Learners to create a job advertisement for a firm describing the nature of job available and the skill set required for it 10 years down the line. They need to figure out how AI is going to transform the nature of jobs and create the Ad accordingly.
AI Ethics	To understand and reflect on the ethical issues around AI.	Video Session: Discussing about AI Ethics Recommended Activity: Ethics Awareness • Students play the role of major stakeholders, and they have to decide what is ethical and what is not for a given scenario.
	To gain awareness around AI bias and AI access.	Session: AI Bias and AI Access • Discussing about the possible bias in data collection • Discussing about the implications of AI technology
	To let the students analyse the advantages and disadvantages of Artificial Intelligence.	Recommended Activity: Balloon Debate • Students divide in teams of 3 and 2 teams are given same theme. One team goes in affirmation to AI for their section while the other one goes against it. • They have to come up with their points as to why AI is beneficial/ harmful for the society.

UNIT 2: AI PROJECT CYCLE:

SUB-UNIT	LEARNING OUTCOMES	SESSION / ACTIVITY / PRACTICAL
Problem Scoping	Identify the AI Project Cycle framework.	Session: Introduction to AI Project Cycle • Problem Scoping • Data Acquisition • Data Exploration • Modelling • Evaluation
	Learn problem scoping and ways to set goals for an AI project.	Activity: Brainstorm around the theme provided and set a goal for the AI project. • Discuss various topics within the given theme and select one. • List down/ Draw a mind map of problems related to the selected topic and choose one problem to be the goal for the project.
	Identify stakeholders involved in the problem scoped. Brainstorm on the ethical issues involved around the problem selected.	Activity: To set actions around the goal. • List down the stakeholders involved in the problem. • Search on the current actions taken to solve this problem. • Think around the ethics involved in the goal of your project.
	Understand the iterative nature of problem scoping for in the AI project cycle. Foresee the kind of data required and the kind of analysis to be done.	Activity: Data and Analysis • What are the data features needed? • Where can you get the data? • How frequent do you have to collect the data? • What happens if you don't have enough data? • What kind of analysis needs to be done? • How will it be validated? • How does the analysis inform the action?
	Share what the students have discussed so far.	Presentation: Presenting the goal, actions and data.
Data Acquisition	Identify data requirements and find reliable sources to obtain relevant data.	Activity: Introduction to data and its types. • Students work around the scenarios given to them and think of ways to acquire data.
Data Exploration	To understand the purpose of Data Visualisation	Session: Data Visualisation • Need of visualising data • Ways to visualise data using various types of graphical tools.
	Use various types of graphs to visualise acquired data.	Recommended Activity: Let's use Graphical Tools • To decide what kind of data is required for a given scenario and acquire the same. • To select an appropriate graphical format to represent the data acquired. • Presenting the graph sketched.

SUB-UNIT	LEARNING OUTCOMES	SESSION / ACTIVITY / PRACTICAL
Modelling	Understand, create and implement the concept of Decision Trees.	Session: Decision Tree • To introduce basic structure of Decision Trees to students.
		Recommended Activity: Decision Tree • To design a Decision Tree based on the data given.
	Understand and visualise computer's ability to identify alphabets and handwritings.	Recommended Activity: Pixel It • To create an "AI Model" to classify handwritten letters. • Students develop a model to classify handwritten letters by diving the alphabets into pixels. • Pixels are then joined together to analyse a pattern amongst same alphabets and to differentiate the different ones.

UNIT 3: NEURAL NETWORK:

LEARNING OUTCOMES	SESSION / ACTIVITY / PRACTICAL
Understand and appreciate the concept of Neural Network through gamification.	Session: Introduction to neural network • Relation between the neural network and nervous system in human body • Describing the function of neural network.
	Recommended Activity: Creating a Human Neural Network • Students split in four teams each representing input layer (X students), hidden layer 1 (Y students), hidden layer 2 (Z students) and output layer (1 student) respectively. • Input layer gets data which is passed on to hidden layers after some processing. The output layer finally gets all information and gives meaningful information as output.

UNIT 4: INTRODUCTION TO PYTHON:

LEARNING OUTCOMES	SESSION / ACTIVITY / PRACTICAL
Learn basic programming skills through gamified platforms.	Recommended Activity: • Introduction to programming using Online Gaming portals like Code Combat.
Acquire introductory Python programming skills in a very user-friendly format.	Session: • Introduction to Python language • Introducing python programming and its applications
	Theory + Practical: Python Basics • Students go through lessons on Python Basics (Variables, Arithmetic Operators, Expressions, Data Types - integer, float, strings, using print() and input() functions) • Students will try some simple problem-solving exercises on Python Compiler.
	Practical: Flow of control and conditions • Students go through lessons on conditional and iterative statements (if, for and while) • Students will try some basic problem-solving exercises using conditional and iterative statements on Python Compiler.
	Practical: Python Lists • Students go through lessons on Python Lists (Simple operations using list) • Students will try some basic problem-solving exercises using lists on Python Compiler.

ARTIFICIAL INTELLIGENCE (SUBJECT CODE 417)
CLASS – X (SESSION 2022-2023)
Total Marks: 100 (Theory-50 + Practical-50)

	UNITS	NO. OF HOURS for Theory and Practical	MAX. MARKS for Theory and Practical
PART A	**Employability Skills**		
	Unit 1: Communication Skills-II*	10	-
	Unit 2: Self-Management Skills-II	10	3
	Unit 3: ICT Skills-II	10	3
	Unit 4: Entrepreneurial Skills-II	15	4
	Unit 5: Green Skills-II*	05	-
	Total	**50**	**10**
PART B	**Subject Specific Skills**		**Marks**
	Unit 1: Introduction to Artificial Intelligence (AI)		10
	Unit 2: AI Project Cycle		10
	Unit 3: Advance Python* *(*To be assessed in Practicals only)*		
	Unit 4: Data Science* *(*To be assessed in Practicals only)*		
	Unit 5: Computer Vision* *(*To be assessed in Practicals only)*		
	Unit 6: Natural Language Processing		10
	Unit 7: Evaluation		10
	Total		**40**
PART C	**Practical Work:** • Unit 3: Advance Python • Unit 4: Data Science • Unit 5: Computer Vision		
	Practical Examination		35
	Viva Voce		
	Total		**35**
PART D	**Project Work / Field Visit / Practical File / Student Portfolio**		15
	Viva Voce		
	Total		**15**
	GRAND TOTAL	**200**	**100**

Note: * marked units are to be assessed through Internal Assessment/ Student Activities. They are not to be assessed in Theory Exams

DETAILED CURRICULUM/TOPICS FOR CLASS X

Part-A: EMPLOYABILITY SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1: Communication Skills-II*	10
2.	Unit 2: Self-management Skills-II	10
3.	Unit 3: Information and Communication Technology Skills-II	10
4.	Unit 4: Entrepreneurial Skills-II	15
5.	Unit 5: Green Skills-II*	05
	TOTAL	**50**

Note: * marked units are to be assessed through Internal Assessment/ Student Activities. They are not to be assessed in Theory Exams

The detailed curriculum/ topics to be covered under Part A: Employability Skills can be downloaded from CBSE website
Part-B – SUBJECT SPECIFIC SKILLS

- ❖ Unit 1: Introduction to Artificial Intelligence (AI)
- ❖ Unit 2: AI Project Cycle
- ❖ Unit 3: Advance Python (To be assessed through Practicals)
- ❖ Unit 4: Data Science (To be assessed through Practicals)
- ❖ Unit 5: Computer Vision (To be assessed through Practicals)
- ❖ Unit 6: Natural Language Processing
- ❖ Unit 7: Evaluation

UNIT	SUB-UNIT	SESSION/ ACTIVITY/ PRACTICAL
1. INTRODUCTION TO AI	Foundational concepts of AI	**Session**: What is Intelligence?
		Session: Decision Making. ● How do you make decisions? ● Make your choices!
		Session: what is Artificial Intelligence and what is not?
	Basics of AI: Let's Get Started	**Session**: Introduction to AI and related terminologies. ● Introducing AI, ML & DL. ● Introduction to AI Domains (Data, CV & NLP)
		Session: Applications of AI – A look at Real-life AI implementations
		Session: AI Ethics
2. AI PROJECT CYCLE	Introduction	**Session:** Introduction to AI Project Cycle
	Problem Scoping	**Session:** Understanding Problem Scoping & Sustainable Development Goals

UNIT	SUB-UNIT	SESSION/ ACTIVITY/ PRACTICAL
	Data Acquisition	**Session:** Simplifying Data Acquisition
	Data Exploration	**Session:** Visualising Data
	Modelling	**Session:** Introduction to modelling ● Introduction to Rule Based & Learning Based AI Approaches ● Introduction to Supervised Unsupervised & Reinforcement Learning Models ● Neural Networks
	Evaluation	**Session:** Evaluating the idea!
3. **ADVANCE PYTHON** (To be assessed through Practicals)	Recap	**Session:** Jupyter Notebook
		Session: Introduction to Python
		Session: Python Basics
4. **DATA SCIENCES** (To be assessed through Practicals)	Introduction	**Session:** Introduction to Data Science
		Session: Applications of Data Science
		Session: Revisiting AI Project Cycle
	Concepts of Data Sciences	**Session**: Python for Data Sciences
		Session: Statistical Learning & Data Visualisation
	K-nearest neighbour model *(Optional)***	**Activity:** Personality Prediction *(Optional)***
		Session: Understanding K-nearest neighbour model *(Optional)***
5. **COMPUTER VISION** (To be assessed through Practicals)	Introduction	**Session:** Introduction to Computer Vision
		Session: Applications of CV
	Concepts of Computer Vision	**Session & Activity:** Understanding CV Concepts ● Pixels ● How do computers see images? ● Image Features
	OpenCV	**Session:** Introduction to OpenCV
		Hands-on: Image Processing
	Convolution Operator *(Optional)***	**Session:** Understanding Convolution operator *(Optional)***
		Activity: Convolution Operator *(Optional)***
	Convolution Neural Network *(Optional)***	**Session:** Introduction to CNN *(Optional)***
		Session: Understanding CNN *(Optional)*** ● Kernel ● Layers of CNN
		Activity: Testing CNN *(Optional)***
6. **NATURAL LANGUAGE PROCESSING**	Introduction	**Session:** Introduction to Natural Language Processing
		Session: NLP Applications
		Session: Revisiting AI Project Cycle

UNIT	SUB-UNIT	SESSION/ ACTIVITY/ PRACTICAL
	Chatbots	**Activity:** Introduction to Chatbots
	Language Differences	**Session:** Human Language VS Computer Language
	Concepts of Natural Language Processing	**Hands-on:** Text processing ● Data Processing ● Bag of Words ● TFIDF *(Optional)*** ● NLTK
7. EVALUATION	Introduction	**Session:** Introduction to Model Evaluation
	Confusion Matrix	**Session & Activity:** Confusion Matrix
	Evaluation Score Calculation	**Session:** Understanding Accuracy, Precision, Recall & F1 Score
		Activity: Practice Evaluation

* NOTE: Unit 3, 4 & 5 should be assessed through Practicals only and should not be assessed with the Theory Exam.

***NOTE: Optional components shall not be assessed. They are for extra knowledge*

LIST OF ITEMS/ EQUIPMENTS (MINIMUM REQUIREMENTS):

The equipment / materials listed below are required to conduct effective hands-on learning sessions while delivering the AI curriculum to class 10 students. The list below consists of minimal configuration required to execute the AI curriculum for class 10 and create social impact real time solutions/ projects. The quantities mentioned here are recommended for a batch of 20 students keeping the human-machine ratio as 2:1. An exhaustive list may be compiled by the teacher(s) teaching the subject.

S. NO.	ITEM NAME, DESCRIPTION & SPECIFICATION
A	**SYSTEM SPECIFICATIONS**
1	Processor: Intel® Core™ i5-7300U Processor or equivalent with minimum SYSmark® 2018 Rating of 750 or higher
2	Graphic Card: Integrated graphics
3	Form Factor: - USFF (Ultra Small Form factor) System chassis volume less than One Litre
4	RAM: 8GB DDR4 – 2400MHz or above
5	Storage: 500 GB HDD – 7200 rpm
6	Display: 18.5" LED Monitor with HDMI, in-built-speaker,
7	Keyboard: Keyboard with numerical keypad (recommended)
8	Mouse: Optical Mouse
9	Webcam: Full HD Camera
10	Headphones with Mic
11	Dual Band Wireless Connectivity Min 800 Mbps
12	Bluetooth V4.2 or Higher
13	Ports: 4 USB 3.0 ports, dual high-definition display ports (HDMI 2.0/DP/thunderbolt 3.0 ports), High definition 8-channel audio through HDMI interface or through audio jack.

S. NO.	ITEM NAME, DESCRIPTION & SPECIFICATION
14	VPU: - Integrated or support for VPU - vision processing unit to accelerate AI machine vision applications.
B	**SOFTWARE SPECIFICATIONS**
1	Operating System: Any
2	Anti-Virus Activated
3	Internet Browser: Google Chrome
4	Productivity Suite: Any (Google+ Suite recommended)
5	Anaconda Navigator Distribution (https://bit.ly/AI-installation-guide)
6	Conceptual installations (https://bit.ly/AI-installation-guide)
7	Intel OpenVINO tools
8	Python

NOTE: In keeping with the spirit of Recycle, Upcycle and Reuse, it is recommended to make use of any equipment/ devices/ accessories from the existing inventory in school.

TEACHER'S/ TRAINER'S QUALIFICATIONS:

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

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

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

These guidelines have been prepared with an aim to help and guide the States in engaging quality

Teachers/Trainers in the schools. Various parameters that need to be looked into while engaging the Vocational Teachers/Trainers are mode and procedure of selection of Teachers/ Trainers, Educational Qualifications, Industry Experience, and Certification/ Accreditation.

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

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

OR

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

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

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

To ensure the quality of the Teachers/Trainers, the State should ensure that a standardized procedure for selection of (Vocational) Teachers/Trainers is followed. The selection procedure should consist of the following:
  (i)   Written test for the technical/domain specific knowledge related to the sector;
  (ii)   Interview for assessing the knowledge, interests and aptitude of trainer through a panel of experts from the field and state representatives; and
  (iii) Practical test/mock test in classroom/workshop/laboratory.

In case of appointment through VTPs, the selection may be done based on the above procedure by a committee having representatives of both the State Government and the VTP.

The State should ensure that the Teachers/ Trainers who are recruited should undergo induction training of 20 days for understanding the scheme, NSQF framework and Vocational Pedagogy before being deployed in the schools.

The State should ensure that the existing trainers undergo in-service training of 5 days every year to make them aware of the relevant and new techniques/approaches in their sector and understand

the latest trends and policy reforms in vocational education.

The Headmaster/Principal of the school where the scheme is being implemented should facilitate and ensure that the (Vocational) Teachers/Trainers:

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

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

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

CBSE | DEPARTMENT OF SKILL EDUCATION
CURRICULUM FOR SESSION 2022-2023

INFORMATION TECHNOLOGY (SUBJECT CODE – 402)
JOB ROLE: DOMESTIC DATA ENTRY OPERATOR

CLASS – X

COURSE TITLE: DOMESTIC DATA ENTRY OPERATOR

Domestic Data Entry Operator in the IT-ITeS Industry is also known as Data Entry Operator. Individuals are responsible to provide daily work reports and work on daily hour bases. The individual is responsible for electronic entry of data from the client side to the office site or vice-versa. Individual tasks vary depending on the size and structure of the organization. This job requires the individual to have thorough knowledge of various technology trends and processes as well as have updated knowledge about database management systems and IT initiatives. The individual should have fast and accurate typing/data encoding. This job involves working in a personal computer, and appropriate software to enter accurate data regarding different issues like retrieving data from a computer or to a computer

COURSE OUTCOME:

On completion of the course, students should be able to:
- Apply effective oral and written communication skills to interact with people and customers;
- Identify the principal components of a computer system; Demonstrate the basic skills of using computer;
- Demonstrate self-management skills;
- Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills and abilities;
- Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- Work safely on the computer.
- Start the computer.
- Open and use the related software.
- Exit from the software.
- Shut down the computer.
- Use the computer for data entry process.
- Collect all necessary information about the query.
- Log any decision about the query on the data entry tracking form.
- Follow Rules and guidelines for data entry.
- Handle queries.
- Undertake data entry with speed and accuracy.
- Identify and control hazards in the workplace that pose a danger or threat to their safety or health, or that of others.

COURSE OBJECTIVES:

In this course, the students will be introduced to the fundamental concepts of digital documentation, digital spreadsheet, digital presentation, database management and internet security.

The following are the main objectives of this course:
- To familiarize the students with the world of IT and IT enabled services.
- To provide in-depth training in use of data entry, internet and internet tools.
- To develop practical knowledge of digital documentation, spreadsheets and presentation.
- To enable the students to understand database management systems and have updated knowledge about digital record keeping.
- To make the students capable of getting employment in Private Sector, Public Sector, Ministries, Courts, House of Parliament and State Legislative Assemblies.
- To develop the following skills:

o   Data Entry and Keyboarding skills

o   The concept of Digital Documentation

o   The concept of Digital Presentation

o   The concept of Electronic Spreadsheet

o   The concept of Databases

o   Internet Technologies

SALIENT FEATURES:

To be a data entry operator/analyst, one requires a lot of hard work and practical hands-on experience. One should have an intensive knowledge of Office applications, computer operations, and knowledge of clerical, administrative techniques and data analysis. Along with this, as a data entry operator/analyst, you will be expected to have fast typing speed, accuracy, and efficiency to perform tasks.

As a data entry operator/analyst, one should improve their computer skills, numerical and literacy skills. These skills can help one expand into a new career path in the future

SCHEME OF UNITS

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

This course is a planned sequence of instructions consisting of units meant for developing employability and vocational competencies of students of Class X opting for skill subject along with other subjects.

The unit-wise distribution of hours and marks for class X is as follows:

INFORMATION TECHNOLOGY (Subject Code 402)
Class X (Session 2022-2023)

	UNITS	NO. OF HOURS for Theory and Practical 200		MAX. MARKS for Theory and Practical 100
Part A	**Employability Skills**			
	Unit 1: Communication Skills-II*	10		-
	Unit 2: Self-Management Skills-II	10		3
	Unit 3: ICT Skills-II	10		3
	Unit 4: Entrepreneurial Skills-II	15		4
	Unit 5: Green Skills-II*	05		-
	Total	**50**		**10**
Part B	**SUBJECT SPECIFIC SKILLS**	**Theory (In Hours)**	**Practicals (In Hours)**	**Marks**
	Unit 1: Digital Documentation (Advanced)	12	18	8
	Unit 2: Electronic Spreadsheet (Advanced)	15	23	10
	Unit 3: Database Management System	18	27	12
	Unit 4: Web Applications and Security	15	22	10
	Total	**60**	**90**	**40**
Part C	**PRACTICAL WORK**			
	Practical Examination			
	● Advanced Documentation	5 Marks		20
	● Advanced Spreadsheets	5 Marks		
	● Databases	10 Marks		
	● Viva Voce	10 Marks		10
	Total			**30**
Part D	**PROJECT WORK/FIELD VISIT** Any Interdisciplinary Real World Case Study to be taken. Summarized data reports of same can be presented in base. Input should be taken using forms and output should be done using reports using base. Documentation of the case study should be presented using writer.			10
	PORTFOLIO/ PRACTICAL FILE: (Portfolio should contain printouts of the practical done using Writer, Calc and Base with minimum 5 problems of each)			10
	Total			**20**
	GRAND TOTAL	**200**		**100**

Note: * marked units are to be assessed through Internal Assessment/ Student Activities. They are not to be assessed in Theory Exams

DETAILED CURRICULUM/ TOPICS:

Part-A: EMPLOYABILITY SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1: Communication Skills-II*	10
2.	Unit 2: Self-management Skills-II	10
3.	Unit 3: Information and Communication Technology Skills-II	10
4.	Unit 4: Entrepreneurial Skills-II	15
5.	Unit 5: Green Skills-II*	05
	TOTAL	**50**

Note: *** marked units are to be assessed through Internal Assessment/ Student Activities. They are not to be assessed in Theory Exams**

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

Part-B – SUBJECT SPECIFIC SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1: Communication Skills-II*	10
2.	Unit 2: Self-management Skills-II	10
3.	Unit 3: Information and Communication Technology Skills-II	10
4.	Unit 4: Entrepreneurial Skills-II	15
5.	Unit 5: Green Skills-II*	05
	TOTAL	**50**

Note: *** marked units are to be assessed through Internal Assessment/ Student Activities. They are not to be assessed in Theory Exams**

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

UNIT 1: DIGITAL DOCUMENTATION (ADVANCED)			
S. No.	**LEARNING OUTCOMES**	**THEORY**	**PRACTICAL**
1.	Create and Apply Styles in the document	• Styles/ categories in Word Processor • Using the Styles and Formatting window.* • Using Fill Format.* • Creating and updating new style from selection • Load style from template or another document. • Creating a new style using drag-and-drop.* • Applying styles.	• List style categories. Select the style from the Styles and Formatting window. • Use Fill Format to apply a style to many different areas quickly. • Create and update a new style from a selection. • Load a style from a template or another document. • Create a new style using drag-and drop.
S. No.	**LEARNING OUTCOMES**	**THEORY**	**PRACTICAL**
2.	Insert and use images in document	• Options to insert image to document from various sources. • Options to modify, resize, crop and delete an image. • Creating drawing objects, setting or changing its properties. Resizing and grouping drawing objects. • Positioning image in the text.	• Insert an image to document from various sources. • Modify, resize, crop and delete an image. • Create drawing objects • Set or change the properties of a drawing object • Resize and group drawing objects • Position the image in the text
3.	Create and use template	• Templates. • Using predefined templates. • Creating a template.* • Set up a custom template as the default.. • Editing a template • Changing to a different template. • Updating a Document*	• Create a template. • Use predefined templates. • Set up a custom default template. • Update a document. • Change to a different template. • Use the Template. • Update the document and save the changes.
4.	Create and customize table of contents	• Table of contents. Hierarchy of headings. Customization of table of contents. • Character styles. Maintaining a table of contents.	• Create a table of contents. Define a hierarchy of headings. • Customize a table of contents. • Apply character styles. Maintain a table of contents.

5	Implement Mail Merge	• Advance concept of mail merge in word processing, • Creating a main document, • Creating the data source, • Entering data in the fields, • Merging the data source with main document, • <mark>Editing individual documents.*</mark> • Printing a letter and its address label	• Demonstrate to print the label using mail merge, do the following to achieve • Create a main document, • Create the data source, • Enter data in the fields, • Merge the data source with main document, • Edit individual document, • Print the letter and address label

(Note: * To be assessed in Practicals only. No question shall be asked from this portion in Theory Exams)

UNIT 2: ELECTRONIC SPREADSHEET (ADVANCED)

S. No.	LEARNING OUTCOMES	THEORY	PRACTICAL
1.	Analyse data using scenarios and goal seek.	• Using consolidating data. Creating subtotals. • Using "what if" scenarios. Using "what if" tools • Using goal seek and solver.	• Use consolidating data Create subtotals • Use "what if" scenarios Use "what if" tools • Use goal seek and solver

2.	Link data and spreadsheets	• Setting up multiple sheets. Creating reference to other sheets by using keyboard and mouse.
		• Creating reference to other document by using keyboard and mouse.*
		• Relative and absolute hyperlinks
		• Hyperlinks to the sheet.
		   o Linking to external data.
		   o Linking to registered data sources.
			• Setup multiple sheets by inserting new sheets.
			• Create reference to other sheets by using keyboard and mouse.
			• Create references to other documents by using keyboard and mouse.
			• Create, Edit and Remove hyperlinks to the sheet.
			• Link to external data.
			• Link to registered data source.

3.	Share and review a spreadsheet	• Setting up a spreadsheet for sharing.* • Opening and saving a shared spreadsheet. Recording changes. • Add, Edit and Format the comments. • Reviewing changes – view, accept or reject changes. Merging and comparing.	• Set up a spreadsheet for sharing. • Open and save a shared spreadsheet. • Record changes. • Add, Edit and Format the comments. • Review changes – view, accept or reject changes. • Merge and compare sheets.
4.	Create and Use Macros in spreadsheet	• Using the macro recorder. Creating a simple macro. Using a macro as a function. Using a macro as a function. • Discuss Passing arguments to a macro. • Discuss Passing the arguments' area values. • Discuss Macros to work like built-in functions. • Accessing cells directly. • Sorting the columns using macro.	• Demonstrate the use of a macro recorder. • Create a simple macro. • Use a macro • Access cells directly • Using a macro. • Sort the columns using macro.

(Note: * To be assessed in Practicals only. No question shall be asked from this portion in Theory Exams)

UNIT 3: DATABASE MANAGEMENT SYSTEM			
S. No.	LEARNING OUTCOMES	THEORY	PRACTICAL
1.	Appreciate the concept of Database Management System	• Concept and examples of data and information, • Concept of database, • Advantages of database, • Features of database, • Concept and examples of Relational database, • Concept and examples of field, record, table, database, • Concept and examples of Primary key, composite primary key, foreign key, • Relational Data base management system (RDBMS) software.	• Identify the data and information, • Identify the field, record, table in the database, • Prepare the sample table with some standard fields. • Assign the primary key to the field, • Identify the primary key, composite primary key, foreign key.
2.	Create and edit tables using wizard and SQL commands	• Introduction to a RDBMS • Database objects – tables, queries, forms, and reports of the database, • Terms in database – table, field, record, • Steps to create a table using table wizard* • Data types in database., • Option to set primary key Table Data View dialog box	• Start the RDBMS and observe the parts of main window, • Identify the data base objects Create the sample table in any category using wizard, Practice to create different tables from the available list and choosing fields from the available fields. • Assign data types of field, Set primary key, • Edit the table in design view, Enter the data in the fields. • Create and edit table using DDL Commands
3.	Perform operations on table	• Inserting data in the table, • Editing records in the table, • Deleting records from the table, • Sorting data in the table, Referential integrity, • Creating and editing relationships – one to one, one to many, many to many • Field properties(default, required and format)	Demonstrate to: • Insert data in the table, Edit records in the table, Delete records from table, Sort data in the table, • Create and edit relationships • one to one, one to many, many to many, • Enter various field properties.

S. No.	LEARNING OUTCOMES	THEORY	PRACTICAL
4.	Retrieve data using query	• Database query, • Defining query, • <mark>Query creation using wizard,*</mark> • <mark>Creation of query using design view,*</mark> • Editing a query, • Applying criteria in query – single field, multiple fields, using wildcard, • Performing calculations, • Grouping of data, • Structured Query Language (SQL). • Introduction to DDL (purpose of- Create database, Create table, Alter table and Drop table)	• Prepare a query for given criteria, • Demonstrate to create query using wizard, and using design view, • Edit a query, • Demonstrate to apply various criteria in query – single field, multiple fields, using wild card, • Performing calculations using query in Base, • Demonstrate to group data, • Use basic SQL commands,
5.	Create Forms and Reports using wizard	• Introduction to Forms in DBMS.. • <mark>Creating form using wizard,*</mark> • <mark>Steps to create form using Form Wizard, *</mark> • Options to enter or remove data from forms • Modifying form, • Changing label, background, • Searching record using Form, • Inserting and deleting record using Form View, • Concept of Report in Base, • <mark>Creating Report using wizard, *</mark> • <mark>Steps to create a Report using Wizard. *</mark> • Insert date and time	• Illustrate the various steps to create Form using Form Wizard, • Enter or remove data from Forms, • Demonstrate to modify Forms, • Demonstrate to change label, background, • Search record using Form, • Insert and delete record using Form View, • Illustrate the various steps to create Report using Report Wizard, • Demonstrate various examples of Report.

<mark>(Note: * To be assessed in Practicals only. No question shall be asked from this portion in Theory Exams)</mark>

S. No.	LEARNING OUTCOMES	THEORY	PRACTICAL
UNIT 4: WEB APPLICATIONS AND SECURITY		
1.	Working with Accessibility Options.	• Understand various types of impairment that impact computer usage • Computer Accessibility Dialog box and its tabs • Serial Keys	• Illustrate use of various options under Computer Accessibility like Keyboard, mouse, sound, display setting serial keys, cursor options • use of toggle keys, filter keys, sticky keys, sound sentry, show sounds etc.
2.	Understand Networking Fundamentals	• Network and its types. • Client Server Architecture, Peer to-peer (P2P) Architecture, • internet, World Wide Web, • benefits of networking • internet, getting access to internet, • internet terminology • Some of the commonly used Internet connectivity options • Data transfer on the Internet	• Identify applications of Internet • comparing various internet technologies • identifying types of networks and selecting internet
3.	Introduction to Instant Messaging	• learn key features of instant messaging • Creating an instant messaging account • Launching Google Talk* • Signing in into your Google Talk Account*	• Illustrate steps to create instant messaging account • Signing In into your Google Talk Account
4.	Chatting with a Contact – Google Talk	• learn to chat with a contact that is already added to your contact list. • sending text chat messages instantly by double-clicking on a contact. • general rules and etiquettes to be followed while chatting. • chatting on various types of messengers	• Illustrate chat with a contact and send messages, • chatting with various messenger services
5	Creating and Publishing Web Pages – Blog …-	• learn and appreciate a blog and its creation with the help of some blog providers* • set up title and other parameters in a blog posting comments • using offline blog editors	• Illustrate Blog Creation and setting various parameters in it

S. No.	LEARNING OUTCOMES	THEORY	PRACTICAL
6	Using Offline Blog Editors	• Concept to create blogs using a blog application and publish the blog whenever internet connectivity is available.	• Demonstration on how to create blogs using a blog application offline. • posting messages in an offline application • Publish the blog whenever internet connectivity is available using various examples
7	Online Transaction	• concept of e-commerce and various online applications • importance of secure passwords	• Illustration of online shopping using various ecommerce sites • Demonstration of securing passwords for online transactions.
8.	Internet Security	• Need of internet security • Cyber threats like phishing, email-spoofing, char spoofing etc. • best practices for internet security and secure passwords • concept of browser, cookies, backup, antivirus • clearing data in browsers	• illustration of internet security threats through various ways • cyber security tips • tips for secure passwords • demonstration of strong passwords using various websites. • clearing data stored in browser applications.
9.	Maintain workplace safety	• Basic safety rules to follow at workplace – Fire safety, • Falls and slips, Electrical safety, Use of first aid. • Case Studies of hazardous situations.	• Practice to follow basic safety rules at workplace to prevent accidents and protect workers – Fire safety, • Falls and slips, Electrical safety, Use of first aid.
10.	Prevent Accidents and Emergencies	• Accidents and emergency, • Types of Accidents, • Handling Accidents • Types of Emergencies.	• Illustrate to handle accidents at workplace, • Demonstrate to follow evacuation plan and procedure in case of an emergency.
11.	Protect Health and Safety at work	• Hazards and sources of hazards, • General evacuation procedures, • Healthy living.	• Identify hazards and sources of hazards, • identify the problems at workplace that could cause accidents, • Practice the general evacuation procedures in case of an emergency.

(Note: * To be assessed in Practicals only. No question shall be asked from this portion in Theory Exams)

ORGANISATION OF FIELD VISITS:

In a year, at least 3 field visits/educational tours should be organised for the students to expose them to the activities in the workplace.

Visit a data entry centre and observe the following: Location, Site, Office building, Computer Systems, Tools and Equipment, Printer, Scanner. During the visit, students should obtain the following information from the owner or the supervisor of the Data Centre:

1. Data Entry Centre.
2. Computer Infrastructure.
3. Sitting Posture of data entry operators.
4. Assistive technology.
5. Man power engaged.
6. Total expenditure of Data Entry Centre.
7. Total annual income.
8. Profit/Loss (Annual).
9. Any other information.

LIST OF EQUIPMENT/ MATERIALS:

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

S. No.	ITEM NAME, DESCRIPTION & SPECIFICATION	QUANTITY
A	HARDWARE	
1.	Computer with latest configuration or minimum Pentium Processor with minimum 2GB RAM, 512 GB HDD, 17" LED Monitor, NIC Card, 3 button Mouse, 105 keys key board and built-in speakers and mic.	15
2.	Laser Printer - Black	01
3.	Inkjet Printers (Colour & Black)	01
4.	Scanner	01
5.	Online UPS 5 KVA	01
6.	16 Port Switches	01
7.	Air Conditioner 1.5 tonne	02
8.	Telephone line (For Internet)	01
9.	Fire extinguisher	01
B	SOFTWARE	
1.	Operating System Linux and Windows	
2.	Anti-Virus Latest version	
3.	Productivity Suite, Example – Open Office, etc.	

C	FURNITURE	
1.	Class room chairs and desks	25
2.	Computer Tables	15
3.	Straight back revolving & adjustable chairs (Computer Chairs)	15
4.	Printer Tables	02
5.	Trainers Table	01
6.	Trainers Chair	01
7.	Steel cupboards drawer type	02
8.	Cabinet with drawer	01
9.	Steel Almira - big size	01
10.	Steel Almira- small size	01

TEACHER'S/ TRAINER'S QUALIFICATIONS:

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

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

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

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

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

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

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

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

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

To ensure the quality of the Teachers/Trainers, the State should ensure that a standardized procedure for selection of (Vocational) Teachers/Trainers is followed. The selection procedure should consist of the following:
(i)   Written test for the technical/domain specific knowledge related to the sector;
(ii) Interview for assessing the knowledge, interests and aptitude of trainer through a panel of experts from the field and state representatives; and (iii) Practical test/mock test in classroom/workshop/laboratory.

In case of appointment through VTPs, the selection may be done based on the above procedure by a committee having representatives of both the State Government and the VTP.

The State should ensure that the Teachers/ Trainers who are recruited should undergo induction training of 20 days for understanding the scheme, NSQF framework and Vocational Pedagogy before being deployed in the schools.

The State should ensure that the existing trainers undergo in-service training of 5 days every year to make them aware of the relevant and new techniques/approaches in their sector and understand the latest trends and policy reforms in vocational education.

The Head Master/Principal of the school where the scheme is being implemented should facilitate and ensure that the (Vocational) Teachers/Trainers:

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

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

Following parameters may be considered during the appraisal process:

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

CAREER OPPORTUNITIES:

The job of a data entry operator/ analyst is to work for a wide variety of public and private organisations. A data entry operator/analyst is responsible to input data in a quick and efficient manner, create data storage and should possess knowledge about the methods for recovering useful data when needed, organizing and analyzing data in a clear and effective way, navigating computer and database systems proficiently, editing and preparing reports based on the information they have put into the system. They also help the organisations to keep up with recording and analyzing the abundance of information received on a daily basis.

Some of the top sectors that require a data entry operator/analyst are listed below:
- Banks and Public Sector
- Marketing Companies
- Accounting Companies
- Human Resources
- Corporate Businesses
- MNCs
- Study Centers
- Schools and Universities
- Hospitals or Healthcare Service Providers
- Insurance Firms
- Small-scale Businesses

VERTICAL MOBILITY
- Students can pursue Polytechnic/Diploma/Certificate courses in IT fields.
- Can work as DEO
- Data Entry/Analysis work from home for different companies