

HIGHER SECONDARY SCHOOL CURRICULUM

Arts, Science, Commerce

Effective from the academic session of 2013



**MIZORAM BOARD OF SCHOOL EDUCATION
AIZAWL : 796 012**

C Secretary, MBSE, Aizawl

May, 2013
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Note : The Board reserves the right to amend Syllabi and Courses as and when it deems necessary. The Schools are required to strictly follow the Syllabi and text books prescribed by the Board for the academic sessions and examinations concerned. No deviation is permissible.

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MIZORAM BOARD OF SCHOOL EDUCATION

AIZAWL - 796 012

No. MBSE/Acad(S)2(Part)/2011-12/21

Dated Aizawl, the 22nd May, 2013

NOTIFICATION

It is hereby notified for the information of all concerned that the Core Syllabus for Science and Commerce subjects, approved by NCERT, is now being implemented as notified vide No. MBSE/Acad(S)2/2011-12/216 dated Aizawl, the 2nd April, 2013.

Accordingly, the Higher Secondary School Curriculum booklet has been updated by incorporating the Core Syllabus in the following subjects:-

1. Physics
2. Chemistry
3. Biology
4. Mathematics
5. Business Studies
6. Economics
7. Accountancy

The Higher Secondary School Leaving Certificate Examinations will be conducted in accordance with this updated Syllabus w.e.f. the HSSLC Examination 2014 onwards and until further order(s).

Sd/- F. LIANHMINGTHANGA

Secretary

Memo No. MBSE/Acad(S)2(Part)/2011-12/21(A)

Dated Aizawl, the 22nd May, 2013

Copy to:-

1. The Secretary to the Govt. of Mizoram, Human Resource Development and School Education Department and Controlling Authority, MBSE, Aizawl.
2. The Director, Department of School Education, Govt. of Mizoram, for information.
3. Regional Officer, MBSE Regional Office, Lunglei.
4. The Principal, Institute of Advanced Study in Education, Govt. of Mizoram, Aizawl, for information.
5. All District Education Officers, Department of School Education, Govt. of Mizoram, for information with a request to inform all Principals of Higher Secondary School stage under their jurisdiction, the availability of the said curriculum in the Board, on payment of the prescribed cost.
6. Guard file No-1&10

(R. VANRAMCHHUANGA)

Director(Academic)

FOREWORD

Curriculum updating is a continuous process necessitated by new concepts and issues that emerge from time to time. Likewise, the MBSE brings out its revised curricula periodically. The present curriculum has been prepared in line with the NCF-2005. In addition, the Core Syllabus for Science and Commerce subjects, approved by NCERT, which is to be followed in all Higher Secondary Schools throughout the Country is now being implemented. All concerned are, therefore, advised to adhere to this curriculum and utilise it for the optimum benefit of the student community.

May, 2013

Dr. LALCHUNGNUNGA
Chairman

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PART - I

ELIGIBILITY REQUIREMENTS, SCHEME OF EXAMINATIONS AND SCHEME OF STUDIES

ELIGIBILITY OF CANDIDATES

- 1 (a) Admission of students to a school : Transfer / Migration of students**
(b) Admission : General Conditions :

1.1 A student seeking admission to any class in a “School” will be eligible for admission to that class only if he –

- (i) has been studying in a school recognised by or affiliated to this Board or any other recognised Board of Secondary Education in India;
- (ii) has passed qualifying or equivalent qualifying examination making him eligible for admission to that class;
- (iii) satisfies the requirements of age limits (minimum & maximum) as determined by the State Government and applicable to the place where the School is located;
- (iv) produces :-
 - (a) the School Leaving Certificate / Transfer Certificate signed by the Head of the Institution last attended and countersigned by a competent authority ; and
 - (b) document(s) in support of his having passed the qualifying or equivalent qualifying examination.

Explanation :-

- (a) A person who has been studying in an institution which is not recognised by this Board or by any other recognised Board of Secondary Education or by the State Government of the concerned place shall not be admitted to any class of a “School” on the basis of Certificate(s) of such unrecognised institution attended by him earlier.
- (b) “Qualifying Examination” means an examination the passing of which makes a student eligible for admission to a particular class: and ‘equivalent examination’ means an examination conducted by any recognised Board of Secondary Education/Indian University or an institution recognised by or affiliated to such Board/University and is recognised by this Board equivalent to the corresponding examination conducted by this Board or conducted by a “School” affiliated to/recognised by this Board.

- 1.2** No student migrating from a school in a foreign country other than the school affiliated to this Board, shall be eligible for admission unless an eligibility certificate in respect of such a student has been obtained from this Board. For obtaining eligibility certificate from the Board, the Principal of the School to which admission is being sought will submit to the Board full details of the case and relevant documents with his own remarks/recommendations. The eligibility certificate will be issued by the Board only after the Board is satisfied that the course of study undergone and examination passed is equivalent to the corresponding class of this Board.
- 1.3** No person who is under the sentence of rustication or is expelled from any Board/University/School or is debarred from appearing in the examination for whatever reason by any Board/University shall be admitted to any class in a school affiliated to this Board.
- 1.4** No student shall be admitted or promoted to any subsequent higher class in any school unless he has completed the regular course of the class to which he was admitted at the beginning of the academic session and has passed the examination, at the end of the concerned academic session, qualifying him for promotion to the next higher class.

Admission : Specific Requirements

- 1.5 Admission to Class XI in a school shall be open only to such a student who has passed :-**
- (i) High School Leaving Certificate Examination (Class X Examination) conducted by this Board: or
 - (ii) an equivalent examination, conducted by any other recognised Board of Secondary Education/ Indian University and recognised by this Board as equivalent to its Secondary School Examination.
- 1.6 (i) Admission to Class XII in a School shall be open only to such a student who :-**
- (a) has completed a regular course of study for Class XI and;
 - (b) has passed Class XI examination from a school affiliated to this Board.
- (ii) A student who has completed a regular course of study for Class XI and has passed class XI examination from an institution recognised by/ affiliated to any recognised Board in India, other than this Board can be admitted to a school only after obtaining permission for such admission from this Board.

Admission to Examinations

1.7 General :

No candidate who has been expelled or is under the punishment or rustication or is debarred from appearing in or taking an examination for any reason whatsoever, shall be admitted to any examination of this Board.

1.8 Qualifications for Undertaking Examination :

A candidate for Higher Secondary School Leaving Certificate Examination should have :-

Passed the High School Leaving Certificate Examination (Class X) of this Board or an equivalent examination from any other recognised Board/ University at least two years earlier than the year in which he/she would take Higher Secondary School Leaving Certificate Examination (Class XII).

1.9 Admission to Examination : Regular Candidates :

Higher Secondary School Leaving Certificate Examination will be open to such regular candidates who have submit duly completed application for admission to the concerned examination, in the manner prescribed by the Board, along with the prescribed fees and is forwarded to the Controller of Examinations by the Head of the Institution/School with the following information duly certified by such head :-

- (i) that he possesses the academic qualifications as laid down under the Examination Regulations :
- (ii) that he has not passed equivalent or higher examination of any other Board or University;
- (iii) that he is on the active rolls of the School;
- (iv) that he has completed a regular Course of Study as prescribed by the Board, in a school in the subjects in which he would appear in the examination;
- (v) that he bears a good moral character and is of good conduct; and
- (vi) that he satisfies all other provisions, applicable to him/her, of the examination regulations and any other provisions made by the Board governing admission to the examination concerned, if any.

1.10 A regular Course of Study :

- (i) The expression “a regular course of study” means at least 75 percent of attendance in the classes/lectures held counted from the day of commencement of teaching in Class XII up to the 1st of the month preceding the month in which the examination of the Board commences.
- (ii) The candidate who had failed in the same examination in the preceding year and who rejoins Class XII shall be required to put in 75 percent of attendance calculated on the possible attendance from the 1st of the month following the publication of the results of that examination by the Board up to the 1st of the month preceding the month in which the examination of the Board commences.
- (iii) In the case of migration from other institutions attendance at the institution/school from which the candidate migrates will be taken into account in calculating the required percentage of attendance.
- (iv) Candidates taking up a subject(s) involving practicals shall be required to have put in at least 75 percent of the total attendance for practical work in the subject in the laboratory.

1.11 Requirement of Attendance in Subjects of Internal Assessment :

- (i) No student from a school affiliated to the Board shall be eligible to take the examination unless he has completed 75% of attendance, counted from the opening of Class XII upto the 1st of the month preceding the month in which the examination commences in the subjects of internal assessment.
- (ii) The Chairman of the Board shall have the powers to condone shortage of attendance in subjects on internal assessment.

1.12 Rules for condonation of shortage of Attendance :

- (i) If a candidate’s attendance falls short of the prescribed percentage, the Head of the School may condone the shortage up to 15% considering the merit of the individual case. But in no case the candidature of any student whose attendance falls below 60% should be forwarded to the Board.
- (ii) The following may be considered valid reasons for considering the cases of the candidates with attendance less than the prescribed percentage –
 - (a) prolonged illness;
 - (b) loss of father/mother or some other such incident leading to his absence from the school and meriting special consideration; and

- (c) any other reason of similar serious nature like earthquakes, landslide, etc.
- (d) authorised participation in sponsored tournaments and Sports Meets of not less than inter-school level and at NCC/NSS/National Integration Camps including the days of journeys for such participation shall be counted as full attendance.

1.13 Detaining of Eligible Candidates :

Heads of affiliated schools shall not detain eligible candidates from appearing at the examination of the Board except with the previous permission of the Chairman of the Board.

1.14 Private Candidates :

Persons eligible to appear as “Private Candidates” at Higher Secondary School Leaving Certificate Examination (Class XII) Examination :

- (i) a candidate who had failed at the Higher Secondary School Leaving Examination of the Board will be eligible to reappear at a subsequent examination as private candidate in the syllabus and text books as prescribed for the examination of the year in which he/she will reappear.
- (ii) teacher serving in educational institutions affiliated to the Board, who have already passed High School Leaving Certificate Examination or equivalent examination at least two years before taking the Higher Secondary School Leaving Certificate Examination. Teacher candidates shall submit their application form to the Board alongwith a certificate by the Head of School in which they are serving duly countersigned by the Director of Education/DEO/SDEO concerned.
- (iii) women candidates who are bonafide residents of Mizoram and have passed the HSLC or an equivalent examination at least two years before appearing at the HSSLC Examination.
- (iv) Physically handicapped students having passed the High School Leaving Certificate Examination or its equivalent at least two years before appearing at the Higher Secondary School Certificate Examination on producing reasonable evidence of having deficiency to attend normal institutions for the purpose of studies.

1.15 Procedures for submission of Applications of Private Candidates at Higher Secondary School Leaving Certificate Examination (Class XII)

- (i) A private candidate must submit to the Board within the prescribed limit an application in the form prescribed together with the prescribed fee for the examination and three copies of passport size photographs duly signed by the candidate and countersigned in the case of teacher by the authorities mentioned in rule 1.14 (ii)
- (ii) When a private candidate's application for admission to the examination is rejected, the examination fee paid by him less Rs 100/- or the amount as decided by the Board from time to time will be refunded to him, but in the case of a candidate whose application has been rejected on account of the candidate's producing a false certificate or making a false statement in the application, the full amount of fee shall be forfeited.
- (iii) Private candidates shall not be allowed to offer a subject which is not being taught in an affiliated school.
- (iv) Private candidates shall not be allowed to offer such subjects which involve practical work except in the case of candidates who had failed earlier and who had put in a regular course of study at an institution affiliated to the Board in the previous academic year.

1.16 Rules of Change in Subject:

- (i) Change of subject(s) in Class XI may be allowed by the Head of the School but not later than 31st October of that academic session.
- (ii) No candidate shall be permitted to change his subject of study after passing Class XI
- (iii) The candidate shall not offer a subject in Class XII which he has not studied and passed in Class XI.
- (iv) Notwithstanding anything contained in (ii) & (iii) above the Chairman shall have the power to allow a change in a subject(s) to avoid undue hardship to the candidate provided such a request for change is made before 30th September.

1.17 Submission of Migration Certificate by Private/Teacher Candidates:

The candidates who have passed the Secondary or equivalent examination from other recognised Boards/Universities shall be required to submit Migration Certificate from the concerned Board/University along with the examination form. However, in case a Migration Certificate is not received fifteen days before the commencement of the examination, the candidature of a candidate shall be cancelled and the admit card for appearance at the examination shall not be issued to him by the Board.

2. SCHEME OF EXAMINATIONS AND PASS CRITERIA

2.1 General Conditions

- (i) The Scheme of Examination and Pass Criteria for Higher Secondary School Leaving Certificate Examination conducted by the Board shall be as laid down from time to time.
- (ii) Class XI examination shall be conducted internally by the schools themselves.
- (iii) The Board will conduct the external examination at the end of class XII
- (iv) Class XII examination will be based on the syllabi as prescribed by the Board for Class XII from time to time.
- (v) Number of papers, duration of examination and marks for each subject/paper will be as specified in the Scheme of Examinations.
- (vi) The examination would be conducted in theory as well as in practicals, depending upon the nature of the subject(s).
- (vii) Marks shall be awarded for individual subjects and the aggregate marks shall determine the classification of successful candidates.

2.2 Scheme of Examinations :

- (i) The Board shall conduct examination in all subjects except General Studies, Work Experience, Physical & Health Education, which will be assessed internally by the schools.
- (ii) In all subjects examined by the Board, there shall be one paper each carrying 100 marks for 3 hours. However, in subjects requiring practical examination, there will be a theory paper and a practical examination.
- (iii) In Work Experience, General Studies and Physical & Health Education, the schools will maintain cumulative records of students' periodical achievements and progress during the year. These records are subject to the scrutiny of the Board as and when required.

- (iv) A candidate from a recognised school who has some physical deformity or is otherwise unable to take part in Work Experience and Physical & Health Education, may be granted exemption by the Chairman on the recommendation of the Head of Institution, supported by medical certification from a registered medical practitioner.
- (v) A candidate may offer an additional subject which can be an elective subject listed in the Scheme of Studies, subject to the conditions laid down in the Pass Criteria.

2.3 Criteria and Classification of Successful Candidates :

(i) Pass Criteria

A candidate shall be declared to have passed in the Higher Secondary School Leaving Certificate Examination if he/she obtains

- (a) 33% of total marks in each theory paper
- (b) 33% of total marks in each practical paper and
- (c) 33% of the aggregate marks.

A candidate shall be required to pass in Theory and Practical examination separately

(ii) Classification of Successful Candidates :

A candidates shall be placed in –

- (a) Distinction Division if he/she secures 75% or more of the aggregate marks;
- (b) First Division if he/she secures 60% and above but below 75% of the aggregate marks;
- (c) Second Division if he/she secures 50% and above but below 60% of the aggregate marks; and
- (d) Third Division if he/she secures 33% and above but below 50% of the aggregate marks

(iii) Norms for Additional Subject :

In respect of a candidate offering an additional subject, the following norms shall be applied:

- (a) An elective subject offered as an additional subject may replace one of the elective subjects offered by the candidate if he or she fails in that elective subject. It may also replace a language provided after replacement the candidate has English/Hindi as one of the languages.

- (b) Marks obtained above the minimum pass marks in the additional subject shall not be added to aggregate marks irrespective of pass or failure.

2.4 Eligibility for Compartment in Higher Secondary School Certificate Examination:

A candidate failing in one of the five subjects of external examination shall be given a compartmental chance in that subject provided he/she qualifies in all other subjects of internal assessment.

2.5 Compartment Examination for Higher Secondary School Leaving Certificate Examination

- (i) A candidate placed in compartment may reappear in two compartmental chances conducted by the Board. The candidate will be declared pass provided he/she qualifies the compartmental subject (s) in which he/she had failed.
- (ii) A candidate who does not appear or fails at both chances of the compartment shall be treated to have failed in the examination and shall be required to reappear in all the subjects at the subsequent annual examination of the Board, in order to pass the examination.
- (iii) The syllabi and courses for the compartmental examinations shall be the same as applicable to the examination in which he/she was placed in the compartmental chance.
- (iv) For subjects involving practical work, in case the candidate has passed in practical at the main Examination, he/she shall appear only in theory part in the compartmental examination and previous practical marks shall be carried forward and accounted for determining pass or failure. The candidate shall have the option to appear at the practical examination in the subjects involving practical or retain their previous marks in one annual Board's examination after the second chance compartment.
- (v) In case a candidate has failed in practical he/she shall have to appear in theory and practical both irrespective of the fact that he/she has already cleared the theory examination.

2.6 Retention of Practical Marks in respect of Failure Candidates for Senior School Certificate Examination.

A candidate who has failed in the examination in the first attempt shall be required to re-appear in all the subjects at the subsequent annual examination of the Board but shall have the option to appear for the practical examination in subjects involving practicals or retain the previous year practical marks for three consecutive years only. In case he/she fails to pass the examination in three consecutive years, he/she shall have to re-appear in all the subjects including practicals.

2.7 Improvement of Performance

- (i) A candidate who has passed an examination of the Board may reappear for improvement of performance in one or more subjects, along with the main examination in the succeeding year only, as a private candidate.
- (ii) A candidate who has passed an examination of the Board may reappear for the improvement of performance in the whole examination as a regular candidate if admitted by an institution as a regular student with proper intimation to the Board through the head of the institution in which the candidate is readmitted.
- (iii) Candidates appearing for improvement in a subject involving practical work in the succeeding year shall appear in theory only and marks obtained in practical at the main examination shall be carried forward and accounted for.
- (iv) The result of such a candidate shall be redeclared only if he/she improves the score already obtained, otherwise the previous score shall stand.

2.8 Other Examination Rules & Conditions

Other Rules or conditions if considered necessary shall be determined by the Examination Committee of the Board from time to time.

SCHEME OF STUDIES

(For Classes XI & XII)

3.1 Academic Stream

The learning areas will include :

I & II Two Languages out of :

English, Mizo, Hindi, Assamese, Bengali, Manipuri, Nepali, Khasi, Garo, Tynyidie.

Notes :

1. Out of the languages, one shall be English or Hindi. Both English and Hindi can also be offered simultaneously.
2. A candidate has the freedom to offer, in lieu of one of the two languages above, any other elective subject provided under III to V in conformity with the streams he/she offers below.

III to V Three Electives out of one of the following streams:

A. Arts stream: Political Science, History, Education, Geography, Economics, Home Science, Sociology, Psychology, Public Administration, Mathematics, Computer Science.

B. Science stream: Physics, Chemistry, Biology, Mathematics, Home Science, Computer Science, Geology.

C. Commerce stream: Business Studies, Accountancy, Economics, Business Mathematics, Computer Science.

VI General Studies

VII Work Experience

VIII Physical and Health Education

Notes :

1. Out of the elective subjects mentioned above, a student is not allowed to offer the following combinations simultaneously :
 - (a) Education and Psychology
 - (b) Political Science and Public Administration
2. If a student wishes to offer Home Science at Degree level, he/she is advised to offer Science stream with Home Science at +2 level.

IX Additional Subjects : A student can also offer an additional subject from the elective subjects mentioned under III -V above other than the one already offered.

While transacting the Curriculum due emphasis should be laid on National Identity and Value Education. Programmes in General Studies, Work Experience and Physical and Health Education be planned in accordance with the guidelines brought out by the Board from time to time.

X Choice of subjects by a student is subject to availability of subject teacher(s) and other facilities in the school concerned. The head of institutions shall guide their students in selecting the elective subjects so that the selection shall enable them to continue their studies at their own choice in Degree Courses.

3.2 Medium of Instruction

The medium of instruction, in general, in all the schools affiliated to the Board shall be English.

3.3 Instructional Time

The instructional time in an academic session shall be not less than 1000 hrs.

PART II

COURSE OF STUDIES

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ENGLISH

Background

Students are expected to have acquired a reasonable degree of language proficiency in English by the time they come to class XI, and the course will aim, essentially, at promoting the higher-order language skills.

For a large number of students, the higher secondary stage will be a preparation for the university, where a fairly high degree of proficiency in English may be required. But for another large group, the higher secondary stage may be a preparation for entry into the world of work. The Core Course should cater to both groups by promoting the language skills required for academic study as well as the language skills required for the workplace.

Objectives

The general objectives at this stage are :

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

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

- read and comprehend extended texts (prescribed and non-prescribed) in the following genres: fiction, science fiction, drama, poetry, biography, autobiography, travel and sports literature, etc.
- text-based writing (i.e., writing in response to questions or tasks based on prescribed or unseen texts)

- understand and respond to lectures, speeches, etc.
- write expository/argumentative essays of 250-500 words, explaining or developing a topic, arguing a case, etc.
- write formal/informal letters and applications for different purposes.
- write items related to the workplace (minutes, memoranda, notices, summaries, reports; filling up of forms, preparing CVs, e-mail messages, etc.).
- taking/making notes from reference materials, recorded talks etc.

Language Items

The Core Course should draw upon the language items suggested for classes IX-X and delve deeper into their usage and functions. Particular attention may, however, be given to the following areas of grammar :

- the uses of different tense forms for different kinds of narration (e.g. media commentaries, reports, programmes, etc.).
- the use of passive forms in scientific and innovative writings
- converting one kind of sentence/clause into a different kind of structure as well as other items to exemplify stylistic variations in different discourses
- modal auxiliaries - uses based on semantic considerations.

Methods and Techniques

The techniques used for teaching should promote habits of self-learning and reduce dependence on the teacher. In general, we recommend a multi-skill, learner-centred, activity based approach, of which there can be many variations. The core classroom activity is likely to be that of silent reading of prescribed/selected texts for comprehension, which can lead to other forms of language learning activities such as role play, dramatization, group discussion, writing, etc. although many such activities could be carried out without the preliminary use of textual material. It is important that students be trained to read independently and intelligently, interacting actively with texts, with the use of reference materials (dictionaries, thesauruses, etc.) where necessary. Some pre-reading activity will generally be required, and the course books should suggest suitable activities, leaving teachers free to devise other activities when desired. So also, the reading of texts should be followed by post reading activities. It is important to remember that every text can generate different readings. Students should be encouraged to interpret texts in different ways.

Group and pair activities can be resorted to when desired, but many useful language activities can be carried out individually.

In general, teachers should encourage students to interact actively with texts and with each other. Oral activity (group discussion, etc.) should be encouraged.

**EXAMINATION SPECIFICATIONS
CLASS - XI**

One paper **3 Hours** **Marks : 100**
Unitwise Weightage

Unit/Areas of Learning		Marks
Section A	Reading Skills Reading unseen prose passages and note making	20
Section B	Writing	25
Section C	Grammar	10
Section D	Textual Questions	
(i)	<i>Textbook</i>	30
(ii)	<i>Supplementary Reader</i>	15

SECTION - A

Reading unseen Passages for Comprehension and Note-making. 20 Marks

Two unseen passages with a variety of questions including 04 marks for vocabulary such as word formation and inferring meaning and 05 marks for note-making.

The total length of the two passages will be between 800- 1000 words. The passages could be any of the following two types :

- (a) **Factual Passages** e.g. instructions, descriptions, reports.
- (b) **Discursive passage** involving opinion e.g. argumentative, persuasive or interpretative text.

SUMMARY

Unseen Passages	No. of words	Testing Areas	Marks Allotted						
1.	500-600	2 Short answer type questions to test local, global and inferential comprehension including. 4 Multiple Choice Questions. Vocabulary	<table border="0" style="border-collapse: collapse;"> <tr> <td style="padding-right: 10px;">$2 \times 2 = 4$</td> <td style="border-left: 1px solid black; padding-left: 10px;"></td> </tr> <tr> <td style="padding-right: 10px;">$4 \times 1 = 4$</td> <td style="border-left: 1px solid black; padding-left: 10px;">12</td> </tr> <tr> <td style="padding-right: 10px;">$4 \times 1 = 4$</td> <td style="border-left: 1px solid black; padding-left: 10px;"></td> </tr> </table>	$2 \times 2 = 4$		$4 \times 1 = 4$	12	$4 \times 1 = 4$	
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2.	300-400	Note-making in an appropriate format Summary	<table border="0" style="border-collapse: collapse;"> <tr> <td style="padding-right: 10px;">05</td> <td style="border-left: 1px solid black; padding-left: 10px;"></td> </tr> <tr> <td style="padding-right: 10px;">03</td> <td style="border-left: 1px solid black; padding-left: 10px;">08</td> </tr> </table>	05		03	08		
05									
03	08								

A passage of about 500-600 words carrying 12 marks and another passage of about 300-400 words carrying 08 marks.

The passage carrying 08 marks should be used for testing note making for 5 marks and testing summary for 3 marks. Vocabulary for 4 marks and multiple choice carrying 4 marks may be tested in the other passage carrying 12 marks.

SECTION - B

WRITING

25 Marks

3. One out of two tasks such as advertisements, notices and posters based on verbal input provided. (50 words) **05**
4. One out of two compositions based on a visual and/ or verbal input **10**
(in about 100-150 words). The output may be descriptive or argumentative in nature such as an article for publication in a newspaper or a school magazine or a report.
5. Writing one out of two letters based on given input. Letter types include **10**
 - (a) business or official letters (for making enquiries, registering complaints, asking for and giving information : placing orders and sending replies):
 - (b) letters to the editor (giving suggestions, opinions on an issue of public interest)
 - (c) application for a job.

SECTION - C

GRAMMAR

10 Marks

Different grammatical structures in meaningful contexts will be tested. Item types will include gap-filling, sentence-reordering, dialogue-completion and sentence-transformation. The grammar syllabus will include the following areas :

- | | | |
|----|---|-----------|
| 6. | Determiners, Tenses, Clauses, Modals and Error Correction
(Objective type) | 4 x 1 = 4 |
| 7. | Punctuation | 4 |
| 8. | Re-ordering of sentences | 2 |

SECTION - D

TEXTUAL QUESTIONS

45 Marks

Textbook

30 marks

- | | | |
|-----|---|---|
| 9. | One out of two abstracts based on poetry from the text to test comprehension and appreciation (objective type). (4 x 1) | 4 |
| 10. | Two out of three short questions from the poetry section to test local and global comprehension of text (<i>upto 30 words</i>). (2 x 3) | 6 |
| 11. | Three out of four short answer questions based on the lessons from the prescribed text (<i>upto 30 words</i>). (3 x 3) | 9 |
| 12. | Four questions from the prescribed text (objective type). (4 x 1) | 4 |
| 13. | One out of two long answer type questions based on the text to test global comprehension and extrapolation beyond the set text. (<i>upto 125 - 150 words</i>) | 7 |

Supplementary Reader

15 marks

- | | | |
|-----|---|---|
| 14. | One out of two long answer type questions based on the text to test comprehension and extrapolation of theme, character and incidents (<i>about 125 - 150 words</i>). | 7 |
| 15. | Four short answer questions from the <i>Supplementary Reader</i> (4 x 2) | 8 |

Conversation Skills (Listening + Speaking)

Conversation Skills are to be tested as part of Continuous Assessment within the school in order to hone the students' knowledge and use of the language. Separate marks will not be allotted. Testing of conversation skills is to be carried out in the following manner :

Listening

The teacher will read aloud a passage based on a relevant theme or a short story. The passage may be factual or discursive. The length of the passage should be around 350 words. The students are expected to complete the listening comprehension tasks given in a separate sheet while listening to the teacher. The tasks set may be gap-filling, multiple choice, true or false or short answer questions. There may be around ten different questions.

Speaking

Narration based on a sequence of pictures. In this section the student will be required to use narrative language.

Description of a picture (can be pictures of people or places)

Speaking on a given topic to test recall of a personal experience.

Note :

- At the beginning of the class, the teacher will give the student some time to prepare. In case of narration the present tense should be used.
- Topics chosen should be within the personal experience of the student such as: relating a funny anecdote, re-telling the theme of a book read or a movie seen recently.
- Once the student has started, the teacher should intervene as little as possible.

Conversation Skills Assessment Scale

Listening

The learner :

1. has general ability to understand words and phrases in a familiar context but cannot follow connected speech;
3. has ability to follow short connected utterances in a familiar context;
5. has ability to understand explicitly stated information in both familiar and unfamiliar contexts;
7. understands a range of longer spoken texts with reasonable accuracy and is able to draw inferences;
9. shows ability to interpret complex discourse in terms of points of view; adapts listening strategies to suit purposes.

Speaking

The learner

1. shows ability to use only isolated words and phrases but cannot operate on connected speech level;
3. in familiar situations, uses only short connected utterances with limited accuracy;
5. shows ability to use more complex utterances with some fluency in longer discourse; still makes some errors which impede communication;
7. organizes and presents thoughts in a reasonably logical and fluent manner in unfamiliar situations; makes errors which do not interfere with communication.
9. can spontaneously adapt style appropriate to purpose and audience; makes only negligible errors.

CLASS - XII

One Paper

3 Hours

Marks : 100

Unitwise Weightage

Unit/Areas of Learning	Marks
Section A Reading unseen prose passages and note making	20
Section B	Advanced Writing Skills 30
Section C	Literature (<i>Prescribed Books</i>)
(i) <i>Textbook</i>	35
(ii) <i>Supplementary Reader</i>	15

SECTION - A

20 Marks

Two unseen passages with a variety of questions including 04 marks for vocabulary such as word formation and inferring meaning and 05 marks for note-making.

The total length of the two passages will be between 800- 1000 words. The passages will include two of the following:

- (a) **Factual Passages** e.g. instructions, descriptions, reports.
- (b) **Discursive passage** involving opinion e.g. argumentative, persuasive or interpretative text.
- (c) **Literary passage** e.g. extract from fiction, drama, poetry, essay or biography.

SUMMARY

Unseen Passages	No. of words	Testing Areas	Marks Allotted
1.	500-600	2 Short answer type questions to test local, global and inferential comprehension	2 x 2 = 4
		4 Multiple choice questions	4 x 1 = 4
		Vocabulary	4 x 1 = 4
2.	300-400	Note-making in an appropriate format Summary	05 03 08

A passage of about 500-600 words carrying 12 marks and another passage of about 300-400 words carrying 08 marks

1. A passage to test reading comprehension. The passage can be literary, factual or discursive. The length of the passage should be between 500-600 words.
12 marks
2. A shorter passage of 300-400 words for note-making and summary.
08 marks

SECTION - B

ADVANCED WRITING SKILLS

30 Marks

3. **Two** short compositions of not more than 50 words each e.g. advertisement *and* notices, designing or drafting posters, writing formal and informal invitations & **5+5**
4. *and* replies.
5. Writing one out of two letters based on verbal input. Letter types include. **10**
- (a) business or official letters (for making enquiries, registering complaints, asking for and giving information : placing orders and sending replies):
- (b) letters to the editor (giving suggestions on an issue)
- (c) application for a job.
6. One composition based on visual and/or verbal input (150 - 200 words). Output may be descriptive or argumentative in nature such as an article or a report. **10**

SECTION - C

LITERATURE

50 Marks

Textbook

35 marks

7. One out of two extracts based on poetry from the text to test comprehension and appreciation (objective type) **(4 x 1)** **4**
8. Two short questions from the poetry section to test local and global comprehension of text (*about 30 words*). **(2 x 2)** **4**
9. Two questions from the poetry section (objective type) **(2 x 1)** **2**
10. Four out of five short answer questions based on the lessons from prescribed text (*about 40-50 words*). **(4 x 3)** **12**
11. Six questions from the prescribed text (objective type) **(6 x 1)** **6**
12. One out of two long answer type questions based on the text to test global comprehension and extrapolation beyond the set text. (*about 125 - 150 words*) **7**

Supplementary Reader

15 marks

13. One out of two long answer type questions based on the Supplementary Reader to test comprehension and extrapolation of theme, character and incidents (*about 125 - 150 words*). **7**
14. Four short answer questions from the *Supplementary Reader* (*about 30 words*) **(4 x 2) 8**

----- X -----

**MIZO
CLASS - XI**

THEN KHATNA - HLA : 20 Marks

FAKNA	1. Ka va ngai em Lal ram ropui	- Hleia
	2. Pathian ralthuam hmangtute chu	- Saihnuna
RAM HMANGAIHNA	3. Pialei hmunrem kan bel	- Dozinga
	4. Ram hmangaihna	- R.L.Kamlala
LENGZEM	5. Chhingkhual Thalengheri	- Laltanpuia
	6. Lenna khua hmun lo	- Lalzova
NUNKAWNG	7. Lei mite hunbi an chhiar e	- Rokunga
	8. Khawngai hnuchham	- Vankhama
KHUAREL	9. Ka lungkham	- Vanlalbeli
	10. Nungchate	- R.Rochungnunga
HLALENGLAWNG	11. Thlawhhma hla	- Romani
HLAHLUI	12. German run zai	

THEN HNIHNA - THU (PROSE) : 20 Marks

NUN KAWNG HRUAINA	1. Hmangaihna	- Lalhmingliana Saiawi
	2. Mi puitling	- Lalena
KHUAREL	3. Zoram par mawi	- C.Rokhuma
	4. Khawvel mawi hi	- R.Lalzarmawia
HNAM ZIARANG	5. Mizo ka ni ka zak dawn lo	- James Dokhuma
RAM LEH HNAM	6. Mizo tlangval rual leh Japan ral	- Zokima
	7. Mizo, Hnam leh Sakhua	- Lalrinawma
	8. Ram nghahfak chu keimahni	- Lalrintluanga
INPUMKHATNA LAM	9. Mizo \awng khawvel	- C.Sangzuala
THUPUI DANG	10. Anni leh keini	- Siamkima
	11. Chanchin Tha malsawmna	- Z.T.Sangkhuma
	12. Nunna tui	- C. Lalnunnama

| **HEN THUMNA - LEMCHAN (DRAMA) : 14 Marks**

1. Hausakna Nun dik tak - Chawngzika & Rev. Samuel Davies

| **HEN LINA - THAWNTHU (FICTION) : 14 Marks**

1. Lali (Lalawmpuii) - Biakliana

| **HEN NGANA - GRAMMAR & COMPOSITION : 20 Marks**

- | | | |
|------------------------------|---|---|
| 1. Mood | - | 4 |
| 2. Tawng Upa | - | 4 |
| 3. Report ziah dan | - | 4 |
| 4. Minute ziah dan | - | 4 |
| 5. Thu lak tawi dan (Precis) | - | 4 |

RAPID READER : 12 Marks

1. C.C. Coy. No. 27 - Zikpuii Pa

**MIZO
CLASS - XII**

| HEN KHATNA - HLA : 20 Marks

KHAWHAR	1. Phungrual an \in anga 2. Enchimloh chawi lai	- Laithangpuia - RaIngama
RAMHMANGAIHNA	3. I t^n ka ding z>l ang 4. Zoram! ka ram!	- T.Zoram>la - Kaphleia
LENGZEM	5. K^r a hla 6. Tleitirah tleitiri	- Lalhmingthanga - Dura Chawngthu
NUNKAWNG	7. Kan dam chhung ni 8. Ph>ngphe nunn>m	- P.S.Chawngthu - Zirsangzela Hnamte
KHUAREL	9. Pi pu chhuahtl^ng hlui	- Liandala
HLA LENGAWNG	10. Hmanah pi pu lenlai chul hnu-	- Damhauhva
HLA HLUI	11. Pan lai ka ram tuanna 12. Hausiampa Zai	- Lalsangzuali Sailo

| HEN HNIHNA - THU (PROSE) : 20 Marks

NUN KAWNG HRUAINA	1. Dawhtheihna 2. Lung in mals^wmna thur<k 3. Zirlaite hnena thuchah 4. Ngaihtuahna 5. I Thinrim elo	- R.L.Thanmawia - H.Lallungmuana - Zikpuii pa - C.H. Thangkhuma - C. Lalhrekima
KHUAREL	6. Lungph^ng lo la 7. Leilung hi Pathian siam a ni	- L.Keivom - P.L.Liandinga
HNAM ZIA-RANG RAM LEH HNAM	8. Mizo thu leh hla \obul 9. Mizo hnam zai leh hla thlavang hauhna	- B.Lalthangliana - Lalsiamthanga
THUPUI DANG	10. Tawrhna 11. Mi huaisen 12. Kan nun khuarei an chang tur hi	- Zairema - Thanpuii pa - C. Thuamluaia

| HEN THUMNA - LEMCHAN (DRAMA) : 14 Marks

1. Thangzawra - Lalsangzuala

| HEN LINA - THAWNTHU (FICTION) : 14 Marks

1. Lal hlau lo \hi - Lalzuia Colney

| HEN NGANA - GRAMMAR & COMPOSITION : 20 Marks

- | | | | |
|----|---------------------------|---|---|
| 1. | Adverb | - | 4 |
| 2. | awng Upa | - | 6 |
| 3. | Lekhathawn : | - | 4 |
| | (i) Sawis>lna (complaint) | | |
| | (ii) Thu pawl thlen (FIR) | | |
| 4. | Essay ziah dan | - | 6 |

RAPID READER : 12 Marks

1. Chawngmawii leh Hrangchhuana - R. Rozika

हिंदी

कक्षा-11

पूर्णांक-100

(क)	अपठित बोध (गद्यांश और काव्यांश-बोध)	10 +5	15
(ख)	रचनात्मक लेखन (कामकाजी हिंदी और रचनात्मक लेखन)		25
(ग)	पाठ्य पुस्तक : आरोह (भाग-1)	20+15	35
	पूरक पुस्तक : यितान (भाग-1)		15
(घ)	मौखिक अभिव्यक्ति		10

क)	अपठित बोध :		15
1.	काव्यांश - बोध: (काव्यांश पर आधारित पाँच लघूत्तरात्मक प्रश्न)		05
2.	गद्यांश - बोध: (गद्यांश पर आधारित बोध, प्रयोग, रचनांतरण, शीर्षक आदि पर लघूत्तरात्मक प्रश्न)		10
(ख)	रचनात्मक लेखन : (कामकाजी हिंदी और रचनात्मक लेखन)	15+10	25
	रचनात्मक लेखन पर दो प्रश्न		
3.	● निबंध		10
4.	● कार्यालयी पत्र		05
5.	निर्धारित पुस्तक 'अभिव्यक्ति और माध्यम' के आधार पर जनसंचार की विधाओं पर दो प्रश्न		
	● प्रिंट माध्यम (समाचार और सम्पादकीय)	}	05
	● रिपोर्ट/आलेख		
6.	फीचर लेखन (जीवन-संदर्भों से जुड़ी घटनाओं और स्थितियों पर)		05
ग	आरोह (काव्य-भाग- 20 अंक, गद्य-भाग-15 अंक)		35
	(काव्य-भाग)		
7.	दो काव्यांशों में से किसी एक पर अर्थग्रहण के चार प्रश्न	(2+2+2+2)	8
8.	काव्यांश के सौंदर्यबोध पर दो प्रश्न	(3+3)	06
9.	कविता की विषय-वस्तु पर आधारित तीन लघूत्तरात्मक प्रश्न (गद्य-भाग)	(2+2+2)	06
10.	दो में से एक गद्यांश पर आधारित अर्थग्रहण संबंधित तीन प्रश्न	(2+2+2)	06
11.	पाठों की विषयवस्तु पर आधारित चार में से तीन बोधात्मक प्रश्न	(3+3+3)	09

पितान – भाग : 1	15
12. पाठों की विषयवस्तु पर आधारित चार में से तीन लघूत्तरात्मक प्रश्न	(3+3+3) 9
13. विषयवस्तु पर आधारित दो में से एक निबंधात्मक प्रश्न	6
घ मौखिक परीक्षण	10 अंक
श्रवण (सुनना): वर्णित या पठित सामग्री को सुनकर अर्थग्रहण करना, वार्तालाप, वाद-विवाद, भाषण, कवितापाठ आदि को सुनकर समझना, मूल्यांकन करना और अभिव्यक्ति के ढंग को समझना।	5
बोलना: भाषण, सस्वर कविता-पाठ, वार्तालाप और उसकी औपचारिकता, कार्यक्रम-प्रस्तुति, कथा-कहानी अथवा घटना सुनाना, परिचय देना, भाषानुकूल संवाद-वाचन।	5

वार्तालाप की दक्षताएँ :

टिप्पणी: वार्तालाप की दक्षताओं का मूल्यांकन निरंतरता के आधार पर परीक्षा के समय होगा। निर्धारित 10 अंकों में से 5 श्रवण (सुनना) के मूल्यांकन के लिए और 5 (बोलना) के मूल्यांकन के लिए होंगे।

श्रवण (सुनना) टिप्पणी का मूल्यांकन:

परीक्षक किसी प्रासंगिक विषय पर एक अनुच्छेद का स्पष्ट वाचन करेगा। अनुच्छेद, तथ्यात्मक या सुझावात्मक हो सकता है। अनुच्छेद लगभग 250 शब्दों का होना चाहिए। परीक्षक/अध्यापक को सुनते-सुनते परीक्षार्थी अलग कागज़ पर दिए हुए श्रवण-बोध के अभ्यासों को हल कर सकेंगे।

अभ्यास रिक्तस्थान-पूर्ति, बहुविकल्पी अथवा सही-गलत का चुनाव आदि विधाओं में हो सकते हैं। आधे-आधे अंक के 10 परीक्षण-प्रश्न होंगे।

मौखिक अभिव्यक्ति (बोलना) का मूल्यांकन:

1. चित्रों के क्रम पर आधारित वर्णन: इस भाग में अपेक्षा की जाएगी कि विवरणात्मक भाषा का प्रयोग करें।
2. किसी चित्र का वर्णन: चित्र लोगों या स्थानों के हो सकते हैं।
3. किसी निर्धारित विषय पर बोलना, जिससे विद्यार्थी/परीक्षार्थी अपने व्यक्तिगत अनुभव का प्रत्यास्मरण कर सकें।
4. कोई कहानी सुनाना या किसी घटना का वर्णन करना।

टिप्पणी :

परीक्षण से पूर्व परीक्षार्थी को कुछ तैयारी के लिए समय दिया जाए।

- विवरणात्मक भाषा में वर्तमान काल का प्रयोग अपेक्षित है।
- निर्धारित विषय परीक्षार्थी के अनुभव-जगत के हों जैसे

कोई चुटकला या हस्य प्रसंग सुनाना।

हाल में पढ़ी पुस्तक या देखे सिनेमा की कहानी सुनाना।

जब परीक्षार्थी बोलना आरंभ कर दे तो परीक्षक कम से कम हस्तक्षेप करें।

कीशलों के अंतरण का मूल्यांकन

(इस बात का निश्चय करना कि क्या विद्यार्थी में श्रवण और वाचन की निम्नलिखित योग्यताएँ हैं।)

श्रवण (सुनना)

विद्यार्थी में-

1. परिचित संदर्भों में प्रयुक्त शब्दों और पदों को समझने की सामान्य योग्यता है किन्तु वह सुसंबद्ध आशय को नहीं समझ पाता।
3. छोटे संबद्ध कथनों को परिचित संदर्भों में समझने की योग्यता है।
5. परिचित या अपरिचित दोनों संदर्भों में कथित सूचना को स्पष्ट समझने की योग्यता है।
7. दीर्घ कथनों की श्रृंखला को पर्याप्त शुद्धता से समझने और निष्कर्ष निकाल सकने की योग्यता है।
9. जटिल कथनों के विचार-बिंदुओं को समझने की योग्यता प्रदर्शित करने की क्षमता है। वह उद्देश्य के अनुकूल सुनने की कुशलता प्रदर्शित करता है।

वाचन (बोलना)

विद्यार्थी -

1. केवल अलग-अलग शब्दों और पदों के प्रयोग की योग्यता प्रदर्शित करता है किन्तु एक सुसंबद्ध स्तर पर नहीं बोल सकता।
3. परिचित संदर्भों में केवल छोटे संबद्ध कथनों का सीमित शुद्धता से प्रयोग करता है।
5. अपेक्षाकृत दीर्घ भाषण में अधिक जटिल कथनों के प्रयोग की योग्यता प्रदर्शित करता है, अभी भी कुछ अशुद्धियाँ करता है, जिससे प्रेषण में रुकवट आती है।
7. अपरिचित स्थितियों में विचारों को तार्किक ढंग से संगठित कर धारा-प्रवाह रूप में प्रस्तुत करता है। ऐसी गलतियाँ करता है जिनसे प्रेषण में रुकवट नहीं आती।
9. उद्देश्य और श्रोता के लिए उपयुक्त शैली को अपना सकता है, केवल मामूली गलतियाँ करता है।

हिंदी
कक्षा-12

		अंक
(क) अपठित बोध (गद्यांश और काव्यांश-बोध)	12+8	20
(ख) रचनात्मक लेखन एवं जन-संचार माध्यम • अभिव्यक्ति और माध्यम (प्रिंट माध्यम संपादकीय, रिपोर्ट, आलेख, फीचर-लेखन)	10+5+5+5	25
(ग) • पाठ्य पुस्तक : • आरोह (भाग-2) (काव्यांश-20 गद्यांश-20)		40
• पूरक पुस्तक : यितान (भाग-2)		15
		100

क	अपठित बोध :	20
1.	काव्यांश-बोध पर आधारित पाँच लघूत्तरात्मक प्रश्न	10
2.	गद्यांश-बोध पर आधारित बोध, प्रयोग, रचनांतरण, शीर्षक आदि पर लघूत्तरात्मक प्रश्न	10
ख	रचनात्मक लेखन एवं जन-संचार माध्यम:	25
3.	निबंध जन-संचार की निम्नलिखित विधाओं पर दो प्रश्न-	10
4.	रिपोर्ट	05
5.	आलेख	05
6.	फीचर लेखन (जीवन-संदर्भों से जुड़ी घटनाओं और स्थितियों पर फीचर-लेखन)	05
ग	आरोह भाग-2 (काव्य -भाग और गद्य-भाग) (20+20)	40
7.	दो काव्यांशों में से किसी एक पर अर्थग्रहण के चार/पाँच प्रश्न	10
8.	काव्यांश के सौंदर्यबोध पर दो प्रश्न के स्थान पर विकल्प दिया जाएगा। (2+2+2) किसी एक काव्यांश के तीन प्रश्नों के उत्तर देने होंगे।	06
9.	कविताओं की विषय-वस्तु से संबंधित तीन में से दो लघूत्तरात्मक प्रश्न (2+2)	04
10.	दो में से किसी एक गद्यांश पर आधारित अर्थ-ग्रहण के चार प्रश्न (2+2+2+2)	08
11.	पाठों की विषय वस्तु पर आधारित पाँच में से चार बोधात्मक प्रश्न (3+3+3+3)	12

पूरक पुस्तक : वितान भाग 2		15
12. पाठों की विषयवस्तु पर आधारित तीन में से दो बोधात्मक प्रश्न	(3+3)	06
13. विचार/संदेश पर आधारित तीन में से दो लघूत्तरात्मक प्रश्न	(2+2)	04
14. विषयवस्तु पर आधारित दो में से एक निबंधात्मक प्रश्न		05

POLITICAL SCIENCE

Rationale

At the senior secondary level students who opt Political Science are given an opportunity to get introduced to the diverse concerns of a Political Scientist. At this level there is a need to enable students to engage with political processes that surround them and provide them with an understanding of the historical context that has shaped the present. The different courses introduce the students to the various streams of the discipline of political science: political theory, Indian politics and international politics. Concerns of the other two streams — comparative politics and public administration — are accommodated to burden the student with the current jargon of the discipline. The basic idea here is to lay the foundations for a serious engagement with the discipline at the undergraduation stage.

Objectives :

INDIAN CONSTITUTION AT WORK

- Enable students to understand historical processes and circumstances in which the Constitution was drafted.
- Provide opportunity for students to be familiar with the diverse visions that guided the makers of the Indian Constitution.
- Enable students to identify the certain key features of the Constitution and compare these to other constitutions in the world.
- Analyse the ways in which the provisions of the Constitution have worked in real political life.

POLITICAL THEORY

- Develop the skills for logical reasoning and abstraction
- Inculcate attention to and respect for viewpoints other than one's own
- Introduce students to the different political thinkers in relation to a concept and in everyday social life.
- Enable students to meaningfully participate in a concern of current political life that surrounds them
- Encourage the students to analyse any unexamined prejudices that one may have inherited.

POLITICS IN INDIA AFTER INDEPENDENCE

- Enable students to be familiar with some of the key political events and figures in the post-independence period.

- Develop skills of political analysis through events and processes of recent history.
- Develop their capacity to link macro processes with micro situations and their own life.
- Encourage the students to take a historical perspective of making sense of the contemporary India.

CONTEMPORARY WORLD POLITICS

- Enable the students to expand their horizon beyond India and make sense of the political map of contemporary world.
- Familiarise the students with some of the key political events and processes in the post cold war era.
- Equip students to be conscious of the way in which global events and processes shape our everyday life.
- Strengthen their capacity for political analysis by thinking of contemporary developments in a historical perspective

COURSE STRUCTURE
CLASS - XI

One Paper

Time 3hrs
Marks 100

Part A : Indian Constitution at work **Marks**

1.	Constitution : Why & How	}	Unit - I	10
2.	Rights in the Indian Constitution	}		
3.	Election and Representation	}	Unit - II	10
4.	Executive	}		
5.	Legislature	}	Unit - III	10
6.	Judiciary	}		
7.	Federalism	}	Unit - IV	10
8.	Local Governments	}		
9.	Constitution as a living document.		Unit - IV	10
				50

Part B : Political Theory

10.	Political Theory : An Introduction	}	Unit - VI	10
11.	Freedom	}		
12.	Equality	}	Unit - VII	10
13.	Social Justice	}		
14.	Rights	}	Unit - VIII	10
15.	Citizenship	}		
16.	Nationalism	}	Unit - IX	10
17.	Secularism	}		
18.	Peace		Unit - X	10
				50

Course Content:

Part A : Indian Constitution at work.

- 1. The Constitution : Why and How ? The authority of a Constitution**
Why do we need a constitution?
- 2. Rights in the Indian Constitution**
The Importance of Rights, Fundamental Rights in the Indian Constitution, Direc

tive Principles of State Policy, Relationship between Fundamental Rights and Directive Principles.

3. Election and Representation

Elections of Democracy, Election System in India, Reservation of Constituencies, Free and Fair Elections, Electoral Reforms

4. Executive

What is an Executive? Different types of Executives. Parliamentary Executive in India: Prime Minister and Council of Ministers. Permanent Executive - Bureaucracy.

5. Legislature

Why do we need a Parliament? Two Houses of Parliament, Functions and Powers of the Parliament, Legislative Functions, control over executive. Parliamentary committees. Self-regulation.

6. Judiciary

Why do we need an Independent Judiciary? Structure of the Judiciary, Judicial Activism, Judiciary and Rights, Judiciary and Parliament.

7. Federalism

What is Federalism? Federalism in the Indian Constitution, Federalism with a strong Central Government, conflicts in India's federal system, Special Provisions.

8. Local Governments

Why do we need Local Governments? Growth of Local Government in India, 73rd and 74th Amendments, implementation of 73rd and 74th Amendments.

9. Constitution as a Living Document

Are Constitutions static? The procedure to amend the Constitution. Why have there been so many amendments? Basic Structure and Evolution of the Constitution. Constitution as a Living Document

Part B : Political Theory

10. Political Theory : An Introduction

What is Politics? What do we study in Political Theory? Putting Political Theory to practice. Why should we study Political Theory?

11. Freedom

The Ideal of Freedom. What is Freedom? Why do we need constraints? Harm principle. Negative and Positive Liberty

12. Equality

Significance of Equality. What is Equality? Various dimensions of Equality. How can we promote Equality?

13. Social Justice

What is Justice? Just Distribution. Justice as fairness. Pursuing Social Justice

14. **Rights**
What are Rights? Where do Rights come from? Legal Rights and the State. Kinds of Rights. Rights and Responsibilities
15. **Citizenship**
What is Citizenship? Citizen and Nation, Universal Citizenship, Global Citizenship
16. **Nationalism**
Nations and Nationalism, National Self-determination, Nationalism and Pluralism
17. **Secularism**
What is Secularism? What is Secular State? The Western and the Indian approach to Secularism. Criticism and Rationale of Indian Secularism
18. **Peace**
What is Peace? Can violence ever promote peace? Peace and the State. Different Approaches to the pursuit of peace. Contemporary challenges to peace

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2. **Disintegration of the ‘Second World’ and the Collapse of Bipolarity.**
New entities in world politics: Russia, Balkan states and Central Asian states, Introduction of democratic politics and capitalism in post-communist regimes. India’s relations with Russia and other post-communist countries.
3. **US Dominance in World Politics.**
Growth of unilateralism: Afghanistan, first Gulf War, response to 9/11 and attack on Iraq. Dominance and challenge to the US in economy and ideology. India’s renegotiation of its relationship with the USA.
4. **Alternative Centres of Economic and Political Power.**
Rise of China as an economic power in post Mao era, creation and expansion of European Union, ASEAN. India’s changing relations with China.
5. **International Organizations in a unipolar World.**
Restructuring and the future of the UN. India’s position in the restructured UN. Rise of new international actors: new international economic organisations, NGOs.
6. **Security in Contemporary World.**
Traditional concerns of security and politics of disarmament. Non-traditional or human security: global poverty, health and education. Issues of human rights and migration.
7. **Environment and Natural Resources in Global Politics:**
Environment movement and evolution of global environmental norms. Conflicts over traditional and common property resources. Rights of indigenous people. India’s stand in global environmental debates.
8. **Globalisation and Its Critics.**
Economic, cultural and political manifestations. Debates on the nature of consequences of globalisation. Anti-globalisation movements. India as an arena of globalisation and struggle against it.

Part B : Politics in India since Independence:

9. **Nation-Building and Its Problems.**
Nehru’s approach to nation-building: Legacy of partition: challenge of ‘refugee’ resettlement, the Kashmir problem. Organisation and reorganisation of states; Political conflicts over language.
10. **Era of One-Party Dominance.**
First three general elections, nature of Congress dominance at the national level, uneven dominance at the state level, coalitional nature of Congress. Major opposition parties.

- 11. India's External Relations.**
Nehru's foreign policy. Sino-Indian war of 1962, Indo-Pak war of 1965 and 1971. India's nuclear programme and shifting alliances in world politics.
- 12. Crisis of the Constitutional Order.**
Search for 'committed' bureaucracy and judiciary. Emergency : context, constitutional and extra-constitutional dimensions, resistance to emergency.
- 13. Regional Aspirations and Conflicts.**
Rise of regional parties. The Kashmir situation. Challenges and responses in the North East.
- 14. Rise of New Social Movements.**
Farmers' movements, Women's movement, Environment and Development - affected people's movements. Implementation of Mandal Commission report and its aftermath.
- 15. Recent Developments in Indian Politics.**
Participatory upsurge in 1990s. Rise of the JD and the BJP. Increasing role of regional parties and coalition politics. UF and NDA governments. Elections 2004 and UPA government. Rise of OBCs in North Indian politics. Dalit politics in electoral and non-electoral arena. Challenge of communalism: Ayodhya dispute, Gujarat riots.

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HISTORY

Rationale

Through a focus on a series of critical historical issues and debates (class XI) or on a range of important historical sources (class XII), the students would be introduced to a set of important historical events and processes. A discussion of these themes, it is hoped, would allow students not only to know about these events and processes, but also to discover the excitement of doing history.

Objectives

- Effort in these senior secondary classes would be to emphasize to students that history is a critical discipline, a process of enquiry, a way of knowing about the past, rather than just a collection of facts. The syllabus would help them understand the process through which historians write history, by choosing and assembling different types of evidence, and by reading their sources critically. They will appreciate how historians follow the trails that lead to the past, and how historical knowledge develops.
- The syllabus would also enable students to relate/compare developments in different situations, analyze connection between similar processes located in different time periods, and discover the relationship between different methods of social enquiry within different social sciences.
- The syllabus in class XI is organized around some major themes in world history. The themes have been selected so as to (i) focus on some important developments in different spheres - political, social, cultural and economic, (ii) study not only the grand narratives of development - urbanization, industrialization and modernization - but also to know about the processes of displacements and marginalization. Through the study of these themes students will acquire a sense of the wider historical processes as well as an idea of the specific debates around them.
- The treatment of each theme in class XI would include (a) a road picture of the theme under discussion, (b) a more detailed focus on one region of study, (c) an introduction to a critical debate associated with the issue.
- In class XII the focus will shift to a detailed study of some themes in Ancient, Medieval and Modern Indian history. The object would be to study a set of these themes in some detail and depth rather than survey the entire chronological span of Indian history. In this sense the course will be built on the knowledge that the students have acquired in the earlier classes.
- Each theme in class XII will also introduce the student to one type of

source for the study of history. Through such a study students would begin to see what different types of sources can reveal and what they cannot tell. They would come to know how historians analyze these sources, the problems and difficulties of interpreting each type of source, and the way a larger picture of an event, a historical process, or a historical figure, is built by looking at different types of sources.

- Each theme for class XII will be organized around four subheads: (a) a detailed overview of the events, issues and processes under discussion, (b) a summary of the present state of research on the theme, (c) an account of how knowledge about the theme has been acquired, (d) an excerpt from a primary source related to the theme, explaining how it has been used by historians.
- While the themes in both classes (XI and XII) are arranged in a broad chronological sequence, there are overlaps between them. This is intended to convey a sense that chronological divides and periodization do not always operate in a neat fashion.
- In the textbooks each theme would be located in a specific time and place. But these discussions would be situated within a wider context by (a) plotting the specific event within time-lines, (b) discussing the particular event or process in relation to developments in other places and other times.

**COURSE STRUCTURE
CLASS - XI**

Paper One	Time : 3 hours	100 Marks
Unit		Marks
1. Introduction to World History		
Section A : Early Societies		17
2. Introduction		
3. From the beginning of time		
4. Early Cities		
Section B. Empires		27
5. Introduction		
6. An empire across the three continents		
7. Central Islamic lands		
8. Nomadic Empires		
Section C : Changing Traditions		25
9. Introduction		

10.	Three orders	
11.	Changing cultural traditions	
12.	Conformation of cultures	
Section D : Paths of Modernization		25
13.	Introduction	
14.	The Industrial Revolution	
15.	Displacing indigenous People	
16.	Paths to modernization	
Map work (units 1 - 16)		10

Class XI : Themes in World History

Themes	Objectives
1. Introduction to World History	
SECTION A : EARLY SOCIETIES	
2. Introduction	
3. From the Beginning of Time Focus : Africa, Europe till 15000 BC (a) Views on the origin of human beings. (b) Early societies. (c) Historians' views' on present-day hunting- gathering societies.	<input type="checkbox"/> Familiarize the learner with ways of reconstructing human evolution. <input type="checkbox"/> Discuss whether the experience of present-day hunting-gathering people can be used to understand early societies.
4. Early Cities Focus : Iraq, 3rd millennium BC (a) Growth of towns. (b) Nature of early urban societies. (c) Historians' Debate on uses of writing.	<input type="checkbox"/> Familiarize the learner with the nature of early urban centres. <input type="checkbox"/> Discuss whether writing is significant as a marker of civilization.

<p>SECTION B : EMPIRES</p> <p>5. Introduction</p> <p>6. An Empire across Three Continents</p> <p>Focus : Roman Empire, 27 B.C to A.D 600. (a) Political evolution (b) Economic expansion (c) Historians views on the institution of Slavery.</p> <p>7. Central Islamic Lands</p> <p>Focus : 7th to 12th centuries (a) Polity (b) Economy (c) Culture. (d) Historians viewpoints on the nature of the crusades.</p> <p>8. Nomadic Empires :</p> <p>Focus : the Mongol, 13th to 14th century (a) The nature of nomadism. (b) Formation of empires. (c) Conquests and relations with other states. (d) Historians' views on nomadic societies and state formation.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Familiarize the learner with the history of a major world empire <input type="checkbox"/> Discuss whether slavery was a significant element in the economy. <input type="checkbox"/> Familiarize the learner with the rise of Islamic empires in the Afro-Asian territories and its implications for economy and society. <input type="checkbox"/> Understand what the crusades meant in these regions and how they were experienced <input type="checkbox"/> Familiarize the learner with the varieties of nomadic society and their institutions. <input type="checkbox"/> Discuss whether state formation is possible in nomadic societies.
<p>SECTION C : CHANGING TRADITIONS</p> <p>9. Introduction</p> <p>10. Three Orders</p> <p>Focus : Western Europe, 13th-16th century (a) Feudal society and economy : (b) Formation of states. (c) Church and Society. (d) Historian's views on decline of feudalism</p> <p>11. Changing cultural traditions</p> <p>Focus on Europe, 14th to 17th century'. (a) New ideas, and new trends in literature and arts. (b) Relationship with</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Familiarize the learner with the nature of the economy and society of this period and the changes within them. <input type="checkbox"/> Show how the debate on the decline of feudalism helps in understanding processes of transition. <input type="checkbox"/> Explore the intellectual trends in the period. <input type="checkbox"/> Familiarize students with the paintings and buildings of the period

<p>earlier ideas (c) The contribution of West Asia. (d) Historian’s view points on the validity of the notion ‘European Renaissance’.</p> <p>12. Confrontation of Cultures Focus on the America 15th to 18th century. (1) European voyages of exploration. (b) Search for gold; enslavement, raids, extermination. (c) Indigenous people and cultures the Arawaks, the Aztecs, the Incas. (c) The history of displacements. (d) Historian’s view points on the slave trade.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Introduce the debate around the idea of ‘Renaissance’. <input type="checkbox"/> Discuss changes in European economy that led to the voyages. <input type="checkbox"/> Discuss the implications of the conquests for the indigenous people. <input type="checkbox"/> Explore the debate on the nature of the slave trade and see what this debate tells us about the meaning of these “discoveries”.
<p>SECTION D : PATHS TO MODERNIZATION</p>	
<p>13. Introduction</p>	
<p>14. The Industrial Revolution Focus on England, 18th and 19th century. (a) Innovations and technological change (b) Patterns of growth (c) Emergence of a working class. (d) Historians’ viewpoints Debate, ‘Was there an Industrial Revolution?’</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Understand the nature of growth in the period and its limits. <input type="checkbox"/> Initiate students to the debate on the idea of industrial revolution.
<p>15. Displacing indigenous People. Focus on North America and Australia, 18th - 20th century, (a) European colonists in North America and Australia. (b) Formation of white settler societies. (c) Displacement and repression of local people, (d) Historians view points on the impact of European settlement on indigenous population.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Sensitize students to the processes of displacements that accompanied the development of America and Australia. <input type="checkbox"/> Understand the implications of such processes for the displaced populations.

<p>16. Paths to Modernization. Focus on East Asia. Late 19th and 20th century. (a) Militarization and economic growth in Japan. (b) China and the Communist alternative. (d) Historians' Debate on meaning of modernization</p> <p>17. Map Work on Units 1 - 15</p>	<ul style="list-style-type: none"> □ Make students aware that transformation in the modern world takes many different forms. □ Show how notions like 'modernization' need to be critically assessed.
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COURSE STRUCTURE
Class - XII

One Paper	100 Marks
Units	Marks
Section A: Archaeology & Ancient India Units 1 - 4	29
Section B : Medieval India Units 5 - 9	29
Section B : Modern India Unit 10 - 15	36
Unit 16 : Map Work	06

Class XII : Themes in Indian History

Themes	Objectives
<p>SECTION A : ARCHAEOLOGY & ANCIENT INDIA</p> <p>1. The Story of the First Cities : Harappan Archaeology.</p> <p>Broad overview : Early urban centres. Story of discovery : Harappan civilization Excerpt : Archaeological report on a major site. Discussion : how it has been utilized by archaeologists/historians.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Familiarize the learner with early urban centres as economic and social institutions <input type="checkbox"/> Introduce the ways in which new data can lead to a revision of existing notions of history. <input type="checkbox"/> Illustrate how archaeological reports are analyzed and interpreted by scholars.
<p>2. Political Economic History : How Inscriptions tell a story.</p> <p>Broad overview : Political and economic history from the Mauryan to the Gupta period. Story of discovery : Inscriptions and the decipherment of the script. Shifts in the understanding of political and economic history. Excerpt : Ashokan inscription and Gupta period land grant. Discussion : Interpretation of inscriptions by historians.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Familiarize the learner with major trends in the political and economic history of the subcontinent. <input type="checkbox"/> Introduce inscriptional analysis and the ways in which these have shaped the understanding of political and economic processes.
<p>3. Social Histories : Using the Mahabharata</p> <p>Broad overview : Issues in social history, including caste, class, kinship and gender. Story of discovery : Transmission and publications of the Mahabharat. Excerpt : from the Mahabharata, illustrating how it has been used by historians. Discussion : Other sources for reconstructing social history.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Familiarize the learner with issues in social history. <input type="checkbox"/> Introduce strategies of textual analysis and their use in reconstructing social history

<p>4. A History of Buddhism : Sanchi Stupa Broad overview : (a) A brief review of religious histories of Vedic religion, Jainism, Vaisnavism, Saivism. (b) Focus on Buddhism. Story of discovery : Sanchi stupa Excerpt : Reproduction of sculptures from Sanchi. Discussion : Ways in which sculpture has been interpreted by historians, other sources for reconstructing the history of Buddhism.</p>	<ul style="list-style-type: none"> □ Discuss the major religious developments in early India. □ Introduce strategies of visual analysis and their use in reconstructing histories of religion
<p>SECTION B : MEDIEVAL INDIA</p> <p>5. Medieval Society Through Travellers' Accounts.</p> <p>Broad Overview : Outline of Social and cultural life as they appear in travellers' accounts. Story of their writings : A discussion of where they travelled, why they travelled, what they wrote, and for whom they wrote. Expert : from Alberuni, Ibn Batuta, Bernier. Discussion : What these travel accounts can tell us and how they have been interpreted by historians.</p>	<ul style="list-style-type: none"> □ Familiarize the learner with the salient features of Social histories described by the travellers. □ Discuss how travellers' accounts can be used as sources of Social history
<p>6. Religious Histories : The Bhakti - Sufi tradition Board Overview : (a) Outline of religious developments during this period. (b) Ideas and Practices of the Bhakti-Sufi saints.</p>	<ul style="list-style-type: none"> □ Familiarize the learner with religious developments. □ Discuss ways of analyzing devotional literature as sources of history.

THEMES	OBJECTIVES
<p>Story of Transmission : How Bhakti-Sufi compositions have been preserved.</p> <p>Excerpt : Extracts from selected Bhakti-Sufi works.</p> <p>Discussion : Ways in which these have been interpreted by historians.</p>	
<p>7. New Architecture : Hampi</p> <p>Broad Overview : (a) Outline of new buildings during Vijayanagar period - temples, forts, irrigation facilities. (b) Relationship between architecture and the political system.</p> <p>Story of Discovery : Account of how Hampi was found.</p> <p>Excerpt : Visuals of buildings at Hampi</p> <p>Discussion : Ways in which historians have analyzed and interpreted these structures.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Familiarize the learner with new buildings that were built during the time. <input type="checkbox"/> Discuss the ways in which architecture can be analyzed to reconstruct history.
<p>8. Agrarian Relations : The Ain-i-Akbari</p> <p>Broad Overview : (a) Structure of agrarian relations in the 16th and 17th centuries. (b) Patterns of Change over the period.</p> <p>Story of Discovery : Account of the compilation and translation of Ain-i-Akbari.</p> <p>Excerpt : from the Ain-i-Akbari</p> <p>Discussion : Ways in which historians have used the text to reconstruct history.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss developments in agrarian relations. <input type="checkbox"/> Discuss how to supplement official documents with other sources.
<p>9. The Mughal Court : Reconstructing Histories through chronicles.</p> <p>Broad Overview : (a) Outline of political history 15th - 17th Centuries. (b) Discussion of the Mughal court and politics.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Familiarize the learner with the major land marks in political history. <input type="checkbox"/> Show how chronicles and other sources are used to reconstruct the histories of political institutions.

<p>Story of Discovery : Account of the production of court chronicles, and their subsequent translation and transmission.</p> <p>Excerpts : from the Akbarnama and Padshahnama</p> <p>Discussion : Ways in which historians have used the texts to reconstruct political histories.</p>	
<p>SECTION C : MODERN INDIA</p> <p>10. Colonialism and - Rural Society : Evidence from Official Reports</p> <p>Broad overview : (a) Life of zamindars, peasants and artisans in the late 18 century (b) East India Company, revenue settlements and surveys. (c) Changes over the nineteenth century.</p> <p>Story of official records : An account of why official investigations into rural societies were undertaken and the types of records and reports produced.</p> <p>Excerpts : From Firminger’s Fifth Report, Accounts of Frances Buchanan-Hamilton, and Deccan Riots Report.</p> <p>Discussion : What the official records tell and do not tell, and how they have been used by historians.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss how colonialism affected Zamindars, peasants and artisans. <input type="checkbox"/> Understand the problems and limits of using official sources for understanding the lives of people.
<p>11. Representations of 1857</p> <p>Broad Overview : (a) The events of 1857 - 58. (b) How these events were recorded and narrated.</p> <p>Focus : Lucknow.</p> <p>Excerpts : Pictures of 1857. Extracts from contemporary accounts.</p> <p>Discussion : How the pictures of 1857 shaped British opinion of what had happened.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss how the events of 1857 are being reinterpreted. <input type="checkbox"/> Discuss how visual material can be used by historians

<p>12. Colonialism and Indian Towns : Two Plans and Municipal Reports Broad Overview : The growth of Mumbai, Chennai, hill stations and cantonments in the 18th and 19th century. Excerpts : Photographs and paintings. Plans of cities. Extract from town plan reports. Focus on Kolkata town planning. Discussion : How the above sources can be used to reconstruct the history of towns. What these sources do not reveal.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Familiarize the learner with the history of modern urban centres. <input type="checkbox"/> Discuss how urban histories can be written by drawing on different types of sources.
<p>13. Mahatma Gandhi through Contemporary Eyes Broad Overview : (a) The nationalist movement 1918 - 48, (b) The nature of Gandhian politics and leadership. Focus : Mahatma Gandhi in 1931. Excerpts : Reports from English and Indian language newspapers and other contemporary writings. Discussion : How newspapers can be a source of history.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Familiarize the learner with significant elements of the nationalist movement and the nature of Gandhian leadership. <input type="checkbox"/> Discuss how Gandhi was perceived by different groups. <input type="checkbox"/> Discuss how historians need to read and interpret newspapers, diaries and letters as historical source.
<p>14. Partition through Oral Sources Broad Overview : (a) The history of the 1940s; (b) Nationalism. Communalism and Partition. Focus : Punjab and Bengal. Excerpts : Oral testimonies of those who experienced partition. Discussion : Ways in which these have been analyzed to reconstruct the history of the event.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss the last decade of the national movement, the growth of communalism and the story of Partition. <input type="checkbox"/> Understand the events through the experience of those who lived through these years of communal violence. <input type="checkbox"/> Show the possibilities and limits of oral sources.
<p>15. The Making of the Constitution Broad Overview : (a) Independence and the new nation state. (b) The making of the constitution.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Familiarize students with the history of the early years after independence.

<p>Focus : The Constitutional Assembly debates.</p> <p>Excerpts : from the debates.</p> <p>Discussion : What such debates reveal and how they can be analyzed.</p>	<p><input type="checkbox"/> Discuss how the founding ideals of the new nation state were debated and formulated.</p> <p><input type="checkbox"/> Understand how such debates and discussions can be read by historians.</p>
<p>16. Map Work on Units 1 - 15</p>	

SOCIOLOGY

Rationale

Sociology is introduced as an elective subject at the senior secondary stage. The syllabus is designed to help learners to reflect on what they hear and see in the course of everyday life and develop a constructive attitude towards society in change; to equip a learner with concepts and theoretical skills for the purpose. The curriculum of Sociology at this stage should enable the learner to understand dynamics of human behaviour in all its complexities and manifestations. The learners of today need answers and explanations to satisfy the questions that arise in their minds while trying to understand social world. Therefore, there is a need to develop an analytical approach towards the social structure so that they can meaningfully participate in the process of social change. There is scope in the syllabus not only for interactive learning, based on exercises and project work but also for teachers and students to jointly innovate new ways of learning.

- Sociology studies society. The child's familiarity with the society in which she/he lives in makes the study of sociology a double edged experience. At one level sociology studies institutions such as family and kinship, class, caste and tribe religion-contexts with which children are familiar, even if differentially. For India is a society which is varied both horizontally and vertically. The effort in the books will be to grapple overtly with this both as a source of strength and as a site for interrogation.
- Significantly the intellectual legacy of sociology equips the discipline with a plural perspective that overtly engages with the need for defamiliarization, to unlearn and question the given. This interrogative and critical character of sociology also makes it possible to understand both other cultures as well as relearn about one's own culture.
- This plural perspective makes for an inbuilt richness and openness that not too many other disciplines in practice share. From its very inception sociology has had mutually enriching and contesting traditions of an interpretative method that openly takes into account 'subjectivity' and causal explanations that pay due importance to establishing causal correspondences with considerable sophistication. Not surprisingly its field work tradition also entails large scale survey methods as well as a rich ethnographic tradition. Indeed Indian sociology, in particular has bridged this distinction between what has often been seen as distinct approaches of sociology and social anthropology. The syllabus provides ample opportunity to make the child familiar with the excitement of field work as well as its theoretical significance for the very discipline of sociology.

- The plural legacy of sociology also enables a bird's eye view and a worm's eye view of the society the child lives in. This is particularly true today when the local is inextricably defined and shaped by macro global processes.
- The syllabus proceeds with the assumption that gender as an organizing principle of society cannot be treated as an add on topic but is fundamental to the manner that all chapters shall be dealt with.
- The chapters shall seek for a child centric approach that makes it possible to connect the lived reality of children with social structures and social processes that sociology studies.
- A conscious effort will be made to build into the chapters a scope for exploration of society that makes learning a process of discovery. A way towards this is to deal with sociological concepts not as givens but a product of societal actions humanly constructed and therefore open to questioning.

Objectives

1. To enable learners to relate classroom teaching to their outside environment.
2. To introduce them to the basic concepts of sociology that would enable them to observe and interpret social life.
3. To be aware of the complexity of social processes.
4. To appreciate diversity in society in India and the world at large.
5. To build the capacity of students to understand and analyze the changes in contemporary Indian society.

COURSE STRUCTURE CLASS - XI

**One Paper Theory
Unitwise Weightage**

3 Hours

Marks :100

Units	Marks
A. Introducing Sociology	
1. Society, Sociology and relationship with other social sciences	10
2. Basic Concepts	10
3. Social Institutions	10
4. Culture and Society	10
5. Doing Sociology: Research Methods	10

B. Understanding Society

6. Structure, Process and Stratification	10
7. Social Change	10
8. Environment and Society	10
9. Western Social Thinkers	10
10. Indian Sociologists	10

A. INTRODUCING SOCIOLOGY

Unit 1 : Society & Sociology and Relationship with other social sciences

- Introducing Society : Individuals and collectivities. Plural Perspectives
- Introducing Sociology : Emergence, Nature & Scope. Relationship to other disciplines

Unit 2 : Basic Concepts

- Social Groups
- Status and Role
- Social Stratification
- Social Control

Unit 3 : Social Institutions

- Family and Kinship
- Political and Economic Institutions
- Religion as a Social Institution
- Education as a Social Institution

Unit 4 : Culture And Society

- Culture, Values and Norms: Shared, Plural, Contested
- Socialization : Conformity, Conflict and the Shaping of Personality

Unit 5 : Practical Sociology : Methods & Techniques

- Tools and Techniques : Observation, Survey, Interview
- The Significance of Field Work in Sociology

B. UNDERSTANDING SOCIETY

Unit 6 : Structure, Process and Stratification

- Social Structure
- Social Processes: Cooperation, Competition, Conflict
- Social Stratification: Class, Caste, Race, Gender.

Unit 7 : Social Change

- Social Change: Types and Dimensions; Causes and Consequences.
- Social Order : Domination, Authority & Law; Contestation, Crime & Violence
- Village, Town & City: Changes in Rural & Urban Society

Unit 8 : Environment And Society

- Ecology and Society
- Environmental Crises and Social Responses

Unit 9 : Western Social Thinkers

- Karl Marx on Class Conflict
- Emile Durkheim on Division of Labour
- Max Weber on Bureaucracy

Unit 10 : Indian Sociologists

- G.S. Ghurye on Race and Caste
- D.P.Mukherji on Tradition and Change
- A.R.Desai on the State
- M.N.Srinivas on the Village

**COURSE STRUCTURE
CLASS - XII**

One Paper Theory Unitwise Weightage	3 Hours	Marks 100
Units		2008
Indian Society		
1. Introducing Indian Society		Non-evaluative
2. Demographic Structure & Indian Society		10
3. Social Institutions-Continuity and change		08
4. Market as a Social Institution		08
5. Pattern of Social Inequality and Exclusion		12
6. Challenges of Cultural Diversity		12
7. Suggestions for Project Work		Non-evaluative
Change and Development in Indian Society		
8. Structural Change		06
9. Cultural Change		06
10. The Story of Democracy		06
11. Change and Development in Rural Society		06
12. Change and Development in Industrial Society		06
13. Globalization and Social Change		06
14. Mass Media and Communications		06
15. Social Movements		08

INDIAN SOCIETY

Unit 1 : Introducing Indian Society

- Colonialism, Nationalism, Class and Community

Unit 2 : Demographic Structure And Indian Society

- Rural-Urban Linkages and Divisions

Unit 3 : Social Institutions : Continuity & Change

- Family and Kinship
- The Caste System

Unit 4 : Market As A Social Institution

- Market as a Social Institution

Unit 5 : Pattern of Social Inequality & Exclusion

- Caste Prejudice, Scheduled Castes and Other Backward Classes
- Marginalization of Tribal Communities
- The Struggle for Women's Equality
- The Protection of Religious Minorities
- Caring for the Differently Abled

Unit 6 : The Challenges Of Cultural Diversity

- Problems of Communalism, Regionalism, Casteism & Patriarchy
- Role of the State in a Plural and Unequal Society
- What We Share

Unit 7 : Suggestions For Project Work**B. CHANGE AND DEVELOPMENT IN INDIA****Unit 8 : Structural Change**

- Colonialism, Industrialization, Urbanization.

Unit 9 : Cultural Change

- Modernization, Westernization, Sanskritisation, Secularization.
- Social Reform Movements & Laws

Unit 10 : The Story Of Democracy

- The Constitution as an instrument of Social Change
- Parties, Pressure Groups and Democratic Politics
- Panchayati Raj and the Challenges of Social Transformation

Unit 11 : Change And Development In Rural Society

- Land Reforms, Green Revolution and Agrarian Society

Unit 12 : Change And Development In Industrial Society

- From Planned Industrialization to Liberalization
- Changes in the Class Structure

Unit 13 : Globalisation And Social Change**Unit 14 : Mass Media And Communication Process**

Unit 15 : Social Movements

- Class-Based Movements: Workers, Peasants.
- Caste-Based Movements : Dalit Movement, Backward Castes, Trends in Upper Caste Responses.
- Women's Movements in Independent India.
- Tribal Movements.
- Environmental Movements.

EDUCATION

COURSE STRUCTURE CLASS XI

Unitwise Weightage

Units	Marks
1. Concept of Education	10
2. Constitutional Provisions Relating to Education	} 14
3. Education and National Objectives	
4. Aims of Education	08
5. Curriculum	10
6. Agencies of Education	08
7. Educational Ideas of Some Great Educators	12
8. Population Education	} 14
9. Adult Education in India	
10. Value-Oriented Education	06
11. Evaluation of Education	08
	Total 90
	Practical Work 10
	Grand Total 100

Unit 1 : **Concept of Education**

Meaning of Education, Narrower and Wider Meaning of Education
Types of Education : Formula, Informal and Non-Formal Education
Meaning of Literacy.
Distinction between Education and Literacy.

Unit 2 : **Constitutional Provision Relating to Education**

Free and Compulsory Education.
Religious Instructions.
Language Safeguards.
Equality of opportunity.
Education of Minorities.
Education of Weaker Sections : Scheduled Caste and Scheduled Tribe.
Education of Anglo-Indian Community.
Instruction of Mother Tongue.
Development of Hindi.
Education in the Union Territories.

- Higher Education and Research.
Education and Cultural Relations with Foreign Countries.
- Unit 3 :** **Educational and National Objectives**
A detailed study of Chapter I of the report of the Education Commission (1964-1966).
- Unit 4 :** **Aims of Education**
Education for Individual Development
Education for Social Development
Synthesis Between Individual and Social Aims of Education
Education for National Development
- Unit 5 :** **Curriculum**
Meaning of Curriculum
Principles of Curriculum Construction
Importance of Co-curricular Activities in Curriculum
- Unit 6 :** **Agencies of Education**
Formal, Informal and Non-formal Agencies of Education
Characteristics and Role of These in the Process of Education
- Unit 7 :** **Educational Ideas of Some Great Educators**
Pestalozzi, Montessori, Gandhiji and Tagore
Their Brief Life Sketch, Educational Ideas and Relevance of Their Ideas in the Present Education
- Unit 8 :** **Population Education**
Education problems due to over population : Over Crowding in Classes, Students indiscipline, Wastage and Stagnation. Problems in School Building, Furniture and Equipment, School Staff Quality of Education
Meaning and Scope of Population Education
- Unit : 9** **Adult Education in India**
Meaning of Adult Education
National Adult Education Programme (NAEP), its Objectives

Methods and Aids for the Promotion of Adult Literacy

Unit : 10 Value Oriented Education

Meaning of Values and Value-Oriented Education
Classification of Values
Need for Value Oriented Education
Inculcation of Values through Education

Unit :11 Evaluation of Education

Concept of Education
Types of Written Examination : Objective Type, Short Answer Type and Essay Type.
Merits and Demerits of the Three Types of Written Examination
Continuous and Comprehensive Evaluation

SUGGESTED ACTIVITIES FOR CLASS XI

The following simple activities are suggested so as to make learning activity-based and a joyful activity.

Unit 1 : Each student may be asked to prepare posters/ charts in which he/she will have to write in coloured pencils or crayons-

- (i) one definition of education as given by any of the educationists in one column and his/her own perception of the meaning of education in one sentence in another column.
- (ii) Meaning of formal, informal and non-formal education in one sentence in each in three columns.

Unit 2 : Preparation of a poster/chart depicting constitutional provisions relating to education along with the numbers of Articles of the Constitution.

Unit 3 : Preparation of a poster/chart showing the five National Objectives.

Unit 4 : Debate may be organized in the class on the motion : “Individual development not social development should be the aim of education”.

- Unit 5 :**
- (i) Preparation of a poster/chart depicting meaning of curriculum and main principles of curriculum construction.
 - (ii) After completing Unit-5, Quiz on the first five units already completed may be organized. Students may be divided into groups and quiz be conducted by the concerned teacher in the class.

Unit 6 : All or any one of the following three activities suggested below may be carried out

- (i) Preparation of a chart depicting various informal agencies of education in one column and that of non-formal in other column.
- (ii) Each student may be required to visit one agency functioning in his/her locality that imparts non-formal education and write on how the agency imparts non-formal education to the beneficiaries. (Some examples of non-formal agencies of education are Adult Education Centre, Centre of Correspondence Course, Open and Distant Learning Centres, Anganwadis)
- (iii) A group of students may be taken to any of the non-formal education centres, and let them observe or study the functioning of the centre. Discussion about the visit may be organised later in the classroom or each student may be required to write a report on the visit.

Unit 7 : Quiz may be organized in classroom on Unit-7 : Educational Ideas of Some Great Educators” after the unit is wholly completed.

Unit 8 : Debate may be organized on the Motion : “Educational Problems are Due to Over Population”

Unit 9 : Stories should be told. The stories should be such that can be used as a means for inculcation of values. Students may be required to collect stories having good morals from their parents, grandparents and other sources.

- Unit 10 :**
- (i) A chart showing meaning of evaluation and types of written examination may be prepared by the students.
 - (ii) Quiz on Units - 6, 8, 9, 10 and 11 may be organized in the class.

COURSE STRUCTURE
CLASS - XII

Unitwise Weightage	100 Marks
Units	Marks
1. Psychology as behavioural Science	08
2. Growth and development upto Adolescence	12
3. Heredity and Environment	08
4. Learning	12
5. Habit	06
6. Attention	06
7. Memory and Forgetting	08
8. Intelligence	10
9. Personality	10
10. Basic Needs	06
11. Mental Hygiene & Mental Health	08
12. Basic Concept of Guidance & Counselling	06

Objectives: To acquaint the students with the knowledge of Psychology as a Science of Human Behaviour.

- Unit 1 :** **Psychology as a behavioural Science**
 Meaning of Psychology, Relationship between Psychology and Education.
 Meaning of Educational Psychology; Nature and scope of Educational Psychology.
 Educational Psychology and the teacher.
- Unit 2 :** **Growth and Development upto Adolescence**
 Meaning of Growth & Development
 Principles of Growth and development & their educational implications.
 Physical Development upto adolescence.
 Needs and problems of adolescence.
- Unit 3 :** **Heredity and Environment**
 Meaning of heredity. Meaning of environment, Types of environment,
 Role of heredity and environment in our lives.
 Theories of heredity.

- Unit 4 : Learning**
Concept of Learning.
Theories of Learning- Trial and Error; Conditioning;
Insight and their educational Implications.
Laws of Learning.
Factors affecting learning.
Types of learning.
- Unit 5 : Habits**
Meaning, Characteristics.
Formation and Dissolution of habits.
Role of teachers and parents in forming good habits.
Importance of habits in life
- Unit 6 : Attention**
Meaning of attention and interest.
Characteristics of attention.
Types of attention.
Factors affecting attention.
How to secure attention.
Educational implementation of interest.
Relationship between attention and interest
- Unit 7 : Memory and Forgetting**
Meaning of memory;
Registration, retention, recognition and recall.
Factors affecting memory.
Aids for facilitating memory.
Meaning of forgetting; causes of forgetting; remedies for forgetfulness.
- Unit 8 : Intelligence**
Definitions, Concept of I.Q. Individual differences in intelligence.
Theories of Intelligence-Unitary Theory of Alfred Binet and Two Factor
Theory of Spearman.
Uses of Intelligence Test.
Measurement of Intelligence Test.

- Unit 9 :** **Personality**
Its meaning; Typology of Personality
Method of assessing Personality
- Unit 10:** **Basic Needs**
Meaning of Needs and ‘Drives’
Biological, Social and Emotional.
Educational significance of needs.
- Unit 11:** **Mental Hygiene and Mental Health**
Concept of Mental Health and Hygiene
Adjustment Mechanisms.
Mental health of the teacher.
Factors affecting Adjustment at home and school.
- Unit 12:** **Guidance and Counselling**
Concept and types of Guidance
Nature of counselling
Need and Importance of guidance
Aims of guidance
Meaning, types of counselling.

PSYCHOLOGY

Psychology is introduced as an elective subject at the higher secondary stage of school education. As a discipline, Psychology specializes in the study of experiences, behaviours and mental processes of human beings within a socio-cultural and socio-historical context. This course purports to introduce the learners to the basic ideas, principles and methods in Psychology so as to enable them to understand themselves and their social world better. The emphasis is put on creating interest and exposure needed by learners to develop their own knowledge base and understanding.

The course deals with psychological knowledge and practices which are contextually rooted. It emphasizes the complexity of behavioural processes and discourages simplistic cause-effect thinking. This is pursued by encouraging critical reasoning, allowing students to appreciate the role of cultural factors in behaviour, and illustrating how biology and experience shape behaviour. The course while developing an appreciation of subjectivity, also focuses on multiplicity of worldviews.

It is suggested that the teaching - learning processes should involve students in evolving their own understanding, therefore, teaching of Psychology should be based on the use of case studies, narratives, experiential exercises, analysis of common everyday experiences, etc.

The present effort at reforming and updating the syllabus is based on the feedback received from the teachers and students as well as some new educational and curriculum concerns such as, the curriculum load, interdisciplinary approach, issues related to gender parity, concerns of special and marginalised groups, peace and environmental concerns, and inculcating citizenship values.

Objectives

1. To develop appreciation about human behaviour and human mind in the context of learners' immediate society and environment.
2. To develop in learners an appreciation of multidisciplinary nature of psychological knowledge and its application in various aspects of life.
3. To enable learners to become perceptive, socially aware and self-reflective.
4. To facilitate students' quest for personal growth and effectiveness, and to enable them to become responsive and responsible citizens.

COURSE STRUCTURE
CLASS - XI (Theory)

One Theory Paper
Unitwise weightage

3 Hours

Marks : 70

Units	Marks
Foundations of Psychology	
I. Introduction to Psychology/What is Psychology	08
II. Methods of Psychology	09
III. The Bases of Human Behaviour	08
IV. Human Development	07
V. Sensory and Perceptual Processes	08
VI. Learning	08
VII. Human Memory	08
VIII. Language and thought/Thinking	07
IX. Motivation and Emotion	07
Practicals (Projects, experiments, small studies)	30

Foundations of Psychology

Unit I : Introduction to Psychology/What is Psychology **08 Marks**

The unit seeks to help understanding and appreciating psychology as a discipline, its applications and relationships with other sciences through appropriate and interesting examples and analysis of everyday experiences.

Nature of psychology; Basic concepts: Person, Consciousness, Behaviour and Experience: Similarities and variations in psychological attributes; Evolution of the discipline of psychology; Developments in psychology in India; Psychology and other disciplines; Branches of Psychology.

Unit II : Methods of Psychology **09 Marks**

The objective of this unit is to familiarize with the methods of studying and understanding psychological questions and issues.

Goals of psychological enquiry; Some important methods : Observation, Naturalistic, Experimental; Correlational study; Interview, Case study; Psychological tools, Questionnaires and gadgets; Ethical issues in the study of psychological processes.

Unit III : The Bases of Human Behaviour **08 Marks**

This unit focuses on the role of biological and socio-cultural factors in the shaping of human behaviour and experience.

Evolutionary perspective on human behaviour; Biological and cultural roots; Nervous system and endocrine system: Structure and relationship of behaviour and experience; Brain and behaviour. Genetic bases of behaviour; Culture and human behaviour: Socialization, Enculturation and Acculturation;

Unit IV : Human Development

07 Marks

This unit deals with variations in development and the developmental tasks across the life span

Meaning of development; Factors influencing development; Contexts of development; Overview of developmental stages : Prenatal development, Infancy, Childhood, Adolescence (particularly issues of identity, health, social participation), Adulthood and Old age.

Unit V : Sensory and Perceptual Process

08 Marks

This unit aims at understanding how various sensory stimuli are received, attended to and given meaning.

Knowing the world; Nature of stimuli; Nature and functioning of sense modalities; Sensory Adaptation; Attention : Nature and determinants; Selective and sustained attention; Principles of perceptual organization; Role of perceiver, characteristics in perception; Perceptual phenomena : After images; Space Perception, Perceptual constancy, Illusions, Person perception; Socio-cultural influences on perception.

Unit VI : Learning

08 Marks

This unit focuses on how human beings acquire new behaviour and how changes in behaviour take place.

Nature of learning. Paradigms of learnings: Classical and Operant Conditioning, Observational Learning, Cognitive learning, Verbal learning, Concept learning, skill-learning; Factors facilitating learning; Transfer of learning : Types and Applications, Learning styles : Learning disabilities; Some Applications of learning principles.

Unit VII : Human Memory

08 Marks

This unit deals with how information is received, stored, retrieved and lost. It will also discuss how memory can be improved.

Nature of memory; Information Processing Approach; Levels of processing; Memory systems - Sensory memory, Short-term memory, Long-term memory; Knowledge representation and organisation in memory; Memory as a constructive process; Nature and causes of forgetting; Enhancing memory;

Unit VIII : Language and Thought/Thinking**07 Marks**

This unit deals with thinking and related processes like reasoning, problem-solving, decision making and creative thinking and relationship between thought and language.

Thought and language : Nature and interrelationship; Stages of cognitive development : Introduction to the ideas of Piaget, Vygotsky, and Information, Processing Approach: Development of language and language use; Reasoning: Problem-solving; Decision making; Creative thinking: Nature, process and development.

Unit IX : Motivation and Emotion**07 Marks**

This unit focuses on why human beings behave as they do. It also deals with how people experience positive and negative events and respond to them.

Human existence and nature of motivation; Biological needs; Social and psychological motives : Achievement, Affiliation and Power, Maslow's hierarchy of needs; Nature of emotions; Physiological, cognitive and cultural bases of emotions; Expression of emotions; Positive emotions; Happiness, Optimism, Empathy and Gratitude; Development of positive emotions; Managing negative emotions such as anger and fear.

Practicals (Projects, experiments, small studies, etc.)**30 Marks**

The students shall be required to undertake one project and conduct three practicals. The project would involve the use of different methods of enquiry and related skills. Practical would involve conducting experiments and undertaking small studies, exercises, related to the topics covered in the course (e.g. Human development, Learning, Memory, Motivation, Perception, Attention and Thinking).

(i) Reporting file including Project work;

05 Marks

(ii) Viva Voce :

05 Marks

(iii) Two experiments : **10 marks each** (05 for conduct and 05 for reporting)

COURSE STRUCTURE
CLASS - XII (Theory)

One Theory Paper
Unitwise weightage

Marks 70

Units

Marks

Psychology, Self and Society

I.	Intelligence and Aptitude/Variations in Psychological Attributes	09
II.	Self and Personality	10
III.	Human Strengths and meeting the Life Challenges	07
IV.	Psychological Disorders	10
V.	Therapeutic Approaches	07
VI.	Attitude and Social Cognition	08
VII.	Social Influence and Group Processes	07
VIII.	Environmental and Social concerns/Psychology and Life	06
IX.	Professional Skills for Psychologists/Developing Psychological Skills	06
	Practicals (Psychological testing, Case Profile etc.)	30

Psychology, Self and Society

Unit I : Intelligence and Aptitude/

Variations in Psychological Attributes

09 Marks

The unit aims at studying how people differ with respect to intelligence and aptitude.

Individual differences in intelligence: Theories of Intelligence; Culture and Intelligence; Emotional intelligence; Aptitude : Nature, creativity and Intelligence.

Unit II : Self and Personality

10 Marks

This unit focuses on the study of self and personality in the context of different approaches in an effort to appraise the person. The assessment of personality will also be discussed.

Aspects of self: self concept: Self-esteem and Self-regulation; Culture and self; Personality: Concept; Approaches to Personality : Type and Trait, Psychodynamic, Humanistic, Behavioural and Cultural; Assessment of Personality : Self-report Measures, Behavioural Analysis, and Projective Measures.

Unit III : Human Strengths and Meeting Life Challenges

07 Marks

This unit deals with the nature of stress and how responses to stress depend

on an individual's appraisal of stressors. Strategies to cope with stress will also be dealt with.

Stress : Nature, Sources, types and effects on psychological functioning; Coping with stress; Concepts of health and well-being Life style, health and well-being.

Unit IV : Psychological Disorders

10 Marks

This unit discusses the concepts of normality and abnormality and the major psychological disorders.

Concepts of abnormality and psychological disorder, Causal factors associated with abnormal behaviour, Classification of disorder, Major psychological disorders : Anxiety, Somato-form Dissociative, Mood, Schizophrenic, Developmental and Behavioural Substance Related.

Unit V : Therapeutic Approaches

07 Marks

This unit discusses the goals, techniques and effectiveness of different approaches to treat psychological disorders.

Nature and process of therapy; Nature of therapeutic relationship; Types of therapies: Psychodynamic, Humanistic, Cognitive, Behaviour; Rehabilitation of mentally ill people; Biomedical therapies; Ethics in Psychotherapy.

Unit VI : Attitude and Social Cognition

08 Marks

This unit focuses on the formation and change of attitudes, cultural influences on attributional tendencies and conditions influencing pro-social behaviour.

Explaining behaviour through attributions; Social cognition; Schemas and stereotypes; Impression formation; Nature and components of attitudes; Attitude formation and change; Behaviour in the presence of others: Pro-social Behaviour; Prejudice and discrimination; Strategies for handling prejudice.

Unit VII : Social Influence and Group Processes

07 Marks

The unit deals with the concept of group, its functions and the dynamics of social influence process like conformity, obedience and compliance. Different conflict resolution strategies will also be discussed.

Influence Processes : Nature of Conformity, Obedience, and Compliance : Cooperation and Competition; Groups : Nature, formation and types; Influence of group on individual behaviour; Social identity; Inter-Group Conflict; Conflict Resolution Strategies.

Unit VIII : Environmental and Social Concerns/ Psychology and Life

06 Marks

This unit focuses on the application of psychological understanding to some

important social issues.

Human-environment relationship; Environmental effects on human behaviour. Noise, pollution, crowding, natural disasters, social issue; Aggression and Violence; Social Inequality and Poverty; Media and human values; Promoting pro-environmental behaviour; Peace.

Unit IX : Professional Skills for a Psychologist/

Developing Psychological Skills

06 Marks

This unit deals with some effective psychological and interpersonal skills for facilitating personal-social development.

Psychological skills : Observation, Interviewing, Testing, Counseling and Communication.

Psychological testing Practicals

30 Marks

The students shall be required to prepare one case profile and conduct 5 practicals related to the topics covered in the course. The case profile will include developmental history of the subject, using both qualitative (observation, interview) and quantitative (Psychological testing) approaches. Practicals would involve using standardised psychological assessment devices in different domains (e.g. intelligence, personality, aptitude, adjustment, attitude, self-concept, and anxiety).

Distribution of Marks:

- | | | |
|-------|---|-----------------|
| (i) | Reporting file including case profile: | 05 Marks |
| (ii) | Viva Voce : | 05 Marks |
| (iii) | Two practicals 10 marks each (5 for accurate conduct and 5 for reporting). | |

COMPUTER SCIENCE

Learning objectives :

1. To develop logic for problem solving.
2. To understand the concept of Object Oriented Methodology.
3. To implement Object Oriented Programming using C++.
4. To understand the concept of working with Relational Database.
5. To understand the basic concept of algebra of logic.
6. To understand and explore the world of communication and networks.
7. To understand the concept of Web Services
8. To understand localisation issues.

Competencies :

The student will be proficient in the following :

1. Identification of a computer System.
2. Problem Solving using object oriented programme.
3. Designing an efficient logic using object oriented approach for solution development handling.
4. Database handling.
5. Logic Circuit designing.
6. Network concepts and Web services.

COURSE STRUCTURE CLASS - XI (Theory)

Unit No.	Unit Name	Marks
1.	COMPUTER FUNDAMENTALS	10
2.	PROGRAMMING METHODOLOGY	10
3.	INTRODUCTION TO C++	15
4.	PROGRAMMING IN C++	35
	Total	70

UNIT 1 : COMPUTER FUNDAMENTALS

Evolution of computers; Basics of computer and its operation: Functional components and their interconnections, concept of Booting.

Software concepts:

Types of Software-System software, Utility Software and Application software.

System software: Operating system, Compilers, Interpreters and Assembler.

Utility software: Anti Virus, File Management tools, Compression tools and Disk Management tools (Disk Cleanup, Disk Defragmenter, Backup);

Application Software as a tool: Word Processor, Presentation tools, Spreadsheet Package, Database Management System; Business software (for example: School Management System, Inventory Management System, Payroll System, Financial Accounting, Hotel Management and Reservation System).

Operating System: Need for Operating System, Functions of Operating System, (Processor Management, Memory management, File Management and Device Management), Types of operating system-Interactive (GUI based), Time Sharing, Real Time and Distributed; Commonly used operating systems: LINUX, Windows, BhartiOO, Solaris, UNIX;

Illustration and practice of the following tasks using any one of the above Operating Systems:

- Opening /Closing Windows
- Creating /Moving/Deleting Files/Folders
- Renaming Files/Folders
- Switching between Tasks

Number System : Binary, Octal, Decimal, Hexadecimal and conversion between two different number systems;

Internal Storage encoding of Characters: ASCII, ISCII (Indian scripts Standard Code for Information Interchange) and UNICODE;

Microprocessor: Basic concepts, clock speed (MHz, GHz), 16 bit, 32 bit, 64 bit processors; Types-CISC, RISC;

Memory concepts :

Units : Byte, Kilo Byte, Mega Byte, Giga Byte, Tera Byte, Peta Byte

Primary Memory : Cache, RAM, ROM,

Secondary Memory : Hard Disk Drive, CD/DVD Drive, Pen Drive, Blue Ray Disk;

Input Output Ports/Connections: Serial, parallel and Universal Serial Bus, PS-2 Port, Infrared Port, Bluetooth.

Unit 2 : PROGRAMMING METHODOLOGY

General Concepts; Modular approach; Clarity and Simplicity of Expressions, Use of proper names for identifiers, Comments, Indentation; Documentation and Programme Maintenance; Running and Debugging programs, Syntax Errors, Run-Time Errors, Logical Errors;

Problem Solving Methodology and Techniques: Understanding of the problem, Identifying minimum number of inputs required for output, step by step solution for the problem, breaking down solution into simple steps, Identification of arithmetic and logical operations required for solution, Using Control Structure: Conditional control and

looping (finite and infinite);

Unit 3 : INTRODUCTION TO C++

Getting started :

C++ character set, C++ Tokens (Identifiers, Keywords, Constants, Operators), Structure of a C++ program (include files, main function); Header files- iostream.h, iomanip.h, **cout**, **cin**; Use of I/O operators(<<and>>), Use of endl and setw(), Cascading of I/O operators, Error Messages, Use of editor, basic commands of editor, compilation, linking and execution; standard input/output operations from C language: gets(), puts ()of stdio.h header file;

Data Types, Variables and Constants:

Concept of Data types; Built-in Data types: **char**, **int**, **float** and **double**;

Constants : Integer Constants, Character Constants (Backlash character constants - \n, \t), Floating Point Constant, String Constant; Access modifier: **const**; Variables of built-in data types, Declaration/ Initialisation of variables, Assignment statement; Type modifier: signed, unsigned, long;

Operators and Expressions :

Operators : Arithmetic operators (-,+, *,/,%), Unary operator (-), Increment and Decrement Operators (--,++), Relational operators (>,>=,<,<=,==, !=), Logical operators (!, &&, ||), Conditional operator: <condition>?<if true>: <else>; Precedence of Operators; Expressions; Automatic type conversion in expressions,. Type casting; C++ shorthands (+=, -=, *=, /=, %=)

Unit 4 : PROGRAMMING IN C++

Flow of Control:

Conditional statements: **if-else**, Nested **if**, **switch..case..default**, Nested **switch..case**, break statement (to be used in switch..case only); Loops: **while**, **do-while**; **for** and Nested loops;

String functions:

Header file: string.h

Function: **isalnum()**, **isalpha()**, **isdigit ()**, **islower()**, **isupper()**, **tolower()**, **toupper()**;

Character functions:

Header File: ctype.h

Functions: **isalnum()**, **isalpha()**, **isdigit()**, **islower()**, **isupper()**, **tolower()**, **toupper()**, **strepy()**, **streat()**, **strlen()**, **strempr()**, **strempr()**;

Mathematical Functions :

Header File-math.h, stdlib.h;

Functions: **fabs(), log(), log 10(), pow(), sqrt(), sin(), cos(), abs(),**

Other Functions :

Header File-stdlib.h;

Functions: **randomize(),random();**

User Defined Functions :

Defining a function; function prototype, Invoking/calling a function, passing arguments to function, specifying argument data types, default argument, constant argument, call by value, call by reference, returning values from a function, calling functions with arrays, scope rules of functions and variables; local and global variables;

Structured Data Type : Array

Declaration/initialisation of one-dimensional array, Inputting array, elements, Accessing array elements, Manipulation of Array elements (sum of elements, product of elements, average of elements, linear search, finding maximum/minimum value);

Declaration/Initialization of a String, string Manipulations (counting vowel/consonants/digits/special characters, case conversion, reversing a string, reversing each word of a string);

Two dimensional Array :

Declaration/initialisation of two-dimensional array, inputting array elements, Accessing array elements, Manipulation of Array elements (sum of row elements, column elements, diagonal elements, finding maximum/minimum values);

User defined Data Types :

Need for User defined data type:

Defining a symbol name using typedef keyword and defining a macro using # define directive;

Structures:

Defining a Structure, Declaring structure variables, Accessing structure elements, Passing structure of Functions as value and reference arguments/parameter, Function returning structure, Array of structures, passing an array of structures as an argument/ a parameter to a function.

Class XI (Practical)

1. Programming in C++

10 Marks

One programming problem in C++ to be developed and tested in computer during the examination. Marks are allotted on the basis of following:

Logic	:	5 Marks
Documentation/Indentation	:	2 Marks
Output Presentation	:	3 Marks

2. Project Work

10 Marks

Problem related to String, Number and Array manipulation;

General Guidelines : Initial Requirement, developing an interface for user General (it is advised to use text based interface screen), developing logic for playing the game and developing logic for scoring points

1. Memory Game : A number guessing game with application of 2 dimensional arrays containing randomly generated numbers in pairs hidden inside boxes.
2. Cross 'N' Knots Game : A regular tic-tac-toe game
3. Hollywood/Hangman : A Word Guessing game
4. Cows 'N' Bulls : A word/number Guessing game

Similar projects may be undertaken in other domains.

(As mentioned in general guidelines for projects, given at the end of the curriculum in a group of 1-2 students)

3. Practical File

05 Marks

Must have minimum 15 programs from the topics covered in class XI course

- 5 Programs on Control structures
- 4 Programs on Array Manipulations
- 4 Programs on String Manipulations
- 2 Programs on structure Manipulations

4. Viva Voce

05 Marks

Viva will be asked from syllabus covered in class XI and the project developed by the student.

COURSE STRUCTURE
CLASS - XII (Theory)

Unit No.	Unit Name	Marks
1.	PROGRAMMING IN C++	30
2.	DATA STRUCTURE	14
3.	DATA BASE AND SQL	08
4.	BOOLEAN ALGEBRA	08
5.	COMMUNICATION AND OPEN SOURCE CONCEPTS	10

UNIT 1 : PROGRAMMING IN C++

REVIEW : C++ covered in Class - XI

Object Oriented in Programming :

Concept of object Oriented Programming-Data hiding, Data encapsulation, Class and Object, Abstract class and Concrete class, polymorphism (implementation of polymorphism using Function overloading as an example in C++); Inheritance, Advantage of Object Oriented Programming over earlier programming methodologies.

Implementation of Object Oriented Programming concepts in C++ :

Definition of a class, Members of a class - Data Members and Member Functions (methods, using Private and Public visibility modes, default visibility modes (private); Member function definition: inside of objects as instances of a class; accessing members from object(s), Array of type class, Objects as function arguments-pass by value and pass by reference;

Constructor and Destructor :

Constructor : Special Characteristic, Declaration and Definition of a constructor, Default Constructor, Overloaded Constructors, Copy Constructor, Constructor with default arguments;

Destructor : Special Characteristics, Declaration and definition of destructor;

Inheritance (Extending Classes):

Concept of inheritance, Base Class, Derived Class, Defining derived classes, protected visibility mode; Single level inheritance, Multilevel inheritance and Multiple inheritance, Privately derived, Publicly derived and Protectedly derived class, accessibility of members from objects and within derived class(es);

Data File Handling :

Need for a data file, Types of data files- Text file and Binary file;

Text file: Basic file operations on text file: Creating/ Writing text file into file, Reading and manipulation of text from an already existing text File (accessing sequentially)

Binary File : Creation of file, Writing data into file, Searching for required data from file, Appending data to a file, Insertion of data in sorted file, Deletion of data from file, Modification of data in a file;

Implementation of above mentioned data file handling C++; Components of C++ to be used with file handling:

Header file fstream.h; ifstream, ofstream, fstream classes;

Opening in text file in **in**, **out** and **app** modes;

Using cascading operators for writing text to the file and reading text from the file;

open(), **get()**, **put()**, **getting()** and **close()** functions; Detecting end-of-file (with or

without using **eof()** function); Opening a binary file using **in**, **out** and **app** modes;

open(), **read()**, **write()** and **close()** functions; Detecting end-of-files (with or without **eof()** function); **tellg()**, **tellp()**, **seekg()**, **seekp()** functions.

Pointers:

Declaration and Initialization of Pointers; Dynamics memory allocation, deallocation operators: new, delete; Pointers and Arrays: Arrays of Pointers, Pointer to an array (1 dimensional array), Function returning a pointer. Reference variables and use of alias; Function call by reference. Pointer to structures: Deference operator *,->; self referencial structures;

UNIT 2 : DATA STRUCTURES

Arrays :

One and two Dimensional arrays : Sequential allocation and address caculation;

One Dimensional array : Traversal , Searching (Linear, Binary Search), Insertion of an element in an array, deletion of an element from an array, sorting (Insertion, Selection, Bubble sort), concatenation of two linear arrays, merging of two sorted arrays;

Two Dimensional arrays: Traversal, Finding sum/difference of two NxM arrays containing numerical values, Interchanging Row and Column elements in two dimensional array;

Stack (Array and Linked implementation of stack):

Operations on stack (PUSH and POP) its implementation in C++, Converting expressions from INFIX to POSTFIX notation and evaluation of Postfix expression.

Queue: (Circular Array and Linked Implementation)

Operation on queue (Inserted and Delete) and its Implementation in C++.

UNIT 3 : DATABASE AND SQL

Database Concepts:

Relational Data model : Concept of domain, tuple, relation, key, primary Key, alternate Key, candidate key;

Relational algebra: Selection, Projection, Union and Cartesian Product;

Structural Query Language:

General Concepts: Advantage of using SQL, Data Definition Language and Data Manipulation Language

Data Types: NUMBER, CHARACTER, DATE;

SQL commands

CREATE TABLE, DROP TABLE, ALTER TABLE, UPDATE..SET., INSERT, DELETE; SELECT, DISTINCT, FROM, WHERE, IN, BETWEEN, GROUP BY, HAVING, ORDER BY;

SQL functions : SUM, AVG, COUNT, MAX and MIN;

Note: Implementation of the above mentioned commands could be done on any SQL supported software on one or two table.

UNIT 4 : BOOLEAN ALGEBRA

Binary-Valued Quantities, Boolean Variable, Boolean Constant and Boolean Operators; AND, OR , NOT; Truth Tables; Closure Property, Commutative Law, Associative Law, Identity Law, Inverse Law, Principle of Duality, Idempotent Law, Distributive Law, Absorption Law, Involution Law, DeMorgan's Law and their applications.

UNIT 5 : COMMUNICATION AND OPEN SOURCE CONCEPTS

Evolution of Networking ARPANET, Internet, Interspace;

Different ways of sending data across the network with reference to switching techniques;

Data Communication terminologies:

Concept of Channel, Baud, Bandwidth (Hz, KHz, MHz) and data transfer rate (bps, kbps, Mbps, Gbps, Tbps);

Transmission Media :

Twisted pair cable, coaxial cable, optical fibre, infrared, radio link, microwave link and satellite link)

Network Devices:

Modem, RJ45 connector, Ethernet Card, Hub, Switch, Gateway;

Network Topologies and Types :

Bus, Star, Tree; Concepts of LAN, WAN, MAN.

Network Protocol :

TCP/IP, File Transfer Protocol (FTP),PPP, Level-Remote Login (Telnet), Internet, Wireless/Mobile Communication, GSM, CDMA, WLL,3G, SMS, Voice Mail, Application Electronic Mail, Chat, Video Conferencing;

Network Security Concepts :

Threats and prevention from Viruses, Worms, Trojan horse, Spams
Use of Cookies, Protection using firewall;
India IT Act, Cyber Law, Cyber Crimes, IPR issues, Hacking.

Web Servers:

Hyper Text Markup Language (HTML), Extensible Markup Language (XML); Hyper Text Transfer Protocol (HTTP), Domain Names; URL; Protocol Address; Website, Web Browser, Web Servers; Web Hosting, Web Scripting-Client side (VB script, Java script, PHP) and Server side (ASP, JSP, PHP)

Open Source Terminologies :

Open Source Software, Freeware, Shareware, Proprietary software, FLOSS, GNU, FSF, OSI.

CLASS XII (Practicals)**1. Programming C++**

One programming problem in C++ to be developed and tested in computer during the examination. Marks are allotted on the basis of the following:

Logic	:	5 Marks
Documentation/Indentation	:	2 Marks
Output Presentation	:	3 Marks

Notes: The types of problems to be given will be of application type from the following topics:

- Arrays (One dimensional and two dimensional)
- Array of Structure
- Stack using arrays and linked implementation
- Queue using arrays (circular) and linked implementation
- Binary file operations (Creation, Displaying, Searching and modification)
- Text File operations (Creation, Displaying and modification)

2. SQL Commands

Five Query questions based on a particular Table/Reaction to be tested practically on Computer during the examination. The command along with the result must be written in the answer sheet.

3. **Project Work**

The project has to be developed in C++ language with Object Oriented Technology and also should have use of Data files. (The project is required to be developed in a group of 1-2 students).

- Presentation on the computer
- Project Report (Listing, Sample, Outputs, Documentations)
- Viva

4. **Practical File**

Must have minimum 20 programmes from the following topics:

- Arrays (One dimensional and two dimensional, sorting, searching, merging, deletion & insertion of elements)
- Arrays of structure, Arrays of Objects
- Stack using arrays and linked implementation
- Queues using arrays (linear and circular) and linked implementation
- File (Binary and text) operations (Creation, Updation, Query)
- Any computational based problems

15 SQL commands along with the output based on any table/relation

5. **Viva Voce**

Viva will be asked from syllabus covered in class XII and the project developed by the student.

GUIDELINES FOR PROJECTS (Class XI and XII)

1. **Preamble**

- 1.1 The academic course in Computer Science includes one Project in each year. The purpose behind this is to consolidate the concepts and the practices imparted during the course and to serve as a record of competence.
- 1.2 A group of two students/three students as a team may be allowed to work on one project.

2. **Project Content**

- 2.1 Project for class XI can be selected from the topics mentioned in syllabus or domains on the similar lines.
- 2.2 Project for class XII should ensure the coverage of the following areas of curriculum:
 - a. Problem Solving
 - b. Data Structure
 - c. Object Oriented Programming in C++
 - d. Data FILE Handling

Theme of the project can be

- Any subsystem of a System Software or Tool.
- Any Scientific or a fairly complex algorithmic situation.
- Business oriented problems like Banking. Library information system, Hotel or Hospital management system, Transport query system
- Quizzes/ Games
- Tutor/Computer Aided Learning System

2.3 The aim of the project is to highlight the abilities of algorithmic formulation, modular programming, optimized code preparation, systematic documentation and other associated aspects of Software Development.

2.4 The assesment would be through the project demonstration and the Project Report, which should portray Programming Style, Structured Design, Minimum Coupling, High Cohesion, Good documentation of the code to ensure readability and ease of maintenance.

HOME SCIENCE

Home Science as a discipline aims to empower learners by developing understanding of four different areas, namely:

- Food and Nutrition
- Human Development
- Community Resource Management and Extension
- Fabric and Apparel Science

The subject helps students to understand changing needs of Indian society, academic principles as well as develop professional skills.

This would make them competent to meet challenges of becoming a responsible citizen.

OBJECTIVES

The Syllabus at Senior Secondary level develops in the learners an understanding that the knowledge and skills acquired through Home Science facilitates development of self, family and community. It endeavours to -

1. acquaint learners with the basics of human development with specific reference to self and child.
2. help develop skills of judicious management of various resources.
3. enable learners to become alert and aware consumers.
4. impart knowledge of nutrition and lifestyles to enable prevention and management of disease.
5. inculcate healthy food habits.
6. help develop understanding of textiles for selection and care of clothes.
7. develop skills of communication to assist in advocacy and dissemination of knowledge to community.

COURSE STRUCTURE CLASS - XI (THEORY)

One Paper (Theory)		Time: 3 Hours	70 Marks
Unit			Marks
I.	Concept of Home Science		02
II.	Know myself		17
III.	Nutrition for Self and Family		17
IV.	My Resources		17
V.	My Apparel		17
			70

Unit I : Concept of Home Science and its Scope

Home Science, its scope.

Unit II : Know myself : Issues related to adolescents

Adolescence, meaning, early (12 - 15 years) and late (16 - 18 years) adolescence, early and late maturers.

Characteristics : Cognitive Development : Transition from concrete to formal operations; physical Development : Growth spurt, sexual development; Social and Emotional development : importance of peer group, interest in the opposite sex, varied and changing interests, concern about future; adolescence a period of strain and stress.

Important developmental tasks : accepting one's physique; achieving new and more matured relations with age mates of both sexes; achieving a masculine/female social gender role; achieving emotional independence from parents; preparing for career; reproductive health and prevention of anemia.

Individual differences : difference between same sex, differences across the two sexes, early and late maturers, role of heredity and environment (family, peers, school and neighbourhood).

Interpersonal Skills : with the family, peers and members of the community.

Special needs of adolescents - (i) Nutritional requirements : qualitative and quantitative; (ii) exercise and entertainment; importance of physical activity in social development and prevention of obesity (iii) understanding from parents.

Some problems of adolescence : awkwardness due to growth spurt; freedom and control; depression; alcohol, drugs and smoking; delinquency; problem related to sex; ignorance and increased curiosity;

Population Education : problems of over population; neglect of girl child : (causes, prevention, legal and social laws, government incentives to improve status of girl child) desire for male child; small family norms.

Unit III : Nutrition for Self and Family

Definition and relationship between food, nutrition, health : nutritional status; classification of foods on the basis of nutrients and functions; nutritional status and calorie intake as a basis of poverty line.

Functions of food : body building, energy giving, protective, regulatory; physiological, psychological and socio-cultural; signs of good health; physical status, psychological status, mental ability, mortality and longevity.

Selection of foods for optimum nutrition and good health : basis knowledge of nutrients - sources, functions, deficiency and prevention; proteins, carbohydrates, fat, dietary fibre, vitamins - A, D, B1, B2, niacin, folic acid, B12 and vitamin C; minerals-calcium, iron and iodine. Basic food groups (ICMR) and their contribution; concept of balanced diet; food and nutritional requirements for family (ICMR tables); factors influencing selection of food: culture, family food practices, media, peer group and availability of foods.

Maximum nutritive value from food by proper selection, preparation, cooking and storage: Selection and storage of foods-perishable, non-perishable; convenience foods; Reasons for spoilage; brief description of household methods of preservation-refrigeration, dehydration, use of chemicals and household preservatives. Preparation of food; loss of nutrients during preparation of food and their minimization; Cooking; principles of cooking; Methods of cooking-boiling, steaming, pressure cooking, deep and shallow frying, parboiling, sauteing, roasting and grilling; Effect of cooking on the nutritive value of food; Method of enhancing nutritive value-germination, fermentation, fortification and proper food combination.

Unit IV : My Resources

Resources : meaning, types : (i) human-knowledge, skills, time, energy, attitudes; (ii) material: money, goods, property; (iii) community facilities; Schools, parks, hospitals, roads, transport, water, electricity, fuel, fodder, need to manage the resources; methods of conservation of shared resources.

Management : meaning and need for management; steps in management: planning, organizing, controlling, implementing and evaluation; decision making and its role in management.

Time and energy management : need and procedure for managing time for occupation and leisure; work simplification: meaning and methods; activities in the home: sleeping, studying, cooking, eating, bathing, washing, entertaining-need to organize space for these activities; use of colours and accessories to make these centres attractive; role of different members of the family in efficient running of a home.

Work ethics : meaning and importance; discipline at work place; reaching on time, staying in seat, knowing the job, using polite language.

Unit V : My Apparel

Fabric Science : types of fibres: (i) natural-cotton, silk and wool; (ii) man-made pure rayon nylon and polyester) and blend (terrycot, terrysilk, terrywool,) (iii) Properties of each and their suitability for the garments.

Fabric Construction : Basic procedure of any yarn making (spinning, mechanical spinning, chemical spinning, weaving: plain, twill & satin, other methods-knitting and non-woven, effect of weaves on appearance, durability and maintenance of garment.

Finishing : meaning and importance; types: (i) basic: cleaning, bleaching, stiffening, tantering; (ii) special: mercerisation, shrinkage control, water proofing, dyeing and printing.

PRACTICALS

Time : 3 Hours

30 Marks

Unit

MARKS

I.	Concept of Home Science	-
II.	Know myself	-
III.	Nutrition for Self & Family	8
IV.	My Resources	8
V.	My Apparel	7
VI.	Record	5
	Viva	2
	Total	30

Unit I : Concept of Home Science

Unit II : Know myself : issues related to adolescents

Activity : Observe and test your own strengths and weaknesses; Discuss about them in class with your teacher and fellow students; take decision about maximum utilization of strength and improvement upon weaknesses.

Activity : Report situations from your life to indicate your interaction within the family, with peers and with members of the community.

Unit III : Nutrition for Self and Family

Activity : Look for signs of good health within your family.

Activity : Make a list of foods available in the local market according to food groups.

Activity : Observe how different food stuffs are stored at home and evaluate the effectiveness of the method; practise skills to preserve and optimise nutrients by preparing meals and snacks.

Practical : Preparing meals and snacks

Practical : Household methods of food preservation - Jam, Squash / Syrup Pickles / Chutney.

Unit IV : My Resources

Activity (Observation) : Observe and list resources available at home and in neighbourhood. Make a detailed study on available community resource and its management, suggest improvements.

Activity : Critically evaluate anyone activity centre of your house. Suggest improvements.

Activity : Suggest a work plan for yourself for a day and state where and why will you take help from others.

Practicals : Make flower and foliage arrangements, floor decorations, clean and polish brass, glass, iron, aluminium and plastic surfaces.

Unit V : My Apparel

Activity : Collect samples of fabrics and study characteristics for identification.

Activity : Collect samples of weaves and identify them.

Practicals : Carry out burning test, slippage test, tearing test and test for colour fastness.

Practical : Dyeing : plain and tie dye printing : use blocks (available or make your own) on small sample.

**COURSE STRUCTURE
CLASS XII (THEORY)**

One Paper (Theory)	Time : 3 Hours	70 Marks
Unit		Marks
I. Know Little Children		15
II. Nutrition for Self and Family (contd.)		15
III. Money Management and Consumer Education		15
IV. My Apparel		15
V. Chemistry		10
	Total	70

Unit I : Know Little Children (0-3 years)

Some specific characteristics: physical and motor-height, weight and body proportions; motor development during 0-3 months, 3-6 months, 6-9 months, 9-12 months and 1-3 years (milestones only); social and emotional developments; recognition of people around; socialization, expression of emotions; cognitive development; learning through concrete operations and imitation.

Protection from preventable diseases : immunization - concept and types (natural and acquired), breast feeding (one of the ways to develop natural immunity); immunization chart; symptoms and incubation period of childhood diseases - TB, DPT, polio, measles, cholera, diarrhoea.

Special needs of disadvantaged and disabled children : socially disadvantaged, physically handicapped (partially blind & deaf, affected/missing limb) : characteristics & needs.

Substitute care at home and outside : siblings, grand parents, neighbours, creche, day care centres etc: Integrated Child Development Scheme (ICDS) - objectives and functions.

Unit III : Nutrition for Self and Family

Planning meals for the family : meaning and importance of meal planning, principles and factors affecting meal planning, planning meals for the family; keeping in mind the needs of individual members, including children, pregnant women, lactating mother, members suffering from fever and diarrhoea; role and preparation of ORS.

Ways to ensure good health for the family : using safe drinking water-importance of potable water for good health, qualities of safe drinking water; household methods of making water safe for drinking; boiling, filtering, use of alum and chlorine tablet, role of hygiene for food handlers at home level. Safety against food adulteration, definition and meaning of food adulteration as given by PFA; common adulterants present in cereals, pulses, milk and milk products, fats and oils, sugar, jaggery, honey, spices and condiments. Ill effects of some of the adulterants present in the foods: kesari dal, metanil yellow, argemone seeds.

Unit III : Money Management and Consumer Education

Family Income : various sources of family income : (i) money income, (ii) real income, direct and indirect; Supplementing family income-need & ways; need and procedure for keeping household accounts.

Savings and Investment : meaning and importance of savings; ways/methods of investment-banks, post-office, LIC, Units, PPF, PF; basis for selection of method of investment risk, security, profit, tax saving.

Consumer Protection and Education : meaning, problems faced by consumer, Consumer Protection Act (1986) and Services; Consumer aids: levels, standardization marks, advertising, guidebooks/leaflets, Consumer redressal forum.

Unit IV : My Apparel

Clothing and its relation to personality : Elements of line, colour, texture: elements of design: balance, rhythm, proportion, harmony, emphasis; factors that influence the selection of clothes: personality, age, climate, occupation, figure, occasion, fashion, selection and purchase of fabrics. Purpose, quality, cost, season, reliable shop.

Checking size and quality in ready-made garments, need and criteria: seams, hem, plackets, fasteners, workmanship, design, drape.

Care of clothes : General principles and precautions to be followed while removing stains and washing: Cleansing agents: soaps and detergents (basis differences); Storage of clothes.

Unit V: Chemistry

A.I. Definition

- (a) Atom (b) Molecules (c) Valency (d) Molecularity
(e) Normality (f) Oxidation (g) Reduction (h) Base
(i) Acid (j) Salt (k) Chemical reaction between bases and acids

II. Basic ideas of-

- (a) Molecular formula (b) Molecular weight (c) Atomic weight

B.I. Hydrocarbon: Definition, type and properties of hydrocarbon

II. Introduction to Organic Chemistry - Basic ideas of functional groups.

Practicals

Time : 3 Hours

30 Marks

Unit

Marks

I.	Know Little Children	03
II.	Nutrition for Self and Family (contd.)	10
III.	Money Management and Consumer Education	03
IV.	My Apparel	07
V.	a) Record	05
	b) Viva	02

Total 30

Unit I : Know Little Children (0 -3 years)

Activity : Observe a child in neighbourhood or at home for various milestones of physical and motor development and prepare a chart.

Practical : Make an interview schedule for working mother.

Activity : Interview three mothers working outside the home to find out their arrangements of substitute care for their children (0-3 yrs.) in their absence.

Practical-Prepare a chart of mile stones

Practical : Prepare a chart for immunization of a child.

Unit II : Nutrition for Self and Family

Practicals : Plan meals for the family and carry out modifications to suit individual needs including persons suffering from fever or diarrhoea and for pregnant and lactating mother. Prepare and serve one dish.

Practical : Preparation of oral rehydration solution

Practical : Simple tests for checking adulteration in -

- (i) Cereals
- (ii) Pulses
- (iii) Milk and milk products
- (iv) Tea leaves
- (v) Dhania powder
- (vi) Red chillies
- (vii) Haldi powder
- (viii) Gur (Jaggery)
- (ix) Black Pepper (Whole)

Unit III : Money management and Consumer Education

Activity : Open an account. Find out and report how an account is opened in a bank and post office. Collect and fill forms.

Activity : Read and evaluate labels of any four household items bearing different standardization marks.

Practical : Fill bank/post office forms

Practical : Prepare one label each for four household items/products bearing different standardization marks.

Unit IV : My Apparel

Practical : Make sample of

- (a) basic stitches and seems:
 - (i) Running Stitch
 - (ii) Hemming
 - (iii) Blind stitch
 - (iv) Inter-locking

(b) Fasteners - Buttons and hooks.

(c) Patch work

or make an apron and incorporate all the above (a,b, and c).

Practical : Examine quality in ready-made garments.

Practicals : Relative effect of temperature of water on the clothes during the process of washing clothes (cold, lukewarm, hot). Draw conclusions and how this knowledge is helpful

Practical :

Removal of stains of -

- (i) Tea stain
- (ii) Coffee stain
- (iii) Curry
- (iv) Grease
- (v) Ball point ink
- (vi) Lipstick
- (vii) Blood

Practical : Make a soap/detergent (liquid/powder/cake).

General Instructions :

A. Out of the several alternatives given in each group of questions only one is to be assigned to the group.

B. Preparation of dish means-methodical procedure, economical use of ingredient and finished product.

C. Neat work

D. In all, there will be seven questions

1 from Unit I		3 marks
2 from Unit II	7+3	10 marks
1 from Unit III		3 marks
2 from Unit IV	3+2+2	7 marks
Record		5 marks
Viva		2 marks
Total		30 marks

GEOGRAPHY

Rationale

Geography is introduced as an elective subject at the senior secondary stage. After ten years of general education, students branch out at the beginning of this stage and are exposed to the rigours of the discipline for the first time. Being an entry point for the higher education, students choose Geography for pursuing their academic interest and, therefore, need a broader and deeper understanding of the subject. For others, geographical knowledge is useful in daily lives because it is a valuable medium for the education of young people. Its contribution lies in the content, cognitive processes, skills and values that Geography promotes and thus helps the students explore, understand and evaluate the environmental and social dimensions of the world in a better manner.

Since Geography explores the relationship between people and their environment, it includes studies of physical and human environments and their interactions at different scales-local, state/region, nation and the world. The fundamental principles responsible for the varieties in the distributional pattern of physical and human features and phenomena over the earth's surface need to be understood properly. Application of these principles would be taken up through selected case studies from the world and India. Thus, the physical and human environment of India and study of some issues from a geographical point of view will be covered in greater detail. Students will be exposed to different methods used in geographical investigations.

Objectives

The course in Geography will help learners:

- Familiarise themselves with the terms, key concepts and basic principles of Geography;
- Search for, recognize and understand the processes and patterns of the spatial arrangement of the natural as well as human features and phenomena on the earth's surface;
- Understand and analyse the inter-relationship between physical and human environments and their impact:
- Apply geographical knowledge and methods of inquiry to new situations or problems at different levels-local, regional, national and global;
- Develop geographical skills, relating to collection, processing and analysis of data/information and preparation of report including maps and graphs and use of computers where possible; and
- Utilize geographical knowledge in understanding issues concerning the community such as environmental issues, socio-economic concerns, gender and become responsible and effective members of the community.

**COURSE STRUCTURE
CLASS - XI**

One Theory Paper	3 Hours	70 Marks
Part A.	Fundamentals of Physical Geography	35 (Marks)
	Unit - 1 : Geography as a discipline	03
	Unit - 2 : The Earth	05
	Unit - 3 : Landforms	08
	Unit - 4 : Climate	10
	Unit - 5 : Water (Oceans)	04
	Unit - 6 : Life on the Earth	03
	Unit - 7 : Map work	02
Part B.	India - Physical Environment	35 (Marks)
	Unit - 8 : Introduction	03
	Unit - 9 : Physiography	10
	Unit - 10 : Climate, vegetation and soil	10
	Unit - 11 : Natural hazards and Disasters	09
	Unit - 12 : Map work	03
Part C.	Practical Work	30 Marks
	3 Hours	
	Unit - 1 : Fundamentals of Maps	10
	Unit - 2 : Topographic and Weather Maps	12
	Unit - 3 : Practical Record Book	05
	Unit - 4 : Viva Voce	03

Part A : Fundamentals of Physical Geography

Unit - 1 : Geography as a Discipline

Geography as an integrating discipline, as a science of spatial attributes;

Branches of geography; importance of physical geography

Unit - 2 : The Earth

Origin and evolution of the earth; Interior of the earth; Wegener's continental drift theory and plate tectonics; earthquakes and volcanoes.

Unit - 3 : Landforms

Rocks: major types of rocks and their characteristics;
Landforms and their evolution
Geomorphic processes-weathering, mass wasting, erosion and deposition; soil-formation

Unit - 4 : Climate

- Atmosphere-composition and structure; elements of weather and climate.
- Insolation-angle of incidence and distribution; heat budget of the earth-heating and cooling of atmosphere (conduction, convection, terrestrial radiation and advection); temperature-factors controlling temperature; distribution of temperature-horizontal and vertical; inversion of temperature.
- Pressure-pressure belts; winds-planetary, seasonal and local; air masses and fronts; tropical and extratropical cyclones.
- Precipitation-evaporation; condensation-dew, frost, fog, mist and cloud; rainfall-types and world distribution.
- World climates-classification (Koeppen), greenhouse effect, global warming and climatic changes.

Unit 5 : Water (Oceans)

- Hydrological Cycle.
- Oceans - distribution of temperature and salinity; movements of ocean water-waves, tides and currents; submarine reliefs.

Unit 6 : Life on the Earth

- Biosphere - importance of plants and other organisms; biodiversity and conservation; ecosystem and ecological balance.

Unit 7 : Map work on identification of features based on the above units on the outline political map of the world.

Part B. India - Physical Environment

Unit 8 : Introduction

- Location-space relations and India's place in the world.

Unit 9 : Physiography

- Structure and Relief ;
- Drainage systems: concepts of watershed; the Himalayan and the Peninsular;
- Physiographic divisions.

Unit 10 : Climate, Vegetation and Soil

- Weather and climate — spatial and temporal distribution of temperature, pressure winds and rainfall, Indian monsoon: mechanism, onset and withdrawal, variability of rainfalls : spatial and temporal; Climatic types (Koeppen)
- Natural vegetation-forest types and distribution; wild life; conservation; biosphere reserves;
- Soils-major types (ICAR's classification) and their distribution, soil degradation and conservation.

Unit 11 : Natural Hazards and Disasters: Causes, Consequences and Management (One case study to be introduced for each topic)

- Floods and droughts
- Earthquakes and Tsunami
- Cyclones
- Landslides

Unit 12 : Map Work of features based on above units for locating and labelling on the Outline Political map of India.

C. Practical Work

Unit 1 : Fundamentals of Maps

- Maps-types; scales-types; construction of simple linear scale, measuring distance; finding direction and use of symbols.
- Latitude, longitude and time.
- Map projection-typology, construction and properties of projections : Conical with one standard parallel and Mercator's projection.

Unit 2 : Topographic and Weather Maps

- Study of topographic maps (1 : 50,000 or 1 : 25,000 Survey of India maps); contour cross section and identification of landforms-slopes, hills, valleys, waterfall, cliffs; distribution of settlements.
- Aerial Photographs : Types & Geometry-vertical aerial photographs; difference between maps & aerial photographs; photo scale determination.
- Satellite imageries, stages in remote sensing data-acquisition, platform & sensors and data products, (photographic & digital).
- Identification of physical & cultural features from aerial photographs & satellite imageries.

- Use of weather instruments : thermometer, wet and dry-bulb thermometer, barometer, wind vane, rain gauge.
- Use of weather charts: describing pressure, wind and rainfall distribution.

Unit 3 : Practical Record Book and Viva voce.

**COURSE STRUCTURE
CLASS - XII**

One Theory Paper 3 Hours 70 Marks

A. Fundamentals of Human Geography 35 Marks

Unit 1 : Human Geography 03

Unit 2 : People 05

Unit 3 : Human Activities 10

Unit 4 : Transport, Communication & Trade 10

Unit 5 : Human settlements 05

Unit 6 : Map Work 02

B. India : People and Economy 35 Marks

Unit 7 : People 05

Unit 8 : Human Settlements 04

Unit 9 : Resources and Development 12

Unit 10 : Transport, Communication and International Trade 07

Unit 11 : Geographical Perspective on selected issues and problems 04

Unit 12 : Map Work 03

C. Practical Work 30 Marks

Unit 1 : Processing of Data and Thematic Mapping 12

Unit 2 : Field study 10

Unit 3 : Practical Record Book 05

Unit 4 : Viva Voce 03

Class XII

A. Fundamentals of Human Geography sssss 35 Marks

Unit 1 : Human Geography : Nature and Scope

Unit 2 : People

- Population — distribution, density and growth
- Population change-spatial patterns and structure; determinants of population change;
- Age-sex ratio; rural-urban composition;
- Human development - concept; selected indications, international comparisons

Unit 3 : Human Activities

- Primary activities - concept and changing trends; gathering, pastoral, mining, subsistence agriculture, modern agriculture; people engaged in agricultural and allied activities - some examples from selected countries.
- Secondary activities-concept; manufacturing: type - household, small scale, large scale; agro based and mineral based industries; people engaged in secondary activities - some examples from selected countries.
- Tertiary activities-concept; trade, transport and communication; services; people engaged in tertiary activities - some examples from selected countries.
- Quaternary activities-concept; knowledge based industries; people engaged in quaternary activities - some examples from selected countries.

Unit 4 : Transport, Communication and Trade

- Land transport - roads, railways; trans-continental railways.
- Water transport-inland waterways; major ocean routes.
- Air transport- Intercontinental air routes.
- Oil and gas pipelines.
- Satellite communication and cyber space.
- International trade-Bases and changing patterns; ports as gateways of international trade, role of WTO in International trade.

Unit 5 : Human Settlements

- Settlement types - rural and urban; morphology of cities (case study); distribution of mega cities; problems of human settlements in developing countries.

Unit 6 : Map Works on identification of features based on above units on the outline Political map of World.

Part B. India : People and Economy

Unit 7 : People

- Population : distribution, density and growth; composition of population - linguistic, religious; sex, rural-urban and occupational-population change through time and regional variations;
- Migration : international, national-causes and consequences;
- Human development : selected indicators and regional patterns;
- Population, environment and development.

Unit 8 : Human Settlements

- Rural settlements - types and distribution;
- Urban settlements - types, distribution and functional classification.

Unit 9 : Resources and Development

- Land resources-general land use; agricultural land use, Distribution of major crops (Wheat, Rice, Tea, Coffee, Cotton, Jute, Sugar cane and Rubber), agricultural development and problems.
- Water resources-availability and utilization-irrigation, domestic, industrial and other uses; scarcity of water and conservation methods-rain water harvesting and watershed management (one case study related with participatory watershed management to be introduced).
- Mineral and energy resources : distribution of metallic (Ironore, Copper, Bauxite, Manganese) non-metallic (Mica, Salt) minerals; conventional (Coal, Petroleum, Natural gas and Hydro electricity) and non-conventional energy sources (solar, wind, biogas).
- Industries - types, industrial location and clustering; distribution and changing pattern of selected industries-iron and steel, cotton textiles, sugar, petrochemicals, and knowledge based industries; impact of liberalization, privatisation and globalisation on industrial location;
- Planning in India-target area planning (case study); idea of sustainable development (case study)

Unit 10 : Transport, Communication and International Trade

- Transport and communication- roads, railways and airways : oil and gas pipelines; national electric grids; communication networkings - radio, television, satellite and internet;
- International trade- changing pattern of India's foreign trade; sea ports and their hinterland and airports,

Unit 11 : Geographical Perspective on Selected Issue and Problems (One case study to be introduced for each topic)

- Environmental pollution; urban-waste disposal.
- Urbanisation rural-urban migration; problem of slum.
- Land Degradation.

Unit 12 : Map work on locating and labelling of features based on above units on outline political map of India

C. Practical Work

Unit I : Processing of Data and Thematic Mapping

- Sources of data.
- Tabulating and processing of data; calculation of averages, measures of central tendency, deviation and rank correlation;
- Representation of data - construction of diagrams : bars, circles and flow-chart; thematic maps; construction of dot; choropleth and isopleth maps.
- Use of computers in data processing and mapping.

Unit II : Field Study or Spatial Information Technology

Field visit and study : map orientation, observation and preparation of sketch; survey on any one of the local concerns; pollution, ground water changes, land use and land-use changes, poverty, energy issues, soil degradation, impact of floods and drought, catchment area of school, Market survey and Household survey (any one topic of local concern may be taken up for the study; observation and questionnaire survey may be adopted for the data collection; collected data may be tabulated and analysed with diagrams and maps).

ECONOMICS

Rationale

Economics is one of the social sciences, which has great influence on every human being. As economic life and the economy go through changes, the need to ground education in children's own experience becomes essential. While doing so, it is imperative to provide them opportunities to acquire analytical skills to observe and understand the economic realities.

At senior secondary stage, the learners are in a position to understand abstract ideas, exercise the power of thinking and to develop their own perception. It is at this stage, the learners are exposed to the rigour of the discipline of economics in a systematic way.

The economics courses are introduced in such a way that in the initial stage, the learners are introduced to the economic realities that the nation is facing today along with some basic statistical tools to understand these broader economic realities. In the later stage, the learners are introduced to economics as a theory of abstraction.

The economics courses also contain many projects and activities. These will provide opportunities for the learners to explore various economic issues both from their day-to-day life and also from issues, which are broader and invisible in nature. The academic skills that they learn in these courses would help to develop the projects and activities. The syllabus is also expected to provide opportunities to use information and communication technologies to facilitate their learning process.

Objectives

1. Understanding of some basic economic concepts and development of economic reasoning which the learners can apply in their day-to-day life as citizens, workers and consumers.
2. Realisation of learners' role in nation building and sensitivity to the economic issues that the nation is facing today.
3. Equipment with basic tools of economics and statistics to analyse economic issues. This is pertinent for even those who may not pursue this course beyond senior secondary stage.
4. Development of understanding that there can be more than one view on any economic issue and necessary skills to argue logically with reasoning.

**COURSE STRUCTURE
CLASS-XI**

One Paper	3 Hours	100 Marks
Units		Marks
Part I: Micro Economics		
1. Introduction		04
2. Demand, Supply and Market Mechanism		16
3. Elasticity		08
4. Behavior of consumers & Producers		12
5. Form of Market & Price Determination		10
Part II: Statistics for Economics		
1. Introduction		03
2. Collection, Presentation and Organization of Data		15
3. Statistical Averages and Dispersion		22
4. Correlation and Index Numbers		10
5. Project on Application of Statistics in Economics		-

PART- I: MICRO ECONOMICS

Unit 1: Introduction

Definition of Economics, Positive & Normative Economics, Micro & Macro Economics, Factors of production- Land, Labour, Capital, Entrepreneur, Central problems of an economy: what, how and for whom to produce; concepts of production possibility frontier and opportunity cost, Difference between Accounting Cost & Opportunity Cost, Economic Systems — Basic Features .

Unit 2: Demand, supply & Market Mechanism

- **Demand:** Demand and its determinants, law of demand, Individual and Market Demand, Demand Schedule, Demand Curve, movement along and shifts in the demand curve, Exception to Law of Demand.
- **Supply** — Supply and its Determinants, Law of Supply, Individual and Market supply, supply schedule, supply curve, movements along and shifts in supply curve, Exception to the law of Supply.
- **Market Mechanism** — Equilibrium and Disequilibrium, Shortage and Surplus, Application of Demand and Supply Analysis.

Unit 3: Elasticity (a) **Price Elasticity of Demand.**
 (b) **Income Elasticity of Demand.**
 (c) **Cross Elasticity of Demand.**

***(definitions only)**

Factors Affecting the Elasticity of Demand.

Methods of Calculating Price Elasticity —

1. Percentage Method
2. Geometric Method
3. Total Expenditure Method

Simple Numerical Problems on Each Method.

Elasticity of Supply — Measurement of Elasticity of Supply,

1. Percentage Method
2. Geometric Method

Unit 4: Behavior of consumers & Producers.

- **Consumer Behavior**- Meaning of Utility, Total Utility, marginal Utility, Law of Diminishing Marginal Utility, Consumer's Equilibrium.
- **Cost** - Concepts and Relationship Between Short Run and Long Run Costs (all costs; total cost, total fixed cost, total variable cost; Average fixed cost, average variable cost and marginal cost)
- **Revenue** - Total revenue, Average Revenue, Marginal Revenue. Producer's Equilibrium-meaning and its conditions-under (a) Total Revenue-Total Cost Approach and (b) Marginal Revenue-Marginal Cost Approach.

Unit 5: Form of Market & Price Determination

Forms of Market — Perfect Competition, Monopoly, Monopolistic Competition, Oligopoly and monopsony — their meaning and basic features. Price determination under perfect competition.

PART- II : STATISTICS FOR ECONOMICS

Unit 1: Introduction

Meaning, Scope, Importance and limitations of Statistics with special reference to Economics.

Unit 2 : Collection, Presentation and Organization of Data

Collection of Data - Source of Data - Primary and Secondary, Method of Collecting Data. Some Important Sources of Secondary Data, Organization of Data - Meaning and Types of Variables, Frequency, Presentation of data — Tabulation, Diagrammatic presentation (bar diagrams, pie-diagrams, line graphs, histogram, polygon and Ogive Curves).

Unit 3: Statistical Averages and Dispersion

Mean, Mode, Median and Quartiles.

Dispersion- Measures of Dispersion (range, quartile deviation, mean deviation, standard deviation) and co-efficient of variation.

Unit 4: Correlation and Index Numbers

Meaning and significance, Scatter diagram, Measure of correlation — Karl Pearson's method (two variables ungrouped data) Spearman's rank correlation. Introduction to index numbers, meaning Laspeyre's & Paasche's & Fisher's index- Wholesale price index, Consumer Price Index and Index of Industrial Production, uses of index numbers.

Unit 5: Project Work

(The list of Projects is only Exemplary & not exhaustive)

- (i) Consumer Awareness amongst households through collection of Primary Data by designing a questionnaire.
- (ii) Productivity Awareness amongst enterprises through use of statistical data from statistical tables from Newspapers/RBI Bulletin/Budget/Census Reports/Economic Survey, etc.
- (iii) Demand, Supply and Market Equilibrium: Each student shall choose any vegetable of her choice. Interview three consumers to find out what their demand would be at 5 different price levels of the commodity. Interview 3 vegetable vendors to find out what they would supply at each of the same 5 price levels.

Based on the data collected, a student will:

- a. construct individual and market demand and supply schedules
- b. determine if there is an equilibrium price that will prevail in the market
explain how the market will react if the price is above and below the determined equilibrium price.

The results of project should highlight

- Understanding of the concepts of demand, supply and equilibrium price
- Construction of an individual and market demand and supply schedules
- Understanding of how equilibrium price is determined in the market.

- (v) **Producer's Equilibrium:**
Visit a local shop/industry/school/ restaurant and understand its production process. Interview the owner to understand what the accountancy profit is for the production unit. Your discussions should also be able to detail:
- a. The fixed and variable factors and their associated costs.
 - b. The normal profit of the production unit
 - c. Are there any implicit costs
- The conclusions should show:
- Understanding of a production process.
 - Reorganization of fixed and variable factors in a production process.
 - Association of fixed and variable costs of production.
 - Determination of revenue of production unit.
- (vi) **Role of PDS in assuring supply of necessities in rural areas.**
=> Students will visit the local ration shops to collect information on
- a) Number of consumers
 - b) Availability / Shortage of necessary goods.

COURSE STRUCTURE
CLASS-XII

One Paper	3 Hours	100 Marks
Units		Marks
Part I: Macro Economics		
1. Introduction		04
2. National Income and related Aggregates: Basic Concepts And Measurement		16
3. Theory of Income and Employment		12
4. Money and Banking		08
5. Monetary Policy, Fiscal Policy and Government Budget		10
Part II: Indian Economic Development		
1. Introduction		08
2. Planning and Economic Development in India		10
3. Structural Changes in the Indian Economy after liberalization		12
4. Current Challenges facing Indian Economy		12
5. Economic Growth and Development		08

PART-I: MACRO ECONOMICS

Unit 1: Introduction

Macroeconomics: Its meaning and scope *viz* Central Problems: - Growth, Inflation, Employment. Some basic concepts of macroeconomics: Business Cycle, Aggregate Demand, Aggregate Supply, Consumption goods, Capital Goods, Final Goods, Intermediate Goods; Stocks and Flows; Gross Investment and Depreciation.

Unit 2: National Income and related Aggregates: Basic Concepts and Measurement.

Circular flow of income; Methods of calculating National Income — Value Added or Product method, Expenditure method, Income method.

Concepts and aggregates related to National Income: Gross National Product (GNP), Net National Product (NNP), Gross and Net Domestic Product (GDP and NDP) — at market price, at factor cost; National Disposable Income (gross and net), Personal Income and Personal Disposable Income; Real and Nominal GDP. GDP and Welfare.

Simple Numerical Examples.

Unit 3: Theory of Income and Employment

Aggregate demand and its components. Consumption Function and Investment Function, Propensity to consume and propensity to save, equilibrium output, Types of Unemployment.

Unit 4: Money and Banking

Money — Meaning, Functions and types. Supply of money — Currency held by the public and net demand deposits held by commercial banks- Definition and Functions, Money and Credit Creation by Commercial banks. Central Bank - Meaning and Functions.

Unit 5: Monetary Policy, Fiscal Policy and Government Budget.

Monetary policy — Meaning types and tools.

Fiscal policy — Meaning types and tools.

Government budget — meaning, objectives, components and types. Classification of receipts — revenue receipt and capital receipt; classification of expenditure - revenue expenditure and capital expenditure. Various measures of government deficit — revenue deficit, fiscal deficit, primary deficit: their meaning and implications.

PART- II: INDIAN ECONOMIC DEVELOPMENT

Unit-1: Introduction

- **Parameters of Development** —Per capita Income, Human Development in India
- A brief introduction of the state of the Indian economy on the eve of independence. Main features, problems and policies of agriculture and Foreign Trade.

Unit-2 : Planning and Economic Development in India

Objectives, Targets, Achievements and drawbacks of different Five Year Plans in India (A brief account).

Unit-3: Structural Changes in the Indian Economy after liberalization.

Meaning, Need, Significance, and Features of Liberalization, Globalization, Disinvestment and Privatization. Present Features of Indian Economy.

Unit-4: Current challenges facing Indian economy

- Poverty — absolute and relative; Main programmes for poverty alleviation: A critical assessment; Rural development: Key issues - credit and marketing —

role of cooperatives; agricultural diversification; alternative farming — organic farming.

- Human Capital Formation: How people become resource; Role of human capital in economic development; Growth of Education Sector in India. Informal Economy Employment: Problems and Policies.
- Sustainable Economic Growth : Meaning, Effects of Economic Development on Resources and Environment.

Unit-5: Economic Growth and Development

Economic Growth and Development-Meaning and Difference, Comparative Study of India and China on the Following Indicators : i) unemployment ii) GDP growth, iii) GDP per capita, iv) GDP purchasing power parity, v) amount in direct foreign investment, vi) inflation, vii) poverty .

Unit 6: Project Work

Macro Economics

- 1) Effect of changing rate on interest on automobiles sale.
- 2) Collect logos of 10 nationalized commercial Bank also collect data on rates of interest (last 1 year) (CRR,SLR)
- 3) Information and pictures projecting evolution of money
- 4) **Economic Growth and Development**

Identify any two indicators of economic growth and three indicators of economic development.

Collect data on these indicators for the last 5 years for at least 4 countries - of which two are developing and 2 are developed.

Analyze the data that is collected to see the differences between economic growth and economic development.
- 5) **Globalization**

Divide the class into suitable groups. Each group shall make a wall magazine or collage that will critically analyse the impact of globalization on their and their families' lives
- 6) **Unemployment & Poverty**

Conduct a comparative study of any 2 localities and present the data by questionnaire or interview method. To find out type of unemployment that exists, how it leads to poverty.

PUBLIC ADMINISTRATION

COURSE STRUCTURE CLASS - XI

Paper	3 Hours	100 Marks
Unit	Topic	Marks
I	Basic Concepts of Public Administration	20
II	Organisation and its Administration	20
III	Personnel Administration	20
IV	Administrative at Works	20
V	Development Administration	20

UNIT-I : Basic Concepts of Public Administration

- Public Administration – Meaning, Nature, Scope.
- Private Administration – Meaning, Similarities and dissimilarities between public and private Administration.
- Relationship of Public with other Social Sciences – Political Science, Economics, Sociology and Psychology.
- Public Administration in developing Societies – Meaning and characteristics of developing societies/ countries, importances and role.

UNIT – II : Organisation and its Administration

- Organisation – Meaning, Theories of Organisation (Classical and Modern), Formal and Non-Formal.
- Principles of Organisation – Hierarchy, Span of Control, Unity of Command,
- Staff and Line Agencies- Meaning, Functions, Dissimilarities.
- Centralisation and Decentralisation, Headquarters and Fields.

UNIT – III : Personnel Administration

- Meaning of Personnel System
- Recruitment – Meaning, Methods of Recruitment (Ref. UPSC, SPSC and SSC)
- Merit System and Spoil System – Meaning, Advantages and disadvantages.
- Bureaucracy – Meaning, Characteristics, Role of Bureaucracy, Evils of Bureaucracy, Suggestion for Improvement.

UNIT – IV : Administrative at Works

- Division of Works – Meaning and Criteria, Reason for division of Works.
- Decision making – Meaning, Nature, Decision making Process.
- Delegated Legislation, Delegation, Subordination.
- Leadership – Meaning, Leadership Style (Autocratic leadership, Democratic leadership, Laissez faire leadership), Qualities of leadership.

UNIT – V : Development Administration

- Development administration – Meaning, importance, non-development.
- Development administration and Administrative Development.
- Planning – Meaning, Planning process, Planning Commission and National Development Commission (NDC)
- Public Relation – Meaning and importance, Agencies of Public Relations.

COURSE STRUCTURE
CLASS - XII

Paper	3 Hours	100 Marks
Unit	Topic	Marks
I	Development of Indian Administration	20
II	Central Administration	20
III	State Administration	20
IV	District Administration	20
V	Personnel Administration	20

UNIT-I : Development of Indian Administration

Development of Indian Administration during British rule(1858-1946) and Post Independence period (1947-1950), Evolution of Indian Constitution, Basic Principles of Indian Administration under the Constitution of India- Sovereign, Socialist, Secular, Democratic Republic; Federal System in India, Meaning and importance of Judiciary- Supreme court & High Court. Meaning and Role of Administrative Tribunal.

UNIT-II : Central Administration

Political Executive- President- Position, Powers and Functions.
Prime Minister- Powers, Functions, and Position as Political Chief and the Real Executive; Relationship with Cabinet/ Council of Ministers.
Cabinet Secretariat- Meaning, Organisation and Functions; Role and importance of the Cabinet Secretary; Relationship between Minister and Secretary in India.
Central Secretariat- Its Meaning, Organisation and Functions.

UNIT-III : State Administration

Governor- Powers and functions- Legislative, Executive, Financial, Judicial, Discretionary.
Chief Minister- Powers and Functions; Relationship with Council of Ministers.
State Secretariat- Its Organisation and Functions.
Chief Secretary- Role and importance in State Administration.
Meaning and Role of Directorates.
Planning Machinery-State Planning Board; role and importance.

UNIT-IV : District Administration

Development of District Administration – Nature of District Administration, Special Development Programmes (with references to NLUP & MIP)
Deputy Commissioner/District Collector – Evolution, Role and Importance.
District Council- Its Composition, Powers and Functions, District Council under the 5th &

6th Scheduled of the Constitution.

Local Self Government- Meaning, Nature (Rural and Urban), Importance of Local Self Government, State Election Commission-Composition and functions. Role of State Finance Commission.

UNIT-V : Personnel Administration

All India Services, Central Services, State Civil Services- Their Meaning, Recruitment and Role.

Union Public Service Commission and State Public Service Commission- Their Composition and Functions.

Comptroller and Auditor General of India- His appointment and Role.

Election Commission - Its Composition and Functions.

Integrity in Administration- Information Commission (Central and State)- Meaning, Importance, Composition and Functions.

Meaning and Role of Lok Pal, Lok Ayukta, Lok Adalat

MATHEMATICS

General Guidelines

1. All concepts/identities must be illustrated by situational examples.
2. The language of 'word problems' must be clear, simple and unambiguous.
3. Problems given should be testing the understanding of the subject.
4. All proofs to be produced in a manner that allows the learner to see flow of reasons. Wherever possible, give more than one proof.
5. Motivate results, wherever possible. Prove explicitly those results where a short and clear argument reinforces mathematical thinking and reasoning. There must be emphasis on correct way of expressing the arguments.

MATHEMATICS
COURSE STRUCTURE
Class XI (Theory)

One Paper	Time 3 Hours	Max. Marks:100
Units	Titles	Weightage
I	Sets and functions	29 marks
II	Algebra	37 marks
III	Coordinate geometry	13 marks
IV	Calculus	06 marks
V	Mathematical Reasoning	03 marks
VI	Statistics and Probability	12 marks
Total		100 marks

(Total Periods 180)

UNIT I: SETS AND FUNCTIONS

1. Sets

(Periods 12)

Sets and their representations. Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of the set of real numbers especially intervals (with notations). Power set. Universal set. Venn diagrams. Union and intersection of sets. Difference of sets. Complement of a set, Properties of Complement sets.

2. Relations and Functions

(Periods 14)

Ordered pairs, Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the reals with itself (upto $\mathbb{R} \times \mathbb{R} \times \mathbb{R}$).

Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain and range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs. Sum, difference, product and quotients of functions.

3. Trigonometric Functions

(Periods 18)

Positive and negative angles Measuring angles in radians and in degrees and conversion one measure to another. Definition of trigonometric functions with the help of unit circle. Truth of the identity- $\sin^2 x + \cos^2 x = 1$, for all X . Signs of trigonometric functions and sketch of their graphs. Expressing $\sin(x \pm y)$ and $\cos(x \pm y)$ in terms of $\sin x$, $\sin y$. Deducing the identities like following:

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

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

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

Identities related to $\sin 2x$, $\cos 2x$, $\tan 2x$, $\sin 3x$, $\cos 3x$ and $\tan 3x$. General solution of trigonometric equations of the type $\sin \theta = \sin \alpha$, $\cos \theta = \cos \alpha$ and $\tan \theta = \tan \alpha$. Proofs and simple applications of sine and cosine formulae.

UNIT II: ALGEBRA

1. Principle of Mathematical Induction

(Periods 06)

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

2. Complex Numbers and Quadratic Equations

(Periods 10)

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

3. Linear Inequalities

(Periods 10)

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

4. Permutations and Combinations

(Periods 12)

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

5. Binomial Theorem.

(Periods 08)

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

6. Sequence and Series (Periods 10)

Sequence and Series. Arithmetic Progression (A.P.), Arithmetic Mean(A.M.), Geometric Progression (G.P.), general term of a G.P., sum of n terms of a G.P. Arithmetic and geometric series, infinite G.P. and its sum, geometric mean (G.M.). Relation between A.M. and G.M. Sum to n terms of the special series:

$$\sum n, \sum n^2 \text{ and } \sum n^3$$

UNIT III: COORDINATE GEOMETRY

1. Straight Lines (Periods 09)

Brief recall of 2-D from earlier-classes, shifting of origin. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two-point form, intercepts form and normal form. General equation of a line. Equation of family of lines passing through the point of intersection of two lines. Distance of a point from a line.

2. Conic Sections (Periods 12)

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

3. Introduction to Three dimensional Geometry (Periods 08)

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

UNIT IV: CALCULUS

Limits and Derivatives (Periods 18)

Derivative introduced as rate of change-both as that of distance function and

intuitive idea of limit. $\lim_{x \rightarrow 0} \frac{\log_e(l+x)}{x}$, $\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$. Definition of derivative,

relate it to slope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.

UNIT V: MATHEMATICAL REASONING**(Periods 08)**

Mathematically acceptable statements. Connecting words/phrases - consolidating the understanding of “if and only if (necessary and sufficient) condition”, “implies”, “and/or”, “implied by”, “and”, “or”, “there exists” and their use through variety of examples related to real life and Mathematics. Validating the statements involving the connecting words difference between contradiction, converse and contra positive.

UNIT VI: STATISTICS AND PROBABILITY**1. Statistics****(Periods 10)**

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

2. Probability**(Periods 10)**

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

MATHEMATICS
COURSE STRUCTURE
Class XII (Theory)

One Paper	Time 3 Hours	Max. Marks: 100
Units	Titles	Weightage
I	Relations and Functions	10 marks
II	Algebra	13 marks
III	Calculus	44 marks
IV	Vectors and Three-Dimensional Geometry	17 marks
V	Linear Programming	06 marks
VI	Probability	10 marks
Total		100 marks

(Total Periods 180)

UNIT I: RELATIONS AND FUNCTIONS

1. Relations and Functions

(Periods 10)

Types of relations: Reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions inverse of a function Binary operations.

2. Inverse Trigonometric Functions

(Periods 12)

Definition, range, domain, principal value branches. Graphs of inverse trigonometric functions. Elementary properties of inverse trigonometric functions.

UNIT II: ALGEBRA

1. Matrices

(Periods 18)

Concept, notation order, equality, types of matrices. zero matrix, transpose of a matrix, symmetric and skew symmetric matrices. Addition, multiplication and scalar multiplication of matrices, simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2). Concept of elementary row and column operations.. Invertible matrices and proof of the uniqueness of inverse, if it exists; (Here all matrices will have real entries).

2. Determinants

(Periods 20)

Determinant of a square matrix (up to 3 x 3 matrices), properties of determinants, minors, cofactors and applications of determinants in finding the area of a triangle.

Adjoint and inverse of a square matrix. Consistent inconsistency and number of solutions of system of linear equations by examples, solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.

UNIT III: CALCULUS

1. Continuity and Differentiability

(Periods 18)

Continuity and differentiability, derivative of composite functions, chain rule, derivatives of inverse trigonometric functions, derivative of implicit function.

Concepts of exponential, logarithmic functions. Derivatives of \log_e^x and e^x .

Logarithmic differentiation. Derivative of functions expressed in parametric forms. Second order derivatives. Rolle's and Lagrange's Mean Value Theorems (without proof) and their geometric interpretations.

2. Applications of Derivatives

(Periods 10)

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

3. Integrals .

(Periods 20)

Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, only simple integrals of the type-

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

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

$$\int \sqrt{ax^2 + bx - c} dx \text{ and } \int (px + q)\sqrt{ax^2 + bx + c} dx$$

to be evaluated.

Definite integrals as a limit of a sum. Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals.

4. Applications of the Integrals

(Periods 10)

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

5. Differential Equations

(Periods 10)

Definition, order and degree, general and particular solutions of a differential equation. Formation of differential equation whose general solution is given. Solution of differential equations by method of separation of variables; homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type —

$$\frac{dy}{dx} + Py = Q, \text{ where P and Q are functions of } x \text{ or constant}$$

$$\frac{dx}{dy} + Px = Q, \text{ where P and Q are functions of } y \text{ or constant}$$

UNIT IV: VECTORS AND THREE-DIMENSIONAL GEOMETRY

1. Vectors

(Periods 10)

Vectors and scalars, magnitude and direction of a vector. Direction cosines/ratios of vectors. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Scalar (dot) product of vectors, projection of a vector on a line. Vector (cross) product of vectors, scalar triple product.

2. Three-dimensional Geometry

(Periods 12)

Direction cosines/ratios of a line joining two points. Cartesian and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Angle between (i) two lines, (ii) two planes, (iii) a line and a plane. Distance of a point from a plane:

UNIT V : LINEAR PROGRAMMING

(Periods 12)

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

UNIT VI: PROBABILITY**(Periods 18)**

Multiplications theorem on probability. Conditional probability, independent events, total probability, Baye's-theorem Random variable and its probability distribution, mean and variance of haphazard variable. Repeated independent (Bernouli) trials and Binomial distribution.

PHYSICS

The syllabus for Physics at the Higher Secondary Stage has been developed with a view that this stage of school education is crucial and challenging as it is a transition from general science to discipline-based curriculum. The recommendations of National Curriculum Framework-2005 have been followed, keeping the disciplinary approach with rigour and depth, appropriate to the comprehension level of learners. Due care has been taken that the syllabus is not heavy and at the same time it is comparable to the international standards. The -syllabus provides logical sequencing of the subject matter with proper placement of concepts with their linkages for better understanding.

It is expected that the syllabus will help to develop an interest in the learners to study Physics as a discipline and inculcate in learners the abilities, useful concepts of Physics in real-life situations for making learning of Physics relevant, meaningful and interesting. The learner is expected to realize and appreciate - the interface of Physics with other disciplines.

RATIONALE

The higher secondary stage is crucial and challenging stage of school education as it is a transition from general science to discipline-based curriculum. Physics is being offered as an elective subject at the higher secondary stage of school education. At this stage, the students take up Physics, as a discipline, with a purpose of pursuing their future careers in basic sciences or professional courses like medicine, engineering, technology and studying courses in applied areas of science and technology at tertiary level. There is a need to provide the learners with sufficient conceptual background of Physics which would eventually make them competent to meet the challenges of academic and professional courses after the higher secondary stage.

The present effort of reforming and updating the Physics curriculum is an exercise based on the feedback received from the school system about existing syllabus and curricular material, large expansion of Physics knowledge, and also the educational and curricular concerns and issues provided in the National Curriculum Framework-2005.

The recommendations of National Curriculum Framework-2005 have been followed, keeping the disciplinary approach with rigour and depth, appropriate to the -comprehension level of learners. Due care has been taken that the syllabus is not heavy and at the same time, it is comparable to the international standards. Also, it is essential to develop linkages with other disciplines for better learning of Physics concepts and establishing relationship with daily-life situations and life-skills.

SALIENT FEATURES

- Emphasis on basic conceptual understanding of content.
- Promoting process-skills, problem-solving abilities and applications of Physics concepts/content, useful in real-life situations for making Physics learning more relevant, meaningful and interesting.
- Emphasis on use of SI Units, Symbols, nomenclature of physical quantities and formulations as per international standards.
- Emphasis on Physics-related technological/industrial aspects to cope up with changing demand of society committed to the use of Physics, technology and informatics.
- Providing logical sequencing of the 'Units' of the subject matter and proper placement of concepts with their linkages for better learning and matching the concepts/content with comprehension level of the learners.
- Reducing the curriculum load by eliminating overlapping of concepts/content within the discipline of Physics or with other disciplines; reducing the descriptive portion and providing suitable formulation/depth of treatment appropriate to the comprehension level of learners, making room for contemporary core - topics and emerging curricular areas in Physics.
- The syllabus is arranged in Units spread over two year's duration. The Unit is so sequenced as to provide different dimensions of Physics as a discipline. The time allocation for learning Physics content per Unit in terms of instructional periods have been mentioned for each Unit to help the Textbook Development Team members to develop the instructional material so as to cover it within the time frame. Each Unit has been arranged with a topic, content related practical work (one core experiment, two activities to be evaluated) and suggested investigatory projects (one project to be evaluated). There is an imperative need for evaluating the learners through Continuous and Comprehensive Evaluation of various concepts covered in a Unit.

With this background, the Physics curriculum at the higher secondary stage attempts to:

- Strengthen the concepts developed at the secondary stage to provide firm ground work and foundation for further learning Physics at the tertiary level more effectively and learning the relationship with daily-life situations;
- Develop conceptual competence in the learners and make them realize and appreciate the interface of Physics with other disciplines;
- Expose the learners to different processes used in Physics-related industrial and technological applications;

- Develop process-skills and experimental, observational, manipulative, decision-making and investigatory skills in the learners;
- Promote problem-solving abilities and creative thinking to develop interest in the learners in the study of Physics as a discipline;
- Understand the relationship between nature and matter on scientific basis, develop positive scientific attitude, and appreciate the contribution of Physics towards the improvement of quality of life and human welfare;
- Physics teaching-learning at the higher secondary stage enables the learners to comprehend the contemporary knowledge and develop aesthetic sensibilities and process skills, The experimental skills and process-skills developed together with conceptual Physics knowledge prepare the learners for more meaningful learning experiences and contribute to the significant improvement of quality of life. The learners would also appreciate the role and impact of Physics and technology, and their linkages with overall national development.

COURSE STRUCTURE
Class XI (Theory)

One Paper	Time 3 Hours	Max. Marks: 70
Units	Titles	Weightage
I	Physical World & Measurement	04
II	Kinematics	08
III	Laws of Motion	08
IV	Work, Energy & Power	08
V	Motion of System of particles & Rigid Body	06
VI	Gravitation	08
VII	Properties of Bulk Matter	10
VIII	Thermodynamics	06
IX	Behaviour of Perfect Gas & Kinetic Theory of Gases	04
X	Oscillations & Waves	08
Total		70

(Total Periods: 180)
(Periods 10)

Unit I: Physical World and Measurement

Physics: Scope and excitement; nature of physical laws; Physics, technology and society.
Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures.

Dimensions of physical quantities, dimensional analysis and its applications.

Unit II: Kinematics:

(Periods 30)

Frame of reference (Inertia and non-inertia frames), Motion in a straight line: Position-time graph, speed and velocity. Uniform and non-uniform motion, average speed and instantaneous-velocity. Uniformly accelerated motion, velocity-time and position-time graphs, relations for uniformly accelerated motion (graphical treatment);

Elementary-concepts of differentiation and integration for describing motion. *Scalar and vector quantities:* Position and displacement vectors, general vectors and notation, equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors. Relative velocity.

Unit vectors. Resolution of a vector in a plane -rectangular components.

Scalar and Vector products of Vectors. Motion in a plane. Cases of uniform velocity and uniform acceleration-projectile motion. Uniform circular motion.

Unit III: Laws of Motion**(Periods 16)**

Intuitive concept of force. Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. Law of conservation of linear momentum and its applications.

Equilibrium of concurrent forces. Static and kinetic friction, laws of friction, rolling friction, lubrication.

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

Unit IV: Work, Energy and Power**(Periods 16)**

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

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

Unit V: Motion of System of Particles and Rigid Body**(Periods 18)**

Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body; centre of mass of uniform rod.

Moment of a force, torque, angular momentum, conservation of angular momentum with some examples.

Equilibrium of rigid bodies, rigid body rotation and equation of rotational motion, comparison of linear and rotational motions; moment of inertia, radius of gyration. Values of M.I. for simple geometrical objects(no derivation). Statement of parallel and perpendicular axes theorem and their applications.

Unit VI: Gravitation**(Periods 14)**

Kepler's laws of planetary motion. The universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth.

Gravitational potential energy; gravitational potential. Escape velocity, orbital velocity of a satellite. Geostationary satellites.

Unit VII: Properties of Bulk Matter**(Periods 28)**

Elastic behaviour, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus-, shear, modulus of rigidity, poisson's ratio; elastic energy.

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

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

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

Heat, temperature, thermal expansion; thermal expansion of solids, liquids, and gases. Anomalous expansion. Specific heat capacity: C_p , C_v — calorimetry; change of state — latent heat.

Heat transfer-conduction and thermal conductivity, convection and radiation. Qualitative ideas of Black Body Radiation, Wein's displacement law, and Green House effect.

Newton's law of cooling and Stefan's law

Unit VIII :Thermodynamics

(Periods 12)

Thermal equilibrium-and definition of temperature (Zeroth law of Thermodynamics). Heat, work and internal energy. First law of thermodynamics. Isothermal and adiabatic processes.

Second law of thermodynamics: Reversible and irreversible processes. Heat engines and refrigerators.

Unit IX: Behaviour of Perfect Gas and Kinetic Theory

(Periods 8)

Equation of state of a perfect gas; work done on compressing a gas.

Kinetic theory of gases : Assumptions, concept of pressure. Kinetic energy and temperature; rms speed of gas molecules; degrees of freedom, law of equipartition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.

Unit X: Oscillations and Waves

(Periods 28)

Periodic motion — period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion(SHM) and its equation; phase; oscillations of a spring - restoring force and force constant; energy in SHM — kinetic and potential energies; simple pendulum - derivation of expression for its time period; free, forced and damped oscillations (qualitative ideas only), resonance.

Wave motion. Longitudinal and transverse waves, speed of wave motion. Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics. Beats Doppler Effect

PRACTICALS

Total Periods 60

Section A

Experiments.

(Any 8 experiments out of the following to be performed by the students)

1. To measure diameter of a small spherical/cylindrical body using Vernier callipers.
2. To measure internal diameter and depth of a given beaker/calorimeter using Vernier callipers and hence find its volume.
3. To measure diameter of a given wire using screw gauge.
4. To measure thickness of a given sheet using screw gauge.
5. To measure volume of an irregular lamina using screw gauge.
6. To determine radius of curvature of a given spherical surface by a spherometer.
7. To determine the mass of two different objects using a beam balance,
8. To find the weight of a given body using parallelogram law of vectors.
9. Using a simple pendulum, plot L-T and L-T² graphs. Hence find the effective length of a second's pendulum using appropriate graph.
10. To study the relationship between force of limiting friction and normal reaction and to find the coefficient of friction between a block and a horizontal surface.
11. To find the downward force, along an inclined plane, acting on a roller due to gravitational pull of the earth and study its relationship with the angle of inclination (θ) by plotting graph between force and $\sin \theta$.

Activities

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

Section B

Experiments

(Any 7 experiments out of the following to be performed by the students)

1. To determine Young's modulus of elasticity of the material of a given wire.
2. To find the force constant of a helical spring by plotting a graph between load and extension.
3. To study the variation in volume with pressure for a sample of air at constant temperature by plotting graphs between P and V, and between P and 1/V.
4. To determine the surface tension of water by capillary rise method.
5. To determine the coefficient of viscosity of a given viscous liquid by measuring the terminal velocity of a given spherical body.
6. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.
7. To determine specific heat capacity of a given (i) solid (ii) liquid, by method of mixtures.
8. (i) To study the relation between frequency and length of a given wire under constant tension using sonometer. .
(ii) To study the relation between the length of a given wire and tension for constant frequency using sonometer.
9. To find the speed of sound in air at room temperature using a resonance tube by two resonance positions.

Activities

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

PHYSICS
COURSE STRUCTURE
Class XII (Theory)

One Paper		Time 3 Hours	Max. Marks: 70
Units	Titles		Weightage
I	Electrostatics		08
II	Current Electricity		07
III	Magnetic Effect of Current & Magnetism		08
IV	Electromagnetic Induction and Alternating Current		08
V	Electromagnetic Waves		03
VI	Optics		14
VII	Dual Nature of Matter		04
VIII	Atoms and Nuclei		06
IX	Electronic Devices		07
X	Communication Systems		05
	Total		70

(Total Periods: 180)

Unit I: Electrostatics

(Periods 25)

Electric charges and their conservation. Coulomb's law— force between two point charges, forces between multiple charges; superposition principle and continuous charge distribution.

Electric field, electric field due to a point charge, electric field lines; electric dipole, electric field due to a dipole; torque on a dipole in a uniform electric field.

Electric flux, statement of Gauss's theorem- and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field-inside and outside).

Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipoles in an electrostatic field.

Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor, Van de Graff generator.

Unit II: Current Electricity.

(Periods 22)

Electric current, flow of electric charges in a metallic conductor drift velocity and mobility, and their relation with electric current; Ohm's law, electrical resistance, $V- I$

characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity.

Carbon resistors, colour code for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance.

Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel.

Kirchhoff -'s laws and simple applications. Wheatstone bridges, metre bridge.

Potentiometer – principle and applications to measure potential difference, and for comparing emf of two cells; measurement of internal resistance of a cell.

Unit III: Magnetic Effects of Current and Magnetism (Periods 25)

Concept of magnetic field, Oersted's experiment. Biot - Savart law and its application to current carrying circular loop.

Ampere's law and its applications to infinitely long straight wire, straight and toroidal solenoids. Force - on a moving charge in uniform magnetic and electric fields. Cyclotron.

Force on a current-carrying conductor in a uniform magnetic field. Force between two parallel current-carrying conductors – definition of ampere. Torque experienced by a current loop in a magnetic field; moving coil galvanometer– its current sensitivity and conversion-to ammeter and voltmeter.

Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron. Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis.-Torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid, magnetic field lines; Earth's magnetic field and magnetic elements.

Para-, dia-, and ferro- magnetic substances, with examples.

Electromagnets and factors affecting their strengths. Permanent magnets.

Unit IV: Electromagnetic Induction and Alternating Currents (Periods 20)

Electromagnetic induction; Faraday's law, induced emf and current; Lenz's Law, Eddy currents. Self - and mutual inductance.

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

AC generator and transformer

Unit V: Electromagnetic Waves (Periods 4)

Need for displacement current.

Electromagnetic waves and their characteristics (qualitative ideas -only). - Transverse nature of electromagnetic waves.

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

Unit VI: Optics

(Periods 30)

Reflection of light, spherical mirrors, mirror formula. Refraction of light, total internal reflection and its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lens-maker's formula. Magnification, power of a lens, combination of thin lenses in contact combination of a lens and a mirror. Refraction and dispersion of light through a prism.

Scattering of light — blue colour of the sky and reddish appearance of the sun at sunrise and sunset.

Optical instruments: Human eye, image formation and accommodation, correction of eye defects (myopia and hypermetropia) using lenses.

Microscope and astronomical telescopes (reflecting and refracting) and their magnifying powers.

Wave optics: Wavefront and Huygens' principle, reflection and refraction of plane wave at a plane surface using wavefronts.

Proof of laws of reflection and refraction using Huygens' principle.

Interference, Young's double hole experiment and expression for fringe width, coherent sources and sustained interference of light.

Diffraction due to a single slit, width of central maximum.

Resolving power of microscopes and astronomical telescopes. Polarisation, plane polarised light; Brewster's law, uses of plane polarised light and Polaroids.

Unit VII: Dual Nature of Matter and Radiation

(Periods 8)

Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation –particle nature of light.

Matter waves — wave nature of particles, de Broglie relation. Davisson-Germer experiment (experimental details should be omitted; only conclusion should be explain.)

Unit VIII: Atoms and Nuclei

(Periods 18)

Alpha - particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum. Composition and size of nucleus, atomic masses, isotopes, isobars; isotones.

Radioactivity — alpha, beta and gamma particles/rays and their properties; radioactive decay law. Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission and fusion.

Unit IX : Electronic Devices**(Periods 18)**

Energy bands in solids (qualitative ideas only), conductors, insulators and semiconductors; semiconductor diode — I - V characteristics in forward and reverse bias, diode as a rectifier; I - V characteristics of LED, photodiode, solar cell, and Zener diode; Zener diode as a voltage regulator. Junction transistor, transistor action, characteristics of a transistor; transistor as an amplifier (common emitter configuration) and oscillator. Logic gates (OR, AND, NOT, NAND and NOR). Transistor as a switch.

Unit X: Communication Systems**(Periods 10)**

Elements of a communication system (block diagram only); bandwidth of signals (speech, TV and-digital data), bandwidth of transmission medium. Propagation of electromagnetic waves in the atmosphere, sky and space wave propagation. Need for modulation-Production and detection of an amplitude-modulated wave.

PRACTICALS**Total Periods: 60**

Every student will perform at least 15 experiments (7 from Section A & 8 from section B). The activities mentioned here should only be for the purpose of demonstration. One Project of three marks is to be carried out by the students.

Section A**Experiments**

1. To find resistance of given wire using metre bridge and hence determine the specific resistance of its material.
2. To determine resistance per cm of a given wire by plotting a graph of potential difference versus current.
3. To verify the laws of combination (series/parallel) of resistances using a metre bridge.
4. To compare the emf of two given primary cells using potentiometer.
5. To determine the internal resistance of given primary cell using potentiometer.
6. To determine resistance of a galvanometer by half-deflection method and to find its figure of - merit.
7. To convert the given galvanometer (of known resistance of figure of merit) into an ammeter and voltmeter of desired range and to verify the same.
8. To find the frequency of the ac mains with a sonometer.

Activities

1. To measure the resistance and impedance-of an inductor with or without iron core.
2. To measure resistance, voltage (ac/dc), current (ac) and check continuity of a given circuit using multimeter.
3. To assemble a household circuit comprising three bulbs, three (on/of) switches, a fuse and a power source.
4. To assemble the components of a given electrical circuit.
5. To study the variation in potential drop with length of a wire for a steady current.
6. To draw the diagram-of a given open circuit comprising at least a battery, resistor/ rheostat, key, ammeter and voltmeter. Mark the components that are not connected in proper order and correct the circuit and also the circuit diagram.

Section B

Experiments

1. To find the value of v for different values of u in case of a concave mirror-and to find the focal length
2. To find the focal length-of-a convex mirror, using a convex lens.
3. To find the focal length of a convex lens by plotting graphs between u and v or between $1/u$ and $1/v$.
4. To find the focal length of a concave lens, using a convex lens.
5. To determine angle of minimum deviation for a given prism by plotting a graph between the angle of incidence and the angle of deviation.
6. To determine refractive index of a glass slab using a travelling microscope.
7. To find refractive index of a liquid by using (i) concave mirror, (ii) convex lens and plane mirror.
8. To draw the I-V characteristics curves of a p-n junction in forward bias and reverse bias.
9. To draw the characteristics curve of a zener diode and to determine its reverse break down voltage.
10. To study the characteristics of a common-emitter npn or pnp transistor and to find out the values of current and voltage gains.

Activities

1. To identify a diode, an LED, a transistor, and IC, a resistor and a capacitor from mixed collection of such items.
2. Use of multimeter to (i) identify base of transistor, (ii) distinguish between npn and pnp type a transistors, (iii) see the unidirectional flow of current in case of a diode

and an LED, (iv) check whether a given electronic component (e.g. diode, transistor or IC) is in working order.

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

CHEMISTRY

RATIONALE

Higher Secondary Stage is the most crucial stage of school education because at this stage specialised discipline based, content oriented courses are introduced. Students reach this-stage after 10 years of general education and opt for Chemistry with a purpose of mostly for pursuing their career in basic sciences or professional courses like medicines, engineering, technology and studying courses in applied areas of science and technology at tertiary level. Therefore, at this stage, there is a need to provide learners with sufficient conceptual background of Chemistry, which will make them competent to meet the challenges of academic and professional courses after the higher secondary stage.

National Curriculum Framework - 2005 recommends a disciplinary approach with appropriate rigour and depth with the care that syllabus is not heavy and at the same time it is comparable to the international level. It emphasizes coherent focus on important ideas within the discipline that are properly sequenced to optimize learning. It recommends that theoretical component of Higher Secondary Science should emphasize on problem solving methods and the awareness of historical development of key concepts of science be judiciously integrated into content. The present exercise of syllabus development in Chemistry' at Higher Secondary Stage is based on this framework.

Salient features of the present syllabus are thus:

- Some background of Chemistry from secondary stage is assumed; however, no specific knowledge of topics in Chemistry is pre-supposed.
- The course is self-contained and broadly covers fundamental concepts of Chemistry.
- Attempt has been made to see discipline of Chemistry does not remain only the science of facts but becomes related to modern applications in the world around us.
- The syllabus provides logical sequencing of the 'Units' of the subject matter with proper placement of concepts with their linkages for better understanding.
- Emphasis has been on promoting process- skills, problem solving abilities and applications of concepts of Chemistry useful in real life situation for making learning of Chemistry more relevant, meaningful and interesting.
- An effort has been made on the basis of feedback, to remove repetition besides reducing the content by suitably integrating the different content areas.
- Practical syllabus has two components. There are core experiments to be undertaken by the students in the classroom and will be part of examination while each student will carry out one investigatory project and submit the report for the examination.

- With this background, the Chemistry curriculum at the higher secondary stage attempts to promote understanding of basic principles in Chemistry while retaining the excitement in Chemistry;
- Develop an interest in students to study- Chemistry as discipline;
- Strengthen the concepts developed at the secondary stage and to provide firm foundation for further learning of Chemistry at-tertiary-level-more effectively;
- Develop positive scientific attitude, and appreciate contribution of Chemistry towards the improvement of quality of human life;
- Develop problem solving skills and nurture curiosity, aesthetic sense and creativity;
- Inculcate values of honesty, integrity, cooperation, concern for life and preservation of the environment;
- Make the learner realise the interface of Chemistry with other disciplines of science such as Physics, Biology, Geology, etc;
- Equip students to face challenges related to health, nutrition, environment, population, whether industries and agriculture.

COURSE STRUCTURE
Class XI (Theory)

One Paper	Time 3 Hours	Max. Marks: 70
Units	Titles	Weightage
I	Some Basic Concepts of Chemistry	05
II	Structure of Atom	06
III	Classification of Elements and Periodicity in Properties	04
IV	Chemical Bonding and Molecular Structure	05
V	States of Matter: Gases and Liquids	04
VI	Thermodynamics	06
VII	Equilibrium	06
VIII	Redox Reactions	03
IX	Hydrogen	03
X	s-Block Elements	05
XI	Some p-Block elements	05
XII	Organic Chemistry: Some Basic Principles and Techniques	07
XIII	Hydrocarbons	08
XIV	Environmental Chemistry	03
Total		70

(Total Periods 180)

Unit I: Some Basic Concepts of Chemistry

(Periods 12)

General Introduction: Importance and scope of chemistry.

Historical approach to particulate nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules.

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

Unit II: Structure of Atom

(Periods 16)

Discovery of electron, proton and neutron; atomic number, isotopes and isobars. Thomson's model and its limitations, Rutherford's model and its limitations, Bohr's model and its limitations, concept of shells and sub-shells, dual-nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept orbitals, quantum numbers, shapes of *s*, *p* and *d* orbitals; - rules for filling electrons in orbitals -Aufbau principle, Pauli exclusion principle and Hund's rule, electronic configuration of atoms, stability of half filled and completely filled orbitals.

Unit III: Classification of Elements and Periodicity in Properties (Periods 8)

Significance of classification, brief history of the development of periodic table, modern periodic law and the present form of periodic table, periodic trends in properties of elements —atomic radii, ionic radii, inert gas radii, ionization enthalpy, electron gain enthalpy, electronegativity, valence. Nomenclature of elements with atomic number greater than 100.

Unit IV: Chemical Bonding and Molecular Structure (Periods 16)

Valence electrons, ionic bond, covalent bond, bond parameters, Lewis-structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridization involving *s*, *p* and *d* orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules -qualitative idea only). Hydrogen bond.

Unit V: States of Matter: Gases and Liquids (Periods 14)

Three states of matter, intermolecular interactions, types of bonding, melting and boiling points, role of gas laws in elucidating the concept of the molecule, Boyle's law, Charles's law, Gay Lussac's-law, Avogadro's law, ideal behaviour, empirical derivation of gas equation, Avogadro number, ideal gas equation. Kinetic energy and molecular speeds (elementary idea), deviation from ideal behaviour, liquefaction of gases, critical temperature.

Liquid State —Vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations).

Unit VI: Thermodynamics (Periods 16)

Concepts of system, types of systems, surroundings, work, heat, energy, extensive and intensive properties, state functions.

First law of thermodynamics — internal energy and enthalpy, heat capacity and specific heat, measurement of ΔU and ΔH , Hess's law of constant heat summation, enthalpy of: bond dissociation; combustion, formation, atomization, sublimation; phase transition; ionization, solution and dilution.

Introduction of entropy as a state function, Second law of thermodynamics, Gibbs energy change for spontaneous and non-spontaneous process, criteria for equilibrium.

Third law of thermodynamics Brief introduction.

Unit VII: Equilibrium**(Periods 20)**

Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium—Le Chatelier's principle; ionic equilibrium—ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of polybasic acids, acid strength, concept of pH., Hydrolysis of salts (elementary idea), , buffer solutions, Henderson equation, solubility product, common ion effect (with- illustrative examples).

Unit VIII: Redox Reactions**(Periods 6)**

Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions in terms of loss and gain of electron and change in oxidation numbers, applications of redox reactions.

Unit IX: Hydrogen**(Periods 8)**

Position of hydrogen in periodic table, occurrence, isotopes, preparation, properties and uses of hydrogen; hydrides — ionic, covalent and interstitial; physical and chemical properties of water, heavy water; hydrogen peroxide-preparation, reactions, use and structure; hydrogen as a fuel.

Unit X: s- Block Elements (Alkali and Alkaline earth metals)**(Periods 12)**

Group 1 and Group 2 elements:

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

Preparation and Properties of Some Important Compounds:

Sodium carbonate, sodium chloride, sodium hydroxide and sodium hydrogencarbonate, biological importance of sodium and potassium.

CaO, CaCO₃, and industrial use of lime and limestone, biological importance of Mg and Ca

Unit XI: Some p-Block Elements**(Periods 14)**

General Introduction to p-Block Elements

Group 13 elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group; Boron-physical and chemical properties, some important compounds: borax, boric acids, boron hydrides. Aluminium: uses, reactions with acids and alkalis.

Group 14 elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first element. Carbon - catenation, allotropic forms, physical and chemical properties; uses of some important compounds: oxides.

Important compounds of silicon and a few uses: silicon tetrachloride, silicones, silicates and zeolites, their uses.

Unit XII: Organic Chemistry -Some Basic Principles and Techniques (Periods 16)

General introduction, methods of purification, qualitative and quantitative, analysis, classification and IUPAC nomenclature of organic compounds.

Electronic displacements in a covalent bond- inductive effect, electromeric effect, resonance and hyper conjugation.

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

Unit XIII: Hydrocarbons

(Periods 16)

Classification of Hydrocarbons-

Aliphatic Hydrocarbons:

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

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

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

Aromatic hydrocarbons: Introduction, IUPAC nomenclature; Benzene: resonance, aromaticity, chemical properties: mechanism of electrophilic substitution— nitration sulphonation, halogenation, Friedel Craft's alkylation and acylation; directive influence of functional group in mono substituted benzene; carcinogenicity and toxicity.

Unit XIV: Environmental Chemistry

(Periods 6)

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

PRACTICAL SYLLABUS

Total Periods 60

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

A. Basic Laboratory Techniques

(Periods 3)

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

B. Characterization and Purification of Chemical Substance

(Periods 7)

1. Determination of melting point of an organic compound.
2. Determination of boiling point of an organic compound.
3. Crystallization involving impure sample of any one of the following:
Alum, copper sulphate, Benzoic acid.

C. Experiments Related to pH Change

(Periods 7)

(a) Any one of the following experiments:

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

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

D. Chemical Equilibrium

(Periods 5)

One of the following experiments:

- a) Study the shift in equilibrium between ferric ions and thiocyanate by increasing/decreasing the concentration of either of the ions.
- b) Study the shift in equilibrium between $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$ and chloride ions by changing the concentration of either of the ions.

E. Quantitative Estimation

(Periods 18)

- Using a chemical balance.
- Preparation of standard solution of oxalic acid.
- Determination of strength of a given solution of sodium hydroxide by titrating it against standard solution of oxalic acid.
- Preparation of standard solution of sodium carbonate.

- Determination of strength of a given solution of hydrochloric acid by titrating it against standard sodium carbonate solution.

F. Qualitative Analysis

(Periods 18)

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

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

Anions – CO_3^{3-} , S^{2-} , SO_3^{2-} , SO_4^{2-} , NO_2^- , NO_3^- , Cl^- , Br^- , I^- , PO_4^{3-} , $\text{C}_2\text{O}_4^{2-}$, CH_3COO^-
(Note : Insoluble salts excluded)

G. Detection of nitrogen, sulphur, chlorine in organic compounds.

(Periods 12)

Project

(Periods 10)

Scientific investigations involving laboratory testing and collecting information from other sources.

A few suggested projects

- Checking the bacterial contamination in drinking water by testing sulphide ions.
- Study of the methods of purification of water.
- Testing the hardness, presence of iron, fluoride, chloride etc: depending upon the regional variation in drinking water and the study of causes of presences of these ions above permissible limit (if any)
- Investigation of the foaming capacity of different washing soaps and the effect of addition of sodium carbonate on them.
- Study of the acidity of different samples of the tea leaves.
- Determination of the rate of evaporation of different liquids.
- Study of the effect of acids and bases on the tensile strength of fibers,
- Analysis of fruit and vegetable juices for their acidity.

Note: Any other investigatory project, which involves about 10 periods of work; can be chosen with the approval of the teacher.

COURSE STRUCTURE
Class XII (Theory)

One Paper		Time 3 Hours	Max. Marks: 70
Units	Titles		Weightage
I	Solid State		4
II	Solutions		5
III	Electrochemistry		5
IV	Chemical Kinetics		5
V	Surface Chemistry		4
VI	General principles and processes of isolation of elements		3
VII	p-Block Elements		6
VIII	d- and f- Block Elements		5
IX	Coordination Compounds		5
X	Haloalkanes and Haloarenes		4
XI	Alcohols, Phenols and Ethers		4
XII	Aldehydes, Ketones and Carboxylic Acids		6
XIII	Organic compounds containing Nitrogen		4
XIV	Biomolecules		4
XV	Polymers		3
XVI	Chemistry in Everyday life		3
Total			70

(Total Periods 180)

Unit I: Solid State

(Periods 12)

Classification of solids based on different binding forces :molecular, ionic covalent and metallic solids, amorphous and crystalline solids(elementary idea },unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency, voids ,number of atoms per unit cell in a cubic unit cell, point defects, electrical and magnetic properties, Band theory of metals, conductors, semiconductors and insulators and *n* and *p* type semiconductors

Unit II: Solutions

(Periods 12)

Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, colligative properties — relative lowering of vapour pressure, Raoult's law elevation of B.P., depression of freezing point osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Vant-Hoff factor. .

Unit III: Electrochemistry**(Periods 14)**

Redox reactions, conductance in electrolytic solutions, specific and molar conductivity variations of conductivity with concentration, Kohlrausch's Law, electrolysis and laws of electrolysis (elementary idea), dry cell—electrolytic cells and Galvanic cells; lead accumulator, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells. Relation between Gibbs energy change and EMF of a cell, fuel cells; corrosion.

Unit IV: Chemical Kinetics**(Periods 12)**

Rate of a reaction (average and instantaneous), factors affecting rates of reaction: concentration, temperature, catalyst; order and molecularity of a reaction; rate law and specific rate constant, integrated rate equations and half life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment). Activation energy, Arrhenius equation.

Unit V: Surface Chemistry**(Periods 8)**

Adsorption — physisorption and chemisorption; factors affecting adsorption of gases on solids; catalysis: homogenous and heterogeneous, activity and selectivity; enzyme catalysis; colloidal state; distinction between true solutions, colloids and suspensions; lyophilic, lyophobic multimolecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation; emulsions — types of emulsions.

Unit VI: General Principles and Processes of Isolation of Elements**(Periods.8)**

Principles and methods of extraction— concentration, oxidation, reduction electrolytic method and refining; occurrence and principles of extraction of aluminium, copper, zinc and iron.

Unit VII: p-Block Elements**(Periods 14)**

Group 15 element: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; nitrogen — preparation, properties and uses; compounds of nitrogen: preparation and properties of ammonia and nitric acid, oxides of nitrogen (structure only); Phosphorous-allotropic forms; compounds of phosphorous: preparation and properties of phosphene, halides (PCl_3 , PCl_5) and oxoacids (elementary idea only).

Group 16 elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; dioxygen: preparation, properties and uses; classification of oxides; ozone. Sulphur — allotropic forms; compounds of sulphur:

preparation, properties and uses of sulphur dioxide; sulphuric acid: industrial process of manufacture, properties and uses, oxoacids of sulphur (structures only).

Group 17 elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens: preparation, properties and uses of chlorine and hydrochloric acid, interhalogen compounds, oxoacids of halogens (structure's only).

Group 18 elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

Unit VIII: d -and f- Block Elements (Period 14)

General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation. Preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$.

Lanthanoids - electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences.

Actinoids – Electronic configuration, oxidation states and comparison with lanthanoids

Unit IX: Coordination Compounds (Period 12)

Coordination compounds: Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds bonding, Werner's theory VBT, CFT; isomerism (structural and stereo) importance of coordination compounds (in qualitative analysis, extraction of metals and biological systems).

Unit X: Haloalkanes and Haloarenes (Periods 12)

Haloalkanes : Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions. Optical rotation.

Haloarenes: Nature of C-X bond, substitution reactions (directive influence of halogen for monosubstituted compounds only).

Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.

Unit XI: Alcohols, Phenols and Ethers (Periods 12)

Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only); identification of primary, secondary and tertiary alcohols, mechanism of dehydration, uses, with special reference to methanol and ethanol.

Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reactions, uses of phenols.

Ethers: Nomenclature, methods of preparation, physical and chemical properties, uses.

Unit XII: Aldehydes, Ketones and Carboxylic Acids (Period 12)

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

Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Unit XIII: Organic Compounds Containing Nitrogen (Periods 10)

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

Cyanides and Isocyanides – will be mentioned at relevant places in context.

Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry.

Unit XIV: Biomolecules (Periods 12)

Carbohydrates - Classification (aldoses and ketoses), monosaccharide (glucose and fructose), D-L configuration, oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen): importance.

Proteins - Elementary idea of a amino acids, peptide bond, polypeptides, proteins, primary structure, secondary structure, tertiary structure an quaternary structure (qualitative idea only), denaturation of preens, enzymes.

Hormones —Elementary idea (excluding structure).

Vitamins - Classification and functions.

Nucleic Acids: DNA and RNA

Unit XV: Polymers (Periods 8)

Classification — Natural and synthetic, methods of polymerization (addition and condensation), copolymerization. Some important polymers: natural and synthetic like polythene, nylon, polyesters, bakelite; rubber Biodegradable and non-biodegradable polymers.

Unit XVI: Chemistry in Everyday Life (Periods 8)

1. Chemicals and medicines — analgesics, tranquilizers, antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines.

2. Chemicals in food — preservatives, artificial sweetening agents, elementary idea of antioxidants.
3. Cleansing agents - soaps and detergents, cleansing action.

PRACTICALS

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

A. Surface Chemistry

(Periods 6)

- (a) Preparation of one lyophilic and one lyophobic sol.

Lyophilic sol: starch, egg albumin and gum.

Lyophobic sol: aluminium hydroxide, ferric hydroxide, arsenious sulphide.

- (b) Dialysis of sol prepared in (a) above.

- (c) Study of the role of emulsifying agent in stabilizing the emulsions of different oils.

B. Chemical Kinetics

(Periods 4)

- (a) Effect of concentration and temperature on the rate of reaction between sodium thiosulphate and hydrochloric acid.

- (b) Study of reaction rates of any one of the following:

(i) Reaction of iodide ion with hydrogen peroxide at room temperature using different concentrations of iodide ions.

(ii) Reaction between potassium iodate (KIO_3) and sodium sulphite ($\text{Na}_2\text{S O}_3$) using starch - solution as indicator (clock reaction).

C. Thermochemistry

(Periods 4)

Anyone of the following experiments

(a) Enthalpy of dissolution of copper sulphate or potassium nitrate.

(b) Enthalpy of neutralization of strong acid (HCl) and strong base (NaOH)

(c) Determination of enthalpy change during interaction (Hydrogen bond formation) between acetone and chloroform.

D. Electrochemistry

(Periods 2)

Variation of cell potential in $\text{Zn}/\text{Zn}^{2+}||\text{Cu}^{2+}/\text{Cu}$ with change in concentration of electrolytes (CuSO_4 or ZnSO_4) at room temperature.

F. Chromatography**(Periods 2)**

(a) Separation of pigments from extracts leaves and flowers by paper chromatography and determination of R_f values.

(b) Separation of constituents present in an inorganic mixture containing two cations only (constituents having wide difference in R_f values to be provided).

F. Preparation of Inorganic Compounds**(Periods 4)**

(a) Preparation of double salt of ferrous ammonium sulphate or potash alum.

(b) Preparation of potassium ferric oxalate.

G. Preparation of Organic Compounds**(Periods 4)**

Preparation of any one of the following compounds:

(a) Acetanilide

(b) Di-benzal acetone

(c) p-Nitroacetanilide

(d) Aniline yellow or 2 - Naphthol aniline dye

(e) Iodoform

H. Test for the Functional Groups Present in Organic Compounds**(Periods 6)**

Unsaturation alcoholic phenolic, aldehydic, ketonic, carboxylic and amino (primary) groups.

I. Characteristic Tests of Carbohydrates, Fats and Proteins in Pure Samples and Their Detection in Given Food Stuffs.**(Periods 4)****J. Determination of Concentration/Molarity of $KMnO_4$ Solution by titrating it against a Standard Solution of —****(Periods 8)**

(i) Oxalic acid

(ii) Ferrous ammonium sulphate

(Students will be required to prepare standard solutions by weighing themselves).

K. Qualitative Analysis**(Periods 14)**

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

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

Anions - CO_3^{2-} , S^{2-} , SO_3^{2-} , SO_4^{2-} , NO_2^- , NO_3^- , Cl^- , Br^- , I^- , PO_4^{3-} , $C_2O_4^{2-}$, CH_3COO^-

(Note: Insoluble salts excluded)

Projects

(Periods 10)

Scientific investigations involving laboratory testing and collecting information from other sources.

A few suggested projects

- Study of presence of oxalate ions in guava fruit at different stages of ripening.
- Study of quantity of casein present in different samples of milk.
- Preparation of soybean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc.
- Study of the effect of potassium bisulphate as food preservative under various conditions (temperature, concentration, time etc.)
- Study of digestion of starch by salivary amylase and effect of pH and temperature on it
- Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice etc.
- Extraction of essential-oils present in Saunf(aniseed), Ajwain (carum), Illaichi (cardamom). Study of common food adulterants in fat, oil, butter, sugar, turmeric powder, chilli powder and pepper.

Note: Any other investigatory project, which involves about 10 periods of work, can be chosen with the approval of the teacher. In addition models and exhibits for exhibition, depicting basic principles and application in daily life may also be included.

BIOLOGY

In the present attempt of the NCERT to revise the Biology syllabus of the Classes: XI and XII, several documents like Learning without Burden, the National Curriculum Framework- 2005, the report of the 'National Focus on Teaching of Science' as well as reports of several external and internal reviews carried out helped to decide the main focus of the revision. Hence, the revised syllabus aims primarily at reducing the information load while ensuring at the same time that ample opportunities and scope for learning and appreciating basic concepts of Biology continues to be available within the framework.

The Biology Syllabus reinforces the ideas introduced in the lower classes while the children learn new concepts besides getting an exposure to contemporary areas of Biology. This syllabus aims also at concepts emphasizing the underlying principles that are common to both animals and plants, as well as highlighting the interrelationships of Biology with other areas of knowledge. The format of the syllabus allows a simple, clear, sequential flow of concepts without any jarring jumps. The empirical experience gained and practical exercises carried out during the course would prepare the student to handle Biology easily at higher levels in case she/he opts to continue further studies in this area.

The revised syllabus stresses the connection of the study of Biology to real life problems use of biological discoveries/innovations in everyday life - in environment, industry; medicine, health and agriculture. Since it was important that the quality of Biology education at the higher secondary level was not compromised in any way, the reduction in load from the syllabus required a very careful selection of topics to be taught. The Committee chose to leave topics out if: the question about why the child needs to study the topic at the particular stage - could not be answered; if the topic had no direct relevance to the child i.e. was not contextual; if the content was repetitive across stages with no change in expected understanding, and if any topic was in isolation with no evident horizontal or vertical linkages. The need for a network of ideas and cross-linking between the areas being identified was deemed very important. While deciding on the units/topics and the depth of each topic for the higher secondary level, a holistic view of the syllabus across all stages from the primary to the higher secondary and beyond was taken. Reducing the use of too many technical terms and avoiding very large numbers of examples will also help to make the content a little lighter. The importance of careful selection of illustrations and their use to make the concepts more explicit was stressed; in Biology the quality of illustrations can make or mar any attempt at good textbooks/teaching.

The principal objective at this stage would be to explore the variations amongst the living and developing respect for the diversities, and to appreciate that the most complex biological phenomena are also built on essentially simple processes. Learning Biology should uncover these elementary aspects and illustrate their linkage to more complex phenomena. It was also felt that the contributions of scientists (women scientists in particular) that led to

critical and important discoveries in Biology should be highlighted, not merely through a chronological listing, but through brief biographical discussions, in an effort to bring out the processes that led to the discovery of principles and ideas in Biology; These would stimulate critical and creative thinking. Besides, the proposed course at the higher secondary stage provides substantial orientation to the students to professional/career opportunities available in medicine, agriculture, research, teaching and industry.

The syllabus also takes up issues pertaining to environment, health and other ethical issues that arise with any interference of human beings in the natural processes, which have great relevance from the societal point of view. A discussion on these in the prescribed syllabus would help tackle prevalent misconceptions and empower the student to play a rational, responsible and- informed role in society. The teaching time in terms of number of periods available is indicated for each unit (total 180 periods).

The young student would get an exposure to the various branches of Biology in a more contextual and friendly manner as they studied various units in the syllabus, each unit could also provide a glimpse of the career opportunities in the particular area. After studying any unit, the child gets an opportunity to think more deeply and to form informed opinions. The description of the diverse/various tools and techniques used in the study of Biology have not been collated to form a distinct unit in the syllabus. It is envisaged that the teachers who teach this syllabus and the textbooks prepared based on it, will discuss techniques in a contextual manner rather than distanced from real experimental situations.

The committee faced a dilemma while considering the topic of animal physiology: whether to deal with 'animal' or 'human' physiology. 'But the moment the focus of discussion shifted - from the 'subject' dictated one to the child - and the available time was considered, it was evident that 'human' physiology was more appropriate at this stage. The student is closest to herself and is curious about the functioning of the human body. The 'science' understood after a study of human physiology could be meaningfully applied to other organisms.

The students should be encouraged to do at least one project, may be in Class XI. The basic objective of these projects should be to provide the child with an exposure to what it means to carry out an investigation, what research methodologies are, how data is analysed and presented and, how to interpret data and draw conclusions. The project should provide space for the child to choose a theme in the area of her interest, think independently allow autonomous working and also provide freedom to present the project in any format of her/his choice, thus improving her/his communication skills.

The syllabus committee hopes that the spirit of the exercise is carried forward to the textbook and the classrooms, across the country, ultimately meeting our objective of reducing the burden on the child while: making learning Biology exciting. Teaching should emphasise on ways of acquiring knowledge rather than on conveying knowledge.

COURSE STRUCTURE
Class XI (Theory)

One Paper		Time 3 Hours	Max. Marks: 70
Units	Titles		Weightage
I	Diversity of Living Organisms		07
II	Structural Organisation in Plants and animals		12
III	Cell: Structure and Function		15
IV	Plant physiology		18
V	Human physiology		18
Total			70

(Total Periods-180)

I. Diversity of Living Organisms

(Periods 25)

What is living? Biodiversity; Need for classification; Three domains of life; Taxonomy & Systematics; Concept of species and taxonomical hierarchy; Binomial nomenclature; Tools for study of Taxonomy— Museums, Zoos, Herbaria, Botanical gardens.

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

Salient features and classification of plants into major groups- Algae, Bryophytes, Pteridophytes, Gymnosperm and Angiosperm (three to five salient and distinguishing features and at least two examples of each category); Angiosperms- classification up to class, characteristic features and examples.

Salient features and classification of animals- non chordate up to phyla level and chordate up to classes level (three to five salient features and at least two examples).

II. Structural Organisation in Animals and Plants

(Periods 25)

Morphology and modifications; Tissues; Anatomy and functions of different parts of flowering plants: Root, stem, leaf, inflorescence- cymose and racemose, flower, fruit and seed (To be dealt along with the relevant practical of the Practical Syllabus).

Animal-tissues; Morphology anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach). (Brief account only)

III. Cell Structure and Function

(Periods 40)

Cell theory and cell as the basic unit of life; Structure of prokaryotic and eukaryotic cell; Plant cell and animal cell; Cell envelope, cell membrane, cell wall; Cell organelles— structure and function, Endomembrane system- endoplasmic reticulum, Golgi bodies,

lysosomes, vacuoles; mitochondria, ribosomes, plastids; microbodies; Cytoskeleton, cilia, flagella, centrioles (ultra structure and function); Nucleus—nuclear membrane, chromatin, nucleolus.

Chemical constituents of living cells: Biomolecules—structure and function of proteins, carbohydrates, lipid, nucleic acids; Enzymes—types, properties, enzyme action.

Cell division: Cell cycle, mitosis meiosis and their significance.

IV. Plant Physiology

(Periods 45)

Transport in plants: Movement of water, gases and nutrients; Cell to cell transport, Diffusion, facilitated diffusion, active transport; Plant - water relations- Imbibition, water potential, osmosis, plasmolysis; Long distance transport of water—Absorption, apoplast, symplast, transpiration pull, root pressure and guttation; Transpiration-Opening and closing of stomata; Uptake and translocation of mineral nutrients—Transport of food, phloem-transport, Mass flow hypothesis; Diffusion of gases (brief mention).

Mineral nutrition: Essential minerals, macro and micronutrients and their role; Deficiency symptoms; Mineral toxicity; Elementary idea of Hydroponics as method to study mineral nutrition; Nitrogen metabolism- Nitrogen cycle, biological nitrogen fixation.

Photosynthesis: Photosynthesis as a means of Autotrophic nutrition; Where does photosynthesis take place; How many pigments are involved in Photosynthesis (Elementary idea) Photochemical and biosynthetic phases of photosynthesis; Cyclic and non cyclic photophosphorylation; Chemiosmotic hypothesis; Photorespiration; C₃ and C₄ pathways, Factors affecting photosynthesis.

Respiration: Exchange of gases; Cellular respiration— glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); Energy relations, - Number of ATP molecules generated; Amphibolic pathways; Respiratory quotient.

Plant growth and development: Seed germination; Phases of plant growth and plant growth rate; Conditions of growth; Differentiation, dedifferentiation and redifferentiation; Sequence of developmental process in a plant cell; Growth regulators— auxin, gibberellin, cytokinin, ethylene, ABA; Seed dormancy, Vernalisation; Photoperiodism,

V. Human Physiology

(Periods 45)

Digestion and absorption: Alimentary canal and digestive glands; Role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats; Calorific value of proteins, carbohydrates and fats (for box item not to be evaluated); Egestion; Nutritional and digestive disorders- PEM, indigestion, constipation, vomiting, jaundice, diarrhea.

Breathing and Respiration: Respiratory organs in animals (recall only); Respiratory system in humans; Mechanism of breathing and its regulation in humans— Exchange of

gases, transport of gases and regulation of respiration, Respiratory volumes; Disorders related to respiration-Asthma, Emphysema, Occupational respiratory disorders.

Body fluids and circulation: Composition of blood, blood groups, coagulation of blood; Composition of lymph and its function; Human circulatory system— Structure of human heart and blood vessels; Cardiac cycle, cardiac output, ECG, Double circulation; Regulation of cardiac activity, Disorders of circulatory system-Hypertension, Coronary artery disease, Angina pectoris; Heart failure.

Excretory products and their elimination: Modes of excretion -Ammonotelism, ureotelism, uricotelism; Human excretory system—structure and function; Urine formation, Osmoregulation; Regulation of kidney function— Renin-angiotensin, Atrial Natriuretic Factor, ADH and Diabetes insipidus; Role of other organs in excretion, Disorders-Uraemia, Renal failure, Renal calculi, Nephritis; Dialysis and artificial kidney.

Locomotion and Movement: Types of movement - ciliary, flagellar muscular; Skeletal muscle contractile proteins and muscle contraction; Skeletal system and its functions (To be dealt with the relevant practical of Practical syllabus);-Joints; Disorders of muscular and skeletal system- Myasthenia gravis, Tetany, Muscular dystrophy, Arthritis, Osteoporosis, Gout.

Neural control and coordination: Neuron and nerves; Nervous system in humans— central nervous system, peripheral nervous system and visceral nervous system; Generation and conduction of nerve impulse; Reflex action; Sensory perception; Sense organs; Elementary structure and function of eye and ear.

Chemical coordination and regulation: Endocrine glands and hormones; Human endocrine system- Hypothalamus, Pituitary; Pineal, Thyroid, Parathyroid, Adrenal, Pancreas, Gonads; Mechanism of hormone action (Elementary Idea); Role of hormones as messengers and regulators, Hypo- and hyperactivity and related disorders (Common disorders e.g. Dwarfism, Acromegaly, Cretinism, goitre, exophthalmic goitre, diabetes, Addison's disease).

Imp: Diseases related to all the human physiology systems to be taught in brief.

PRACTICALS

(Total Periods 60)

A. List of experiments

1. Study and describe three locally available common flowering plants from each of the following families (Solanaceae, Fabaceae and Liliaceae) including dissection and display of floral whorls and anther and ovary to show number of chambers. Types of root (Tap and Adventitious); Stem (Herbaceous and woody); Leaf (arrangement,—shape; venation, simple and compound).
2. Preparation and study of TS of dicot and monocot roots and stems (primary).
3. Study of osmosis by potato osmometer.
4. Study of plasmolysis in epidermal peels (e.g. Rhoeo leaves)
5. Study of distribution of stomata in the upper and lower surface of leaves.
6. Comparative study of the rates of transpiration in the upper and lower surface of leaves.
7. Test for the presence of sugar, starch, proteins and fats, To detect them in suitable plant and animal materials.
8. Separation of plant pigments through paper chromatography.
9. To study the rate of respiration in flower buds/leaf tissue and germinating seeds.
10. To test the presence of urea in urine.
11. To detect the presence of sugar in urine/blood sample.
12. To detect the presence of albumin in urine.
13. To detect the presence of bile salts in urine.

B. Study/observation of the following (spotting)

1. Study parts of a compound microscope.
2. Study of the specimens and identification with reasons- Bacteria, Oscillatoria, Spirogyra, Rhizopus, mushroom, yeast, liverwort, moss, fern, pine, one monocotyledonous plant and one dicotyledonous plant and one lichen.
3. Study of specimens and identification with reasons- Amoeba, Hydra, Liver fluke, Ascaris, leech, earthworm; prawn, silkworm, honeybee, snail, starfish; shark, rohu, frog, lizard, pigeon and rabbit
4. Study of tissues and diversity in shapes and sizes of plant and animal cells (e.g. palisade cells, guard cells, parenchyma, collenchyma, selerenchyma, xylem, phloem, squamous epithelium, muscle fibers and mammalian blood smear) through temporary/permanent slides.
5. Study of mitosis in onion root tips cells and animals cells (grasshopper) from permanent slides.
6. Study of different modifications in root, stem and leaves.

7. Study and identification of different types of inflorescence.
8. Study of imbibition in seeds/raisins.
9. Observation and comments on the experimental set up for showing:
 - a. Anaerobic respiration
 - b. Phototropism
 - c. Apical bud removal
 - d. Suction due to transpiration
10. Study of human skeleton and different types of joints:
11. Study of external morphology of cockroach through models.

COURSE STRUCTURE

Class XII (Theory)

One Paper		Time 3 Hours	Max. Marks: 70
Units	Titles		Weightage
I	Reproduction in Organisms		14
II	Genetics and Evolution		18
III	Biology and Human Welfare		14
IV	Biotechnology and its applications		10
V	Ecology and Environment		14
Total			70

(Total Periods 180)

1. Reproduction

(Periods 35)

Reproduction in organisms: Reproduction, a characteristic feature of all organisms for continuation of species Modes of reproduction —Asexual and sexual; Asexual reproduction; Modes- Binary fission, sporulation, budding, gemmule, fragmentation; vegetative propagation in plants.

Sexual reproduction in flowering plants: Flower structure; Development of male- and female gametophytes; Pollination-types, agencies and examples; Outbreedings devices; Pollen-Pistil interaction; Double fertilization; Post fertilization events— Development of endosperm and embryo, Development of seed and formation of fruit; Special modes - apomixis, parthenocarpy, polyembryony; Significance of seed and fruit formation.

Human Reproduction: Male and female reproductive systems, Microscopic anatomy of testis and ovary; Gametogenesis- spermatogenesis & oogenesis; Menstrual cycle; Fertilisation, embryo development upto blastocyst formation, implantation; Pregnancy and placenta formation (Elementary idea), Parturition (Elementary idea); Lactation (Elementary idea).

Reproductive health: Need for-reproductive health and prevention of sexually transmitted diseases (STD); Birth control- Need and Methods, Contraception and Medical Termination of Pregnancy (MTP); Amniocentesis; Infertility and assisted reproductive technologies - IVF, ZIFT, GIFT (Elementary idea for general awareness).

II. Genetics and Evolution -

(Periods 45)

Heredity and variation: Mendelian Inheritance; Deviations from Mendelism— Incomplete dominance, Co-dominance; Multiple alleles and Inheritance of blood groups,- Pleiotropy; Elementary idea of polygenic inheritance; Chromosome theory of inheritance; Chromosome and genes, Sex determination= In humans, birds, honey bee; Linkage and crossing over; Sex linked inheritance- Haemophilia, Colour blindness; Mendelian disorders

in humans—Thalassemia; Chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

Molecular Basis of Inheritance: Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; Transcription, genetic code, translation; Gene expression and regulation— Lac Operon; Genome and human genome project; DNA finger printing.

Evolution: Origin of life; Biological evolution and evidences for biological evolution (Paleontological, comparative anatomy, embryology and molecular evidence); Darwin's contribution, Modern Synthetic theory of Evolution; Mechanism of evolution—Variation (Mutation and Recombination) and Natural Selection with examples, types of natural selection; Gene flow and genetic drift; Hardy- Weinberg's principle; Adaptive Radiation; Human evolution.

III. Biology and Human Welfare (Periods 35)

Health and Disease: Pathogens; parasites causing human diseases (Malaria, Filariasis, Ascariasis, Typhoid, Pneumonia, common cold, amoebiasis, ring worm); Basic concepts or immunology—vaccines; Cancer; HIV and AIDS; Adolescence, drug and alcohol abuse.

Improvement in food production: Plant breeding, tissue culture, single cell protein, Biofortification; Apiculture and Animal husbandry.

Microbes in human welfare: In household food processing, industrial production, sewage treatment, energy generation and as biocontrol agents and biofertilizers.

IV. Biotechnology and Its Applications (Periods 30)

Principles and process of Biotechnology: Genetic engineering (Recombinant DNA technology).

Application of Biotechnology in health and agriculture: Human insulin and vaccine production, gene therapy; Genetically modified organisms- Bt crops; Transgenic Animals; Biosafety issues— Biopiracy and patents.

V. Ecology and environment (Periods 35)

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

Ecosystems: Patterns, components; productivity and decomposition; Energy flow; Pyramids of number, biomass, energy; Nutrient cycling(carbon and phosphorous); Ecological succession; Ecological Services— Carbon fixation, pollination, oxygen release.

Biodiversity and its conservation: Concept of Biodiversity; Patterns of Biodiversity; Importance of Biodiversity; Loss of Biodiversity; Biodiversity conservation; Hotspots,

endangered organism, extinction, Red Data Book, biosphere reserves, National parks and sanctuaries.

Environmental issues: Air pollution and its control; Water pollution and its control; Agrochemicals and their effects; Solid waste management; Radioactive waste management; Greenhouse effect and global warming, Ozone depletion; Deforestation; Any three case studies as success stories addressing environmental issues.

PRACTICALS

(Total Periods 60)

A. List of Experiments

1. Study pollen germination on a slide.
2. Collect and study soil from at least two different sites and study them for texture, moisture content, pH and water holding capacity of soil. Correlate with the kinds of plants found in them.
3. Collect water from two different water bodies around you and study them for pH, clarity and presence of any living organisms.
4. Study the presence of suspended particulate matter in air at the two widely different sites.
5. Study of plant population density by quadrat method.
6. Study of plant population frequency by quadrat method.
7. Prepare a temporary mount of onion root tip to study mitosis.
8. To study the effect of the different temperatures and different pH on the activity of salivary amylase on starch.

B. Study/observation of the following (Spotting)

1. Flowers adapted to pollination by different agencies (wind, insect).
2. Pollen germination on stigma through a permanent slide.
3. Identification of stages of gamete development i.e. T.S. testis and T.S. ovary through permanent slides (from any mammal).
4. Meiosis in onion bud cell or grass hopper testis through permanent slides.
5. T.S. of blastula through permanent slides.
6. Mendelian inheritance using seeds of different colour/size of any plant.
7. Prepared pedigree charts of genetic traits such as rolling of tongue, blood groups, widow's peak, colour blindness.
8. Exercise on controlled pollination—Emasculation, tagging and bagging.

9. Identification of common disease causing organisms like Ascaris, Entamoeba, Plasmodium, ringworm through permanent slides or specimens. Comment on symptoms of diseases that they cause.
10. Two plants and two animals found in xerophytic conditions. Comment upon their morphological adaptations.
11. Plants and animals found in aquatic conditions. Comment upon their morphological adaptations.

GEOLOGY

Objectives :

1. To explain the basic concept of Geology.
2. To acquire the fundamental knowledge of different branches of Geology with their specific importance.
3. To develop an interest to nature and its processes.
4. To develop interest towards the constitution of the Earth's crust.
5. To increase the awareness of the problems of environment due to mining and industrial activity and its remedial measures.
6. To develop an ability to use and interpret a geological map.
7. To know the importance of Geology contributing towards the national development especially the Engineering Projects.

COURSE STRUCTURE CLASS - XI (THEORY)

One Paper		70 Marks
Unit No.	Title	Marks
1.	General and Physical Geology	15
2.	Crystallography and Mineralogy	20
3.	Petrology	20
4.	General Stratigraphy and Indian Stratigraphy	15

Unit 1: General and Physical Geology

- (i) Introduction to Geology:** Definition, Branches of Geology and Scope of Geology
- (ii) Theories of Origin of the Earth:** Nebular Hypothesis, Planetesimal Hypothesis, Tidal Hypothesis and Gas-Dust Cloud Hypothesis.
- (iii) Age of the Earth:** Determination of age of the Earth using indirect methods (relative age) and Radioactive methods (actual age).
- (iv) Internal structure of Earth:** Origin, evolution and composition of Crust (Continental and Oceanic crust), Mantle and Core.
- (v) Plate Tectonics:** Definition and Theory, Nature and types of Plate Boundary – Divergent, Convergent and Transform Fault Boundaries; Continental Drift and Sea Floor spreading with their supporting evidences.
- (vi) Classification and processes of weathering, erosion, denudation. Erosional and Depositional landforms.**

Unit 2: Crystallography and Mineralogy

- (i) **Crystallography: Elements of crystals** – Symmetry elements (Plane of symmetry, Axis of symmetry and Centre of symmetry), Forms, Crystallographic axes and Miller's indices.
- (ii) **Introduction to Crystal Systems** – Isometric (Cubic) system, Tetragonal system, Orthorhombic system, Monoclinic system, Triclinic system and Hexagonal system. Study of the normal class of Isometric, Tetragonal and Hexagonal systems (symmetry elements, forms, general symbol).
- (iii) **Mineralogy: Minerals** – Definition, Physical properties of minerals (Colour, form, streak, lustre, hardness, cleavage, fracture and specific gravity). Moh's scale of hardness.
- (iv) **Physical characteristics, chemical composition and uses of the following rock forming minerals:** Quartz, feldspar (orthoclase and plagioclase), calcite, augite, hornblende, olivine, tourmaline, micas (biotite and muscovite), talc and gypsum.
- (v) **Introduction to Optical Mineralogy:** Workings of Polarising microscope or Petrological microscope. Ordinary light, Polarized light, Refractive index, Double refraction, Isotropic and Anisotropic substance.
- (vi) **Optical properties of minerals under (a) Plane Polarized Light** – Form, colour, Cleavage, Refractive index and Pleochroism **(b) Cross Nicol** – Isotropism, Extinction and Interference colours.

Unit 3: Petrology

- (i) **Rocks:** Definition and types of rocks (Igneous rocks, Sedimentary rocks and Metamorphic rocks); Magma – Definition, Type and Composition.
- (ii) **Igneous Rocks:**
 - (a) **Texture** – Definitions, types of igneous texture (1) Degree of Crystallization, Granularity, and (2) Fabric – Shape of grains, Equigranular textures and Inequigranular textures
 - (b) **Structures** – Definitions, types of igneous structures (Flow structure, pillow structure, Ropy and blocky lavas and Joints)
 - (c) **Occurrence of Igneous rocks** – (a) **Concordant bodies** (Sills, Phacoliths, Lopoliths and Laccoliths). (b) **Discordant bodies** (Dykes, Volcanic plugs, and Batholiths)
 - (d) **Mineralogical and Textural classification of Igneous rocks.**
 - (e) **Mineralogical composition and texture of common igneous rocks** – Granite, Gabbro, Prigmatite, Dolerite, Basalt and Rhyolite.

- (iii) **Sedimentary Rocks:**
 - (a) **Processes of formation of sedimentary rocks.**
 - (b) **Texture** – Grain size, shape, packing and fabric.
 - (c) **Structures** – Bedding or stratification, Cross-bedding, Graded bedding, Sole marks (Flute, grooves and load casts), Ripple-marks, Mud cracks.
 - (d) **Simple classification of sedimentary rocks into clastic and non-clastic**
 - (e) **Mineralogical composition and texture of common sedimentary rocks** – Conglomerate, Sandstone, Shale and Limestone.
- (iv) **Metamorphic Rocks:**
 - (a) **Definition and Kinds of metamorphism** – Thermal metamorphism, Clastic metamorphism, dynamothermal metamorphism, Plutonic metamorphism, Metasomatism and Regional metamorphism
 - (b) **Study of simple structure and textures of metamorphic rocks - Texture** (Cystaloblastic and Palimpsest or Relict textures); **Structure** (Cataclastic, Schistose, Gneissose, Maculose and Granulose structures)
 - (c) **Descriptive study of important metamorphic rocks** – Slate, Phyllite, Schist, Gneiss, Quartzite and Marble.
 - (v) **General Stratigraphy and Indian Stratigraphy**
 - (a) **Principles of Stratigraphy** – Stratigraphic units (Lithostatigraphy, Bios stratigraphy and Chronostratigraphy), Principles of Correlations and Geologic Time Scale.
 - (b) **Physiographic divisions of India**
 - (c) **Study of the following stratigraphic systems of India** – Dharwars of Mysore, Cuddapah, the Vindhyan system of Sone Valley, Gondwana System and Tertiaries of N. E India (Assam, Meghalaya and Mizoram)

Paper II (PRACTICALS)

30 Marks

- (i) **Cystallography** – Study of crystals belonging to the normal classes of Isometric, tetragonal and hexagonal systems with the help of models.
- (ii) **Mineralogy** – (a) Identification of common rock forming minerals in hand Specimen – Quartz, feldspar (orthoclase and plagioclase), micas (Muscovite and Biotite), Tourmaline, Calcite, Hornblende, Olivine, Garnet, Magnetite, Haematite, Bauxite, Pyrite, Galena and Sphalerite.
(b) Identification of the following minerals in thin section – Quartz, Feldspar (Othoclase and Plagioclase), Augite, Hornblende, Micas (Muscovite and Bi

otite), Calcite and Garnet.

- (iii) **Petrology** – Megascopic study of the following rocks – Dunite, Granite, Gabbro, Dolerite, Basalt, Rhyolite, Slate, Phyllite, Schist, Gneiss, Quartzite, Marble, Conglomerate, Sandstone, Shale and Limestone.
- (iv) **Practical Record and Viva Voce.**

COURSE STRUCTURE
CLASS - XII (THEORY)

One Paper		70 Marks
Unit No.	Title	Marks
1.	Structural Geology	15
2.	Palaeontology	15
3.	Economic Geology	20
4.	Applied Geology	20

Unit 1: Structural Geology

- (i) **Introduction to Structural Geology:** Definition and scope of structural Geology, Basic knowledge of Brunton Compass and Clinometer.
- (ii) **Study of attitudes of bed** – Strike, True dip and Apparent dip, Dip amount and Dip direction.
- (iii) **Definition and types of fold, fault, joint and unconformity.**

Unit 2: Palaeontology

- (i) **Introduction to Palaeontology:** Definitions and Scope of Palaeontology.
- (ii) **Fossil:** Definition of fossil and index fossil, Mode of Preservation and Significance of fossil in geological studies.
- (iii) **Classification, geologic range and brief morphological study of** – Bivalvia, Gastropoda, Brachiopoda and Plant fossils.

Unit 3: Economic Geology

- (i) **Introduction:** Definition of ore, gangue and tenor, Scope of Economic geology.
- (ii) **Elementary idea of the Processes of mineral deposits** – Magmatic deposits, Hydrothermal deposits, Mechanical and Residual deposits, sedimentary deposits and Metamorphic deposits.
- (iii) **Origin and mode of occurrence, Indian distribution and uses of the following mineral deposits** – coal, petroleum, Lead, copper, Zinc, Gold, Manganese, Iron (haematite and magnetite) and Chromite.
- (iv) **Mineral resources of Assam, Meghalaya and Mizoram.**

Unit 4: Applied Geology

- (i) **Hydrogeology:** Hydrologic cycle, types of precipitation, types of water, types of aquifers, Porosity, permeability and water table.
- (ii) **Engineering Geology:** Engineering properties of rocks; Types of dam, geological considerations in selection of sites for dams; Types of tunnel, geological consideration in tunnels.
- (iii) **Environmental Geology:** Soil – Factors affecting soil formation; Soil erosion and its prevention; Natural hazards – Landslide, types of landslides, causes and preventive measures; Earthquake – origin, types, causes and effects; volcanoes, Tsunamis; Pollution – definition, water and air pollutions, common water and air pollutants; Green house effects, Green house gases; Global warming.

(PRACTICALS & GEOLOGICAL FIELDWORK)

A. PRACTICALS

20 Marks

- (i) Determination of strike, dip amount and dip direction of a plane surface using Brunton Compass and Clinometer. Drawing of contour, profile and cross-sections of simple geological maps.
- (ii) Identification and study of morphological characteristics of fossils - Arca, Cardium, Cardita, Pecten, Productus, Spirifer, Terebratulla, Turritella, Cyprea, Conus, Ammonites etc.
- (iii) Identification and chemical compositions of the following ores in hand specimen – Galena, Sphalerite, Chalcopyrite, Pyrite, Haematite, Magnetite, Bauxite, Pyrolusite and Psilomelane,
- (iv) Practical Record and Viva Voce.

B. GEOLOGICAL FIELDWORK

10 Marks

- (i) Geological fieldwork must be carried out anywhere within Mizoram in order to have basic ideas on the geology of Mizoram, identification of different rock types, structural features like folds, faults and joints in the field.
- (ii) Geological fieldwork report should be prepared for evaluation of mark.

BUSINESS STUDIES

Rationale

The courses in Business Studies and Accountancy are introduced at + 2 stage of Senior Secondary Education as formal commerce education is provided after first ten years of schooling. Therefore, it becomes necessary that instructions in these subjects are given in such a manner that students have a good understanding of the principles and practices bearing in business (trade and industry) as well as their relationship with the society.

Business is a dynamic process that brings together technology, natural resources and human initiative in a constantly changing global environment. To understand the framework in which a business operates, a detailed study of the organisation and management of business processes and its interaction with the environment is required. Globalisation has changed the way firms transact their business. Information Technology is becoming a part of business operations in more and more organisations. Computerised systems are fast replacing other systems. E-business and other related concepts are picking up fast which need to be emphasized in the curriculum.

The course in Business Studies will prepare students to analyse, manage, evaluate and respond to change which affect business. It provides a way of looking at and interacting with the business environment. It recognizes the fact that business influences and is influenced by social, political, legal and economic forces. It allows-students to appreciate that business is an integral component of society and develops an understanding of many social and ethical issues.

Therefore, to acquire basic knowledge of the business world, a course in Business Studies would be useful. It also informs students of a range of study and work options and bridges the gap between school and work.

Objectives

1. To develop in students an understanding of the processes of business and its environment;
2. To acquaint student with the dynamic nature and inter-dependent aspects of business;
3. To develop an interest in the theory and practice of business, trade and industry;
4. To familiarize students with theoretical foundations of organizing, managing and handling operations of a business firm;
5. To help students appreciate the economic and social significance of business activity and the social cost and benefits arising therefrom;

6. To acquaint students with the practice of managing the operations and resources of business; .
7. To prepare students to function more effectively and responsibly as consumers, employers, employees and citizens;
8. To help students in making the transition from school to the world of work including self-employment;
9. To develop in students a business attitude and skills to be precise and articulate.

COURSE STRUCTURE

CLASS-XI

One Paper	3 Hours	100 Marks
Units	Marks	
Part A: Foundation of Business		
1. Nature and Purpose of Business		08
2. Forms of Business organizations		12
3. Public, Private and Global Enterprises		10
4. Business Services		08
5. Emerging Modes of Business		06
6. Social Responsibility of Business and Business Ethics		06
Part B: Finance and Trade		
7. Sources of Business Finance		14
8. Small Business		06
9. Internal Trade		12
10. International Trade		08
11. Project Work		10

Part A: Foundation of Business

Unit 1: Nature and Purpose of Business:

- Concept and characteristics of business.
- Business profession and employment — distinctive features.
- Objectives of business — economic and social, role of profit in business
- Classification of business activities: Industry and Commerce.
- Industry —Types: Primary, Secondary and Tertiary.
- Commerce Trade: Types (Internal, External, Wholesale, and Retail) and Auxiliaries to trade: Banking, Insurance, Transportation Warehousing, Communication, and Advertising.
- Business risks — Nature and Causes.

Unit 2: Forms of Business organizations

- Sole proprietorship: Meaning, Features, Merits and Limitations.
- Partnership: Meaning, Features, Merits and Limitations, Types of partnership and Types of partners, Registration of a partnership firm, Partnership Deed
- Cooperative Societies: Features, Merits and Limitations, Types.
- Company: Private Company, Public company -Features, Merits and Limitations.
- Starting a Business — Basic factors,

Unit 3: Public, Private and Global Enterprises

- Private Sector and Public Sector.
- Forms of Public Sector Enterprises: Departmental Undertakings, Statutory Corporation, Government Company (**Features, Merits and Limitation**)
- Global enterprises, Joint ventures, Public private; partnership- Features

Unit 4: Business Services

- Banking: Types of Bank Accounts- Saving, Current, Recurring, Fixed deposit Accounts.
- Banking Services with particular reference to —Issue of Bank Draft, banker's cheque (Pay order), RTGS (Real Time Gross Settlement), NEFT (National Electronic Funds Transfer), Bank overdraft, Cash Credits, SMS alerts.
- E-Banking
- Insurance: Principles, Concept of Life, Health, Fire and Marine insurance
- Postal and Telecom Services: Mail; (UPC, Registered Post, parcel Speed Post, Courier) and Saving services (Recurring Deposit, NSCs, KVP, PPF, MIS)

Unit 5: Emerging Modes of Business

- E-Business — Scope and Benefits, Resources required for successful e-business implementation, Online transactions, Payment mechanism, Security and Safety of business transactions.
- Outsourcing—Concept, Need and Scope of BPO (Business process outsourcing) and KPO (Knowledge Process Outsourcing).

Unit 6: Social Responsibility of Business and Business Ethics

- Concept of social responsibility.
- Case for social responsibility.
- Responsibility towards Investors, Consumers, Employees, Government and Community.
- Environmental protection and Business.
- Business ethics — Concept and elements.

Part B: Finance and Trade

Unit 7: Sources of Business Finance

- Concept of Business Finance.
- Owner's Funds — Equity Shares, Preference Shares, and Retained Earnings,
- Borrowed funds- Debentures and Bonds, Loan from Financial Institutions, Loans from Commercial banks, Public Deposits, Trade Credit, ICD (Inter Corporate Deposits).

Unit 8: Small Business

- Small Scale Enterprise' As defined by MSMED Act 2006'(Micro Small and Medium Enterprises Development Act)
- Role of small business in India- With special reference to Rural Areas
- Government schemes and Agencies for Small Scale Industries: NSIC (National Small Industries Corporation) and DIC (District Industries Centre) with special reference to Rural & Hilly Areas,

Unit 9: Internal Trade

- Services of a Wholesaler and Retailer
- Types of Retail Trade.- Itinerants and Small scale Fixed Shops
- Large Scale Retailers- Departmental stores, Chain Stores, Mail Order Business.
- Concept of Automatic Vending Machine.
- Chambers of Commerce and Industry: Basic Functions
- Main Documents Used in Internal trade: Proforma Invoice, Invoice, Debit Note, Credit Note, LR (Lorry Receipt), RR (Railway Receipt)
- Terms of Trade: COD, (Cash on Delivery), FOB (Free on Board), CIF (Cost Insurance and Freight), E&OE (Errors and Omissions Excepted)

Unit 10: International Trade

- Concept and Problems of International Trade.
- Export Import Procedure and Documents.
- Role of WTO

Unit 11: Project Work.

List of project: (this list is only exemplary not exhaustive)

1. Auxiliaries to Trade
Find out names of five companies each related to different auxiliaries, i.e., Banking, Insurance, Warehousing, Transportation, Communication and Advertising from real life.
2. Co-operative Society
Find out names of five different types of Co operative Societies around you. Also, give details of business activities of any one of them.
3. Private, Public & Global enterprises
Give five names each of different types of Public Sector Enterprises (including all 3 types), Global enterprises, Joint Ventures and Public Private Partnerships. Also, give details of business activities of any one of them.
4. Banking-SB Account
Visit a nearby bank to find out the procedure for opening a Saving Bank Account. Collect the required documents and prepare a report on the same.
5. Banking-Remittance
Visit a bank and remit Rs. 100 to any of your relatives. Write the formalities completed by you for the same.
6. E-Banking
Write the procedure for transferring funds through RTGS or NEFT.
7. External Trade
Imagine yourself to be an exporter or importer. Collect documents used in your trade, fill them and present them in a file.
8. Insurance
Compare life insurance policies targeting children of any two insurance companies.
9. Social responsibilities

Select any two companies/firms and give an account of the steps taken by them for discharging their social responsibilities.

COURSE STRUCTURE
CLASS-XII

One Paper	3 Hours	100 Marks
Units		Marks
Part A: Principles and Functions of Management		
1. Nature and significance of Management		07
2. Principle of Management		07
3. Business Environment		05
4. Planning		07
5. Organising		10
6. Staffing		08
7. Directing		10
8. Controlling		06
Part B: Business Finance and Marketing		
9. Financial Management		12
10. Financial Markets		08
11. Marketing Management		14
12. Consumer Protection		06

Part A: Principle and Function of Management

Unit 1: Nature and significance of Management

- Management - Concept, Objective, Importance.
- Management as Science, Art, Profession
- Levels of Management.
- Management Functions — Planning, Organising, Staffing, Directing and Controlling.
- Coordination- Characteristics and Importance.

Unit 2: Principle of Management

- Principles of Management - Concept, Nature and significance.
- Fayol's Principles of Management
- Taylor's Scientific Management — Principles and Techniques.

Unit 3: Business Environment

- Business Environment — Concept, Importance.
- Dimensions of Business Environment— Economic, Social, Technological, Political and legal.
- Concept of Liberalisation, Privatisation and Globalisation on Business and Industry

- Impact of Government Policy Changes on Business and Industry with special reference to Liberalization, Privatization, Globalisation

Unit 4: Planning

- Concept, Importance, Limitations.
- Planning Process.
- Types of plans -Objective, Strategy, Policy, Procedure, Method, Rule, Budget Programme.

Unit 5: Organising

- Concept and importance.
- Steps in the process of Organising.
- Structure of Organisation- Functional and Divisional.
- Formal and Informal Organisation.
- Delegation: Concept, Elements and Importance.
- Decentralization: Concept and importance.

Unit 6: Staffing

- Concept and Importance of staffing.
- Staffing as a part of Human Resource Management.
- Staffing Process
 - : Recruitment — Meaning and Sources
 - : Selection — Process
- Training and Development- Concept and Importance.

Unit 7: Directing

- Concept and Importance
 - Elements of Directing
 - Supervision — Concept, Functions of a Supervisor.
 - Motivation- Concept, Maslow's hierarchy of needs;
 - Financial and Non Financial Incentives.
 - Leadership — Concept, Qualities of a good leader.
 - Communication-Concept, Formal and Informal Communication,
- Barriers to effective communication, How to overcome the barriers.

Unit 8: Controlling

- Concept and Importance.
- Relationship between Planning and Controlling.
- Steps in the process of Control.

Part B: Business Finance and Marketing

Unit 9: Financial Management

- Concept, Objective of financial management.
- Decisions relating to Investment, Financing and Dividend.
- Financial Planning: Concept and Importance.
- Financial Structure- Concept and Factors affecting.
- Fixed and Working capital - Concept and Factors affecting its requirements.

Unit 10: Financial Markets

- Financial Markets: Concept and Types
- Money market and its Instruments.
- Capital market and its types (Primary and Secondary).
- Stock Exchange — Functions, Trading Procedure (NSDL and CDSL)
- NSEI — Objectives
- Securities Exchange Board of India (SEBI) - Objectives and Functions.

Unit 11: Marketing Management

- Marketing — Meaning, Functions, Marketing Vs Selling
- Marketing Management Philosophies.
- Marketing Mix — Concept
 - Product — Concept, Branding, Labeling and Packaging.
 - Price — Factors determining Price.
 - Physical Distribution- Concept, Channels of distribution: Types, Choice of channels.
 - Promotion — Concept and elements; Advertising- Concept, role, objections against advertising; Personal selling — Concept and qualities of a good salesman; Sales Promotion — Concept and techniques, Publicity — Concept and role.

Unit 12: Consumer Protection

- Concept and Importance of Consumer Protection.
- Consumer Protection Act 1986
 - Meaning of Consumer and consumer protection.
 - Rights and Responsibilities of consumers
 - Who can file a complaint and against whom?
 - Redressal Machinery.
 - Remedies available.

- Consumer Awareness — Role of consumer organizations and NGO's

Unit 13: Project Work

1. File at least 10 complaints of consumer exploitation of different types (defective goods & deficient services). Also, mention the decisions thereof.
2. Marketing-Objectionable Advertisements
Collect information related to five objectionable advertisements presented through any media and explain the objections.
3. Marketing-Useful Advertisements
Collect five printed advertisements and interpret their message.
4. Marketing-Physical Distribution
Observe the marketing plan of any two companies and find the levels adopted by them for distribution of their products.
5. Consumer Protection- Role of NGOs
As a consumer, contact an NGO for a complaint against any defective good or deficient service and report the assistance provided by them.
6. Marketing- Sales Promotion
Select any two famous firms / companies and find out the sales promotion techniques generally adopted by them.

ACCOUNTANCY

Rationale

The course in Accountancy is introduced at +2 stage of Senior Secondary education, as formal commerce education is provided after first ten years of schooling. With the fast changing economic scenario and business environment in a state of continuous flux, elementary business education along with accountancy as the language of business and as a source of financial information has carved out a place for itself at the Senior Secondary stage. Its syllabus content should give students a firm foundation in basic accounting principles and methodology and also acquaint them with the changes taking place in the presentation and analysis of accounting information, keeping in view the development of accounting standards and use of computers.

Against this background, the course puts emphasis on developing basic understanding about the nature and purpose of the accounting information and its use in the conduct of business operations. This would help to develop among students logical reasoning, careful analysis and considered judgement.

Accounting as an information system aids in providing financial information. The emphasis at Class XI is placed on basic concepts and process of accounting leading to the preparation of accounts for a sole proprietorship firm.

In class XII, Partnership Firms and Companies are to be taught as a compulsory part.

Objectives :

1. To familiarise the students with accounting as an information system;
2. To acquaint the students with basic concepts of accounting and accounting standards;
3. To develop the skills of using accounting equation in processing business transactions;
4. To develop an understanding about recording of business transactions and preparation of financial statements;
5. To enable the students with accounting for reconstitution of partnership firms.
6. To enable the students to understand and analyse the financial statements;

COURSE STRUCTURE

CLASS-XI

One Paper	3 Hours	100 Marks
Units		Marks
Part A: Financial Accounting-I		
1. Introduction to Accounting		05
2. Theory Base of Accounting		07
3. Recording of Transactions & Preparation of Trial Balance		18
4. Depreciation, Provisions and Reserves		08
5. Accounting for Bills of Exchange		08
6. Rectification of Errors		07
7. Financial Statements of Business Organizations		12
Part B: Financial Accounting-II		
8. Financial Statements of Not for Profit Organisations		10
9. Accounts from Incomplete Records		05
10. Computers in Accounting		10
11. Project Work		10

Financial Accounting-I

1. Introduction to Accounting

- Accounting- Meaning, Objectives, Types of accounting information, advantages and limitations. Users of Accounting information and their needs. Double Entry system: Basis of accounting — Cash basis, accrual basis and hybrid basis.

- **Basic Accounting Terms** : Business transaction, Event, Account, Capital, Drawings, Liability (Internal & External, Long term & Short term), Asset (Intangible & Tangible, Fixed, Current, Liquid, Fictitious), Receipts (Capital & Revenue), Expenditure (Capital, Revenue & Deferred Revenue), Expense, Income, Profits, Losses, Purchases, Sales, Stock, Debtors, Bills Receivables, Creditors; Bills Payables, Goods, Cost, Vouchers, Discount (Trade, Cash, Received & Allowed).

2. **Theory Base of Accounting**
 - **Fundamental Accounting Assumptions:** Going concern, Consistency, Accrual.
 - **Accounting Principles:** Accounting Entity, Money Measurement, Accounting Period, Full Disclosure, Materiality, Prudence, Cost Concept, and Dual Aspect.
 - **Accounting Standards:** Concept & objective

3. **Recording of Transactions & Preparation of Trial Balance**
 - **Accounting Equation:** Meaning, .Analysis of transactions using Accounting Equation.
 - **Rules of Debit and Credit:** For Assets, Liabilities, Capital, Revenue and Expenses.
 - **Origin of transactions-** Source Documents (Invoice, Cash memo, Pay in slip, Cheque) ,Preparation of Vouchers — cash (Debit & Credit), Non-Cash (Transfer).
 - **Books of Original Entry:** Meaning ,Format and Recording there in
 - **Cash book:** Simple, Cash book with Bank Column, Petty Cash Book,
 - **Other Books:** Purchases Book, Sales Book, Purchases Return Book, Sales Return Book, Bills Receivable Book, Bills Payable Book and Journal Proper.
 - **Ledger** —Meaning, Utility, Format, Posting from Journal, Cash Book and other Special Purpose Books, Balancing of Accounts.
 - **Trial balance:** Meaning, Objectives and Preparation
 - **Bank Reconciliation Statement:** Meaning, Need and Preparation.

4. **Depreciation, Provisions and Reserves**
 - **Depreciation:** Meaning, Need and Factors affecting depreciation,.
 - **Methods of computation of Depreciation:** Straight Line Method, Written Down Value Method (Excluding Change in method)
 - **Accounting Treatment of Depreciation:** By charging to asset account, by creating Provision for depreciation/ accumulated depreciation account, Preparation of Asset Disposal Account.,
 - **Provisions and Reserves:** Meaning, Objective and Difference between Provisions and Reserves.
 - **Types of Reserves:** Revenue Reserve, Capital Reserve, General Reserve, Specific reserves, Secret reserves.

5. Accounting for Bills of Exchange

- **Bills of Exchange and Promissory Note:** Definition, Features, Parties, Specimen and Distinction.
- **Important Terms :** Term of Bill ,Due date, Days of Grace ,Date of Maturity ,Bill at Sight, Bill after Date, Discounting of Bill, Endorsement of Bill, Bill Sent For . Collection, Dishonor of Bill, Noting of Bill, Insolvency of Acceptor, Retirement and Renewal of a bill.
- **Accounting Treatment of bill transactions.**

6. Rectification of Errors

- **Errors and their types:** Errors not affecting trial balance and Errors affecting trial balance.
- Rectification of errors before and after the preparation of financial statements
- **Suspense account:** Meaning, preparation and treatment of suspense account balance in final statements

7. Financial Statements of Business Organizations

- **Financial Statements:** Meaning, Objective and Importance.
- **Trading and profit and loss account:** Gross profit, Operating Profit and Net Profit.
- **Balance Sheet:** Need, Grouping, Marshalling of Assets and Liabilities.
- **Adjustments in Preparation of Financial Statements :** With respect to closing stock, outstanding expenses ,prepaid expenses, accrued income, income received in advance, depreciation , Bad debts, provision for doubtful debts, provision for discount debtors, manager's commission, abnormal loss, goods taken for personal use, goods distributed as free Sample.
- Preparation of Trading and Profit and Loss Account and Balance Sheet of Sole Proprietorship Concerns.

8. Financial Statements of Not for Profit Organisations

- **Not For Profit Organizations:** Concept.
- **Receipts and Payment Account:** Meaning and Features.
- **Income and Expenditure Account:** Meaning and Features. Preparation of Income and Expenditure Account and Balance Sheet from the given Receipt and payment Account with additional information.
- **Balance Sheet:** Meaning and Features
- Preparation of Income and Expenditure Account and Balance Sheet from the given Receipt and payment Account with additional information.

9. Accounts from Incomplete Records

- **Incomplete Records:** Meaning, Uses and Limitations.
- Ascertainment of Profit/Loss by Statement of Affairs Method.
- Preparation of Trading and Profit and Loss Account and Balance Sheet (with reference to missing figures in total debtors account, total creditors account, Bills Receivable A/C , Bills Payable A/C, Cash Book and Opening Statement of Affairs).

10. Computers in Accounting

- **Introduction to Computer Accounting System:** Components of CAS, Features, Grouping of Accounts, Using Software of CAS, Advantages & Limitations CAS, Accounting Information System.
- **Application of computers in Accounting** — Automation of accounting process, designing accounting reports, data exchange with other information systems.
- Comparison of accounting processes in manual and computerized accounting highlighting advantages and limitations of automation.
- **Sourcing of accounting system:** Readymade, customized, tailor-made accounting system. Advantages and Disadvantages of each option.

11. Project Work (Any one)

1. Collection of Source Documents, Preparation of Vouchers, Recording of Transactions With help of vouchers..
2. Preparation of Bank Reconciliation Statement with the help of given Cash book and Pass book.
3. Project Work on any Windows based Accounting package: Installing & starting the package, setting up a new Company, Setting up account heads, voucher entry, viewing and editing data.

**ACCOUNTANCY
COURSE STRUCTURE
CLASS-XII**

One Paper	3 Hours	80 Marks
Units		Marks
PART A: Accounting for Partnership Firms and Companies		
1. Introduction to Partnership		10
2. Reconstitution of Partnership		25
3. Accounting for Shares		18
4. Accounting for Debentures		07
PART B: Financial Statement Analysis		
5. Analysis of Financial Statements		12
6. Cash Flow Statement		08
7. Project Work		20
Unit 1: Project File	4 marks	
Unit 2: Written Test	12 marks (one hour)	
Unit 3: Viva Voce	4 marks	

PART A

1. Introduction to Partnership

- Meaning: Partnership, Partners, Firm, Partnership Deed.
- Provisions of The Indian Partnership Act 1932 affecting Accounts in the absence of Partnership Deed.
- Fixed v/s Fluctuating Capital Accounts, Division of Profit among partners, Guarantee of profits, Past adjustments (Relating to interest on capital, interest on drawing, salary and Profit sharing Ratio), Preparation of P& L Appropriation Account.
- Goodwill: Nature, Factors affecting and Methods of valuation - Average profit, super profit, and capitalization

2. Reconstitution of Partnership

- **Change in the Profit Sharing Ratio among the existing partners:** Sacrificing ratio, Gaining Ratio. Accounting for Revaluation of Assets and Re-assessment of Liabilities and Distribution of Reserves and Accumulated profits.
- **Admission of a Partner** — Effect of admission of a Partner on : change in the Profit Sharing Ratio, Treatment of goodwill (As per AS 26), treatment for Revaluation of Assets and Re -assessment of Liabilities, Treatment of Reserves and Accumulated profits, Adjustment of Capital Accounts and Preparation of Balance Sheet
- **Retirement and Death of a Partner:** Effect of Retirement /Death of a partner-change in Profit Sharing Ratio, Treatment of goodwill, treatment for Revaluation of Assets and Re-assessment of Liabilities, Adjustment of Accumulated Profit and Reserves. Calculation of deceased partner's share of profit till the date of death. Preparation of Deceased partner's Executor's account and Preparation of Balance Sheet
- **Dissolution of Partnership Firm:** Meaning and Types of Dissolution of firm. Settlement of accounts - Preparation of Realisation Account, and related accounts (**excluding piecemeal distribution, sale to a company and insolvency of partners, Firm**).

3. Accounting for Shares

- **Share and Share Capital:** Meaning, Nature and Types
- **Accounting for Share Capital:** Issue and Allotment of Equity Shares. Private placement of Shares. Public Subscription of shares - over subscription and under subscription of shares .Issue at Par and Premium, calls in advance and arrears, Issue of shares for consideration other than cash.
- **Accounting treatment of forfeiture and re-issue.**
- **Disclosure of Share capital in Company's Balance Sheet (Horizontal form)**

4. Accounting for Debentures

- **Debentures:** Meaning, Issue of debentures at par and at premium. Issue of debentures for consideration other than cash, Debentures as collateral security. Interest on Debentures

PART B

5. Analysis of financial Statements

- **Financial statements of a company:** Balance Sheet of a Company in the prescribed Horizontal Form with major headings and sub headings (As per Schedule VI to The Companies Act 1956).

- **Financial Statement Analysis:** Meaning, Objectives and Limitations.
 - **Tools for Financial Statement Analysis:** Comparative Statements, Common Size Statements, Cash flow Analysis, Ratio Analysis.
 - **Accounting Ratios:** Meaning, Objectives and Classification of Ratios.
 - **Liquidity ratios:** Current Ratio and Quick Ratio.
 - **Solvency Ratios:** Debt to Equity Ratio, Total Asset to Debt Ratio, Proprietary Ratio, Interest Coverage Ratio.
 - **Activity ratios:** Stock Turnover Ratio, Debtors Turnover Ratio, Creditors Turnover Ratio, Working Capital Turnover Ratio.
 - **Profitability Ratios :** Gross Profit Ratio, Operating Ratio, Operating Profit Ratio, Net Profit Ratio,
6. **Cash Flow Statement**
- **Meaning, Objective and preparation (as per AS 3, without Adjustment). (Indirect Method)**
7. **Project work.**
- **Comprehensive Problem :** From the given set of Transactions Preparation of vouchers ,books of account, trial balance and financial statements of a proprietorship firm or a partnership firm.
 - **Analysis:** Analysis of given data using analytical tools such as ratio analysis and cash flow

OR Part C

Application of Computers in Financial Accounting

Unit: 5 (C) Electronic Spread Sheet

- Concept, Data Entry Text Management and Cell formatting, Data Formatting, Output Reports, Preparation of Reports Using Pivot table, Common Errors in Spread Sheet.
- **Use of Spreadsheet in Business Application:** Payroll Accounting, Asset Accounting.
- **Graphs And Charts for Business:** Data Graphs and Charts, Preparation of Graphs and Charts using Excel, Advantages of using Graphs and Charts.

Unit: 6 (C) Data Base Management System for Accounting

- Defining Database Requirements, Identification of data to be stored in Tables, Structuring of Data.
- Creating data tables for accounting, Using queries, forms and reports for generating accounting information with the help of Microsoft Access Software.

Unit: 7 (C) Project Work

BUSINESS MATHEMATICS

COURSE STRUCTURE CLASS - XI

One Paper	Three Hours	Max. Marks 100
Topic		Marks
Profit and Loss		10
Logarithms		05
Instalment Schemes		05
Compound Interest		05
Annuities		05
Basic Trigonometry		06
Compound Angles		08
Multiple Angles		06
Inverse Trigonometric Functions		10
Coordinate Geometry		12
Linear Inequalities		08
Probability		10
Relations and Functions		10
		100

PART-A : COMMERCIAL ARITHMETIC

Unit I : Profit and Loss

Cost Price, Selling Price, Gross Profit, Net Profit, Marked Price, Trade discount, Cash discount, Successive Discounts.

Unit 2 : Logarithms

Laws of logarithm, change of Base, Common Logarithms, Antilogarithms, characteristics and Mantissa, use of log table.

Unit 3 : Instalment Schemes

Simple interest, Instalment Plan, Instalment Purchase, Repayment of loans in instalment.

Unit 4 : Compound Interest

Amount, Principal, Compound Interest, Interest Period, Rate of interest, Depreciation.

Unit 5 : Annuities

Annuity and its types, present value, amount in case of ordinary annuity, present value of perpetuity, annuity due and deffered annuity, sinking fund.

PART B**Unit 1: Basic Trigonometry**

Basic trigonometric ratios and angles: relation and reciprocal relation between sine, cosine, tangent, cotangent, secant and cosecant.

Proof of the identities : $\sin^2 \theta + \cos^2 \theta = 1$, $\sec^2 \theta = 1 + \tan^2 \theta$,

$\operatorname{cosec}^2 \theta = 1 + \cot^2 \theta$, application of the identities in problems.

Ratios and Angles: Values of trigonometric functions at 0° , 30° , 45° , 60° and 90° , trigonometrical ratios of angles $90^\circ - \theta$, $90^\circ + \theta$, $180^\circ - \theta$, $180^\circ + \theta$, $270^\circ - \theta$, $270^\circ + \theta$, $360^\circ - \theta$, $360^\circ + \theta$ and also of any magnitude.

Unit 2 : Compound Angles

Proofs of the following identities with application:

$$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

$$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

$$\sin(A+B) \sin(A-B) = \sin^2 A - \sin^2 B = \cos^2 B - \cos^2 A$$

$$\cos(A+B) \cos(A-B) = \cos^2 A - \sin^2 B = \cos^2 B - \sin^2 A$$

$$\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$$

$$\cot(A \pm B) = \frac{\cot A \cot B \mp 1}{\cot B \pm \cot A}$$

$$2 \sin A \cos B = \sin(A+B) + \sin(A-B)$$

$$2 \cos A \sin B = \sin(A+B) - \sin(A-B)$$

$$2 \cos A \cos B = \cos(A+B) + \cos(A-B)$$

$$2 \sin A \sin B = \cos(A-B) - \cos(A+B)$$

Unit 3 : Multiple Angles

Application of the following formulae with their proof :

$$\sin 2A = 2 \sin A \cos A$$

$$\sin 2A = \frac{2 \tan A}{1 + \tan^2 A}$$

$$\cos 2A = \cos^2 A - \sin^2 A = \cos^2 A - 1 = 1 - 2 \sin^2 A$$

$$\cos 2A = \frac{1 - \tan^2 A}{1 + \tan^2 A}$$

$$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

$$\cot 2A = \frac{\cot^2 A - 1}{2 \cot A}$$

$$\sin 3A = 3 \sin A - 4 \sin^3 A$$

$$\cos 3A = 4 \cos^3 A - 3 \cos A$$

$$\tan 3A = \frac{3 \tan A - \tan^3 A}{1 - 3 \tan^2 A}$$

Unit 4 : Inverse trigonometric functions

Definition, principal value branches, Elementary properties of inverse trigonometric functions.

Unit 5 : Coordinate geometry

Cartesian system, distance between two points, section formula, slope of a line, various forms of equations of a line (parallel to axes, point-slope form, two point form, intercept form)

Unit 6 : Linear inequalities

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

PART - C

Unit 1: Probability

Random experiment, sample space, Event: simple event, compound event, sure event, impossible event, mutually exclusive events, independent events, probability of an event, probability of occurrence of a complementary event. Results on probability, addition theorem for two events (Simple applications).

Unit 2 : Relations & Functions

Ordered pairs, cartesian product of sets, relation, function, different types of functions (into, onto, one-one).

**COURSE STRUCTURE
CLASS - XII**

One Paper	Three Hours	Max. Marks 100
Topic		Marks
Ratio and Proportion		10
Commission, Brokerage, Insurance		05
Partnership		10
Tender and Quotation		05
Permutations and Combinations		07
Binomial Theorem		07
Sequence and Series		13
Probability		07
Matrices and Determinants		10
Linear Programming		06
Functions, Limits, Continuity		06
Differentiation and Integration		14
		100

PART - A : COMMERCIAL ARITHMETIC

Unit 1: Ratio & Proportion

Ratio, Proportion, simple proportion, fourth proportion (Rule of three), Direct Rule of three, Inverse Rule of three, chain Rule.

Unit 2: Commission, Brokerage, Insurance

Commission, Percentage of Commission, Brokerage, Percentage of Brokerage, new selling price, new buying price, Insurance, declared value, rates or taxes, rateable value, Assessment.

Unit 3: Partnership

Agreement, Interest on Capital, Interest on Drawings, Salary, Problems related to Partnership.

Unit 4: Tender & Quotation

Tender, tender method, tender method of purchase, sealed tender, Quotation, cost sheets.

PART - B

Unit 1: Permutations & Combinations

Fundamental principle of counting. Factorial n ($n!$), Permutations and combinations, simple application.

Unit 2 : Binomial Theorem

Statement and proof of binomial theorem for positive integral indices, general and middle terms in binomial expansion, simple application, application of Binomial theorem for approximation.

Unit 3 : Sequence and Series

Arithmetic progression (A.P.), Arithmetic mean (A.M), Geometric progression (G.P), general term of a G.P., sum of n terms of a G.P, geometric mean (G.M.), sum to n terms of the special series $\sum n$ and $\sum n^2$ and $\sum n^3$. Insertion of G.M as well as A.M between two real numbers.

Unit 4 : Probability

Application of addition theorem, conditional probability, probability of independent events.

Unit 5 : Matrices & Determinants

Determinant of order 2 and 3. Elementary properties of determinants and their use in evaluating a determinant. Matrices - order, types of matrices. Equality of matrices. Addition and multiplication of matrices. Symmetric and Skew-symmetric matrices. Adjoint and inverse of a matrix. Application of matrices in solving simultaneous equations in two and three variables.

Unit 6 : Linear Programming

Introduction, definition of constraints, objective function, optimization. Optimization problems using graphical method, when the objective function and constraints are given.

PART C

Unit 1 : Functions, Limits and Continuity

Function, different types of functions (constant, identity, modulus, reciprocal, polynomial, exponential, trigonometric, logarithmic, rational, inverse trigonometric). Limit, continuity (simple problems only).

Unit 2 : Differentiation and Integration

Definition of derivative, sum, difference, product and quotient of functions. Derivative of composite functions, chain rule, derivative of inverse trigonometric and trigonometric functions, derivative of implicit functions, concept of exponential and logarithmic functions and their derivative. Logarithmic differentiation (simple problems). Derivative of functions in parametric forms.

Integration as reverse process of differentiation, Integration of functions by substitution (simple problems).