SENIOR SCHOOL CURRICULUM 2021-22

CENTRAL BOARD OF SECONDARY EDUCATION
Academic Unit, Shiksha Sadan, 17, Rouse Avenue, New Delhi-110 002

Senior School Curriculum 2021-22

Class XI-XII

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THE CONSTITUTION OF INDIA

PREAMBLE

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a [1]**[SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC]** and to secure to all its citizens :

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity; and to promote among them all

FRATERNITY assuring the dignity of the individual and the[2] [unity and integrity of the Nation];

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do **HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.**

1. Subs, by the Constitution (Forty-Second Amendment) Act. 1976, sec. 2, for "Sovereign Democratic Republic" (w.e.f. 3.1.1977)
2. Subs, by the Constitution (Forty-Second Amendment) Act. 1976, sec. 2, for "unity of the Nation" (w.e.f. 3.1.1977)

THE CONSTITUTION OF INDIA

Chapter IV A

FUNDAMENTAL DUTIES

ARTICLE 51A

Fundamental Duties - It shall be the duty of every citizen of India-

(a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

(b) to cherish and follow the noble ideals which inspired our national struggle for freedom;

(c) to uphold and protect the sovereignty, unity and integrity of India;

(d) to defend the country and render national service when called upon to do so;

(e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;

(f) to value and preserve the rich heritage of our composite culture;

(g) to protect and improve the natural environment including forests, lakes, rivers, wild life and to have compassion for living creatures;

(h) to develop the scientific temper, humanism and the spirit of inquiry and reform;

(i) to safeguard public property and to abjure violence;

(j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;

[1](k) who is a parent or guardian to provide opportunities for education to his/her child or, as the case may be, ward between age of six and forteen years.

1. Ins. by the constitution (Eighty - Sixth Amendment) Act, 2002 S.4 (w.e.f. 12.12.2002)

भारत का संविधान

उद्देशिका

हम, भारत के लोग, भारत को एक सम्पूर्ण [1]प्रभुत्व-संपन्न समाजवादी पंथनिरपेक्ष लोकतंत्रात्मक गणराज्य बनाने के लिए, तथा उसके समस्त नागरिकों को:

सामाजिक, आर्थिक और राजनैतिक न्याय,
विचार, अभिव्यक्ति, विश्वास, धर्म
और उपासना की स्वतंत्रता,
प्रतिष्ठा और अवसर की समता
प्राप्त कराने के लिए
तथा उन सब में व्यक्ति की गरिमा
[2]और राष्ट्र की एकता और अखंडता
सुनिश्चित करने वाली बंधुता बढ़ाने के लिए

दृढ़संकल्प होकर अपनी इस संविधान सभा में आज तारीख 26 नवम्बर, 1949 ई॰ को एतद्द्वारा इस संविधान को अंगीकृत, अधिनियमित और आत्मार्पित करते हैं।

1. संविधान (बयालीसवां संशोधन) अधिनियम, 1976 की धारा 2 द्वारा (3.1.1977) से "प्रभुत्व-संपन्न लोकतंत्रात्मक गणराज्य" के स्थान पर प्रतिस्थापित।
2. संविधान (बयालीसवां संशोधन) अधिनियम, 1976 की धारा 2 द्वारा (3.1.1977) से "राष्ट्र की एकता" के स्थान पर प्रतिस्थापित।

भाग 4 क

मूल कर्तव्य

51 क. मूल कर्तव्य – भारत के प्रत्येक नागरिक का यह कर्तव्य होगा कि वह –

(क) संविधान का पालन करे और उसके आदर्शों, संस्थाओं, राष्ट्रध्वज और राष्ट्रगान का आदर करे;

(ख) स्वतंत्रता के लिए हमारे राष्ट्रीय आंदोलन को प्रेरित करने वाले उच्च आदर्शों को हृदय में संजोए रखे और उनका पालन करे;

(ग) भारत की प्रभुता, एकता और अखंडता की रक्षा करे और उसे अक्षुण्ण रखे;

(घ) देश की रक्षा करे और आह्वान किए जाने पर राष्ट्र की सेवा करे;

(ङ) भारत के सभी लोगों में समरसता और समान भ्रातृत्व की भावना का निर्माण करे जो धर्म, भाषा और प्रदेश या वर्ग पर आधारित सभी भेदभाव से परे हों, ऐसी प्रथाओं का त्याग करे जो स्त्रियों के सम्मान के विरुद्ध हैं;

(च) हमारी सामासिक संस्कृति की गौरवशाली परंपरा का महत्त्व समझे और उसका परिरक्षण करे;

(छ) प्राकृतिक पर्यावरण की जिसके अंतर्गत वन, झील, नदी, और वन्य जीव हैं, रक्षा करे और उसका संवर्धन करे तथा प्राणी मात्र के प्रति दयाभाव रखे;

(ज) वैज्ञानिक दृष्टिकोण, मानववाद और ज्ञानार्जन तथा सुधार की भावना का विकास करे;

(झ) सार्वजनिक संपत्ति को सुरक्षित रखे और हिंसा से दूर रहे;

(ञ) व्यक्तिगत और सामूहिक गतिविधियों के सभी क्षेत्रों में उत्कर्ष की ओर बढ़ने का सतत प्रयास करे जिससे राष्ट्र निरंतर बढ़ते हुए प्रयत्न और उपलब्धि की नई उंचाइयों को छू ले;

[1](ट) यदि माता-पिता या संरक्षक है, छह वर्ष से चौदह वर्ष तक की आयु वाले अपने, यथास्थिति, बालक या प्रतिपाल्य के लिये शिक्षा के अवसर प्रदान करे।

1. संविधान (छयासीवां संशोधन) अधिनियम, 2002 की धारा 4 द्वारा प्रतिस्थापित।

1. PRINCIPLES OF THE CBSE CURRICULUM

The curriculum refers to the lessons and educational content to be taught to a learner in a school. In empirical terms, it may be regarded as the sum total of a planned set of educational experiences provided to a learner by a school. It encompasses general objectives of learning, competencies to be attained, courses of study, subject-wise learning outcomes and content, pedagogical practices and assessment guidelines. The curriculum provided by CBSE is based on National Curriculum Framework-2005 and seeks to provide opportunities for students to achieve excellence in learning.

1.1 Salient Features of the CBSE Senior Secondary School Curriculum

The Curriculum prescribed by CBSE strives to:

1. provide ample scope for holistic i.e. physical, Intellectual and social development of students;
2. emphasize constructivist rather than rote learning by highlighting the importance of hands-on experience;
3. enlist general and specific teaching and assessment objectives to make learning competency based;
4. encourage the application of knowledge and skills in real life problem solving scenarios;
5. uphold the Constitutional Values by encouraging values-based learning activities;
6. promote Critical and Creative Thinking aligned to the 21st Century Skills in classrooms;
7. integrate innovations in pedagogy such as experiential learning, Sport & Art-Integrated Learning ,toy-based pedagogy, storytelling, gamification etc. with technological innovations (ICT integration) to keep pace with the global trends in various disciplines;

8. promote inclusive practices as an overriding consideration in all educational activities;

9. enhance and support learning by different types of assessments; and

10. integrate environmental education in various disciplines from classes I- XII.

1.2 Objectives of the Curriculum

1. achieve desired national level of competencies in cognitive, affective and psychomotor domains;

2. facilitate acquisition of 21st Century Skills and enhance self and social awareness through thematic or multidisciplinary approach;

3. promote Cooperative Learning, Collaborative Learning, Self-directed learning etc. to facilitate realization of learning outcomes;

4. promote Authentic Assessments based on real world tasks involving meaningful application of knowledge and skills;

5. promote Life Skills , inculcate values , foster cultural learning and international understanding in an interdependent society;

6. acquire the ability to utilize technology and information for the betterment of humankind;

7. strengthen knowledge and attitude related to livelihood skills and promote lifelong learning;

8. develop the ability to appreciate art and showcase talents;

9. promote physical fitness, health and well-being

1.3 Curriculum Areas at Senior Secondary Level

For the purpose of fostering competences in learners, the curriculum encompasses seven major learning areas, which are: Languages, Humanities, Mathematics, Sciences, Skill Subjects, General Studies and Health and Physical Education. These areas are broadly divided into electives and compulsory areas as detailed below:-

Languages Electives Skill Electives	Electives
General Studies Health & Physical Education *Work Experience	Compulsory

*Work experience is subsumed in Health and Physical Education

1.3.1 Elective Areas:

(i) **Languages** include Hindi, English and other 30 languages. The curricula in languages focus on listening, speaking, reading and writing skills for developing effective communicative proficiency. Learners use language to comprehend, acquire and communicate ideas.

(ii) **Humanities and Social Sciences-** Geography, History, Economics, Home Science, Sociology, Fine Arts, Political Science, and related subjects promote the learning of history and culture, geographical environment, global institutions, constitutional values and norms, politics, economy, interpersonal and societal interactions, civic responsibilities and the interplay of all these. Learners appreciate and value every human's right to feel respected and safe, and, in this regard, also understand their Fundamental Rights and Duties and behave responsibly. Learners learn to be tolerant and empathetic towards others through the study of these subjects.

(iii) **Sciences:** Biology, Chemistry, Physics, Computer Science, and Informatics Practices help in making students perceptive about matter and energy, nature, the environment, technological breakthroughs in science. The focus is on knowledge and skills to develop a scientific attitude and to use and apply such knowledge for improving the quality of life. The Curriculum promotes the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen by being able to explain phenomena scientifically, evaluate and design

scientific enquiry, and interpret data and evidence scientifically. Students understand the importance of to apply scientific knowledge in the context of real-life situations and gain competencies that enable them to participate effectively and productively in life.

(iv) **Mathematics** includes acquiring the concepts related to numbers, operations, computation, measurement, geometry, probability and statistics, the skill to calculate and organize and the ability to apply this knowledge and acquired skills in their daily life. It also includes understanding of the principles of reasoning and problem solving. Learners identify, integrate and apply numerical and spatial concepts and techniques. They have clarity of concepts and are able to connect them to the real world. Learners rationalize and reason about pre-defined arrangements, norms and relationships in order to comprehend, decode, validate and develop relevant patterns.

(v) **Business and commerce based electives-** Business Studies, Accountancy, Entrepreneurship, Economics and related subjects help in gaining understanding about core business disciplines. They understand the concept like, the exchange of items of value or products between persons or companies and the meaning / relevance/ significance of any such exchange of money for a product, service, or information.

(vi) **Visual; Performing and Creative Arts-** Subjects like Dance, Drama, Music, Heritage Crafts, Fine Arts, Sculpture and related subjects aim to help learners cultivate an interest and appreciation for arts and encourage them to enthusiastically participate in related activities, thus, promoting abilities such as imagination, creativity, value arts, and the cultural heritage.

(vii) **Skill Electives** help in development of professional competencies, which are analytical, applied and outcome based. Undergoing skills training in schools can help students learn about a trade progressively to create a product and also to become a problem solver in real life.

At present many Skill electives are being offered by the Board in the fields of Hospitality and Tourism, emerging technology like Artificial Intelligence, Geospatial Technology, Finance, Business, and Retail & Insurance etc. Students can also choose subject from diverse areas such as Fashion Design, Agriculture, Banking, Mass-Media Healthcare and many more students.

(viii) **Health and Physical Education** focuses on holistic development, both mental and physical, understanding the importance of physical fitness, health, well-being and the factors that contribute to them. Focus of this area is on helping learners develop a positive attitude and commitment to lifelong, healthy active living and the capacity to live satisfying, productive lives with the help of health management, indigenous sports, yoga, NCC, self-defense, fitness and lifestyle choices.

These learning areas are to be integrated with each other in terms of knowledge, skills (life and livelihood), comprehension, values and attitudes. Learners should get opportunities to think laterally, critically, identify opportunity, challenge their potential and be open to challenges. Learners value and engage in practices that promote physical, cognitive, emotional and social development and wellbeing. This enables learners to connect different areas of knowledge, application and values with their own lives and the world around them. The holistic nature of human learning and knowledge should be brought forth throughout.

(ix) **General Studies:** The purpose of orienting students to General Studies is to develop in them an appreciation for the holistic nature of knowledge. In contemporary times, familiarity with General Studies is indispensable because at the senior school stage there is an element of specialization due to which the students do not get exposed to some vital disciplines/areas of study that are not covered in their specialized field. The documents with details of Health and Physical Education and General Studies are available on www.cbseacademic.nic.in

2. IMPLEMENTATION OF CURRICULUM

2.1 School Curriculum Committee

The Board mandates that all schools must setup a School Curriculum Committee comprising teachers from each curricular area. The School Curriculum Committee would define activities for pedagogical practices, evolve a plan of assessment and mechanism of feedback and reflection and ensure its implementation. The committee would also ensure that the textbooks/ reference materials are age appropriate, incorporate inclusive principles, gender sensitive, have valid content and do not contain any material which may hurt the sentiments of any community. The committee will then send the list of books to the Principal to take action as per para 2.4.7 (b) of the Affiliation Byelaws, 2018.The committee would also ensure that the reference materials reflect conformity with the underlying principles of the Constitution of India and are compliant with NCF-2005. Issues of gender, social, cultural and regional disparities must be taken care of in the curriculum transaction.

2.2 Pedagogical Leadership:

Principals have a crucial role in the evolution of the teaching- learning ecosystem as pedagogical leader of their schools. As pedagogical leaders, they are expected to undertake the following:

a) Lead, Guide and Support the teaching and learning processes in the school by focusing on classroom specific requirements for transacting the curriculum, so that both teachers and students perform at their best.

b) Direct the entire focus of all school activities towards the students' learning and acquiring of necessary competencies. Every activity taken up by the school, therefore, should be mapped for the competencies, and for life skills, values, etc., being acquired by the students.

c) Prepare Annual Pedagogical Plan of the school by designing and developing annual plan for the school by giving equal importance to elective and compulsory areas.

d) Promote innovative pedagogy, with special focus on integrating art, sports and ICT (Information and Communication Technology) with education, and use active and experiential learning methods in the classrooms.

e) Ensure joyful learning at all levels through use of such innovative pedagogy.

f) Develop school specific resources for teaching and learning, in the form of lesson plans, e-content, use of mathematics and science kits developed by NCERT, etc.

g) Ensure proper in-house training of teachers in the school to enable them to unleash their own unique capabilities and creativity in their classrooms.

h) To be up to date with all new ideas and tools, etc. being used in education at the global level and constantly innovate the pedagogy of the school.

i) To make efforts to learn from the best practices of other schools, by arranging for discussions with Principals of such schools, or through observation visits of teachers to other schools.

Respecting the autonomy of every school, the Board has not laid down the structure or format of the annual pedagogical plan. A schools needs to prepare its unique, implementable and innovative annual plan. This plan must be with realistic timelines that should include administrative inputs and detailed pedagogical aspects.

2.3 Pedagogical Practices by Teachers

The pedagogical practices should be learner centric. It is expected of a teacher to ensure an atmosphere for students to feel free to ask questions. They would promote active learning among students with a focus on reflections, connecting with the world around them, creating and constructing knowledge. The role of a teacher should be that of a facilitator who would encourage collaborative learning and development of multiple

skills through the generous use of resources via diverse approaches for transacting the curriculum.

Teachers should follow inclusive principles and not label children as 'slow learners' or 'bright students', or 'problem children'. They should instead attend to the individual difference of students by diagnosing and modifying their pedagogic planning. As far as possible, Arts should be integrated in teaching, especially while teaching the concept which students find difficult to understand.

2.4 Competency based Learning:

To face the challenges of 21st Century, education should be competency based and Principals as Pedagogical Leaders must create conducive environment for development of competencies among the students. Competency based Learning focuses on the student's demonstration of desired learning outcomes as central to the learning process. Learning outcomes are statements of abilities that are expected students will gain as a result of learning the activity. Learning outcomes are, thus, statements of what a learner is expected to know, understand and/or be able to demonstrate after completion of a process of learning. Therefore, the focus is on measuring learning through attainment of prescribed learning outcomes, rather than on measuring time. Experiential and active learning are the recommend pedagogies for Competency Based Learning. Experiential Learning promotes critical thinking, creativity and effective study skills among students. Learning Outcomes sugested by NCERT for classes' I-X must be adopted by all the schools and teaching-learning process may be changed in the light of these outcomes. The schools are expected to have well-defined Learning objectives mapped with the stipulated learning outcomes for every grade that are observable and measurable, and empower learners to focus on mastery of valuable skills and knowledge. It is expected that teachers will provide meaningful and joyful learning experiences to the students by adopting variety of innovative pedagogies or instructional activities and go beyond textbooks. Schools are expected to track the attainment of Learning Outcomes in each learner and ensure that no child is left behind.

2.5 Lesson/ Unit Plan

Specific Lesson Plans for the topics are to be prepared by the teachers. These plan may have the following parts:

- Specific Learning Outcomes;
- Pedagogical Strategies;
- Group activities/experiments/hands-on-learning;
- Interdisciplinary Linkages and infusion of Life-skills, Values, Gender sensitivity etc.;
- Resources (including ICT);
- Assessment items for measuring the attainment of the Learning Outcome
- Feedback and Remedial Teaching Plan.
- Inclusive Practices

2.6 Classroom and School Environment

School environment should be conducive for holistic development of the students. The school should focus on health and hygiene by adopting inclusive practices. As part of the policy the school should adopt practices which will promote mental health. In this direction, the schools may follow the guidelines issued by the Board on making the school a No-Anger Zone or Anger Free Zone. The board has developed school health manuals which are available on www.cbseacademic.nic.in. The time table in the school should take care of proper rest and intake of healthy foods and the children learn subjects with relaxation. School must also ensure that Children avoid the intake of junk food and should ban it around school premises. Intake of the healthy foods should be encouraged with activities described in circular issued by CBSE.

The surroundings and daily life activities and situations are the best

experiential teachers for the students. Teachers must make efforts to draw examples and group activities from daily life observations within the classroom/within the school and surroundings, and encourage presentations and reflection by the students once the activity is completed, to develop the skills of critical thinking and communication.

Children learn a lot through peer learning. To promote peer learning, flexible seating arrangements may be made available during the classroom transactions. The seating should also take care of the needs of the students with disabilities as well. Learning should focus on individual differences and promote collaborative learning. The classroom activities must be connected to the immediate environment of children. The school should maintain connection with the parents and the progress of children should be communicated to the parents, and, if needed remedial measures be taken up for improving the learning outcomes.

2.7 Creating Cross-Curricular Linkages

Creating cross-curricular linkages are vital to learning as they help to connect prior knowledge with new information. For example, Mathematical data handling and interpretation can be effectively applied in geography and science. Children can write better-framed answers in history, geography and science when they have learnt how to write explanations/ short descriptions in a language. Similarly, Life Skills like empathy, problem solving and interpersonal communications can be easily integrated with the study of literature and other areas. Universal Values, Life Skills and Constitutional Values with emphasis on realization of Fundamental Duties may be incorporated depending upon context in almost all the subjects.

2.8 Special emphasis on Integrating Arts in education:

All disciplines being pursued by students at all stages require creative thinking and problem-solving abilities. Therefore, when Art is integrated with education, it helps the child apply art-based enquiry, investigation and exploration, critical thinking and creativity for a deeper understanding of the concepts/topics. Secondly, Art Integrated learning is a strong contender

for experiential learning, as it enables the student to derive meaning and understanding, directly from the learning experience. Thirdly, this kind of integration not only makes the teaching and learning process joyful, it also has a positive impact on the development of certain life skills, such as, communication skills, reflection and enquiry skills, un-conditioning of the mind leading to higher confidence levels and self-esteem, appreciation for aesthetics and creativity, etc. Fourthly, this kind of integration broadens the mind of the student, and enables him/her to see the multi-disciplinary links between subjects, topics, and real life. Schools are, thus, required to take up the integration of Art with the teaching learning process.

It must be understood that Art Education and Art Integrated Education may be mutually exclusive, but they build upon each other and strengthen each other. Art Education is not only relevant for developing creativity and appreciation of art among students, but is also necessary for inculcating art-based enquiry skills in the students. Art Education is a necessary precursor for the adoption of Art Integrated learning.

2.8.1 Art Education and Art Integration:

The following two-pronged approach is followed during a session:

(i) Art education continues to be an integral part of the curriculum, as a compulsory area at Secondary level. The schools may also promote and offer Visual and Performing Arts based subjects at the Secondary and Senior Secondary level.

(ii) Art needs to be integrated with the teaching and learning process of all subjects from classes 1 to 12, to promote active and experiential learning for "connecting knowledge to life outside the school, ensuring that learning shifts away from rote methods and for enriching the curriculum, so that it goes beyond textbooks."

2.8.2 Art Integrated Pedagogy:

While preparing its annual pedagogical plan under the leadership of the Principal of the school, the school must plan out in detail the Art Education

to be imparted at various levels, and how that Art can be integrated with classroom learning of various subjects. The focus must be on mutually reinforcing Art as a subject and Art as a tool for learning, with efforts towards seamless integration. Team teaching (combination of subject teachers and Art teachers) would also strengthen the integration.

For implementing this in classrooms, the subject teacher picks the topic/concept/idea that she wants to teach by integrating art. The teacher can do this jointly with the Art teacher too. Then, the subject teacher collaborates with the Art teacher to align the pedagogy. Next, the teacher teaches the topic/concept/idea ensuring active learning and ensuring that both the subject and Art are integrated well and there is learning in both areas. Finally, the teacher prepares a rubric to assess the student in both the areas – that is, the topic taught and the Art used.

2.9 21st Century Skills:

There is an increased awareness among the educators of the need to integrate what are called as 21st Century skills in educational systems. There are three key 21st century skills i.e. Learning Skills, Literacy Skills and Life Skills.

Learning skills include:

- Critical Thinking
- Creativity
- Communication
- Collaboration

Literacy skills include:

- Information literacy
- Media literacy
- Technology literacy

Life skills include:

- Flexibility
- Leadership
- Initiative
- Productivity
- Self-awareness

Schools must focus on enhancing the skills required for a successful adult life in 21st Century. It is important that the students are able to think scientifically, mathematically or artistically to face the real-life challenges in an information and technology driven world and enhance their inherent potential. CBSE has publised a handbook on 21st century skills available at its website. Schools may further refer to it.

2.10 Inclusive Education:

Inclusive approach in education is a prerequisite for ensuring full participation of all students with equal opportunity in all areas without any discrimination. Inclusive attitude in all staff and faculty members is crucial for successful inclusive education. Therefore, all the members of teaching and non-teaching staff should be sensitized on the issues of inclusive education. Students without disabilities should also be sensitized. Schools must organize these sensitization programmes with the support of experts from respective field of disabilities. Capacity Building Programmes on Inclusive Education may be organized in collaboration with the CBSE-Centres of Excellence. Board has made the appointment of special educator mandatory to all the schools affiliated to the CBSE. Special Educators must possess the qualification as prescribed by the Rehabilitation Council of India. (CBSE Circular No. 31/2015). CBSE has published a handbook on Inclusive Education available at its website.

3. SCHEME OF STUDIES

Class XI and XII is a composite course. Students need to take only those subjects in class XI which he/she intends to continue in class-XII. Students can offer a minimum of 5 or more subjects in class XI. They need to continue the same subjects in class XII.

3.1 Combination of Subjects: Subjects can be offered as under:

Subject		Name of Subjects
Compulsory	Subject 1	Hindi Elective or Hindi Core or English Elective or English Core
	Subject 2	Any one Language from Group – L not opted as Subject 1 **OR** Any one Elective from the Group – A
	Subject 3, Subject 4, and Subject 5	Any three electives either from Group – A **Or** Group-S **OR** Any three from Combination of Group – A and Group – S
Additional Subject Optional	Subject 6	Any one elective or Language from any subject group not opted as subjects 1-5
Subjects of Internal Assessment	Subject 7 to 9 (to be taken by all Regular Candidates)	*Work Experience Health and Physical Education General Studies

*Work experience is subsumed in Health and Physical Education

a) Hindi or English must be one of the two languages to be studied in class XI and XII. Hindi and English can also be offered simultaneously. In Hindi and English, two courses have been provided for class XI

and XII keeping in view the varying backgrounds of the students and a student may either opt Hindi Elective (Code 002) or Hindi Core (Code 302) and English Elective (Code-001) or English Core (Code-301). However, the same language cannot be offered both at Core and Elective levels.

In addition to above, the following combinations cannot be taken together;

3.1.1.1 Business Studies (Code 054) and Business Administration (Code 833)

3.1.1.2 Out of three Computer Science/IT related subjects i.e. Informatics Practices (065), Computer Science (Code 083), and Information Technology (Code 802), a candidate can opt only for one subject.

3.1.1.3 Biology (Code 044) and Biotechnology (Code 045)

3.1.1.4 Mathematics (Code 041) and Applied Mathematics (Code 241)

b) The first 5 subjects in the chronological order of filling the subjects in the online registration system/ Mark Sheet are considered as Main subjects.

c) A candidate can also offer an additional elective which may either be a language at elective level or, any other elective subject.

d) While transacting the Curriculum, due emphasis should be laid on National Identity and Values Education. Schools are expected to draw their own programmes in this area in accordance with the guidelines given from time to time by the Board. Likewise, programmes in General Studies and Health and Physical Education be planned in accordance with the guidelines brought out by the Board.

e) For candidates who take 6 subjects (5 main and 1 additional subject) and pass in all 6 subjects, the percentage is to be calculated by the employer/institution/university according to the norms of employer/ institution/university in which the candidate will be seeking admission.

f) If a student has taken 6th subjects, and if he/she fails in any one of first five subjects, the same will be replaced by the 6th subject provided the candidate satisfies the scheme of studies i.e. after replacement either Hindi or English remains as one of the main five subjects.

g) Skill electives can be offered along with any subject, as per the scheme of studies.

h) Board is extending several exemptions/concessions to candidates with disabilities as defined in the "THE RIGHTS OF PERSONS WITH DISABILITIES ACT 2016". Exemptions/Concessions extended to Persons with Benchmark Disabilities for Class X & XII Examinations conducted by the Board and the Standard Operating Procedure for availing these concessions are available on :

https://www.cbse.gov.in/cbsenew/Examination_Circular/2019/5_CIRCULAR.pdf

Schools and candidates may also refer to the circulars issued by the Board from time to time on this matter.

i) For Regional Languages, the Board prescribes the textbooks being followed in classes XI and XII in the respective State Boards where the language is taught. Schools are also advised to bring to the notice of CBSE the changes, if any, brought out at the commencement of the session by the respective State Boards, in the textbooks of the language of their State. Schools are directed to strictly follow the textbooks prescribed by CBSE in its curriculum. Changes, if any, can be adopted only when CBSE notifies them. School will be responsible for any issue arising out of School not following Boards' directives.

a. Subjects Offered

LIST OF SUBJECTS

LANGUAGES (GROUP - L)						
S No	CODE	NAME		Theory	Practical	IA
1	001	ENGLISH ELECTIVE	Any One	080	---	020
	301	ENGLISH CORE		080	----	020
2	002	HINDI ELECTIVE	Any One	080	----	020
	302	HINDI CORE		080	----	020
3	003	URDU ELECTIVE	Any One	080	---	020
	303	URDU CORE		080	---	020
4	022	SANSKRIT ELECTIVE	Any One	080	----	020
	322	SANSKRIT CORE		080	---	020
5	104	PUNJABI		080	----	020
6	105	BENGALI		080	----	020
7	106	TAMIL		080	----	020
8	107	TELUGU	Any One	080	----	020
	189	TELUGU TELANGANA		080	-----	020
9	108	SINDHI		080	-----	020
10	109	MARATHI		080	-----	020
11	110	GUJARATI		080	-----	020
12	111	MANIPURI		080	-----	020
13	112	MALAYALAM		080	----	020
14	113	ODIA		080	----	020
15	114	ASSAMESE		080	----	020
16	115	KANNADA		080	---	020
17	116	ARABIC		080	----	020
18	117	TIBETAN		080	-----	020

19	118	FRENCH	080	-----	020
20	120	GERMAN	080	-----	020
21	121	RUSSIAN	080	----	020
22	123	PERSIAN	080	----	020
23	124	NEPALI	080	----	020
24	125	LIMBOO	080	----	020
25	126	LEPCHA	080	----	020
26	192	BODO	080	----	020
27	193	TANGKHUL	080	----	020
28	194	JAPANESE	080	---	020
29	195	BHUTIA	080	----	020
30	196	SPANISH	080	----	020
31	197	KASHMIRI	080	----	020
32	198	MIZO	080	----	020

Academics Electives (GROUP-A)

S No	CODE	NAME		Theory	Practical	IA
1	027	HISTORY		080	--	020
2	028	POLITICAL SCIENCE		080	--	020
3	029	GEOGRAPHY		070	030	--
4	030	ECONOMICS		080	---	020
5	031	CARNATIC MUSIC VOCAL	Any One	030	050	020
	032	CARNATIC MUSIC MEL. INS.		030	050	020
	033	CARNATIC PER. INS. MRIDANGAM		030	050	020
	034	HINDUSTANI MUSIC VOCAL		030	050	020
	035	HINDUSTANI MUSIC MEL. INS.		030	050	020
	036	HINDUSTANI PER. INS.		030	050	020
6	037	PSYCHOLOGY		070	030	---

7	039	SOCIOLOGY		080	--	020
8	041	MATHEMATICS	Any One	080	--	020
	241*	APPLIED MATHEMATICS		080	--	020
9	042	PHYSICS		070	030	---
10	043	CHEMISTRY		070	030	----
11	044	BIOLOGY	Any One	070	030	----
	045	BIOTECHNOLOGY		070	030	----
12	046	ENGINEERING GRAPHICS		070	030	----
13	048	PHYSICAL EDUCATION		070	030	----
14	049	PAINTING	Any one	030	070	---
	050	GRAPHICS		030	070	---
	051	SCULPTURE		030	070	--
	052	APPLIED/ COMMERCIAL ART		030	070	---
15	054	BUSINESS STUDIES		080	---	020
16	055	ACCOUNTANCY		080	---	020
17	056	KATHAK – DANCE	Any one	030	070	**----**
	057	BHARATNATYAM – DANCE		030	070	----
	058	KUCHIPUDI – DANCE		030	070	---
	059	ODISSI – DANCE		030	070	----
	060	MANIPURI – DANCE		030	070	---
	061	KATHAKALI – DANCE		030	070	----
18	064	HOME SCIENCE		070	030	---
19	065	INFORMATICS PRACTICES	Any one	070	030	---
	083	COMPUTER SCIENCE		070	030	---
20	066	ENTREPRENEURSHIP		070	----	030

21	073	KNOWLEDGE TRADITION & PRACTICES OF INDIA	070	----	030
22	074	LEGAL STUDIES	080	---	020
23	076	NATIONAL CADET CORPS (NCC)	070	030	----

Skills Elective (Group-S)

S. No.	SUB. CODE	NAME	JOB ROLES	MARKS DISTRIBUTION	
				THEORY	PRACTICAL
1.	801	RETAIL	SALES ASSOCIATE	60	40
2.	802	INFORMATION TECHNOLOGY	IT HELPDESK ASSISTANT	60	40
3.	803	WEB APPLICATION	WEB DEVELOPER	60	40
4.	804	AUTOMOTIVE	AUTOMOTIVE SERVICE TECHNICIAN	60	40
5.	805	FINANCIAL MARKETS MANAGEMENT	EQUITY DEALER/ MUTUAL FUND AGENT	60	40
6.	806	TOURISM	TOUR GUIDE	60	40
7.	807	BEAUTY & WELLNESS	BEAUTY THERAPIST	60	40
8.	808	AGRICULTURE	AGRICULTURE EXTENSION WORKER	70	30
9.	809	FOOD PRODUCTION	TRAINEE COMMIE	60	40
10.	810	FRONT OFFICE OPERATIONS	COUNTER SALES EXECUTIVE	60	40
11.	811	BANKING	SALES EXECUTIVE (BANKING PRODUCT)	60	40
12.	812	MARKETING	MARKETING EXECUTIVE	60	40
13.	813	HEALTH CARE	GENERAL DUTY ASSISTANT	60	40
14.	814	INSURANCE	SALES EXECUTIVE (INSURANCE)	60	40
15.	816	HORTICULTURE	FLORICULTURIST (PROTECTED)/ ENTREPREEUR	60	40
16.	817	TYPOGRAPHY & COMPUTER APPLICATION	EXECUTIVE ASSISTANT	60	40

17.	818	GEOSPATIAL TECHNOLOGY	GIS OPERATOR	60	40
18.	819	ELECTRICAL TECHNOLOGY	FIELD TECHNICIAN-OTHER HOME	60	40
19.	820	ELECTRONIC TECHNOLOGY	INSTALLATION TECHNICIAN	60	40
20.	821	MULTI-MEDIA	ANIMATOR	50	50
21.	822	TAXATION	ASSISTANT TAX CONSULTANT / GST ACCOUNTS ASSISTANT	60	40
22.	823	COST ACCOUNTING	JR. ACCOUNTANT	60	40
23.	824	OFFICE PROCEDURES & PRACTICES	EXECUTIVE ASSISTANT	60	40
24.	825	SHORTHAND (ENGLISH)	STENOGRAPHER	60	40
25.	826	SHORTHAND (HINDI)	STENOGRAPHER	60	40
26.	827	AIR-CONDITIONING & REFRIGERATION	SERVICE TECHNICIAN	60	40
27.	828	MEDICAL DIAGNOSTICS	MEDICAL LAB TECHNICIAN	60	40
28.	829	TEXTILE DESIGN	DESIGN ASSISTANT (APPAREL / TEXTILE)	60	40
29.	830	DESIGN	ASSISTANT DESIGNER	50	50
30.	831	SALESMANSHIP	SALES EXECUTIVE	60	40
31.	833	BUSINESS ADMINISTRATION	BUSINESS EXECUTIVE	70	30
32.	834	FOOD NUTRITION & DIETETICS	ASSISTANT DIETICIAN	70	30
33.	835	MASS MEDIA STUDIES	MEDIA ASSISTANT	70	30
34.	836	LIBRARY & INFORMATION SCIENCE	LIBRARY ASSISTANT	70	30
35.	837	FASHION STUDIES	ASSISTANT FASHION DESIGNER	70	30
36.	841	YOGA	YOGA INSTRUCTOR	50	50
37.	842	EARLY CHILDHOOD CARE & EDUCATION	EARLY CHILDHOOD EDUCATOR	50	50
38.	843	ARTIFICIAL INTELLIGENCE (NEW)		50	50

The curriculum and the study material for the Skill Electives are available on the CBSE academic website under the tab 'Skill Education' and can be accessed through the link: http://cbseacademic.nic.in/skill-education.html.

3.3. Medium of Instruction

The medium of instruction in general in all the schools affiliated with the Board shall either be Hindi or English.

4. STRUCTURE OF ASSESSMENT SCHEME

The Assessment scheme will have theory, internal assessment or practical components as per syllabus given for each subject. Board shall conduct Annual examinations for class XII

As the Board is progressively allowing more space to 'learning outcome based' assessment in place of textbook driven assessment, question papers of Board examinations will have more questions based on real-life situations requiring students to apply, analyse, evaluate and synthesize information as per the stipulated outcomes. The core-competencies to be assessed in all questions, however, will be from the prescribed syllabus and textbooks recommended therein. This will eliminate predictability and rote learning to a large extent.

4.1 Annual examination:

For Class XII

The Board Examination will cover the entire syllabus of Class-XII as per syllabus for each subject. Grades shall be awarded on the basis of 9-point grading system in each elective subject. For awarding the grades, the Board will put all the passed students in a rank order and will award the grades as follows:

A-1	Top 1/8th of the passed candidates	
A-2	Next 1/8th of the passed candidates	
B-1	Next 1/8th of the passed candidates	
B-2	Next 1/8th of the passed candidates	

C-1	Next 1/8th of the passed candidates	
C-2	Next 1/8th of the passed candidates	
D-1	Next 1/8th of the passed candidates	
D-2	Next 1/8th of the passed candidates	
E*	*Essential Repeat	

Notes:-

(i) Minor variations in proportion of candidates to adjust ties will be made.

(ii) In case of a tie, all the students getting the same score will get the same grade. If the number of students at a score point needs to be divided into two segments, the smaller segment will go with the larger.

(iii) Method of grading will be used in subjects where the number of candidates who have passed is more than 500.

(iv) In respect of subjects where the total number of candidates passing as subject is less than 500, the grading would be adopted on the pattern of grading and distribution in other similar subjects.

For Class XI:

The assessment scheme will be similar to class XII Board examination and shall be carried out at school level. However, the grading in class XI will be as follows:

Grading Scale for Elective Areas (Class-XI) (School will award grades as per the following grading scale)	
MARK RANGE	**GRADE**
91-100	A1
81-90	A2
71-80	B1

61-70	B2
51-60	C1
41-50	C2
33-40	D
32 and below	*Essential Repeat

Absolute grading is suggested for class XI keeping in view the number of students appearing from any particular school as against positional grading used for class XII.

4.2 Internal Assessment:

Internal Assessment in different subjects will be as per details given in the syllabus for each subject.

4.3 Assessment of Compulsory Areas

Assessment of compulsory Areas may be continuously done by collecting information, reflecting on and using that information to review children's progress and to plan future learning experiences. The documented data, after interpretation, should be reflected in the Report Card of the children in the form of grades.

In the existing scheme of assessment, these activities will be graded on a 8-point grading scale (A1 to E) for classes XI -XII and will have no descriptive indicators. The students shall be assessed on three areas i.e. Health and Physical Education with Work Experience and General Studies. Work Experience is subsumed in the Health and Physical Education. No up scaling of grades will be done.

The concerned teacher would make an objective assessment of the level of performance/ participation demonstrated by a student throughout the academic year and finally assign grades.

Parameters of Assessment

Marks and grades on the basis of 9-point grading system may be awarded in

each compulsory area (General Studies, Health and Physical Education) for classes XI and XII as detailed below:

Grading for General Studies:

Grade	Description
A1	Top1/8th of the passed candidates
A2	Next 1/8th of the passed candidates
B1	Next 1/8th of the passed candidates
B2	Next 1/8th of the passed candidates
C1	Next 1/8th of the passed candidates
C2	Next 1/8th of the passed candidates
D1	Next 1/8th of the passed candidates
D2	Next 1/8th of the passed candidates
E	Essential Repeat

Distribution of Periods/ Grades for Internal Assessment in Health and Physical Education (with Work Experience subsumed in it)

Strand	Periods (Approx.)	Grades*
1. GAMES a) Athletics/ Swimming b) Team Games c) Individual Games/ Activity d) Adventure Sports	90 periods	While filling online data, following grades may be filled against **HPE:** **Class XI-XII:** Grade (A-E) on 9-point scale (A1,A2,B1,B2,C1,C2,D1,D2,E)
2. Health and Fitness	50 periods	
3. SEWA	50 periods	While filling online data, following grades of SEWA shall be filled against Work Education / Work Experience: **Class XI-XII:** Grade (A-E) on 9-point scale (A1,A2,B1,B2,C1,C2,D1,D2,E)
4. Health and Activity Card	10 periods	**- Enclosed separately**
Total	**200 Periods** (Approx.)	-

* Refer the detailed HPE guidelines available on www.cbseacademic.nic.in with the amendment given above.

4.4 Design of the Question Paper for Board examination:

To ensure flexibility in the assessment at Board examination, the detailed design of the paper is not included in the curriculum document. The details of design of the Q.P shall be subsequently notified with the sample question paper. However the Board examination shall test as per weightage allocated to each area or unit given in the respective subject.

4.5 Development of competencies through Student Enrichment activities:

In the recent pas board has been organizing various activities for promoting various 21st century skills. Following are some such activities introduced with the intention of enhancement of the skills and values.

S. No.	Student Enrichment Activity	Skills/Values to be Enhanced
1	Story Telling Competition	• Thinking Skills: Creative, Analytical, Evaluative • Communication Skills • Linguistic Skills
2	Reading Week	
3	Fastest Reading Contest	
4	Aryabhata Ganit Challenge	• Reasoning Abilities • Problem Solving Skills • Critical thinking • Analytical thinking • Ability to manipulate precise and intricate ideas • Ability to construct logical arguments
5	CBSE Heritage India Quiz	• Values of respect for diversity and tolerance • Awareness about preserving Indian heritage and monuments • Critical thinking skills • Appreciation for rich heritage and diversity of the country

6	Science Exhibition	• Critical and Creative Thinking Skills • Problem Solving Skills • Scientific Temperament • Connecting Science to day to day life
7	Science Literacy Promotion Test	
8	Expression Series	• Creative Thinking Skills • Communication Skills
9	Eco-Club Activities	• Awareness about Environmental Conservation and Protection • Cleanliness Habits
10	Swachhata Abhiyan	
11	Ek Bharat Shrestha Bharat	• Spirit of Patriotism and Unity • Creative Skills
12	Rashtriya Ekta Diwas	
13	Inter School Band Competition	
14	Fit India School Week	• Healthy life style
15	CBSE Inter-School Sports & Games Competitions	• Attention and concentration powers
16	International Day of Yoga	
17	Matri bhasha Diwas	• Awareness of Linguistic and Cultural traditions • Values of Tolerance and Dialogue • Communication Skills
Addition in the last table in both the Senior secondary and Secondary Curiculum		
18	The Constitution Day	importance of Constitution, its history, structure and implications to citizens orientation to composite culture and diversity of our nation awareness of Fundamental Rights and Duties as enshrined in the Indian Constitution.

19	Art Integrated Project	application of art-based enquiry, investigation and exploration, critical thinking and creativity for a deeper understanding of the concepts/topics promotes experiential learning as it enables to derive meaning and understanding directly from the learning enables students to see the multi-disciplinary linkages between subjects, topics, and real life.

Schools are encouraged to participate in these activities of the Board for making students future ready.

4.5.1 Rules regarding Admission and Examination

Regarding eligibility for Admission, Eligibility for Examination, Scheme of Examination and related information, please see the Examination Bye-Laws of CBSE available on www.cbse.nic.in

CENTRAL BOARD OF SECONDARY EDUCATION
Academic Unit, Shiksha Sadan, 17, Rouse Avenue, New Delhi-110 002

ENGLISH (CORE)- 301

(2021-22)

Background

Students are expected to have acquired a reasonable degree of language proficiency in English Language by the time they come to class XI, and the course aims, 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 professional domain. 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.

Competencies to be focused on:

The general objectives at this stage are to:

- listen and comprehend live as well as record in writing oral presentations on a variety of topics
- develop greater confidence and proficiency in the use of language skills necessary for social and academic purpose to participate in group discussions, interviews by making short oral presentation on given topics
- perceive the overall meaning and organisation of the text (i.e., correlation of the vital portions of the text)
- identify the central/main point and supporting details, etc., to build communicative competence in various lexicons of English
- promote advanced language skills with an aim to develop the skills of reasoning, drawing inferences, etc. through meaningful activities
- translate texts from mother tongue(s) into English and vice versa
- develop ability and acquire knowledge required in order to engage in independent reflection and enquiry
- read and comprehend extended texts (prescribed and non-prescribed) in the following genres: science fiction, drama, poetry, biography, autobiography, travel and sports literature, etc.
- text-based writing (i.e., writing in response to questions or tasks based on prescribed or unseen texts) understand and respond to lectures, speeches, etc.

- write expository / argumentative essays, explaining or developing a topic, arguing a case, etc. write formal/informal letters and applications for different purposes
- make use of contextual clues to infer meanings of unfamiliar vocabulary
- select, compile and collate information for an oral presentation
- produce unified paragraphs with adequate details and support
- use grammatical structures accurately and appropriately
- write items related to the workplace (minutes, memoranda, notices, summaries, reports etc.
- filling up of forms, preparing CV, e-mail messages., making notes from reference materials, recorded talks etc.

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

- The use of passive forms in scientific and innovative writings.
- Convert 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.

A. Specific Objectives of Reading

Students are expected to develop the following study skills:

- skim for main ideas and scan for details
- refer to dictionaries, encyclopedia, thesaurus and academic reference material in any format
- select and extract relevant information, using reading skills of skimming and scanning
- understand the writer's purpose and tone
- comprehend the difference between the literal and the figurative
- differentiate between claims and realities, facts and opinions, form business opinions on the basis of latest trends available
- comprehend technical language as required in computer related fields, arrive at personal conclusion and logically comment on a given text
- Specifically develop the ability to be original and creative in interpreting opinion, develop the ability to be logically persuasive in defending one's opinion and making notes based on a text

Develop literary skills as enumerated below:

- respond to literary texts
- appreciate and analyse special features of languages that differentiate literary texts from non-literary ones, explore and evaluate features of character, plot, setting, etc.
- understand and appreciate the oral, mobile and visual elements of drama .Identify the elements of style such as humour, pathos, satire and irony, etc.
- make notes from various resources for the purpose of developing the extracted ideas into sustained pieces of writing

B. Listening and Speaking

Speaking needs a very strong emphasis and is an important objective leading to professional competence. Hence, testing of oral skills must be made an important component of the overall testing pattern. To this end, speaking and listening skills are overtly built into the material to guide the teachers in actualization of the skills.

I. Specific Objectives of Listening & Speaking

Students are expected to develop the ability to:

- take organized notes on lectures, talks and listening passages
- listen to news bulletins and to develop the ability to discuss informally a wide ranging issues like current national and international affairs, sports, business, etc.
- respond in interviews and to participate in formal group discussions.
- make enquiries meaningfully and adequately and to respond to enquiries for the purpose of travelling within the country and abroad.
- listen to business news and to be able to extract relevant important information.
- to develop public speaking skills.

II. Guidelines for Assessment in Listening and Speaking Skills

i. Activities:

- Activities for listening and speaking available at www.cbseacademic.in can be used for developing listening and speaking skills of students.

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

ii. Parameters for Assessment:

The listening and speaking skills are to be assessed on the following parameters:

i. Interactive competence (Initiation & turn taking, relevance to the topic).
ii. Fluency (cohesion, coherence and speed of delivery).
iii. Pronunciation
iv. Language (accuracy and vocabulary).

iii. Schedule:

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

III. Record keeping:

The record of the activities done and the marks given must be kept for three months after the declaration of result, for any random checking by the Board.

No recording of speaking skills is to be sent to the Board.

C. Specific Objectives of Writing

The students will be able to:

- write letters to friends, relatives, etc. to write business and official letters.
- open accounts in post offices and banks. To fill in railway/airline reservation forms.
- draft notices, advertisements and design posters effectively and appropriately
- write on various issues to institutions seeking relevant information, lodge complaints, express gratitude or render apology.
- write applications, fill in application forms, prepare a personal bio-data for admission into colleges, universities, entrance tests and jobs.
- write informal reports as part of personal letters on functions, programmes and activities held in school (morning assembly, annual day, sports day, etc.)
- write formal reports for school magazines/events/processes/ or in local newspapers about events or occasions.
- express opinions, facts, arguments in the form of speech or debates, using a variety of accurate sentence structures
- draft papers to be presented in symposia.

- take down notes from talks and lectures.
- write examination answers according to the requirement of various subjects.
- summarise a text.

D. More About Reading

Inculcating good reading habits in children has always been a concern for all stakeholders in education. The purpose is to create independent thinking individuals with the ability to not only create their own knowledge but also critically interpret, analyse and evaluate it with objectivity and fairness. This will also help students in learning and acquiring better language skills.

Creating learners for the 21st century involves making them independent learners who can learn, unlearn and relearn. If our children are in the habit of reading, they will learn to reinvent themselves and deal with the many challenges that lie ahead of them.

Reading is not merely decoding information or pronouncing words correctly. It is an interactive dialogue between the author and the reader in which the reader and the author share their experiences and knowledge with each other. Good readers are critical readers with an ability to arrive at a deeper understanding of not only the world presented in the book but also of the real world around them.

Consequently, they become independent thinkers capable of taking their own decisions in life rationally. Hence, a few activities are suggested below which teachers may use as a part of the reading project.

- Short review / dramatization of the story
- Commentary on the characters
- Critical evaluation of the plot, storyline and characters
- Comparing and contrasting the characters within the story, with other characters in stories by the same author or by different authors
- Extrapolating about the story read or life of characters after the story ends defending characters actions in the story
- Making an audio story out of the novel/text to be read aloud.
- Interacting with the author
- Holding a literature fest where students role-play as various characters to interact with each other
- Role playing as authors/poets/dramatists, to defend their works and characters
- Symposiums and seminars for introducing a book, an author, or a theme
- Creating graphic novels out of novel or short stories they read
- Dramatizing incidents from a novel or a story

- Creating their own stories
- Books of one genre to be read by the whole class.

Teachers may select books and e-books suitable to the age and level of the learners. Care ought to be taken to choose books that are appropriate in terms of language, theme and content and which do not hurt the sensibilities of a child.

Teachers may later suggest books from other languages by dealing with the same themes as an extended activity. The Project should lead to independent learning/reading skills and hence the chosen book should not be taught in class, but may be introduced through activities and be left for the students to read at their own pace. Teachers may, however, choose to assess a student's progress or success in reading the book by asking for verbal or written progress reports, looking at their diary entries, engaging in a discussion about the book, giving a short quiz or a work sheet about the book/short story. A befitting mode of assessment may be chosen by the teacher.

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 (dictionary, thesaurus, 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 students should be encouraged to interpret texts in different ways.

Group and pair activities can be resorted to when desired, although 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.

ENGLISH CORE (CODE NO.301)

CLASS – XI (2021-22)

PART A - 40 MARKS

Reading **18 Marks**

I. Multiple Choice questions based on one unseen passage to assess comprehension, interpretation and inference. Vocabulary and inference of meaning will also be assessed. The passage may be factual, descriptive or literary. Ten out of eleven questions to be done. (**10x1=10 Marks)**

II. Multiple Choice questions based on one unseen **case-based** factual passage with verbal/visual inputs like statistical data, charts etc. Eight out of Nine questions to be done. (**8x1=8 Marks)**

Note: The combined word limit for both the passages will be 600-750.

Grammar **8 Marks**

III. Multiple choice questions on Gap filling (Determiners, Tenses, **Modals Clauses, Change of Voice, Error Correction, editing task/cloze passages**

IV. Multiple choice questions on re-ordering/transformation of sentences

(Total eight questions to be done out of the ten given).

Literature Section **14 Marks**

V. Multiple Choice questions from an extract from Poetry from **Hornbill** to assess comprehension and appreciation. Any 1 out of 2 extracts to be done.(3x1=3)

VI. Multiple Choice questions based on two Prose extracts, out of the three given, from Prose (**Hornbill as well as Snapshots** to assess comprehension and appreciation. (6x1=6)

VII. Text based Multiple Choice Questions to assess comprehension, analysis and interpretation, from Prose and Poetry. Five questions out of six to be done. (5x1=5)

PART B - 40 MARKS

Reading Section: **8 Marks**

Q1. Note Making and Summarization based on a passage of approximately 200-250 words.

I. Note Making: **5 Marks**
- Title: 1
- Numbering and indenting: 1
- Key/glossary: 1
- Notes: 2

II. Summary (up to 50 words): **3 Marks**
- Content: 2
- Expression: 1

Writing Section: **16 Marks**

Q2. Short writing task -**Notice/ Advertisement** writing up to 50 words. One out of the two given questions to be answered **(3 Marks**: Format : 1 / Content : 1 / Expression : 1)

Q3. Short writing task –**Poster** up to 50 words. One out of the two given questions to be answered.(**3marks:**Format : 1 / Content : 1 / Expression : 1)

Q4. Letters based on verbal/visual input, to be answered in 120-150 words. Business or official letters (for making enquiries, registering complaints, asking for and giving information, placing orders and sending replies), letter to the school or college authorities, regarding admissions, school issues, requirements / suitability of courses, Application for Job interview etc. One out of the two given questions to be answered (**5 Marks**: Format: 1 / Content: 2 / Expression: 2)

Q5 .Writing composition based on visual/verbal inputs in 120-150 words. May be descriptive / argumentative in nature such as Article/Report/ Narrative/speech/debate. The theme should be contemporary topical issues. One out of the two given questions to be answered. **(5 Marks**: Format: 1 / Content: 2 / Expression: 2)

Literature Section: **16 Marks**

Q6. Two Short answer type question **(one from Prose and one from Poetry from the book Hornbill), out of four,** to be answered in 30-40 words. Questions should elicit inferential responses through critical thinking. **(2x2=4)**

Q7. One Short answer type question, from **Prose (Snapshots),** to be answered in 40-50 words. Questions should elicit inferential responses through critical thinking. Any 1 out of 2 questions to be done. **(1x2=2)**

Q 8. One Long answer type question, from **Prose/poetry (Hornbill),** to be answered in 120-150 words to assess global comprehension and extrapolation beyond the text. Questions to provide evaluative and analytical responses using incidents, events, themes as reference points. Any 1 out of 2 questions to be done.**(1x5=5)**

Q.9 One Long answer type question, based on the chapters from the book **Snapshots**, to be answered in 120-150 words to assess global comprehension and extrapolation beyond the text. Questions to provide evaluative and analytical responses using incidents, events, themes as reference points. Any 1 out of 2 questions to be done.**(1x5=5)**

Prescribed Books

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

Question Paper Design 2021-22

English CORE XI (Code No. 301)

Section	**Competencies**	**Total marks**	**%**
Reading Comprehension	Conceptual understanding, decoding, Analyzing, inferring, interpreting, appreciating, literary, conventions and vocabulary, summarizing and using appropriate format/s	26	32.5%
Creative Writing Skills and Grammar	Conceptual Understanding, application of rules, Analysis, Reasoning, appropriacy of style and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity	24	30%
Literature Textbooks and Supplementary Reading Text	Recalling, reasoning, appreciating literary convention, inference, analysis, creativity with fluency	30	37.5%
	TOTAL	**80**	**100%**
Assessment of Listening and Speaking Skills		**20**	**-**
	GRAND TOTAL	**100**	

MATHEMATICS (XI-XII)

(Code No. 041)

Session – 2021-22

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

Objectives

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

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

COURSE STRUCTURE

CLASS XI (2021-22)

One Paper Total Period–240 [35 Minutes each]

Three Hours **Max Marks: 80**

No.	Units	No. of Periods	Marks
I.	Sets and Functions	60	23
II.	Algebra	70	30
III.	Coordinate Geometry	40	10
IV.	Calculus	30	05
V.	Mathematical Reasoning	10	02
VI.	Statistics and Probability	30	10
	Total	240	80
	Internal Assessment		20

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

Unit-I: Sets and Functions

1. **Sets** **(20) Periods**

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

2. **Relations & Functions** **(20) Periods**

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

3. **Trigonometric Functions** **(20) Periods**

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

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

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

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

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

Identities related to sin2*x*, cos2*x*, tan2 *x*, sin3*x*, cos3*x* and tan3*x*. General solution of trigonometric equations of the type sin*y* = sin*a*, *cosy* = *cosa* and tan*y* = tan*a*.

Unit-II: Algebra

1. **Principle of Mathematical Induction** **(10) Periods**

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

2. **Complex Numbers and Quadratic Equations** **(15) Periods**

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

3. **Linear Inequalities** **(15) Periods**

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

4. **Permutations and Combinations** **(10) Periods**

Fundamental principle of counting. Factorial *n.* (n!) Permutations and combinations, derivation of Formulae for n_{p_r} and n_{c_r} and their connections, simple applications.

5. **Binomial Theorem** **(10) Periods**

Historical perspective, 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** **(10) Periods**

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

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

Unit-III: Coordinate Geometry

1. Straight Lines **(10) Periods**

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

2. Conic Sections **(20) Periods**

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

3. Introduction to Three-dimensional Geometry **(10) Periods**

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

Unit-IV: Calculus

1. Limits and Derivatives (30) Periods

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

Unit-V: Mathematical Reasoning

1. Mathematical Reasoning (10) Periods

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 among contradiction, converse and contrapositive.

Unit-VI: Statistics and Probability

1. Statistics (15) Periods

Measures of Dispersion: Range, Mean deviation, variance and standard deviation of ungrouped/grouped data. Analysis of frequency distributions with equal means but different variances.

2. Probability (15) Periods

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

MATHEMATICS

QUESTION PAPER DESIGN

CLASS – XI (2021-22)

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

S. No.	Typology of Questions	Total Marks	% Weightage
1	**Remembering:** Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding:** Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	44	55
2	**Applying:** Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	20	25
3	**Analysing :** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations **Evaluating:** Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. **Creating:** Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions	16	20
	Total	80	100

1. *No chapter wise weightage. Care to be taken to cover all the chapters*
2. *Suitable internal variations may be made for generating various templates keeping the overall weightage to different form of questions and typology of questions same.*

Choice(s):

There will be no overall choice in the question paper.

However, 33% internal choices will be given in all the sections

INTERNAL ASSESSMENT	**20 MARKS**
Periodic Tests (Best 2 out of 3 tests conducted)	10 Marks
Mathematics Activities	10 Marks

Note: Please refer the guidelines given under XII Mathematics Syllabus:

Applied Mathematics (XI-XII)

(Code-241)

Session- 2021-22

Secondary School Education prepares students to explore future career options after graduating from schools. Mathematics is an important subject that helps students to choose various fields of their choices. Mathematics is widely used in higher studies as an allied subject in the field of Economics, Commerce, Social Sciences and many others. It has been observed that the syllabus of Mathematics in senior secondary grades meant for Science subjects may not be appropriate for the students who wish to pursue Commerce or Social Science-based subjects in university education. By keeping this in mind, one more elective course in the Mathematics syllabus is developed for Senior Secondary classes with an aim to provide students relevant experience in Mathematics that can be used in fields other than Physical Sciences.

This course is designed to develop substantial mathematical skills and methods needed in other subject areas. Topics covered in two years aim to enable students to use mathematical knowledge in the field of business, economic and social sciences. It aims to promote appreciation of mathematical power and simplicity for its countless applications in diverse fields. The course continues to develop mathematical language and symbolism to communicate and relate everyday experiences mathematically. In addition, it reinforces the logical reasoning skills of formulating and validating mathematical arguments, framing examples, finding counterexamples. It encourages students to engage in mathematical investigations and to build connections within mathematical topics and with other disciplines. The course prepares students to use algebraic methods as a means of representation and as a problem-solving tool. It also enables students to interpret two-dimensional geometrical figures using algebra and to further deduce properties of geometrical figures in a coordinate system. The course content will help students to develop a sound understanding of descriptive and inferential statistics which they can use to describe and analyze a given set of data and to further make meaningful inferences out of it. Data based case studies from the field of business, economics, psychology, education, biology and census data will be used to appreciate the power of data in contemporary society.

It is expected that the subject is taught connecting concepts to the applications in various fields. The objectives of the course areas are as follows:

Objectives:

a) To develop an understanding of basic mathematical and statistical tools and their applications in the field of commerce (business/ finance/economics) and social sciences.
b) To model real-world experiences/problems into mathematical expressions using numerical/algebraic/graphical representation.
c) To make sense of the data by organizing, representing, interpreting, analysing, and making meaningful inferences from real-world situations.
d) To develop logical reasoning skills and apply the same in simple problem-solving.
e) To reinforce mathematical communication by formulating conjectures, validating logical arguments and testing hypothesis.
f) To make connections between Mathematics and other disciplines.

Grade XI (2021-22)

Number of Paper: **1**

Total number of Periods: **240 (35 Minutes Each)**

Time: **3 Hours**

Max Marks: **80**

No.	Units	No. of Periods	Marks
I	Numbers, Quantification and Numerical Applications	25	09
II	Algebra	45	15
III	Mathematical Reasoning	15	06
IV	Calculus	35	10
V	Probability	25	08
VI	Descriptive Statistics	35	12
VII	Basics of Financial Mathematics	45	15
VIII	Coordinate Geometry	15	05
Total		240	80
Internal Assessment			20

CLASS- XI

Sl. No.	Contents	Learning Outcomes: Students will be able to	Notes / Explanation
UNIT – 1 NUMBERS, QUANTIFICATION AND NUMERICAL APPLICATIONS			
Numbers & Quantification			
1.1	Prime Numbers, Encryptions using Prime Numbers	● Identify prime numbers ● Encrypt or Decrypt the message using prime numbers	● Definition and meaning ● Introduction to encryption /decryption using prime numbers by RSA algorithm
1.2	Binary Numbers	● Express decimal numbers in binary system ● Express binary numbers in decimal system	● Definition of number system (decimal and binary) ● Conversion from decimal to binary system and vice - versa
1.3	Complex Numbers (Preliminary Idea Only)	● Define complex numbers and explain basic notions of complex numbers ● Perform basic operations on the complex numbers ● Find additive inverse and multiplicative inverse of a complex number ● Find conjugate and modulus of complex numbers	• Definition and representation of Complex Numbers • Basic operations (addition, subtraction, multiplication and division) on two or more complex numbers ● Properties of Conjugate and Modulus of complex numbers
1.4	Indices, Logarithm and Antilogarithm	● Relate indices and logarithm /antilogarithm ● Find logarithm and antilogarithms of given number	● Applications of rules of indices ● Introduction of logarithm and antilogarithm ● Common and Natural logarithm
1.5	Laws and properties of logarithms	● Enlist the laws and properties of logarithms ● Apply laws of logarithm	● Fundamental laws of logarithm
1.6	Simple applications of logarithm and antilogarithm	● Use logarithm in different applications	● Express the problem in the form of an equation and apply logarithm/ antilogarithm
Numerical Applications			
1.7	Averages	● Determine average for a given data	● Definition and meaning ● Problems on average, weighted average
1.8	Clock	● Evaluate the angular value of a minute ● Calculate the angle formed between two hands of clock at given time ● Calculate the time for which hands of clock meet	● Number of rotations of minute hand / hour hand of a clock in a day ● Number of times minute hand and hour hand coincides in a day

1.9	Calendar	● Determine Odd days in a month/ year/ century ● Decode the day for the given date	● Definition of odd days ● Odd days in a year/ century. ● Day corresponding to a given date
1.10	Time, Work and Distance	● Establish the relationship between work and time ● Compare the work done by the individual / group w.r.t. time ● Calculate the time taken/ distance covered/ Work done from the given data	● Basic concept of time and work ● Problems on time taken / distance covered / work done
1.11	Mensuration	● Solve problems based on surface area and volume of 2D and 3D shapes ● Calculate the volume/ surface area for solid formed using two or more shapes	● Comparison between 2D and 3D shapes ● Combination of solids ● Transforming one solid shape to another
1.12	Seating arrangement	● Create suitable seating plan/ draft as per given conditions (Linear/circular) ● Locate the position of a person in a seating arrangement	● Linear and circular seating arrangement ● Position of a person in a seating arrangement
UNIT – 2 ALGEBRA			
Sets			
2.1	Introduction to sets – definition	● Define set as well-defined collection of objects	● Definition of a Set ● Examples and Non-examples of Set
2.2	Representation of sets	● Represent a set in Roster form and Set builder form	● Write elements of a set in Set Builder form and Roster Form ● Convert a set given in Roster form into Set builder form and vice-versa
2.3	Types of sets and their notations	• Identify different types of sets on the basis of number of elements in the set • Differentiate between equal set and equivalence set	• Types of Sets: Finite Set, Infinite Set, Empty Set, Singleton Set
2.4	Subsets	• Enlist all subsets of a set • Find number of subsets of a given set • Find number of elements of a power set	• Subset of a given set • Familiarity with terms like Superset, Improper subset, Universal set, Power set

2.5	Intervals	• Express subset of real numbers as intervals	• Open interval, closed interval, semi open interval and semi closed interval
2.6	Venn diagrams	• Apply the concept of Venn diagram to understand the relationship between sets • Solve problems using Venn diagram	• Venn diagrams as the pictorial representation of relationship between sets • Practical Problems based on Venn Diagrams
2.7	Operations on sets	• Perform operations on sets to solve practical problems	• Operations on sets include i) Union of sets ii) Intersection of sets iii) Difference of sets iv) Complement of a set v) De Morgan's Laws
Relations			
2.8	Ordered pairs Cartesian product of two sets	• Explain the significance of specific arrangement of elements in a pair • Write Cartesian product of two sets • Find the number of elements in a Cartesian product of two sets	• Ordered pair, order of elements in an ordered pair and equality of ordered pairs • Cartesian product of two non-empty sets
2.9	Relations	• Express relation as a subset of Cartesian product • Find domain and range of a relation	• Definition of Relation, examples pertaining to relations in the real number system
2.10	Types of relations	• Define and illustrate different types of relations: Empty relation and universal relation • Examine whether the relation is equivalence or not • Define function as a special type of relation • Categorize relations that are functions and non-functions	• Types of relations: Empty relation, universal relation, reflexive relation, symmetric relation, transitive relation, equivalence relation • Introducing a function as a special type of relation • Examples and non-examples of functions
Sequences and Series			
2.11	Sequence and Series	• Differentiate between sequence and series	• Sequence: $a_1, a_2, a_3, \ldots, a_n$ • Series: $a_1 + a_2 + a_3 + \cdots + a_n$
2.12	Arithmetic Progression	• Identify Arithmetic Progression (AP) • Establish the formulae of finding n^{th}term and sum of *n* terms	• General term of AP: $t_n = a + (n-1)d$ • Sum of n terms of AP : $S_n = \frac{n}{2}[2a + (n-1)d]$

		● Solve application problems based on AP ● Find arithmetic mean (AM) of two positive numbers	AM of $a\ and\ b$= $\frac{a+b}{2}$
2.13	Geometric Progression	● Identify Geometric Progression (GP) ● Derive the n^{th}term and sum of n terms of a given GP ● Solve problems based on applications of GP ● Find geometric mean (GM) of two positive numbers ● Solve problems based on relation between AM and GM	● General term of GP: $t_n = ar^{n-1}$ ● Sum of n terms of a GP: $S_n = \frac{a(r^n-1)}{r-1}$ ● Sum of infinite term of GP = $\frac{a}{1-r}$, where $-1 < r < 1$ ● Geometric mean of *a* and *b* = $\sqrt{ab}$ ● For two positive numbers a and b, AM ≥GM i.e., $\frac{a+b}{2} \geq \sqrt{ab}$
2.14	Applications of AP and GP	● Apply appropriate formulas of AP and GP to solve application problems	Applications based on ● Economy Stimulation ● The Virus spread etc.
Permutations and Combinations			
2.15	Factorial	● Define factorial of a number ● Calculate factorial of a number	● Definition of factorial: n! = n(n-1)(n-2)…3.2.1 Usage of factorial in counting principles
2.16	Fundamental Principle of Counting	● Appreciate how to count without counting	● Fundamental Principle of Addition ● Fundamental Principle of Multiplication
2.17	Permutations	● Define permutation ● Apply the concept of permutation to solve simple problems	● Permutation as arrangement of objects in a definite order taken some or all at a time ● Theorems under different conditions resulting in $^nP_r=\frac{n!}{(n-r)!}$ or n^r or $\frac{n!}{n_1!n_2!\ldots n_k!}$ arrangements
2.18	Circular permutation	●Define circular permutation ●Solve problems based on circular permutation	● (n-1)! as the number of permutations of n distinct objects in a circle ● Number of arrangements as $\frac{(n-1)!}{2}$, when clockwise and anticlockwise arrangement of objects are indistinguishable
2.19	Permutations	● Solving problems based	● Permutations in which some

	with restrictions	on permutations with restrictions	objects come together or come at designated places. ● Permutations in which some objects are always included or excluded
2.20	Combinations	● Define combination ● Differentiate between permutation and combination ● Apply the formula of combination to solve the related problems	-The number of combinations of n different objects taken r at a time is given by ${}^nC_r = \frac{n!}{r!.(n-r)!}$ Some results on combinations: ● ${}^nC_0 = 1 = {}^nC_n$ ● ${}^nC_a = {}^nC_b \Rightarrow a=b$ or $a+b=n$ ● ${}^nC_r = {}^nC_{n-r}$ ● ${}^nC_r + {}^nC_{r-1} = {}^{n+1}C_r$
2.21	Combination with repetition	● Solve problems using combination with repetitions	● Combination of n distinct objects taken r at a time if repetition is allowed
UNIT -3 MATHEMATICAL REASONING			
3.1	Mathematical reasoning	● Identify mathematically acceptable statements ● Express the implications of the compound statement ● Validate mathematical statements	● Meaning of mathematical statements ● Negation ● Compound statements ● Quantifiers ● Converse and Contrapositive of the statement ● Implications ● Validating statements
3.2	Logical reasoning	● Solve logical problems involving odd man out, syllogism, blood relation and coding decoding	● Odd man out ● Syllogism ● Blood relations ● Coding Decoding
UNIT – 4 CALCULUS			
4.1	Functions	● Identify dependent and independent variables ● Define a function using dependent and independent variable	● Dependent variable and independent variable ● Function as a rule or law that defines a relationship between one variable (the independent variable) and another variable (the dependent variable)
4.2	Domain and Range of a function	● Define domain, range and co-domain of a given function	● Domain as a set of all values of independent variable ● Co-domain as a set of all values of dependent variable ● Range of a function as set of all possible resulting values of dependent variable
4.3	Types of functions	● Define various types of functions ● Identify domain, co-domain and range of the function	● Following types of functions with definitions and characteristics Constant function, Identity function, Polynomial function, Rational function, Composite

			function, Logarithm function, Exponential function, Modulus function, Greatest integer function, Signum function, Algebraic function
4.4	Graphical representation of functions	● Representation of function graphically	● Graph of some polynomial functions, Logarithm function, Exponential Function, Modulus function, Greatest integer function, Signum function
4.5	Concepts of limits and continuity of a function	● Define limit of a function ● Solve problems based on the algebra of limits ● Define continuity of a function	● Left hand limit, Right hand limit, Limit of a function, Continuity of a function
4.6	Instantaneous rate of change	● Define instantaneous rate of change	● The ratio $\frac{\Delta y}{\Delta x} = \frac{f(x+\Delta x)-f(x)}{\Delta x}$ as instantaneous rate of change, where Δy is change in y and Δx is change in x at any instant
4.7	Differentiation as a process of finding derivative	● Find the derivative of the functions	● Derivatives of functions (non-trigonometric only)
4.8	Derivatives of algebraic functions using Chain Rule	● Find the derivative of function of a function	● If $y = f(u)$ where $u = g(x)$ then differential coefficient of y w.r.t x is $\frac{dy}{dx} = \frac{dy}{du}.\frac{du}{dx}$
4.9	Tangent line and Equation of tangent	● Define tangent line ● Find the gradient of a tangent ● Find equation of tangent to the curve $y = f(x)$ at a given point	● The slope (gradient) of the tangent to the curve $y = f(x)$ at the given point ● The equation of the tangent to the curve at the given point
UNIT – 5 PROBABILITY			
5.1	Introduction	● Appreciate the use of probability in daily life situations	● Probability as quantitative measure of uncertainty ● Use of probability in determining the insurance premium, weather forecasts etc.
5.2	Random experiment and sample space	● Define random experiment and sample space with suitable examples	● Sample space as set of all possible outcomes
5.3	Event	● Define an event ● Recognize and differentiate different types of events and find their probabilities	● Types of Event: Impossible and sure event, Independent and dependent event, mutually exclusive and exhaustive event

5.4	Conditional Probability	• Define the concept of conditional probability • Apply reasoning skills to solve problems based on conditional probability	• Conditional Probability of event E given that F has occurred is: $P(E\|F) = \frac{P(E \cap F)}{P(F)}$, $P(F) \neq 0$
5.5	Total Probability	• Interpret mathematical information and identify situations when to apply total probability • Solve problems based on application of total probability	• Total Probability: Let $E_1, E_2, \ldots, E_n$ be a partition of the sample space S, then probability of an event A associated with S is: $P(A) = \sum_{j=1}^{n} P(E_j) P(A\|E_j)$
5.6	Bayes' Theorem	• State Bayes' theorem • Solve practical problems based on Bayes' Theorem	• Bayes' Theorem: If $E_1, E_2, \ldots, E_n$ be *n* non empty events which constitute a partition of a sample space S and A be any event with non zero probability, then: $P(E_i\|A) = \frac{P(E_i)P(A\|E_i)}{\sum_{j=1}^{n} P(E_j)P(A\|E_j)}$
UNIT- 6 DESCRIPTIVE STATISTICS			
6.1	Types of data	• Identify real life situations for collecting data • Categorize data based on nature of data (Primary and Secondary Data, Raw and Organized Data) • Identify and differentiate univariate, bivariate and multi-variate data • Identify and differentiate discrete data and continuous data • Collect raw data from practical examples	• Examples of raw data from different surveys, sports • Multi-variate data from not more than three variables • Collection of data up to three variables from real life examples, such as, data of students (age, weight, height)
6.2	Data on various scales	• Describe nominal, ordinal, interval and ratio scale of data collection • Collect and classify data on different scales of measurement	• Examples and non-examples of data on different scales • Benefit and limitations of collecting data on various scales
6.3	Data representation and data visualization	• Organize raw data in discrete and continuous form • Represent data on nominal and ordinal scales of measurement using pie chart and bar graphs	• Data organization in increasing/decreasing order, using frequency table and in class intervals of various length • Graphical representation of data using pie-chart/bar graphs/histogram using class interval of equal and unequal length

		● Represent data on interval and ratio scale using histogram and frequency polygon ● Represent bivariate continuous data using line graph ● Choose appropriate graph to represent data of various kinds	●Visualization of data using Excel Spreadsheet or any other computer assisted tool
6.4	Data Interpretation		
	Measure of Central Tendency	● Define central tendency of a data set ● Differentiate between mean, median and mode ● Calculate mean, median and mode for ungrouped and grouped data ● Choose appropriate measure to calculate central tendency	●Mean using direct method, assumed mean method and step deviation method ●Median and Mode ●Examples of different kinds of data helping students to choose and compare different measures of central tendency
	Measure of Dispersion	● Understand meaning of dispersion in a data set ● Differentiate between range, quartile deviation, mean deviation and standard deviation ● Calculate range, quartile deviation, mean deviation and standard deviation for ungrouped and grouped data set ● Choose appropriate measure of dispersion to calculate spread of data	●Mean deviation around mean and median ●Standard deviation and variance ●Examples of different kinds of data helping students to choose and compare different measures of dispersion
	Skewness and Kurtosis	● Define Skewness and Kurtosis using graphical representation of a data set ● Interpret Skewness and Kurtosis of a frequency distribution by plotting the graph ● Calculate coefficient of Skewness and interpret the results	●Examples of symmetrical and asymmetrical data ●Visualization of graphical representation of data using Excel Spreadsheet or any other computer assisted tool
6.5	Percentile rank and Quartile rank	● Define Percentile rank and Quartile rank ● Calculate and interpret Percentile and Quartile rank of scores in a given data set	●Emphasis on visualizing, analysing and interpreting percentile and quartile rank scores
6.6	Correlation	● Define correlation in	●Emphasis on application, analysis

		values of two data sets ● Calculate Product moment correlation for ungrouped and grouped data ● Calculate Karl Pearson's coefficient of correlation ● Calculate Spearman's rank correlation ● Interpret the coefficient of correlation	and interpreting the results of coefficient of correlation using practical examples
UNIT – 7 FINANCIAL MATHEMATICS			
7.1	Interest and Interest Rates	● Define the concept of Interest Rates ● Compare the difference between Nominal Interest Rate, Effective Rate and Real Interest Rate ● Solve Practical applications of interest rate	● Impact of high interest rates and low interest rates on the business
7.2	Accumulation with simple and compound interest	● Interpret the concept of simple and compound interest ● Calculate Simple Interest and Compound Interest	●Meaning and significance of simple and compound interest ●Compound interest rates applications on various financial products
7.3	Simple and compound interest rates with equivalency	● Explain the meaning, nature and concept of equivalency ● Analyze various examples for understanding annual equivalency rate	● Concept of Equivalency ● Annual Equivalency Rate
7.4	Effective rate of interest	● Define with examples the concept of effective rate of interest	● Effective Annual Interest Rate $= (1 + i/n)^n - 1$ where: i = Nominal Interest Rate n = No. of Periods
7.5	Present value, net present value and future value	●Interpret the concept of compounding and discounting along with practical applications ●Compute net present value ●Apply net present value in capital budgeting decisions	• Formula for Present Value: $PV = CF/(1 + r)^n$ Where: CF = Cash Flow in Future Period r = Periodic Rate of return or Interest (also called the discount rate or the required rate of return) n = no. of periods • Use of PVAF, FVAF tables for practical purposes • Solve problems based on Application of net present value

7.6	Annuities, Calculating value of Regular Annuity	● Explain the concept of Immediate Annuity, Annuity due and Deferred Annuity ● Calculate General Annuity	● Definition, Formulae and Examples
7.7	Simple applications of regular annuities (upto 3 period)	● Calculate the future value of regular annuity, annuity due ● Apply the concept of Annuity in real life situations	● Examples of regular annuity: Mortgage Payment, Car Loan Payments, Leases, Rent Payment, Insurance payouts etc.
7.8	Tax, calculation of tax, simple applications of tax calculation in Goods and service tax, Income Tax	● Explain fundamentals of taxation ● Differentiate between Direct and indirect tax ● Define and explain GST ● Calculate GST ● Explain rules under State Goods and Services Tax (SGST) Central Goods and Services Tax (CGST) and Union Territory Goods and Services Tax (UTGST)	● Computation of income tax Add Income from Salary, house property, business or profession, capital gain, other sources, etc. Less deductions PF, PPF, LIC, Housing loan, FD, NSC etc. ● Assess the Individuals under Income Tax Act ● Formula for GST Different Tax heads under GST
7.9	Bills, tariff rates, fixed charge, surcharge, service charge	● Describe the meaning of bills and its various types ● Analyze the meaning and rules determining tariff rates ● Explain the concept of fixed charge	● Tariff rates- its basis of determination ● Concept of fixed charge service charge and their applications in various sectors of Indian economy
7.10	Calculation and interpretation of electricity bill, water supply bill and other supply bills	● To interpret and analyze electricity bills, water bills and other supply bills ● Evaluate how to calculate units consumed under electricity bills/water bill	● Components of electricity bill/water supply and other supply bills: i) overcharging of electricity ii) water supply bills iii) units consumed in electricity bills
UNIT – 8 COORDINATE GEOMETRY			
8.1	Straight line	● Find the slope and equation of line in various form ● Find angle between the two lines ● Find the perpendicular from a given point on a line ● Find the distance between two parallel	● Gradient of a line ● Equation of line: Parallel to axes, point-slope form, two-points form, slope intercept form, intercept form ● Application of the straight line in demand curve related to economics problems

		lines	
8.2	Circle	● Define a circle ● Find different form of equations of a circle ● Solve problems based on applications of circle	● Circle as a locus of a point in a plane ● Equation of a circle in standard form, central form, diameter form and general form
8.3	Parabola	● Define parabola and related terms ● Define eccentricity of a parabola ● Derive the equation of parabola	● Parabola as a locus of a point in a plane. ● Equation of a parabola in standard form: ● Focus, Directrix, Axis, Latus rectum, Eccentricity ● Application in parabolic reflector, beam supported by wires at the end of the support, girder of a railway bridge, etc.

Practical: Use of spreadsheet

Calculating average, interest (simple and compound), creating pictographs, drawing pie chart, bar graphs, calculating central tendency visualizing graphs (straight line, circles and parabola using real-time data)

Suggested practical using spreadsheet

1. Plot the graph of functions on excel study the nature of function at various points, drawing lines of tangents
2. Create a budget of income and spending
3. Create and compare sheet of price & features to buy a product
4. Prepare the best option plan to buy a product by comparing cost, shipping charges, tax and other hidden costs
5. Smart purchasing during sale season
6. Prepare a report card using scores of the last four exams and compare the performance
7. Collect the data on weather, price, inflation, and pollution. Sketch different types of graphs and analyze the results

PHYSICS

Class XI-XII (Code No. 042)

(2021-22)

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

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

Besides, the syllabus also attempts to

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

PHYSICS (Code No. 042)
COURSE STRUCTURE
Class XI – 2021-22 (Theory)

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

		No. of Periods	Marks
Unit–I	**Physical World and Measurement**	**10**	**23**
	Chapter–1: Physical World		
	Chapter–2: Units and Measurements		
Unit-II	**Kinematics**	**24**	
	Chapter–3: Motion in a Straight Line		
	Chapter–4: Motion in a Plane		
Unit–III	**Laws of Motion**	**14**	
	Chapter–5: Laws of Motion		
Unit–IV	**Work, Energy and Power**	**12**	**17**
	Chapter–6: Work, Energy and Power		
Unit–V	**Motion of System of Particles and Rigid Body**	**18**	
	Chapter–7: System of Particles and Rotational Motion		
Unit-VI	**Gravitation**	**12**	
	Chapter–8: Gravitation		
Unit–VII	**Properties of Bulk Matter**	**24**	**20**
	Chapter–9: Mechanical Properties of Solids		
	Chapter–10: Mechanical Properties of Fluids		
	Chapter–11: Thermal Properties of Matter		
Unit–VIII	**Thermodynamics**	**12**	
	Chapter–12: Thermodynamics		
Unit–IX	**Behaviour of Perfect Gases and Kinetic Theory of Gases**	**08**	
	Chapter–13: Kinetic Theory		
Unit–X	**Oscillations and Waves**	**26**	**10**
	Chapter–14: Oscillations		
	Chapter–15: Waves		
Total		**160**	**70**

Unit I: Physical World and Measurement **10 Periods**

Chapter–1: Physical World

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

Chapter–2: Units and Measurements

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

Dimensions of physical quantities, dimensional analysis and its applications.

Unit II: Kinematics **24 Periods**

Chapter–3: Motion in a Straight Line

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

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

Relations for uniformly accelerated motion (graphical treatment).

Chapter–4: Motion in a Plane

Scalar and vector quantities; position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors, relative velocity, Unit vector; resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors.

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

Unit III: Laws of Motion **14 Periods**

Chapter–5: Laws of Motion

Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion.

Law of conservation of linear momentum and its applications.

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

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

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

Chapter–6: Work, Engery and Power

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

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

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

Chapter–7: System of Particles and Rotational Motion

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

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

Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects (no derivation). Statement of parallel and perpendicular axes theorems and their applications.

Unit VI: Gravitation **12 Periods**

Chapter–8: Gravitation

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

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

Unit VII: Properties of Bulk Matter **24 Periods**

Chapter–9: Mechanical Properties of Solids

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

Chapter–10: Mechanical Properties of Fluids

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

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

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

Chapter–11: Thermal Properties of Matter

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

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

Unit VIII: Thermodynamics **12 Periods**

Chapter–12: Thermodynamics

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

Second law of thermodynamics: reversible and irreversible processes, Heat engine and refrigerator.

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

Chapter–13: Kinetic Theory

Equation of state of a perfect gas, work done in compressing a gas.

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

Unit X: Oscillations and Waves **26 Periods**

Chapter–14: Oscillations

Periodic motion - time period, frequency, displacement as a function of time, periodic functions.

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

Chapter–15: Waves

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

PRACTICALS **Total Periods: 60**

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

- Record of at least 12 Experiments [with 6 from each section], to be performed by the students.
- Record of at least 6 Activities [with 3 each from section A and section B], to be performed by the students.
- Report of the project to be carried out by the students.

EVALUATION SCHEME

Time Allowed: Three hours **Max. Marks: 30**

Two experiments one from each section	7+7 Marks
Practical record (experiment and activities)	5 Marks
One activity from any section	3 Marks
Investigatory Project	3 Marks
Viva on experiments, activities and project	5 Marks
Total	**30 Marks**

SECTION–A

Experiments

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

5. To determine the mass of two different objects using a beam balance.
6. To find the weight of a given body using parallelogram law of vectors.
7. Using a simple pendulum, plot its L-T^2 graph and use it to find the effective length of second's pendulum.
8. To study variation of time period of a simple pendulum of a given length by taking bobs of same size but different masses and interpret the result.
9. To study the relationship between force of limiting friction and normal reaction and to find the co- efficient of friction between a block and a horizontal surface.
10. 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 sinθ.

Activities

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

SECTION–B

Experiments

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 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 solid by method of mixtures.
8. To study the relation between frequency and length of a given wire under constant tension using sonometer.
9. To study the relation between the length of a given wire and tension for constant frequency using sonometer.
10. To find the speed of sound in air at room temperature using a resonance tube by two resonance positions.

Activities

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

Practical Examination for Visually Impaired Students Class XI

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

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

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

B. List of Practicals

1. To measure diameter of a small spherical/cylindrical body using vernier calipers.
2. To measure the internal diameter and depth of a given beaker/calorimeter using vernier calipers and hence find its volume.
3. To measure diameter of given wire using screw gauge.
4. To measure thickness of a given sheet using screw gauge.
5. To determine the mass of a given object using a beam balance.
6. To find the weight of given body using the parallelogram law of vectors.
7. Using a simple pendulum plot L-T and L-T^2 graphs. Hence find the effective length of second's pendulum using appropriate length values.
8. To find the force constant of given helical spring by plotting a graph between load and extension.

9. (i) To study the relation between frequency and length of a given wire under constant tension using a sonometer.
   (ii) To study the relation between the length of a given wire and tension, for constant frequency, using a sonometer.
10. To find the speed of sound in air, at room temperature, using a resonance tube, by observing the two resonance positions.

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

Prescribed Books:

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

8. CHEMISTRY (Code No. 043)

Rationale

Higher Secondary is the most crucial stage of school education because at this juncture specialized 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 pursuing their career in basic sciences or professional courses like medicine, engineering, technology and study courses in applied areas of science and technology at tertiary level. Therefore, 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 senior secondary stage.

The new and updated curriculum is based on disciplinary approach with rigour and depth taking care that the syllabus is not heavy and at the same time it is comparable to the international level. The knowledge related to the subject of Chemistry has undergone tremendous changes during the past one decade. Many new areas like synthetic materials, bio -molecules, natural resources, industrial chemistry are coming in a big way and deserve to be an integral part of chemistry syllabus at senior secondary stage. At international level, new formulations and nomenclature of elements and compounds, symbols and units of physical quantities floated by scientific bodies like IUPAC and CGPM are of immense importance and need to be incorporated in the updated syllabus. The revised syllabus takes care of all these aspects. Greater emphasis has been laid on use of new nomenclature, symbols and formulations, teaching of fundamental concepts, application of concepts in chemistry to industry/ technology, logical sequencing of units, removal of obsolete content and repetition, etc.

Objectives

The curriculum of Chemistry at Senior Secondary Stage aims to:

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

COURSE STRUCTURE
CLASS-XI (THEORY) (2021-22)

Total Periods (Theory 160 + Practical60)

Time:3Hours **Total Marks70**

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

Unit I: Some Basic Concepts of Chemistry **12 Periods**

General Introduction: Importance and scope of Chemistry.

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

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

Unit II: Structure of Atom **14 Periods**

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

Unit III: Classification of Elements and Periodicity in Properties 08 Periods

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

Unit IV: Chemical Bonding and Molecular Structure 14 Periods

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 12 Periods

Three states of matter, intermolecular interactions, types of bonding, melting and boiling points, role of gas laws in elucidating the concept of the molecule, Boyle's law, Charles law, Gay Lussac's law, Avogadro's law, ideal behaviour, empirical derivation of gas equation, Avogadro's number, ideal gas equation. Deviation from ideal behaviour, liquefaction of gases, critical temperature, kinetic energy and molecular speeds (elementary idea), Liquid State- vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations)

Unit VI: Chemical Thermodynamics 16 Periods

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

First law of thermodynamics -internal energy and enthalpy, heat capacity and specific heat, measurement of ΔU and ΔH, Hess's law of constant heat summation, enthalpy of bond dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution. Second law of Thermodynamics (brief introduction)

Introduction of entropy as a state function, Gibb's energy change for spontaneous and non-spontaneous processes, criteria for equilibrium.

Third law of thermodynamics (brief introduction).

Unit VII: Equilibrium 14 Periods

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

Unit VIII: Redox Reactions 06 Periods

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

UnitIX: Hydrogen 08 Periods

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

Unit X: s-Block Elements (Alkali and Alkaline Earth Metals) 10 Period

Group 1 and Group 2 Elements

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

Preparation and Properties of Some Important Compounds:

Sodium Carbonate, Sodium Chloride, Sodium Hydroxide and Sodium Hydrogen carbonate, Biological importance of Sodium and Potassium.

Calcium Oxide and Calcium Carbonate and their industrial uses, biological importance of Magnesium and Calcium.

Unit XI: Some p-Block Elements 14Periods

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 acid, Boron Hydrides, Aluminium: Reactions with acids and alkalies, uses.

Group 14 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first elements. Carbon-catenation, allotropic forms, physical and chemical properties; uses of some important compounds: oxides. Important compounds of Silicon and a few uses: Silicon Tetrachloride, Silicones, Silicates and Zeolites, their uses.

Unit XII: Organic Chemistry -Some Basic Principles and Techniques 14 Periods

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 12 Periods

Classification of Hydrocarbons

Aliphatic Hydrocarbons:

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

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

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

Aromatic Hydrocarbons:

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

Unit XIV: Environmental Chemistry **06 Periods**

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

PRACTICALS

Evaluation Scheme for Examination	Marks
Volumetric Analysis	08
Salt Analysis	08
Content Based Experiment	06
Project Work	04
Class record and viva	04
Total	**30**

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

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

B. Characterization and Purification of Chemical Substances

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

C. Experiments based on pH

a) Any one of the following experiments:

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

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

D. Chemical Equilibrium

One of the following experiments:

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

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

E. Quantitative Estimation

i. Using a mechanical balance/electronic balance.
ii. Preparation of standard solution of Oxalic acid.
iii. Determination of strength of a given solution of Sodium hydroxide by titrating it against standard solution of Oxalic acid.
iv. Preparation of standard solution of Sodium carbonate.
v. Determination of strength of a given solution of hydrochloric acid by titrating it against standard Sodium Carbonate solution.

F. Qualitative Analysis

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

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

Anions – $(CO_3)^{2-}$, S^{2-}, NO_2^-, SO_3^{2-}, SO^{2-}_4, NO_3^-, Cl^-, Br^-, I^-, PO_4^{3-}, $C_2O^{2-}_4$, CH_3COO^-
(Note: Insoluble salts excluded)

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

c) PROJECTS

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 ion
- 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 study of causes of presence 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 it
- Study the acidity of different samples of tea leaves.
- Determination of the rate of evaporation of different liquids
- Study the effect of acids and bases on the tensile strength of fibers.
- Study of acidity of fruit and vegetable juices.

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

Practical Examination for Visually Impaired Students
Class XI

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

A. List of apparatus for identification for assessment in practicals (All experiments)

Beaker, tripod stand, wire gauze, glass rod, funnel, filter paper, Bunsen burner, test tube, test tube stand, dropper, test tube holder, ignition tube, china dish, tongs, standard flask, pipette, burette, conical flask, clamp stand, dropper, wash bottle

- Odour detection in qualitative analysis
- Procedure/Setup of the apparatus

B. List of Experiments

A. Characterization and Purification of Chemical Substances

1. Crystallization of an impure sample of any one of the following: copper sulphate, benzoic acid

B. Experiments based on pH

1. Determination of pH of some solutions obtained from fruit juices, solutions of known and varied concentrations of acids, bases and salts using pH paper
2. Comparing the pH of solutions of strong and weak acids of same concentration.

C. Chemical Equilibrium

1. Study the shift in equilibrium between ferric ions and thiocyanate ions by increasing/decreasing the concentration of eitherions.
2. Study the shift in equilibrium between $[Co(H_2O)_6]^{2+}$ and chloride ions by changing the concentration of either of the ions.

D. Quantitative estimation

1. Preparation of standard solution of oxalic acid.
2. Determination of molarity of a given solution of sodium hydroxide by titrating it against standard solution of oxalic acid.

E. Qualitative Analysis

1. Determination of one anion and one cation in a given salt
2. Cations - NH^+_4
   Anions – $(CO_3)^{2-}$, S^{2-}, $(SO_3)^{2-}$, Cl^-, CH_3COO^-
   (Note: insoluble salts excluded)
3. Detection of Nitrogen in the given organic compound.
4. Detection of Halogen in the given organic compound.

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

Prescribed Books:

1. Chemistry Part – I, Class-XI, Published by NCERT.
2. Chemistry Part – II, Class-XI, Published by NCERT.

BIOLOGY (Code No. 044)
2021-22

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

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

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

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

Time: 03 Hours **Max. Marks: 70**

Unit	Title	No. of Periods	Marks
I	Diversity of Living Organisms	27	12
II	Structural Organization in Plants and Animals	27	12
III	Cell: Structure and Functions	26	12
IV	Plant Physiology	40	17
V	Human Physiology	40	17
	Total	**160**	**70**

Unit-I Diversity of Living Organisms

Chapter-1: The Living World

What is living? Biodiversity; Need for classification; taxonomy and systematics; concept of species and taxonomical hierarchy; binomial nomenclature; tools for study of taxonomy-museums, zoological parks, herbaria, botanical gardens, keys for identification.

Chapter-2: Biological Classification

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

Chapter-3: Plant Kingdom

Salient features and classification of plants into major groups - Algae, Bryophyta, Pteridophyta, Gymnospermae and Angiospermae (salient and distinguishing features and a few examples of each category): Angiosperms - classification up to class, characteristic features and examples. Plant life cycles and alternation of generations

Chapter-4: Animal Kingdom

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

Unit-II Structural Organization in Plants and Animals

Chapter-5: Morphology of Flowering Plants

Morphology and modifications: Morphology of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed. Description of families: Fabaceae, Solanaceae and Liliaceae (to be dealt along with the relevant experiments of the Practical Syllabus).

Chapter-6: Anatomy of Flowering Plants

Anatomy and functions of different tissues and tissue systems in dicots and monocots. Secondary growth.

Chapter-7: Structural Organisation in Animals

Animal tissues; Morphology, Anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect-cockroach (a brief account only).

Unit-III Cell: Structure and Functions

Chapter-8: Cell-The Unit of Life

Cell theory and cell as the basic unit of life, structure of prokaryotic and eukaryotic cells; Plant cell and animal cell; cell envelope; cell membrane, cell wall; cell organelles - structure and function; endomembrane system- endoplasmic reticulum, ribosomes, golgi bodies, lysosomes, vacuoles; mitochondria, plastids, microbodies; cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); nucleus.

Chapter-9: Biomolecules

Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, nucleic acids; concept of metabolism; Enzymes - properties, enzyme action, factors, classification, Co-factors.

Chapter-10: Cell Cycle and Cell Division

Cell cycle, mitosis, meiosis and their significance

Unit-IV Plant Physiology

Chapter-11: Transport in Plants

Movement of water, gases and nutrients; cell to cell transport - diffusion, facilitated diffusion, active transport; plant-water relations, imbibition, water potential, osmosis, plasmolysis; 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.

Chapter-12: Mineral Nutrition

Elementary idea of hydroponics as a method to study mineral nutrition; essential minerals, macro- and micronutrients and their role; deficiency symptoms; mineral toxicity; nitrogen metabolism, nitrogen cycle, biological nitrogen fixation.

Chapter-13: Photosynthesis in Higher Plants

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

Chapter-14: Cellular Respiration

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

Chapter-15: Plant - Growth and Development

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

Unit-V Human Physiology

Chapter-16: Digestion and Absorption

Alimentary canal and digestive glands, role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats; egestion; nutritional and digestive disorders - indigestion, constipation, vomiting, jaundice, diarrhoea.

Chapter-17: Breathing and Exchange of Gases

Introduction to respiratory organs in animals; 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.

Chapter-18: Body Fluids and Circulation

Composition of blood, blood groups, coagulation of blood; composition of lymph and its function; circulatory pathways; human circulatory system - Structure of human heart and blood vessels; cardiac cycle, cardiac output, ECG; double circulation; regulation of cardiac activity; disorders of circulatory system - hypertension, coronary artery disease, angina pectoris, heart failure.

Chapter-19: Excretory Products and their Elimination

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

Chapter-20: Locomotion and Movement

Types of movement – amoeboid, ciliary, flagellar, muscular; types of muscles; skeletal muscle, contractile proteins and muscle contraction; skeletal system and its functions; joints; disorders of muscular and skeletal systems - myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout.

Chapter-21: Neural Control and Coordination

Neuron and nerves; Nervous system in humans - central nervous system and peripheral nervous system; generation, conduction and transmission of nerve impulse; reflex action; sensory perception; sense organs; elementary structure and functions of eye and ear.

Chapter-22: Chemical Coordination and Integration

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

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

PRACTICALS

Time: 03 hours **Max. Marks: 30**

Evaluation Scheme		Marks
One Major Experiment Part A (Experiment No- 1,3,7,8)		5
One Minor Experiment Part A (Experiment No- 6,9,10,11,12,13)		4
Slide Preparation Part A (Experiment No- 2,4,5)		5
Spotting Part B		7
Practical Record + Viva Voce	Credit to the students' work over the academic session may be given	4
Project Record + Viva Voce		5
Total		**30**

A: List of Experiments

1. Study and describe three locally available common flowering plants, one from each of the families Solanaceae, Fabaceae and Liliaceae (Poaceae, Asteraceae or Brassicaceae can be substituted in case of particular geographical location) including dissection and display of floral whorls, anther and ovary to show number of chambers (floral formulae and floral diagrams). Types of root (Tap and adventitious); types of stem (herbaceous and woody); leaf (arrangement, shape, venation, simple and compound).
2. Preparation and study of T.S. 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/lily leaves or flashy scale leaves of onion bulb).
5. Study of distribution of stomata in the upper and lower surfaces of leaves.
6. Comparative study of the rates of transpiration in the upper and lower surface of leaves.
7. Test for the presence of sugar, starch, proteins and fats in suitable plant and animal materials.
8. Separation of plant pigments through paper chromatography.
9. Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.
10. Test for presence of urea in urine.
11. Test for presence of sugar in urine.
12. Test for presence of albumin in urine.
13. Test for presence of bile salts in urine.

B. Careful observation of the following (spotting):

1. Parts of a compound microscope.
2. Specimens/slides/models and identification with reasons - Bacteria, *Oscillatoria*, *Spirogyra*, *Rhizopus*, mushroom, yeast, liverwort, moss, fern, pine, one monocotyledonous plant, one dicotyledonous plant and one lichen.
3. Virtual specimens/slides/models and identifying features of - *Amoeba*, *Hydra*, liverfluke, *Ascaris*, leech, earthworm, prawn, silkworm, honeybee, snail, starfish, shark, rohu, frog, lizard, pigeon and rabbit.
4. Tissues and diversity in shape and size of plant cells (palisade cells, guard cells, parenchyma, collenchyma, sclerenchyma, xylem and phloem) through temporary and permanent slides.

5. Tissues and diversity in shape and size of animal cells (squamous epithelium, smooth, skeletal and cardiac muscle fibers and mammalian blood smear) through temporary/permanent slides.
6. Mitosis in onion root tip cells and animals cells (grasshopper) from permanent slides.
7. Different modifications in roots, stems and leaves.
8. Different types of inflorescence (cymose and racemose).
9. Human skeleton and different types of joints with the help of virtual images/models only.

Practical Work for Visually Impaired Students - Class XI

Note: The 'Evaluation scheme' and 'General Guidelines' for visually impaired students given at the end of this document may be referred to.

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

- Plants of Solanaceae family (Brinjal, Petunia or any other), Fabaceae family (Pea, Gram or any other) or The Liliaceae family (Any of the Lilies)
- Mushroom, Succulents such as *Aloe vera*/*Kalanchoe*
- Raisins and Potatoes
- Honey comb, Mollusc shell, Model of cockroach, Pigeon and Star fish
- Compound microscope, Test tube, Petri dish, Beaker, Scalpel
- Chromatography paper, Chromatography chamber, Alcohol

B. **List of Practicals**

1. Study three locally available common flowering plants of the families – Solanaceae, Fabaceae, Liliaceae and identify:
2. Types of stems as Herbaceous or Woody, Types of leaves as Compound or Simple
3. Study the parts of a compound microscope- eye piece and objective lens, mirror, stage, coarse and fine adjustment knobs.
4. Differentiate between monocot and dicot plants on the basis of venation patterns.
5. Study the following parts of human skeleton (Model): Ball and socket joints of thigh and shoulder, Rib cage
6. Study honey-bee/butterfly, snail shell, Starfish, Pigeon (through models).
7. Identify the given specimen of a fungus – Mushroom, gymnosperm- pine cone
8. Identify and relate the experimental set up with the aim of experiment:

   For Potato Osmometer/ endosmosis in raisins.

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

Prescribed Books:

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

ACCOUNTANCY (Code No. 055)

Rationale

The course in accountancy is introduced at plus two stage of senior second of school education, as the formal commerce education is provided after ten years of schooling. With the fast changing economic scenario, accounting as a source of financial information has carved out a place for itself at the senior secondary stage. Its syllabus content provide students a firm foundation in basic accounting concepts and methodology and also acquaint them with the changes taking place in the preparation and presentation of financial statements in accordance to the applicable accounting standards and the Companies Act 2013.

The course in accounting put emphasis on developing basic understanding about accounting as an information system. The emphasis in Class XI is placed on basic concepts and process of accounting leading to the preparation of accounts for a sole proprietorship firm. The students are also familiarized with basic calculations of Goods and Services Tax (GST) in recording the business transactions. The accounting treatment of GST is confined to the syllabus of class XI.

The increased role of ICT in all walks of life cannot be overemphasized and is becoming an integral part of business operations. The learners of accounting are introduced to Computerized Accounting System at class XI and XII. Computerized Accounting System is a compulsory component which is to be studied by all students of commerce in class XI; whereas in class XII it is offered as an optional subject to Company Accounts and Analysis of Financial Statements. This course is developed to impart skills for designing need based accounting database for maintaining book of accounts.

The complete course of Accountancy at the senior secondary stage introduces the learners to the world of business and emphasize on strengthening the fundamentals of the subject.

Objectives:

1. To familiarize students with new and emerging areas in the preparation and presentation of financial statements.
2. To acquaint students with basic accounting concepts and accounting standards.

3. To develop the skills of designing need based accounting database.
4. To appreciate the role of ICT in business operations.
5. To develop an understanding about recording of business transactions and preparation of financial statements.
6. To enable students with accounting for Not-for-Profit organizations, accounting for Partnership Firms and company accounts.

Accountancy (Code No.055)

Course Structure

Class-XI (2021-22)

Theory: 80 Marks **3 Hours**

Project: 20 Marks

Units		Periods	Marks
Part A: Financial Accounting-1			
	Unit-1: Theoretical Framework	**25**	**12**
	Unit-2: Accounting Process	**105**	**40**
Part B: Financial Accounting-II			
	Unit-3: Financial Statements of Sole Proprietorship from Complete and Incomplete Records	**55**	**20**
	Unit-4: Computers in Accounting	**15**	**08**
Part C: Project Work		**20**	**20**

PART A: FINANCIAL ACCOUNTING - I

Unit-1: Theoretical Frame Work

Units/Topics	Learning Outcomes
Introduction to Accounting • Accounting- concept, objectives, advantages and limitations, types of accounting information; users of accounting information and their needs. Qualitative Characteristics of Accounting Information. Role of Accounting in Business. • Basic Accounting Terms- Business Transaction, Capital, Drawings. Liabilities (Non Current and Current). Assets (Non Current, Current); Fixed assets (Tangible and Intangible), Expenditure (Capital and Revenue), Expense, Income, Profit, Gain, Loss, Purchase, Sales, Goods, Stock, Debtor, Creditor, Voucher, Discount (Trade discount and Cash Discount)	**After going through this Unit, the students will be able to:** • describe the meaning, significance, objectives, advantages and limitations of accounting in the modem economic environment with varied types of business and non-business economic entities. • identify / recognise the individual(s) and entities that use accounting information for serving their needs of decision making. • explain the various terms used in accounting and differentiate between different related terms like current and non-current, capital and revenue. • give examples of terms like business transaction, liabilities, assets, expenditure and purchases.

Theory Base of Accounting • Fundamental accounting assumptions: GAAP: Concept • Business Entity, Money Measurement, Going Concern, Accounting Period, Cost Concept, Dual Aspect, Revenue Recognition, Matching, Full Disclosure, Consistency, Conservatism, Materiality and Objectivity • System of Accounting. Basis of Accounting: cash basis and accrual basis • Accounting Standards: Applicability in IndAS • Goods and Services Tax (GST): Characteristics and Objective.	• explain that sales/purchases include both cash and credit sales/purchases relating to the accounting year. • differentiate among income, profits and gains. • state the meaning of fundamental accounting assumptions and their relevance in accounting. • describe the meaning of accounting assumptions and the situation in which an assumption is applied during the accounting process. • explain the meaning and objectives of accounting standards. • appreciate that various accounting standards developed nationally and globally are in practice for bringing parity in the accounting treatment of different items. • acknowledge the fact that recording of accounting transactions follows double entry system. • explain the bases of recording accounting transaction and to appreciate that accrual basis is a better basis for depicting the correct financial position of an enterprise. • Understand the need of IFRS • Explain the meaning, objective and characteristic of GST.

Unit-2: Accounting Process

Units/Topics	**Learning Outcomes**
Recording of Business Transactions • Voucher and Transactions: Source documents and Vouchers, Preparation of Vouchers, Accounting Equation Approach: Meaning and Analysis, Rules of Debit and Credit. • Recording of Transactions: Books of Original	**After going through this Unit, the students will be able to:** • explain the concept of accounting equation and appreciate that every transaction affects either both the sides of the equation or a positive effect on one item and a negative effect on another item on the same side of

Entry- Journal • Special Purpose books: • Cash Book: Simple, cash book with bank column and petty cashbook • Purchases book • Sales book • Purchases return book • Sales return book ***Note: Including trade discount, freight and cartage expenses for simple GST calculation.*** • Ledger: Format, Posting from journal and subsidiary books, Balancing of accounts **Bank Reconciliation Statement:** • Need and preparation, Bank Reconciliation Statement with Adjusted Cash Book **Depreciation, Provisions and Reserves** • Depreciation: Concept, Features, Causes, factors • Other similar terms: Depletion and Amortisation • Methods of Depreciation: i. Straight Line Method (SLM) ii. Written Down Value Method (WDV) ***Note: Excluding change of method*** • Difference between SLM and WDV; Advantages of SLM and WDV • Accounting treatment of depreciation i. Charging to asset account ii. Creating provision for depreciation/accumulated depreciation account iii. Treatment for disposal of asset • Provisions and Reserves: Difference • Types of Reserves: i. Revenue reserve ii. Capital reserve iii. General reserve iv. Specific reserve	accounting equation. • explain the effect of a transaction (increase or decrease) on the assets, liabilities, capital, revenue and expenses. • appreciate that on the basis of source documents, accounting vouchers are prepared for recording transaction in the books of accounts. • develop the understanding of recording of transactions in journal and the skill of calculating GST. • explain the purpose of maintaining a Cash Book and develop the skill of preparing the format of different types of cash books and the method of recording cash transactions in Cash book. • describe the method of recording transactions other than cash transactions as per their nature in different subsidiary books . • appreciate that at times bank balance as indicated by cash book is different from the bank balance as shown by the pass book / bank statement and to reconcile both the balances, bank reconciliation statement is prepared. • develop understanding of preparing bank reconciliation statement. • appreciate that for ascertaining the position of individual accounts, transactions are posted from subsidiary books and journal proper into the concerned accounts in the ledger and develop the skill of ledger posting. • explain the necessity of providing depreciation and develop the skill of using different methods for computing depreciation. • understand the accounting treatment of providing depreciation directly to the concerned asset account or by creating provision for depreciation account.

v. Secret Reserve • Difference between capital and revenue reserve **Accounting for Bills of Exchange** • Bill of exchange and Promissory Note: Definition, Specimen, Features, Parties. • Difference between Bill of Exchange and Promissory Note • Terms in Bill of Exchange: i. Term of Bill ii. Accommodation bill (concept) iii. Days of Grace iv. Date of maturity v. Discounting of bill vi. Endorsement of bill vii. Bill after due date viii. Negotiation ix. Bill sent for collection x. Dishonour of bill xi. Retirement of bill xii. Renewal of bill • Accounting Treatment ***Note: excluding accounting treatment for accommodation bill*** **Trial balance and Rectification of Errors** • Trial balance: objectives and preparation **(Scope:** *Trial balance with balance method only*) • Errors: types-errors of omission, commission, principles, and compensating; their effect on Trial Balance. • Detection and rectification of errors; preparation of suspense account.	• appreciate the method of asset disposal through the concerned asset account or by preparing asset disposal account. • appreciate the need for creating reserves and also making provisions for events which may belong to the current year but may happen in next year. • appreciate the difference between reserve and reserve fund. • acquire the knowledge of using bills of exchange and promissory notes for financing business transactions; • understand the meaning and distinctive features of these instruments and develop the skills of their preparation. • state the meaning of different terms used in bills of exchange and their implication in accounting. • explain the method of recording of bill transactions. • state the need and objectives of preparing trial balance and develop the skill of preparing trial balance. • appreciate that errors may be committed during the process of accounting. • understand the meaning of different types of errors and their effect on trial balance. • develop the skill of identification and location of errors and their rectification and preparation of suspense account.

Part B: Financial Accounting - II

Unit 3: Financial Statements of Sole Proprietorship

Units/Topics	Learning Outcomes
Financial Statements Meaning, objectives and importance; Revenue and Capital Receipts; Revenue and Capital Expenditure; Deferred Revenue expenditure. Trading and Profit and Loss Account: Gross Profit, Operating profit and Net profit. Preparation. Balance Sheet: need, grouping and marshalling of assets and liabilities. Preparation. 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 on debtors, Abnormal loss, Goods taken for personal use/staff welfare, interest on capital and managers commission. Preparation of Trading and Profit and Loss account and Balance Sheet of a sole proprietorship with adjustments. **Incomplete Records** Features, reasons and limitations. Ascertainment of Profit/Loss by Statement of Affairs method. Difference between accounts from incomplete records and Statement of Affairs. Preparation of Trading, Profit and Loss account and Balance Sheet.	**After going through this Unit, the students will be able to:** • state the meaning of financial statements the • purpose of preparing financial statements. • state the meaning of gross profit, operating profit and net profit and develop the skill of preparing trading and profit and loss account. • explain the need for preparing balance sheet. • understand the technique of grouping and marshalling of assets and liabilities. • appreciate that there may be certain items other than those shown in trial balance which may need adjustments while preparing financial statements. • develop the understanding and skill to do adjustments for items and their presentation in financial statements like depreciation, closing stock, provisions, abnormal loss etc. • develop the skill of preparation of trading and profit and loss account and balance sheet. • state the meaning of incomplete records and their uses and limitations. • develop the understanding and skill of computation of profit / loss using the statement of affairs method.

Unit 4: Computers in Accounting

Units/Topics	Learning Outcomes
• Introduction to computer and accounting information system {AIS}: Introduction to computers (elements, capabilities, limitations of computer system) • Introduction to operating software, utility software and application software.	**After going through this Unit, the students will be able to:** • state the meaning of a computer, describe its components, capabilities and limitations. • state the meaning of accounting information system.

Introduction to accounting information system (AIS) as a part of Management Information System. • Automation of accounting process: meaning • Stages in automation: (a) Accounting process in a computerised environment; comparison between manual accounting process and computerised accounting process, (b) Sourcing of accounting software; kinds of software: readymade software; customised software and tailor-made software; generic considerations before sourcing accounting software (c) creation of account groups and hierarchy (d) generation of reports - trial balance, profit and loss account and balance sheet **Scope:** *(i) The scope of the unit is to understand accounting as an information system for the generation of accounting information and preparation of accounting reports.* *(ii) It is presumed that the working knowledge of any appropriate accounting software will be given to the students to help them learn basic accounting operations on computers.*	• appreciate the need for use of computers in accounting for preparing accounting reports. • develop the understanding of comparing the manual and computerized accounting process and appreciate the advantages and limitations of automation. • understand the different kinds of accounting software.

Part C: Project Work (Any One)

1. Collection of source documents, preparation of vouchers, recording of transactions with the help of vouchers.

2. Comprehensive project of any sole proprietorship business. This may state with journal entries and their ledgering, preparation of Trial balance. Trading and Profit and Loss Account and Balance Sheet. Expenses, incomes and profit (loss), assets and liabilities are to be depicted using pie chart / bar diagram.

PROJECT WORK

It is suggested to undertake this project after completing the unit on preparation of financial statements. The student(s) will be allowed to select any business of their choice or develop the transaction of imaginary business. The project is to run through the chapters and make the project an interesting process. The amounts should emerge as more realistic and closer to reality.

Specific Guidelines for Teachers

Give a list of options to the students to select a business form. You can add to the given list:

1. A beauty parlour
2. Men's saloon
3. A tailoring shop
4. A canteen
5. A cake shop
6. A confectionery shop
7. A chocolate shop
8. A dry cleaner
9. A stationery shop
10. Men's wear
11. Ladies wear
12. Kiddies wear
13. A Saree shop
14. Artificial jewellery shop
15. A small restaurant
16. A sweet shop
17. A grocery shop
18. A shoe shop
19. A coffee shop
20. A music shop
21. A juice shop
22. A school canteen
23. An ice cream parlour
24. A sandwich shop
25. A flower shop

After selection, advise the student(s) to visit a shop in the locality (this will help them to settle on a realistic amounts different items. The student(s) would be able to see the things as they need to invest in furniture, decor, lights, machines, computers etc.

A suggested list of different item is given below.

1. Rent
2. Advance rent [approximately three months]
3. Electricity deposit
4. Electricity bill
5. Electricity fitting
6. Water bill
7. Water connection security deposit
8. Water fittings
9. Telephone bill
10. Telephone security deposit
11. Telephone instrument
12. Furniture
13. Computers
14. Internet connection
15. Stationery
16. Advertisements
17. Glow sign
18. Rates and Taxes
19. Wages and Salary
20. Newspaper and magazines
21. Petty expenses
22. Tea expenses
23. Packaging expenses
24. Transport
25. Delivery cycle or a vehicle purchased
26. Registration
27. Insurance
28. Auditors fee
29. Repairs & Maintenance
30. Depreciations
31. Air conditioners
32. Fans and lights
33. Interior decorations
34. Refrigerators
35. Purchase and sales

At this stage, performas of bulk of originality and ledger may be provided to the students and they may be asked to complete the same.

In the next step the students are expected to prepare the trial balance and the financial statements.

Suggested Question Paper Design
Accountancy (Code No. 055)
Class XI (2021-22)

Theory: 80 Marks **3 hrs.**
Project: 20 Marks

S N	Typology of Questions	Marks	Percentage
1	**Remembering and Understanding**: Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	44	55%
3	**Applying**: Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	19	23.75%
4	**Analysing, Evaluating and Creating:** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations. Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.	17	21.25%
	TOTAL	**80**	**100%**

BUSINESS STUDIES (Code No. 054)

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 organizations 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 prepares students to analyse, manage, evaluate and respond to changes 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:

- To inculcate business attitude and develop skills among students to pursue higher education, world of work including self employment.
- To develop students with an understanding of the processes of business and its environment;
- To acquaint students with the dynamic nature and inter-dependent aspects of business;
- To develop an interest in the theory and practice of business, trade and industry;
- To familiarize students with theoretical foundations of the process of organizing and managing the operations of a business firm;
- To help students appreciate the economic and social significance of business activity and the social cost and benefits arising there from;
- To acquaint students with the practice of managing the operations and resources of business;
- To enable students to act more effectively and responsibly as consumers, employers, employees and citizens;

BUSINESS STUDIES (Code No. 054)
CLASS–XI (2021-22)

Theory: 80 Marks **3 Hours**
Project: 20 Marks

Units		Periods	Marks
Part A	**Foundations of Business**		
1	Nature and Purpose of Business	18	16
2	Forms of Business Organisations	24	
3	Public, Private and Global Enterprises	18	14
4	Business Services	18	
5	Emerging Modes of Business	10	10
6	Social Responsibility of Business and Business Ethics	12	
	Total	**100**	**40**
Part B	**Finance and Trade**		
7	Sources of Business Finance	30	20
8	Small Business	16	
9	Internal Trade	30	20
10	International Business	14	
	Total	**90**	**40**
	Project Work	**30**	**20**

Part A: Foundation of Business
Concept includes meaning and features

Unit 1: Evolution and Fundamentals of Business

Content	After going through this unit, the student/ learner would be able to:
History of Trade and Commerce in India: Indigenous Banking System, Rise of Intermediaries, Transport, Trading Communities: Merchant Corporations, Major Trade Centres, Major Imports and Exports, Position of Indian Sub-Continent in the World Economy.	• To acquaint the History of Trade and Commerce in India
Business – meaning and characteristics	• Understand the meaning of business with special reference to economic and non-economic activities. • Discuss the characteristics of business.
Business, profession and employment- Concept	• Understand the concept of business, profession and employment. • Differentiate between business, profession and employment.

Objectives of business	• Appreciate the economic and social objectives of business. • Examine the role of profit in business.
Classification of business activities - Industry and Commerce	• Understand the broad categories of business activities- industry and commerce.
Industry-types: primary, secondary, tertiary Meaning and subgroups	• Describe the various types of industries.
Commerce-trade: (types-internal, external; wholesale and retail) and auxiliaries to trade; (banking, insurance, transportation, warehousing, communication, and advertising) – meaning	• Discuss the meaning of commerce, trade and auxiliaries to trade. • Discuss the meaning of different types of trade and auxiliaries to trade. • Examine the role of commerce-trade and auxiliaries to trade.
Business risk-Concept	• Understand the concept of risk as a special characteristic of business. • Examine the nature and causes of business risks.

Unit 2: Forms of Business organizations

Sole Proprietorship-Concept, merits and limitations.	• List the different forms of business organizations and understand their meaning. • Identify and explain the concept, merits and limitations of Sole Proprietorship.
Partnership - Concept, types, merits and limitation of partnership, registration of a partnership firm, partnership deed. Types of partners Partnership vs. Limited Liability Partnership (LLP)	• Identify and explain the concept, merits and limitations of a Partnership firm. • Understand the types of partnership on the basis of duration and on the basis of liability. • State the need for registration of a partnership firm. • Discuss types of partners –active, sleeping, secret, nominal and partner by estoppel.
Hindu Undivided Family Business: Concept	• Understand the concept of Hindu Undivided Family Business.
Cooperative Societies-Concept, merits, and limitations.	• Identify and explain the concept, merits and limitations of Cooperative Societies. • Understand the concept of consumers, producers, marketing, farmers, credit and housing co-operatives.

Company - Concept, merits and limitations; Types: Private, Public and One Person Company – Concept Private Company vs. Limited Liability Partnership (LLP)	• Identify and explain the concept, merits and limitations of private and public companies. • Understand the meaning of one person company. • Distinguish between a private company and a public company.
Formation of company - stages, important documents to be used in formation of a company	• Highlight the stages in the formation of a company. • Discuss the important documents used in the various stages in the formation of a company.
Choice of form of business organization	• Distinguish between the various forms of business organizations. • Explain the factors that influence the choice of a suitable form of business organization.

Unit 3: Public, Private and Global Enterprises

Public sector and private sector enterprises – Concept	• Develop an understanding of Public sector and private sector enterprises
Forms of public sector enterprises: Departmental Undertakings, Statutory Corporations and Government Company.	• Identify and explain the features, merits and limitations of different forms of public sector enterprises
Global Enterprises – Feature. Joint ventures, Public private partnership – concept	• Develop an understanding of Global Enterprises, joint ventures and public private partnership by studying their meaning and features.

Unit 4: Business Services

Business services – meaning and types. Banking: Types of bank accounts - savings, current, recurring, fixed deposit and multiple option deposit account	• Understand the meaning and types of business services. • Discuss the meaning and types of Business service Banking • Develop an understanding of difference types of bank account.
Banking services with particular reference to Bank Draft, Bank Overdraft, Cash credit. E-Banking meaning, Types of digital payments	• Develop an understanding of the different services provided by banks
Insurance – Principles. Types – life, health, fire and marine insurance – concept	• Recall the concept of insurance • Understand Utmost Good Faith, Insurable Interest, Indemnity, Contribution, Doctrine of Subrogation and Causa Proxima as principles of insurance

	• Discuss the meaning of different types of insurance-life, health, fire, marine insurance.
Postal Service - Mail, Registered Post, Parcel, Speed Post, Courier - meaning	• Understand the utility of different telecom services

Unit 5: Emerging Modes of Business

E - business: concept, scope and benefits	• Give the meaning of e-business. • Discuss the scope of e-business. • Appreciate the benefits of e-business • Distinguish e-business from traditional business.
Business Process Outsourcing (BPO): Concept, need and scope	• Understand the concept of outsourcing. • Examine the scope of outsourcing, appreciate the need of outsourcing. • Discuss the meaning of Business Process Outsourcing and Knowledge Process Outsourcing

Unit 6: Social Responsibility of Business and Business Ethics

Concept of social responsibility	• State the concept of social responsibility.
Case for social responsibility	• Examine the case for social responsibility.
Responsibility towards owners, investors, consumers, employees, government and community.	• Identify the social responsibility towards different interest groups.
Role of business in environment protection	• Appreciate the role of business in environment protection.
Business Ethics - Concept and Elements	• State the concept of business ethics. • Describe the elements of business ethics.

Part B: Finance and Trade

Unit 7: Sources of Business Finance

Concept of business finance	• State the meaning, nature and importance of business finance.
Owners' funds - equity shares, preferences share, retained earnings, Global Depository receipt (GDR), American Depository Receipt (ADR) and International Depository Receipt (IDR) – concept	• Classify the various sources of funds into owners' funds. • State the meaning of owners' funds. • Understand the meaning of Global Depository receipts, American

	Depository Receipts and International Depository Receipts.
Borrowed funds: debentures and bonds, loan from financial institution and commercial banks, public deposits, trade credit, Inter Corporate Deposits (ICD).	• State the meaning of borrowed funds. • Discuss the concept of debentures, bonds, loans from financial institutions and commercial banks, Trade credit and inter corporate deposits. • Distinguish between owners' funds and borrowed funds.

Unit 8: Small Business and Enterprises

Entrepreneurship Development (ED): Concept, Characteristics and Need. Process of Entrepreneurship Development: Start-up India Scheme, ways to fund start-up. Intellectual Property Rights and Entrepreneurship	• Understand the concept of Entrepreneurship Development (ED), Intellectual Property Rights
Small scale enterprise as defined by MSMED Act 2006 (Micro, Small and Medium Enterprise Development Act)	• Understand the meaning of small business
Role of small business in India with special reference to rural areas	• Discuss the role of small business in India
Government schemes and agencies for small scale industries: National Small Industries Corporation (NSIC) and District Industrial Centre (DIC) with special reference to rural, backward areas	• Appreciate the various Government schemes and agencies for development of small scale industries. NSIC and DIC with special reference to rural, backward area.

Unit 9: Internal Trade

Internal trade - meaning and types services rendered by a wholesaler and a retailer	• State the meaning and types of internal trade. • Appreciate the services of wholesalers and retailers.
Types of retail-trade-Itinerant and small scale fixed shops retailers	• Explain the different types of retail trade.
Large scale retailers-Departmental stores, chain stores - concept	• Highlight the distinctive features of departmental stores, chain stores and mail order business.
GST (Goods and Services Tax): Concept and key-features	• Understand the concept of GST

Unit 10: International Trade

International trade: concept and benefits	• Understand the concept of international trade. • Describe the scope of international trade to the nation and business firms.
Export trade – Meaning and procedure	• State the meaning and objectives of export trade. • Explain the important steps involved in executing export trade.
Import Trade - Meaning and procedure	• State the meaning and objectives of import trade. • Discuss the important steps involved in executing import trade.
Documents involved in International Trade; indent, letter of credit, shipping order, shipping bills, mate's receipt (DA/DP)	• Develop an understanding of the various documents used in international trade. • Identify the specimen of the various documents used in international trade. • Highlight the importance of the documents needed in connection with international trade transactions
World Trade Organization (WTO) meaning and objectives	• State the meaning of World Trade Organization. • Discuss the objectives of World Trade Organization in promoting international trade.

Unit 11: Project Work

As per CBSE guidelines.

Suggested Question Paper Design
Business Studies (Code No. 054)
Class XI (2021-22)
March 2022 Examination

Marks: 80 **Duration: 3 hrs.**

SN	Typology of Questions	Marks	Percentage
1	**Remembering and Understanding**: Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	44	55%
2	**Applying**: Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way	19	23.75%
3	**Analysing, Evaluating and Creating:** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations. Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.	17	21.25%
	Total	**80**	**100%**

ECONOMICS (Code No. 030)
(2021-22)

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:

- 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.
- Realisation of learners' role in nation building and sensitivity to the economic issues that the nation is facing today.
- 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.
- Development of understanding that there can be more than one view on any economic issue and necessary skills to argue logically with reasoning.

ECONOMICS (030)
CLASS – XI (2021-22)

Theory: 80 Marks **3 Hours**
Project: 20 Marks

Units		**Marks**	**Periods**
Part A	**Statistics for Economics**		
Unit 1	Introduction	13	07
Unit 2	Collection, Organisation and Presentation of Data		27
Unit 3	Statistical Tools and Interpretation	27	66
		40	**100**
Part B	**Introductory Microeconomics**		
Unit 4	Introduction	4	8
Unit 5	Consumer's Equilibrium and Demand	13	32
Unit 6	Producer Behaviour and Supply	13	32
Unit 7	Forms of Market and Price Determination under perfect competition with simple applications	10	28
		40	**100**
Part C	**Project Work**	**20**	**20**

Part A: Statistics for Economics

In this course, the learners are expected to acquire skills in collection, organisation and presentation of quantitative and qualitative information pertaining to various simple economic aspects systematically. It also intends to provide some basic statistical tools to analyse, and interpret any economic information and draw appropriate inferences. In this process, the learners are also expected to understand the behaviour of various economic data.

Unit 1: Introduction **07 Periods**

What is Economics?

Meaning, scope, functions and importance of statistics in Economics

Unit 2: Collection, Organisation and Presentation of data **27 Periods**

Collection of data - sources of data - primary and secondary; how basic data is collected with concepts of Sampling; methods of collecting data; some important sources of secondary data: Census of India and National Sample Survey Organisation.

Organisation of Data: Meaning and types of variables; Frequency Distribution.

Presentation of Data: Tabular Presentation and Diagrammatic Presentation of Data: (i) Geometric forms (bar diagrams and pie diagrams), (ii) Frequency diagrams (histogram, polygon and Ogive) and (iii) Arithmetic line graphs (time series graph).

Unit 3: Statistical Tools and Interpretation **66 Periods**

For all the numerical problems and solutions, the appropriate economic interpretation may be attempted. This means, the students need to solve the problems and provide interpretation for the results derived.

Measures of Central Tendency- Arithmatic mean, median and mode

Measures of Dispersion - absolute dispersion (range, quartile deviation, mean deviation and standard deviation); relative dispersion (co-efficient of range, co-efficient of quartile-deviation, co-efficient of mean deviation, co-efficient of variation)

Correlation – meaning and properties, scatter diagram; Measures of correlation - Karl Pearson's method (two variables ungrouped data) Spearman's rank correlation.

Introduction to Index Numbers - meaning, types - wholesale price index, consumer price index and index of industrial production, uses of index numbers; Inflation and index numbers.

Part B: Introductory Microeconomics

Unit 4: Introduction **8 Periods**

Meaning of microeconomics and macroeconomics; positive and normative economics

What is an economy? Central problems of an economy: what, how and for whom to produce; concepts of production possibility frontier and opportunity cost.

Unit 5: Consumer's Equilibrium and Demand **32 Periods**

Consumer's equilibrium - meaning of utility, marginal utility, law of diminishing marginal utility, conditions of consumer's equilibrium using marginal utility analysis.

Indifference curve analysis of consumer's equilibrium-the consumer's budget (budget set and budget line), preferences of the consumer (indifference curve, indifference map) and conditions of consumer's equilibrium.

Demand, market demand, determinants of demand, demand schedule, demand curve and its slope, movement along and shifts in the demand curve; price elasticity of demand - factors affecting price elasticity of demand; measurement of price elasticity of demand – percentage-change method.

Unit 6: Producer Behaviour and Supply **32 Periods**

Meaning of Production Function – Short-Run and Long-Run

Total Product, Average Product and Marginal Product.

Returns to a Factor: Law of Variable Proportions

Cost: Short run costs - total cost, total fixed cost, total variable cost; average cost; average fixed cost, average variable cost and marginal cost-meaning and their relationships.

Revenue - total, average and marginal revenue - meaning and their relationship.

Producer's equilibrium - meaning and its conditions in terms of marginal revenue - marginal cost.

Supply, market supply, determinants of supply, supply schedule, supply curve and its slope, movements along and shifts in supply curve, price elasticity of supply; measurement of price elasticity of supply - percentage-change method.

Unit 7: Forms of Market and Price Determination under Perfect Competition with simple applications. **28 Periods**

Perfect competition - Features; Determination of market equilibrium and effects of shifts in demand and supply.

Other Market Forms - monopoly, monopolistic competition - their meaning and features.

Simple Applications of Demand and Supply: Price ceiling, price floor.

Part C: Project in Economics 20 Periods

Guidelines as given in class XII curriculum

Suggested Question Paper Design
Economics (Code No. 030)
Class XI (2021-22)
March 2022 Examination

Marks: 80 **Duration: 3 hrs.**

SN	Typology of Questions	Marks	Percentage
1	**Remembering and Understanding**: Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	44	55%
2	**Applying**: Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	18	22.5%
3	**Analysing, Evaluating and Creating:** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations. Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.	18	22.5%
	Total	**80**	**100%**

PHYSICAL EDUCATION (048)
Class XI (2021–22)

Theory **Max. Marks 70**

Unit I Changing Trends & Career in Physical Education

- Meaning & definition of Physical Education
- Aims & Objectives of Physical Education
- Career Options in Physical Education
- Competitions in various sports at national and international level
- Khelo-India Program

Unit II Olympic Value Education

- Olympics, Paralympics and Special Olympics
- Olympic Symbols, Ideals, Objectives & Values of Olympism
- International Olympic Committee
- Indian Olympic Association

Unit III Physical Fitness, Wellness & Lifestyle

- Meaning & Importance of Physical Fitness, Wellness & Lifestyle
- Components of physical fitness and Wellness
- Components of Health related fitness

Unit IV Physical Education & Sports for CWSN (Children With Special Needs- Divyang)

- Aims & objectives of Adaptive Physical Education
- Organization promoting Adaptive Sports (Special Olympics Bharat; Paralympics; Deaflympics)
- Concept of Inclusion, its need and Implementation
- Role of various professionals for children with special needs (Counsellor, Occupational Therapist, Physiotherapist, Physical Education Teacher, Speech Therapist & special Educator)

Unit V Yoga

- Meaning & Importance of Yoga
- Elements of Yoga
- Introduction - Asanas, Pranayam, Meditation & Yogic Kriyas
- Yoga for concentration & related Asanas (Sukhasana; Tadasana; Padmasana & Shashankasana, Naukasana, Vrikshasana (Tree pose), Garudasana (Eagle pose)
- Relaxation Techniques for improving concentration – Yog-nidra

Unit VI Physical Activity & Leadership Training

- Leadership Qualities & Role of a Leader
- Creating leaders through Physical Education
- Meaning, objectives & types of Adventure Sports (Rock Climbing, Tracking, River Rafting, Mountaineering, Surfing and Para Gliding)
- Safety measures to prevent sports injuries

Unit VII Test, Measurement & Evaluation

- Define Test, Measurement & Evaluation
- Importance of Test, Measurement & Evaluation In Sports
- Calculation of BMI & Waist - Hip Ratio
- Somato Types (Endomorphy, Mesomorphy & Ectomorphy)
- Measurement of health related fitness

Unit VIII Fundamentals of Anatomy, Physiology & Kinesiology in Sports

- Definition and Importance of Anatomy, Physiology & Kinesiology
- Function of Skeleton System, Classification of Bones & Types of Joints
- Properties and Functions of Muscles
- Function & Structure of Respiratory System and Circulatory System
- Equilibrium – Dynamic & Static And Centre of Gravity and its application in sports

Unit IX Psychology & Sports

- Definition & Importance of Psychology in Phy. Edu. & Sports
- Define & Differentiate Between Growth & Development
- Developmental Characteristics At Different Stages of Development
- Adolescent Problems & Their Management

Unit X Training and Doping in Sports

- Meaning & Concept of Sports Training
- Principles of Sports Training
- Warming up & limbering down
- Skill, Technique & Style
- Concept & classification of doping
- Prohibited Substances & their side effects
- Dealing with alcohol and substance abuse

Practical **Max. Marks 30**

01. Physical Fitness Test - 6 Marks
02. Proficiency in Games and Sports (Skill of any one Game of choice from the given list*)- 7 Marks
03. Yogic Practices - 7 Marks
04. Record File ** - 5 Marks
05. Viva Voce (Health/ Games & Sports/ Yoga) - 5 Marks

* Athletics, Archery, Badminton, Boxing, Chess, Judo, Shooting, Skating, Swimming, Taekwondo, Tennis, Aerobics, Gymastics, Rope-Skipping, Yoga, Bocce & Unified Basketball [CWSN (Children With Special Needs - Divyang)]

***Record File shall include:*
Practical-1: Labelled diagram of 400 M Track & Field with computations.
Practical-2: Computation of BMI from family or neighbourhood & graphical representation of the data. Practical-3: Labelled diagram of field & equipment of any one game of your choice out of the above list. Practical-4: List of current National Awardees (Dronacharya Award, Arjuna Award & Rajiv Gandhi Khel Ratna Award) Practical-5: Pictorial presentation of any five Asanas for improving concentration.