Estd. :1988

Our Motto: **Learn and Teach**

F E I

Govt. Recognised Senior Secondary School; Affiliated to the J&K BOSE

[A Unit of "FAYAZ CHARITABLE TRUST"]

Faiz-Abad, Nowgam – 190 015, Srinagar, Kashmir

Mobile: 9419072646 ***e-mail: feinowgam88@gmail.com***

website: www.feinowgam.com

Syllabi & Courses of Study

- **Study material** of topics covered is made available on FEI School website **www.feinowgam.com**
- To access study material, click on "**Student Login**".
  - **User I.D. : student**
  - **Password : student@fei**
- Study material of **different classes** is available in **different tabs** on the drop down menu.
- As per new Education Policy, all subjects carry 20% marks as Internal Assessment which shall be awarded by concerned subject teachers.

EXAMINATION SCHEDULE OF THE INSTITUTE

Sr. No.	PARTICULARS / DESCRIPTION			
	Name of the Test	**Tentative Exam. Date**	**Syllabus Coverage**	**Max. Marks**
02.	Unit Test 1 (UT_1)	March (2nd week)	1/4 (25%)	50
03.	Term Test 1 (TT_1)	May (3rd Week)	1/2 (50%)	50
04.	Unit Test 2 (UT_2)	July (3rd week)	3/4 (75%)	50
06.	Pre-Board	October (1st week)	Full (100%)	50

Note: *If for any unavoidable circumstances an Examination is not conducted as per schedule, then that portion of the syllabus shall be clubbed with the next Examination.*

F.E.I.
Fayaz Educational Institute
(Govt. Recognised Senior Secondary School)
[A Unit of "FAYAZ CHARITABLE TRUST"]
Faiz-Abad, Nowgam - 190 015, Srinagar, Kashmir

PLEASE NOTE THE FOLLOWING REGULATIONS:

01. Parents / Guardians are requested to sincerely co-operate with the functioning of the Institute by enforcing regularity, punctuality and discipline and also by taking keen interest in their ward's progress.
02. The progress and conduct of every pupil are ascertained from the reports of all the concerned staff.
03. In deciding the eligibility of a child to sit for Board Examination, the Class Work, the Home Work/ Assignments and the marks obtained in all the tests are taken into consideration. For eligibility, to submit Board Examination Form, a child should obtain minimum of 40% marks in all the subjects individually.
04. Any student not having at least 80% attendance in theory and minimum of 90% attendance in Practicals shall not be allowed to appear in the Board Examination. Shortage of attendance on account of illness etc. shall not be entertained.
05. For Subject/s carrying practicals, a student has to pass theory and practical examinations separately. Failing in either component will be deemed Not Eligible for Final Examination.
06. 20% of the marks in all subjects are earmarked for Internal Assessments which shall be awarded on the basis of all the exams conducted round the year.
07. Re-examination is not ordinarily allowed except in case of exigencies like acute illness supported by authentic documents. The full expenses of such examination shall have to be borne by the student.
08. Parents/Guardians are earnestly requested to see the Progress Report and the Evaluated Answer Sheets (which are returned after each test) of their wards and sign them. They should note the subject/s in which the pupil is weak and help/encourage him/her for better performance.
09. In case of unexpected holidays, the students shall utilize the time in completing the prescribed courses with the help of Parents/Guardians and also by utilizing online available resources.
10. Reference Books / Reading Material / Reference Notes are kept available in the School Library. Students, in their own interest, may consult these in the Library itself and extend the habit of self study and develop self prepared Notes.

Dear Students: While handing over copy of the Syllabus in your hands, we pray to Almighty Allah (the Most Gracious, the Most Merciful) to provide all of us (Teachers, Students & Parents) Insight, Courage and Dynamism to move towards our goal with Zeal and Zest. May He bestow upon us His choicest blessings and provide us the will power to get to our target which we have set for the years to come. May we come up to the expectations of our society and work earnestly, truthfully, honestly and sincerely with all the strengths (**'Mental'**, **'Physical'** & **'Economic'**) which have been bestowed on us by Almighty Allah, as all of us are answerable to Him on the day of Judgment for all our Deeds in this life, as deeds are better than words.

[May Almighty Allah crown our efforts with Success in the practical field "Aameen"]

Dear Students, there are no two opinions that we are passing through a period of competition age where it is not the academic qualification but the Merit in the Academic Qualification and then the Merit of the Competitive Examinations on the basis of which the future of the students is decided and it is not possible to achieve this goal through a casual approach. It needs a strong Will Power and Constant Hard work which will take us to our set targets. Thus two things are very important; firstly we have to **set our target** and secondly we have to **move each step to reach to the set target**. So let us pledge that we will sincerely move every step towards the promised goal & will not waste any moment, so that we fulfill our entrusted responsibility.

When I Asked God for **Strength**; He Gave Me Difficult **Situations** to Face
When I Asked God for **Brain & Brawn**; He Gave Me **Puzzles** in Life to Solve
When I Asked God for **Happiness**; He Showed Me Some **Unhappy People**
When I Asked God for **Wealth**; He Showed Me How to **Work Hard**
When I Asked God for **Favours**; He Showed Me Opportunities to **Work Hard**
When I Asked God for **Peace**; He Showed Me How to **Help Others**
God Gave Me Nothing I **Wanted**; He Gave Me Everything I **Needed**

SCHEME OF STUDIES / COMBINATION OF SUBJECTS

The students who seek admission in Higher Secondary Part-I (Class 11th) shall follow the given below scheme.

Group-I	Group-II	Group-III	Group-IV	Group-V	Group-VI
General English (Compulsory)	Physics (Compulsory)	Chemistry (Compulsory)	Mathematics (Optional)	Biology (Optional)	Environmental Science (Optional)

Note: A student shall have to opt any two subjects from IV to VI.

SCHEME OF ASSESSMENT / EXAMINATION

The Higher Secondary Examination Part 1st (Class 11th) conducted by the Board at the end of Academic Session on the basis of syllabi prescribed for Class 11th is open to eligible candidates and shall be conducted according to the following scheme of examination.

Sr. No.	✓ Marks ✓ Examinations ✓ Subjects	Marks distribution in different Components & Tests			
		Theory Marks	Practical/Internal Assessment		Total Marks
			Internal Ass.	External Exam.	
1.	**General English**	80	20	-	100
2.	**Physics**	70	10	20	100
3.	**Chemistry**	70	10	20	100
4.	**Biology**	70	10	20	100
5.	**Mathematics**				100
6.	**Environmental Science**	70	10	20	100

Subject: General English **Class: 11th**

Objectives of Teaching English at the Senior Secondary Level

At the higher secondary level the students are expected to:

- ✓ listen and comprehend lectures 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 organization 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 extend 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 forms, preparing CV, e-mail message, amking notes from reference materials, recorded talks etc.;
- ✓ use of passive forms in scientific and innovative writings;
- ✓ concert 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.

Prescribed Textbooks:

- Hornbill: Textbook published by NCERT, New Delhi
- Snapshots: Supplementary Reader Published by NCERT, New Delhi

Suggested Reading:

- English Grammar in Use by Raymond Murphy (Cambridge University Press)
- Oxford Practice Grammar by John Eastwood (Oxford University Press)
- Grammar Practice Activities by Penny Ur (Cambridge University Press)
- A Practical English Grammar by Thomson and Martinet (Oxford University Press)
- High School English Grammar by Wren & Martin (S Chand Publishing))

Q. No.	Description	Weightage
	Section "A": Reading Comprehension	**20 marks**
1	One unseen passage of 400-500 words in length for note-making (5 marks) and summarizing (5 marks)	10 marks
2	One unseen prose passage of 400-500 words in length followed by ten objective type questions including MCQs, fill ups, true/false, yes/no to assess comprehension, vocabulary, interpretation and inference. OR One unseen poetry passage of 15-30 lines in length followed by five MCQs and five objective type questions to assess comprehension, interpretation and inference	1 x 10 = 10 marks
	Section "B": Writing Skills and Grammar	**30 marks**
3	One out of two questions on notice / poster/ advertisement (50 words)	4 marks
4	One out of two questions on letter writing (business or official letters for making enquiries, registering complaints, asking for and giving information, placing orders and sending replies, letters to the editor giving suggestions / opinions on an issue; letter to the school or college authorities, regarding admissions, school issues, requirements . suitability of courses, etc.) [120 -150 words)	6 marks
5	One question on writing a personal e-mail (to a friend/ relative etc.)	4 marks
6	One out of two questions on article/ speech/ report/ narrative/ debate writing (200-250 words)	8 marks
7	One passage 100-150 words in length for assessing through error correction the following items: determiners, tense, punctuation, modals, conjunctions and prepositions (8 items)	8 marks
	Section "C" Literature	**30 marks**
8	An extract from the prescribed poems followed by three objective type questions (two to be attempted) assessing reference to context comprehension and appreciation.	1 x 2 = 2 marks
9	Five out of six short answer type questions (four each from Hornbill and Snapshots) based on poetry, prose and plays to assess inference and critical thinking.	2 x 5 = 10 marks
10	One out of two long answer questions from Hornbill to assess global comprehension and extrapolation beyond the texts. Questions to provide evaluative and analytical stimuli to the learners, using incidents, events, themes as reference points (120-150 words)	6 marks
11	One out of two long answer questions from Snapshots based on incidents or events to test global comprehension and extrapolation beyond the texts. Questions to elicit creative responses and ability to form opinions (120-150 words)	6 marks
12	One out of two long answer questions from Hornbill to provide evaluative and analytical stimuli to the learners using incidents, events, themes as reference points (120-150 words)	

Internal Assessment

Assessment of Listening and Speaking Skills

Assessment of Listening and Speaking Skills will be for 20 marks. Practice and assessment to be based on the activities included in the prescribed textbooks and by taking recourse to various resources and techniques available in the school.

Suggested Reading:

For grammar, teachers and students can refer to any standard grammar textbook for further reading and clarification of concepts. Some of the books include:

- English Grammar in Use by Raymond Murphy (Cambridge University Press)
- Oxford Practice Grammar by John Eastwood (Oxford University Press)
- Grammar Practice Activities by Penny Ur (Cambridge University Press)
- A Practical English Grammar by Thomson and Martinet (Oxford University Press)
- High School English Grammar by Wren & Martin (S Chand Publishing)

Prescribed Textbooks:

- Hornbill: Textbook published by NCERT, New Delhi
- Snapshots: Supplementary Reader Published by NCERT, New Delhi

Question Paper Design General English XI Marks: 80 + 20 = 100

Section	Components	Total Marks
Reading Comprehension	Conceptual understanding, decoding, Analysing, inferring, interpreting, appreciating, literary, conventions and vocabulary, summarizing and using appropriate format/s	20 marks
Writing Skill and Grammar	Reasoning, appropriacy of style and tone, using and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity	30 marks
Literature Textbook and Supplementary Reader Text	Recalling, reasoning, appreciating literary convention, inference, analysis, creativity with fluency	30 marks
	Total	**80 marks**
Assessment of Listening and Speaking Skills		20 marks
	Grand Total	**100 marks**

Detailed break-up of the Syllabus as per Examination Schedule

Exam	Section	Description	Marks	Due Date
UT$_1$	Prose	★ The Portrait of a Lady. ★ We're Not Afraid to Die…if We Can All Be Together	20	**10th April**
	Poem	☞ A Photograph. ☞ The Laburnum top.		
	Story	➢ The Summer of the Beautiful White Horse. ➢ The Address.		
	Essay & Speech	✓ Importance of Cleanliness ✓ The Only Way to Minimize Human Suffering ✓ Indiscipline in School		

	Writing	✓ The Car Craze and Pollution`		
	Writing	[Report Writing] ♣ Panic due to Gas Leaking ♣ Health Mela		
	Letters	➧ Ordering Books ➧ About Increasing Theft's. ➧ About Rising Prices.		
	Grammar	✍ Modal Auxiliaries ✍ Active passive voices		
TT1	Prose	❖ Discovering Tut: the Saga continues ❖ Landscape of the Soul.	20	**15th June**
	Poem	★ The Voice of the Rain ★ Childhood.		
	Story	☞ Ranga's Marriage. ☞ Albert Einstein at school.		
	Debates	➢ The importance of Games ➢ Role of a library at school ➢ Homes for the aged are necessity in India.		
	Writing	✓ Note Making / Note Taking ✓ Filling up of Forms.		
	Letters	♣ Seeking Library membership. ♣ For study loan.		
	Grammar	✍ Narration. ✍ Prepositions		
UT2	Prose	❖ The Ailing Planet .. : The green movement's role. ❖ The Browning Version.	20	**10th August**
	Poem	★ Father to Son.		
	Play	☞ Mother's day.		
	Article Writing	➢ Craze for new fashions. ➢ Importance of hard work. ➢ The evil of cheating in Examination.		
	Writing	✓ Notice for notice Board. ✓ Cv's		
	Letters	♣ For Fee concession. ♣ Seeking apology for change of examination date		
	Grammar	✍ Determiners ✍ Punctuation		
TT2	Prose	❖ The Adventure. ❖ Silk Road.	20	**30th September**
	Poem	★ The tale of Melon city.		
	Story	☞ Birth ☞ The Ghat of the only world.		
	Writing Skill	➢ Memoranda ➢ Minutes		
	Writing	✓ Email. ✓ A visit to a book fair. ✓ Invitation to sister's marriage. ✓ Messages.		
	Poetic Devices	♣ Simile. ♣ Metaphor …….. etc		
	Grammar	✍ Conditional Clauses		

Subject: PHYSICS Class: 11th

Book Prescribed: *Textbook of Physics for Class XI published by NCERT New Delhi*

Suggested Reading:

- *Concept of Physics by H. C. Verna*
- *IIT Physics Series by D. C. Pandey*
- *A Text-Book of Physics by Rascenic, Halliday & Walker*
- *Textbook of Physics for Class XI – Saraswati Publication.*
- *Pradeep's Fundamental Physics for Class XI*
- *Systematic Physics for Class XI - Kalyani Publication.*
- *Dinesh New Millennium Physics for XI.*

Senior Secondary stage of school education is a stage of transition from general education to discipline-based focus on curriculum. The present syllabus keeps in view the rigour and depth of disciplinary approach as well as the comprehension level of learners.

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.

COURSE STRUCTURE

25% of the maximum marks are allotted to numerical problems.

Maximum Marks: **100** (Theory – 70 marks + Practical – 30 marks) Time: **3 hours**

Examination	Chapter No.	Name of the Chapter	Completion Date	Marks	Periods
U_1	Unit I	*Mathematical Tools*	*January*	04	
	Unit II	*Physical World & Measurement*	*February*	05	
	Unit III	*Kinematics*	*March*	07	
	Unit IV	*Laws of Motion*	*25th April*	07	
T_1	Unit V	*Work, Energy & Power*	*15th May*	06	
	Unit VI	*Motion of System of particles & Rigid Body*	*15th June*	06	
U_2	Unit VII	*Gravitation*	*15th July*	06	
	Unit VIII	*Properties of Bulk Matter*	*20th August*	07	
	Unit IX	*Thermodynamics*	*30th August*	06	
T_2	Unit X	*Behaviour of Perfect Gas & Kinetic Theory*	*15th September*	06	
	Unit XI	*Oscillations & Waves*	*15th October*	10	

Unit I: *Mathematical Tools*	✓ Functions, ✓ Limits of Function, ✓ Simple ideas of Differentiation and integration, ✓ Differentiation of x^n, e^{ax}, sin x by ab-initio method, ✓ Integration of x^n, $1/x$, e^{ax}, sin x and cos x. ✓ Simple idea of definite integrals.
Unit II: *Physical World and Measurement*	➢ Physics - Scope and excitement; ➢ Physics in relation to science, society and technology. ➢ 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 III: *Kinematics*	♣ Motion in a straight line: Position-time graph, speed and velocity. ♣ Uniform and non-uniform motion, ♣ Average speed and instantaneous velocity. ♣ Uniformly accelerated motion, velocity-time graph, position-time graphs, ♣ Relations for uniformly accelerated motion (graphical treatment & calculus approach). ☞ Scalar and vector quantities: Position and displacement vectors, ☞ General vectors and notation, Equality of vectors, ☞ Multiplication of vectors by a real number; ☞ Addition and subtraction of vectors. ☞ Relative velocity. ❖ Unit vector; ❖ Resolution of a vector in a plane - rectangular components. ❖ Scalar and vector product of two vectors with properties, ❖ Motion in a plane. Cases of uniform velocity and uniform acceleration. ❖ Projectile motion.
Unit IV: *Laws of Motion*	✍ Concept of force and 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. ♦ Friction: Static and kinetic friction, laws of friction, rolling friction. ♦ Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on level circular road, vehicle on banked road).
Unit V: *Work, Energy and Power*	☞ Concept of Scalar product of vectors. ☞ 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: elastic and inelastic collisions in one & two dimensions.

Unit VI: *Motion of System of Particles and Rigid Body*	♣ Centre of mass of a two-particle system, ♣ Momentum, conversation and centre of mass motion. ♣ Centre of mass of a rigid body; centre of mass of circular ring, disc, rod & sphere. ✍ Concept of Vector product of vectors: Moment of a force, torque, angular momentum, conservation of angular momentum with some examples. ☆ 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 VII: *Gravitation*	⌗ Keplar's laws of planetary motion. ⌗ The universal law of gravitation. ⌗ Acceleration due to gravity and its variation with altitude, depth and shape. ⌗ Gravitational potential; gravitational potential energy. ⌗ Escape velocity. Orbital velocity of a satellite. Geo-stationary satellites. ⌗ Inertial and Gravitational mass.
Unit VIII: *Properties of Bulk Matter*	★ Elastic behaviour, Stress-strain relationship, ★ Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity. ✍ 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. Reynold number, Bernoulli's theorem and its applications. ♣ Surface energy and surface tension, angle of contact, ♣ Applications of surface tension ideas to drops, bubbles and capillary rise, action of detergents. ♦ Heat, temperature, thermal expansion; specific heat - calorimetry; change of state - latent heat. ♦ Heat transfer – conduction, convection and radiation, ♦ Thermal conductivity, Newton's law of cooling.
Unit IX: *Thermodynamics*	✸ Thermal equilibrium and definition of temperature (Zeroth law of thermodynamics). ✸ Heat, work and internal energy. ✸ First law of thermodynamics. ✸ Second law of thermodynamics: reversible and irreversible processes. ✸ Heat engines and refrigerators (concept only).
Unit X: *Behaviour of Perfect Gas & Kinetic Theory*	★ Equation of state of a perfect gas, work done on compressing a gas. ○ Kinetic theory of gases - assumptions, concept of pressure, expression for pressure exerted by a gas. ○ Kinetic energy and temperature; rms speed of gas molecules; degrees of freedom, law of equipartition of energy (statement only) and application to specific heat capacities of gases; ○ Concept of mean free path, Avogadro's number.
Unit XI: *Oscillations and Waves*	☞ Periodic motion - period, frequency, displacement as a function of time. Periodic functions. ☞ Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a spring-restoring force and force constant; ☞ Energy in S.H.M. – kinetic and potential energies; ☞ Simple pendulum – derivation of expression for its time period; free, forced and damped oscillations (qualitative ideas only), resonance. ⌖ Wave motion - Longitudinal and transverse waves, speed of wave motion. ⌖ Displacement relation for a progressive wave. ⌖ Principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, ⌖ Fundamental mode and harmonics, Beats, Doppler effect.

PRACTICALS

Every student is required to perform minimum of 5 experiments and 4 activities from the following.

Experiments:

1. Use of Vernier Calipers
   (i) To measure diameter of a small spherical/cylindrical body.
   (ii) To measure internal diameter and depth of a given beaker/calorimeter and hence find its volume.
2. Use of screw-gauge
   (i) To measure diameter of a given wire.
   (ii) To measure thickness of a given sheet.
   (iii)To measure volume of an irregular lamina.
3. To determine radius of curvature of a given spherical surface by a spherometer.
4. To find the weight of a given body using parallelogram law of vectors.
5. Using a simple pendulum, Plot L-T Graph and hence find acceleration due to gravity (g).
6. Friction: To study the relation between force of limiting friction and normal relation force and find co-efficient of friction between a block and a horizontal pull of the earth and study in relationship with the angle of inclination by plotting a graph between force and sin θ.
7. 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 by plotting graph between force & sin θ.

Activities:

1. To make a paper scale of given least count i.e., 0.2 cm., 0.5 cm.
2. To determine mass of a given body using a meter 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 jet of water with angle of projection.
6. To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude & time.
7. To study collision of two balls in two dimensions.

Every student is required to perform a minimum of 5 experiments and 4 activities from the following.

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 graph between load and extension.
3. To determine the surface tension of water by capillary rise method.
4. To determine the coefficient of viscosity of a given viscous fluid by measuring terminal velocity of a given spherical body.
5. To find the speed of sound in air at room temperature using a resonance tube by two resonance position method.
6. To study relation between the length of a given wire and tension for constant frequency using sonometer.
7. To determine specific heat of a given (i) solid and (ii) liquid, by method of mixtures.

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 study the effect of detergent on surface tension by observing capillary rise.
4. To study the factors affecting the rate of loss of heat of a liquid.
5. To study the effect of nature of surface on emission and absorption of radiation.

Subject: CHEMISTRY Class: 11th

Recommended Textbook:

- ***A Textbook of Chemistry for class XI published by NCERT New Delhi***

Suggested Readings:

- ***Textbook of Chemistry for Class XI – Saraswati Publication.***
- ***Pradeep's New Course Chemistry for Class XI***
- ***Dinesh Companion Chemistry for Class XI***
- ***Arihant Chemistry***
- ***ABC Chemistry***

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 higher secondary stage.

The 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 syllabus. Greater emphasis has been laid on use of new nomenclature, symbols and formulations, teaching of fundamental concepts, applications of concepts in chemistry to industry/ technology, logical sequencing of units, removal of obsolete content and repetition etc.

OBJECTIVES

The broad objectives of teaching Chemistry at Senior Secondary Stage are to help the learners:

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

COURSE STRUCTURE

Maximum Marks: **100** (Theory – 70 marks + Practical – 30 marks) Time: **3 hours**

Exam.	Chapter No.	Name of the Chapter	*Completion Date*	Marks	Periods
UT_1	Unit I	Some Basic Concepts of Chemistry	February	05	40
	Unit II	Structure of Atom	March	05	30
	Unit V	States of Matter: Gases and Liquids	April	06	20
TT_1	Unit III	Classification of Elements & Periodicity in Properties	March	05	10
	Unit IV	Chemical Bonding and Molecular Structure	March	05	20
	Unit VI	Thermodynamics	May	04	15
	Unit VII	Equilibrium	July	05	15
UT_2	Unit VIII	Redox Reactions	10th August	02	06
	Unit IX	Hydrogen	20th August	02	05
	Unit X	s-block Elements (Alkali and Alkaline Earth Metals)	30th August	06	05
	Unit XI	Some p – Block Elements	10th September	05	05
TT_2	Unit XII	Organic Chemistry – Some Basic Principles and Techniques	August	09	20
	Unit XIII	Hydrocarbons	September	09	10
	Unit XIV	Environmental Chemistry	September	02	03

Unit	Description
Unit I: *Some Basic Concepts of Chemistry*	✓ General Introduction: Importance of studying chemistry. ✓ Historical approach to particulate nature of matter, ✓ Laws of chemical combination (numerical). ✓ 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. Limiting reagent.
Unit II: *Structure of Atom*	• Discovery of electron, proton and neutron; • Atomic number, isotopes and isobars. • Thomson's model and its limitations, • Rutherford's model and its limitations. • Bohr's model and its limitations, • Emission & Absorption Spectrum; Line Spectrum; Hydrogen Spectrum; Quantum Mechanics. • Concept of shells and sub-shells; Dual nature of matter and light, de Broglie's relationship, • Heisenberg's uncertainty principle, • Concept of orbitals, quantum numbers, shapes of s, p, and d- orbitals, • Rules for filling electrons in orbitals – Aufbau's principle, Pauli's exclusion principle and Hund's rule. • Electronic configuration of atoms, stability of half filled and completely filled orbitals.
Unit V: *States of Matter: Gases and Liquids*	♣ Three states of matter: Intermolecular interactions, type of bonding, melting and boiling points. ♣ Role of gas laws in elucidating the concept of the molecule, ♣ Boyle's law. Gay Lussac's law, Avogadro's law; Charle's law; Dalton's law; Graham's law. ♣ Ideal behaviour, empirical derivation of gas equation, Avogadro's number. ♣ Ideal gas equation. ♣ Deviation of real gases from ideal behaviour, liquefaction of gases, critical temperature. ☞ Liquid State - Vapour pressure, surface tension, viscosity (qualitative idea only, no mathematical derivations).
Unit III: Classification of Elements and Periodicity in Properties	❖ Significance of classification, ❖ Brief history of the development of periodic table (Doberneir, Newland & Mendeleev). ❖ Modern periodic law and the present form of the periodic table, ❖ Periodic trends in properties of elements: atomic radii, ionic radii. Inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valence.
Unit IV: *Chemical Bonding & Molecular Structure*	▪ Valence electrons, ionic bond, covalent bond: bond parameters. Octet rule. Formal charge. ▪ Lewis structure, polar character of covalent 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 VI: *Thermo-dynamics*	⊕ Concepts of System, types of systems, surroundings. ⊕ Work, heat, energy, intensive and extensive properties, state functions. ⊕ First law of thermodynamics - internal energy, enthalpy, heat capacity, specific heat, molar heat capacity, measurement of ΔE and ΔH, ⊕ Hess's law of constant heat summation, ⊕ Enthalpy of bond dissociation, combustion, formation, atomization, sublimation. Phase transformation, ionization, and dilution. ✍ Introduction of entropy as a state function, free energy change for spontaneous and non-spontaneous processes, criteria for equilibrium. 2nd law of Thermodynamics.
Unit VII: *Equilibrium*	➢ Equilibrium in physical and chemical processes, ➢ Dynamic nature of equilibrium, law of mass action, equilibrium constant, ➢ Factors affecting equilibrium – Le-Chatelier's principle; ➢ Ionic equilibrium - ionization of acids and bases, strong and weak electrolytes, degree of ionization, concept of pH. ➢ Hydrolysis of salts (elementary idea). Buffer solutions, solubility product, common ion effect (with illustrative examples).
Unit VIII: *Redox Reactions*	❖ Concept of oxidation and reduction, ❖ Redox reactions, oxidation number, ❖ Balancing of chemical equations in redox reactions, ❖ Applications of redox reactions. ❖ Electrochemical cell. Electrode potential.

Unit IX: *Hydrogen*	○ Position of hydrogen in periodic table, occurrence, isotopes, ○ Preparation, properties and uses of hydrogen; ○ hydrides - ionic, covalent and interstitial; ○ Physical and chemical properties of water, heavy water; ○ Hydrogen peroxide - preparation, reactions and structure; hydrogen as a fuel.
Unit X: *s-Block Elements (Alkali and Alkaline earth metals)*	**Group 1 and Group 2 elements:** ✓ General introduction, electronic configuration, occurrence, uses, ✓ Anomalous properties of the first element in 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. ➢ CaO, $CaCO_3$ and industrial use of lime and limestone, ➢ Biological importance of Mg and Ca
Unit XI: *Some p-Block Elements*	**General Introduction to p-Block Elements** **Group 13 elements:** ❖ General introduction, electronic configuration, occurrence. ❖ Variation of properties, oxidation states, trends in chemical reactivity, ❖ Anomalous properties of first element of the group; ❖ Boron - physical and chemical properties, ❖ Some important compounds: borax, boric acids, boron hydrides. ❖ Aluminium: uses, reactions with acids and alkalis. **Group 14 elements:** ⊕ General introduction, electronic configuration, occurrence, ⊕ Anomalous properties of first element in group, ⊕ Trends in physical properties, trends in chemical properties, ⊕ Carbon - catenation, allotropic forms, physical and chemical properties; trends in chemical properties, uses of oxides of carbon. ⊕ Important compounds of silicon and their uses: silicon tetrachloride, silicones, silicates and zeolites.
Unit XII: *Organic Chemistry - Some Basic Principles & Techniques*	☎ General introduction to organic chemistry, ☎ 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, electrophiles, nucleophiles carbocations and carbanions; types of organic reactions
Unit XIII: *Hydrocarbons*	**Classification of hydrocarbons** ✵ **Alkanes**: Nomenclature, isomerism, conformations (ethane only), ✵ Physical properties, chemical reactions including free radical mechanism of halogenation, combustion & pyrolysis. • **Alkenes**: Nomenclature, structure of double bond (ethene), • Geometrical isomerism, methods of preparation; • Physical properties, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markovnikov's addition and peroxide effect), • Ozonolysis, oxidation, mechanism of electrophilic addition. ♣ **Alkynes**: Nomenclature, structure of triple bond (ethyne), ♣ Physical properties. Methods of preparation, chemical reactions: acidic character of alkynes, ♣ Addition reaction of - hydrogen, halogens, hydrogen halides and water. ▪ **Aromatic hydrocarbons**: Introduction, IUPAC nomenclature; ▪ Benzene: resonance aromaticity; ▪ Chemical properties: mechanism of electrophilic substitution – nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation: directive influence of functional group in mono-substituted benzene.
Unit XIV: *Environmental Chemistry*	⊕ **Environmental pollutions**: soil, water and air pollution, acid rain, ⊕ Effects of the depletion of ozone layer, green-house effect & global warming - pollution due to industrial wastes; ➢ **Lake water pollution**: sources of pollutants in lake water, ➢ Sources of pollution in Dal lake, Wullar lake and Mansar lake in J&K state. ➢ Green chemistry as an alternative tool for reducing pollution, ➢ Strategy for control of environmental pollution.

Practicals

Marks: 30 **Time: 3 hrs.**

Sr.	Description
A.	**Organic Preparations:** 1. Preparation of acetylene and study of its acidic character. 2. Preparation of Acetanilide. 3. Preparation of p-Nitroacetanilide.
B.	**Characterization and purification of chemical substances:** 1. Determination of melting point of an organic compound (below 100°C) 2. Determination of boiling point of an organic liquid. 3. Crystallization of impure sample of anyone of the following: Alum, Copper Sulphate, Benzoic acid.
C.	**Experiments related to pH change** Anyone of the following experiments: 1. Determination of pH of some solutions obtained from juices and solutions of known and varied concentrations of acids, bases and salts using pH paper/universal indicator. 2. Comparing the pH of solutions of strong and weak acid of same concentration. 3. Study the pH change in the titration of a strong acid with a strong base using universal indicator. 4. Study of pH change by common-ion effect in case of weak acids and weak bases.
D.	**Chemical equilibrium** One of the following experiments: 1. Study the shift in equilibrium between ferric ions and thiocyanate ions by increasing/decreasing the concentration of either ions. 2. Study the shift in equilibrium between $[Co(H_2O)_6]^{2+}$ and chloride ions (Cl^-) by changing the concentration of either of the ions.
E.	**Quantitative estimation:** 1. Setting of a chemical balance and Preparation of standard solution of oxalic acid. 2. Determination of strength of a given sodium hydroxide solution by titrating it against a standard solution of oxalic acid. 3. Preparation of standard solution of sodium carbonate. 4. Determination of strength of a given solution of dilute hydrochloric acid by titrating it against standard sodium carbonate solution.
F.	**Qualitative analysis** Determination of one cation and one anion in a given salt (insoluble salts to be excluded): **Cations:** Pb^{2+}, Cu^{2+}, As^{3+}, $A1^{3+}$, Fe^{3+}, Mn^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+ **Anions:** CO_3^{2-}, S^{2-}, SO_3^{2-}, SO_4^{2-}, NO_2^-, NO_3^-, Cl^-, Br^-, I^-, PO_4^{3-}, $C_2O_4^{2-}$, CH_3COO^-

PROJECT

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

1.	Determination of BOD/COD of locally available water sample.
2.	Analysis of fruit and vegetable juices for their acidity.
3.	Preparation of a sample of soap from available oils (Groundnut/Coconut oil).
4.	To dye wool and cotton clothes with any marked available dye.
5.	To study the effect of acids and bases on the tensile strength of fibres.
6.	Silvering of mirrors
7.	Compare the contents of tannic/caffeine in various samples of tea and hence their flavor.

Subject: Biology **Class: 11th**

Maximum Marks: 100 (Theory: 70 Marks; Practical: 30 Marks) **Time: 3 hrs.**

Book Prescribed:

- *A Textbook of Biology for Class XI published by NCERT, New Delhi*

Suggested Readings:

- *Trueman's Elementary Biology for class XI by Bhatia and Tyagi*
- *Textbook of Biology for Class XI – Saraswati Publication.*
- *Dinesh A to Z in Biology for Class XI*
- *Pradeep's Text book of Biology for Class XI*
- *MTG Biology*
- *Arihant Biology*
- *GRB Biology (Disha Publication)*

The present syllabus reinforces the ideas introduced in the lower classes while the students learn new concepts besides getting an exposure to contemporary areas of the subject. The syllabus also aims at emphasizing the underlying principles that are common to both animals and plants as well as highlighting the relationships of biology with other areas of knowledge. The format of the syllabus allows a simple, clear, consequential flow of concepts without any jarring jumps. The syllabus also stresses the connection of the study of Biology to real life problems, use of biological discoveries/innovations in everyday life - in environment, nature, medicine, health and agriculture. The syllabus also focuses on reducing the curriculum load while ensuring that ample opportunities and scope for learning and appreciating basic concepts of the subject continues to be available within its framework.

The prescribed syllabus is expected to:

- ✓ promote understanding of basic principles of biology
- ✓ learning of emerging knowledge and its relevance to individual and society
- ✓ encourage rational/specific attitude to issues related to population, environment and development
- ✓ enhance awareness about environmental issues and problems and the appropriate solutions
- ✓ create awareness amongst the learners about variations amongst the living and developing respect for the diversities and to appreciate that the most complex biological phenomenon are also built on essentially simple processes.

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

Exam.	Chapter No.	Name of the Chapter	*Completion Date*	Marks	Periods
		Section A: *BOTANY*		**35**	
U_1	Unit I	*Diversity of Life*	Ending April	08	40
T_1	Unit II	*Kingdom Plantae*	Ending May	09	45
U_2	Unit III	*Anatomy of Flowering Plants*	Ending June	08	15
		Plant Physiology	15th July		15
T_2	Unit IV	*Mineral Nutrition*	20th September	10	30
		***Section B*: ZOOLOGY**		**35**	
U_1	Unit I	*Diversity in Living World*	10th May	08	50
T_1	Unit II	*Cell Structure & Function*	5th April	10	60
U_2	Unit III	*Histology & Morphology*	15th June	07	40
T_2	Unit IV	*Human Physiology*	15th September	10	75

Section A: Botany — Marks: 35

Unit	Detailed Description of Topics
Unit I: Diversity of Life	• Variety of Living organisms; • Systematics: Need, History and Classification (Artificial, Natural, & Phylogenetic); **Biosystematics**: ⊕ Binomial nomenclature ⊕ Two kingdom system, ⊕ Five kingdom system, ⊕ Their Merits and Demerits (Detailed study of kingdom: Monera, Protista and Fungi) ⊕ Status of some acellular organisms/(Slime moulds like: viruses and viroids) Lichens ⊕ Taxonomic aids: Botanical gardens, Herbaria, Museums and Keys.
Unit II: *Kingdom Plantae*	➢ Salient features of various plant groups for identification and their classes (Algae, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms) **Morphology of flowering plants and their function** ♦ Morphology of root, stem, leaves, inflorescence, flowers, fruits and seed. ♦ Description of flowering plants of families Fabaceae, Solanaceae and Liliacae.
Unit III: Anatomy of flowering plants	**Tissue and Tissue System** ✓ Types of Tissues, Meristematic and Permanent and their classification and functions. ✓ Anatomy of Dicot and Monocot Root, Stem, Leaves, ✓ Secondary growth in Dicot stems and roots
	Plant Physiology **Transport in Plants**: ✪ Means of transport, (Diffusion, Facilitated diffusion, Passive symports and antiports, Active transport) **Plant water relations** ✸ Water potential, osmosis, plasmolysis, imbibitions, ✸ Long distance transport of water – apoplast, symplast, pathways ✸ Ascent of sap, Root pressure theory and transpirational pull theory (cohesion - tension theory) **Transpiration** ☞ Types and significance, mechanism of opening and closing of stomata, ☞ Guttation Phloem transport ☞ Flow from source to sink (mass flow Hypothesis)
Unit IV: Mineral Nutrition	❖ Methods to study mineral requirement (Hydrophonics) ❖ Essential mineral, elements criteria for essentiality of nutrients, essential elements, ❖ Micro and Macro nutrients, their role and deficiency symptoms ❖ Mechanism of absorption of elements, ❖ Translocation of solutes, ❖ Soil as reservoir of essential elements, ❖ Macronutrients and Micro nutrients Nitrogen Metabolism ☆ Nitrogen cycle – Biological nitrogen fixation ☆ Photosynthesis, Historical background, site of photosynthesis. ☆ Various photosynthetic pigments, ☆ Mechanism, Light reaction including PS I, P II and photo-phosphorylation (cyclic and non-cyclic). Dark reaction or Biosynthetic phase, Calvin (C_3) cycle and C_4 cycle ☆ Factors affecting photosynthesis ☆ Photorespiration

	Respiration ♣ Introduction ♣ Mechanism – glycolysis, Kreb's cycle ♣ Electron transport system ♣ Aerobic and anaerobic respiration ♣ Respiratory quotient **Growth and Development** 🕯 Characteristics of Plant growth 🕯 Phases of growth 🕯 Growth curve and its components – Differentiation, Dedifferentiation and Redifferentiation **Development** ➢ Sequence of developmental processes in a plant cell Plant Growth Regulators ➡ Discovery and Physiological effects (Auxins, Gibberlins, Cytokinins, Ethylene and IBA, Photoperiodism and Vernalisation)

Section B: Zoology **Marks: 35**

Unit	Description
Unit I: Diversity in Living World	➢ Characteristic features of living organisms ➢ Salient features of animals (non chordates upto phylum level, chordates upto class level), Animal kingdom, ➢ Zoological Parks. Natural museums (with special reference to local Zoos/National Parks – Manda, Mahamaya, Dachigam, Hemis)
Unit II: Cell – Structure and Function	**i) Cell** ✓ Brief description of cell ✓ Cell theory ✓ Prokaryotic and Eukaryotic cell ✓ Cell wall, cell membrane and cell organelles (Plastids, Mitochondria, Endoplasmic reticulum, Golgi bodies/ dictyosomes, Ribosomes, Lysosomes, Nucleus, Vacuoles, Centrioles) ✓ Cillia and flagella and nuclear organization
	ii) Cell Division ☪ Cell cycle ☪ Mitosis ☪ Meiosis
	iii) Basic chemical constituents of living bodies
	iv) Biomolecules ✓ Structure and function of: Carbohydrates, Proteins, Lipids and Nucleic acids ✓ Metabolites [Primary and Secondary Metabolism (elementary idea)]
	v) Enzymes: Types, Properties, Functions
Unit III: Histology and Morphology	**i) Animal Tissues** ✈ Epithelial, Connective, Muscular & Nervous ✈ Organ and Organ system **ii) Elementary knowledge** ☞ Morphology and Anatomy of Frog, earthworm and Cockroach
Unit IV: Human Physiology	☞ Digestion and Absorption. ☞ Breathing and Respiration. ☞ Body fluids and circulation. ☞ Excretory products and elimination. ☞ Locomotion and Movement. ☞ Neural control and coordination, ☞ Chemical coordination and Integration.

Practicals and Project Work

Maximum Marks: 30 **Time: 3 hrs**

Section A: Botany	**Marks: 15**
1.	Study of different parts of a Compound Microscope
2.	Study of specimens and identification with reasons – Bacteria, *Oscillatoria*, *Spirogyra*, *Rhizopus*, Mushroom, Yeast, Liverwort (*Marchantia*) Moss – (*Funaria*), *Pinus* (Male & Female cone), Lichens
3.	Study of different modifications in: (a) Roots (Tap and Adventitious) (b) Stems (Herbaceous & Woody) (c) Leaves (Leaf arrangement, shape, venation, simple & compound leaves)
4.	Description of 3 locally available flowers from the families – Fabaceae, Solanaceae and Lilliaceae (1 from each family)
5.	Study of plant tissues from permanent slides (Paranchyma, Collenchyma, Sclerenchyma, Xylem and Phloem)
6.	Study of T.S. of Dicots & Monocot Root, Stem and Leaf permanent slides
7.	Study of Osmosis by Potato osmoscope
8.	Stusy of Plasmolysis in epidermal peels (*e.g.*, Rhoeo leaves)
9.	Study of distribution of stomata in upper and lower surface of leaves
10.	To make comparative study of the rates of transpiration in upper and lower surface of leaves by cobalt chloride method
11.	Study of imbibitions in seeds / raisins
12.	Observation and comment on the experimental set up on phototropism.
13.	To separate plant pigments through paper chromatography.
Section B: Zoology	**Marks: 15**
1.	Study and handling of compound microscope.
2.	Study of salient features of specimens and identification with reasons – *Amoeba*, *Paramoecium*, *Hydra*, Liver fluke, *Ascaris*, Leech, Earthworm, Honeybee, Snail, Starfish, Shark, *Labeo*, Frog, Lizard and Pigeon.
3.	Study of preserved specimens of at least one representative of each group to understand co-relations between characteristics of organisms and systematic position
4.	Study of animal cell and its organelles with the help of charts/slides
5.	Study of mitosis and meiosis from prepared slides
6.	Preparation of temporary mounts of mammalian Squamous epithelium stripped muscles, fibres and mammalian blood film
7.	Study of different types of mammalian connective tissue, muscle fibres and nerve cells through prepared permanent slides
8.	Study of different systems with the help of charts/dissections – Earthworm, Cockroach
9.	Testing for the presence of carbohydrate and protein
10.	Preparation and study of human blood smear
	Project Work
1.	Collection of animal specimens for school museum
2.	Visit to a Zoological/ National park and preparation of report
3.	Study of cyclosis in *Paramecium*
4.	Study of Mitosis by using root tips of onion
5.	Study of Meiosis from flower buds
6.	Study of external morphology of Earthworm, Cockroach and Frog

Subject: **Mathematics** Class: **11TH**

Book Prescribed:

- ***Textbook of Mathematics for Class XI, Published by NCERT, New Delhi.***

Suggested Readings:

- ***Mathematics for Class XI – Full Marks Publication (Notes).***
- ***Mathematics for Class XI by S. Chand (Concept)***
- ***Pradeep's New Course Mathematics for Class XI (Notes as well as Concept)***
- ***Mathematics for Class XI by R. D. Sharma (Notes as well as Concept)***
- ***Mathematics for Class XI by A. K. Roy (Oxford Publication) - Concept***
- ***H. K. Dass and Aggarwal (for Concept)***
- ***NCERT Solved Questions by Saraswati Publishers – Nasir Ahmad Shah (for Notes)***

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 Bioscience, commerce or computer applications. The syllabus has been designed 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 pupil:

- ❖ 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 sex biases.
- ❖ to develop reverence and respect towards great Mathematicians for their contributions to the field of Mathematics.

COURSE STRUCTURE

Exami-nation	Chapter No.	Name of the Chapter	Completion Date	Marks	Periods
		TERM TEST – I		*Max. Marks: 50*	
U_1	1	Sets	10th January	06	
	2	Relations and Functions	Ending January	06	
	3	Trigonometry (Trigonometric Functions)	February	12	
T_1	4	Principle of Mathematical Induction	March	04	
	5	Permutations and Combinations		06	
	6	Complex Numbers and Linear Inequalities	24th April	06	
	7	Limits and Derivatives	20th May	10	
		TERM Test – II		*Max. Marks: 50*	
U_2	8	Coordinate Geometry (Straight Lines)	Ending May	06	
	9	Conic Sections (Circles) Parabola, Ellipse, Hyperbola	15th June	10	
	10	Probability	Ending June	06	
	11	Statistics	10th July	06	
T_2	12	Binomial Theorem	5th August	06	
	13	Sequences and Series	25th August	08	
	14	Three-dimensional Geometry	20th September	04	
	15	Mathematical Reasoning	4th November	04	

COURSE DETAILS

Unit	Detailed Description of Topics
Unit I: Sets	**1. Sets:** • Sets and their representations. • Empty set. • Finite & Infinite sets. • Equal sets, Subsets. • Subsets of the set of real numbers especially intervals (with notations). • Power set. Universal set. • Venn diagrams. • Union and Intersection of sets. • Difference of sets. • Complement of a set.
Unit II: Relations and Functions	**2. Relations & Functions:** ❖ Ordered pairs, Cartesian product of sets. ❖ Number of elements in the Cartesian product of two finite sets. ❖ Cartesian product of the reals with itself (upto RxRxR). ➢ Definition of relation, pictorial diagrams, domain, Co-domain and range of relation.

	➢ Function as a special kind of relation from one set to another. ➢ Pictorial representation of a function, domain, co-domain & range of a function. ➢ Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs. ➢ Sum, difference, product and quotients of functions.
Unit III: Trigonometry	**3. Trigonometric Functions:** ❖ Positive and negative angles. ❖ Measuring angles in radians & in degrees and conversion from one measure to another. ❖ Definition of trigonometric functions with the help of unit circle. ❖ Truth of the identity $\sin^2 x + \cos^2 x = 1$, for all x. ❖ Signs of trigonometric functions and sketch of their graphs. ❖ Expressing $\sin(x+y)$ and $\cos(x+y)$ in terms of $\sin x$, $\sin y$, $\cos x$ & $\cos y$. ❖ Deducing the identities like the following: $\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}$, $\cot(x \pm y) = \frac{\cot x \cot y \mp 1}{\cot y \pm \cot x}$, $\sin x + \sin y = 2 \sin \frac{x+y}{2} \cos \frac{x-y}{2}$, $\cos x + \cos y = 2 \cos \left[\frac{x+y}{2}\right] \cos \left[\frac{x-y}{2}\right]$, $\sin x - \sin y = 2 \cos \frac{x+y}{2} \sin \left[\frac{x-y}{2}\right]$, $\cos x - \cos y = -2 \sin \left[\frac{x+y}{2}\right] \sin \left[\frac{x-y}{2}\right]$ ❖ Identities related to $\sin 2x$, $\cos 2x$, $\tan 2x$, $\sin 3x$, $\cos 3x$ and $\tan 3x$. ❖ General solution of trigonometric equations of the type $\sin\theta = \sin\alpha$, $\cos\theta = \cos\alpha$ and $\tan\theta = \tan\alpha$. ❖ Proofs and simple applications of sine and cosine formulae.
Unit IV: Principle of Mathematical Induction	**4. Principle of Mathematical Induction:** ⌖ The Principle of Mathematical induction and simple applications.
Unit V: Permutations & Combinations	➢ Fundamental principle of counting. ➢ Factorial n. ➢ Permutations and combinations, derivation of formulae and their connections, simple applications.
Unit VI: Complex Numbers & Linear Inequalities	**Complex Numbers** ⌖ Need for complex numbers, especially $\sqrt{-1}$, to be motivated by inability to solve every quadratic equation. ⌖ Brief description of algebraic properties of complex numbers. ⌖ Argand plane and polar representation of complex numbers. ⌖ Statement of Fundamental Theorem of Algebra, ⌖ Solution of quadratic equations in the complex number system. **Linear inequalities** ✚ Algebraic solutions of linear inequalities in one variable and their representation on the number line. ✚ Graphical solution of linear inequalities in two variables. ✚ Solution of system of linear inequalities in two variables - graphically.

Unit VII: Limits and Derivatives	❖ Derivative introduced as rate of change both as that of distance function and geometrically, intuitive idea of limit. ❖ Definition of derivative, relate it to slope of tangent of the curve, derivative of sum, difference, product and quotient of functions. ❖ Derivatives of polynomial and trigonometric functions.
Unit VIII: Coordinate Geometry (Straight Lines)	♣ Brief recall of 2D from earlier classes. ♣ Slope of a line and angle between two lines. ♣ Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two-point form, intercepts form and normal form. ♣ General equation of a line. Distance of a point from a line.
Unit IX: Conic Sections (Circles)	✪ Sections of a cone: Circle, 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.
Unit X: Probability	➢ Random experiments: Outcomes, Simple spaces (set representation). ➢ Events: Occurrence of events, 'not', 'and' and 'or' events, mutually exclusive events ➢ Axiomatic (set theoretic) probability, connections with the theories of earlier classes. ➢ Probability of an event, probability of 'not', 'and' & 'or' events.
Unit XI: Statistics	♦ Measure of dispersion; mean deviation, variance and standard deviation of ungrouped/grouped data. ♦ Analysis of frequency distributions with equal means but different variances.
Unit XII: Binomial Theorem	⌗ History, statement and proof of the binomial theorem for positive integral indices. ⌗ Pascal's triangle, General and middle term in binomial expansion, simple applications.
Unit XIII: Sequence and Series	✵ Sequence and Series. ✵ Arithmetic progression (A.P.). ✵ Arithmetic mean (A.M.) ✵ Geometric progression (G.P.), ✵ General term of a G.P., sum of *n* terms of a G.P., ✵ Geometric mean (G.M.), ✵ Relation between A.M. and G.M. ✵ Sum to *n* terms of the special series Σn, Σn^2 and Σn^3.
Unit XIV: Three - dimensional Geometry	✓ Coordinate axes and coordinate planes in three dimensions. ✓ Coordinates of a point. ✓ Distance between two points and section formula.
Unit XV: Mathematical Reasoning	⌗ Mathematically acceptable statements. ⌗ Connecting words / phrases – consolidating the understanding of "if and only if (necessary and sufficient) conditions", "implies", "and/or", "implied by", "and", "or", "there exists" and their use through variety of examples related to real life and Mathematics/ ⌗ Validating the statements involving the connecting words – difference between contradiction, converse and contrapositive.

Subject: ENVIRONMENTAL SCIENCE **Class: 11th**

Max. Marks: 100 (Practical: 30; Theory: 70)

Book Prescribed:

- *A Textbook of Environmental Science for Class XI, published by J&K BOSE in Collaboration with Foundation Books, Pvt. Ltd., New Delhi.*
- *Elements of Environmental Science*
- *Environmental Science by K. C. Santara*

Examination	Chapter No.	Name of the Chapter	Completion Date	Marks	Periods
U_1	1	Understanding Environment		07	10
	2	Ecology		07	20
T_1	3	Ecological Interaction and Adaptation		07	20
	4	Population Ecology		07	10
	5	Energy Resources		07	18
U_2	6	Earth's Environment & Natural Disasters		07	12
	7	Environmental Education and Awareness		07	15
T_2	8	Environmental Health		07	20
	9	Natural Resources		07	20
	10	Managing Agriculture		07	20

Lesson	Detailed Description of Topics
Unit 1: Understanding Environment (7 marks)	(1) Concept of Environment and its types: Physical, Biological & Social environment (2) Concept, scope and importance of Environmental Science (3) Components of Environment: (a) Lithosphere (b) Hydrosphere (c) Atmosphere (d) Biosphere (4) Origin of Earth (5) Human and Environment Relationship
Unit 2: Ecology (7 marks)	(1) Ecology (definition and types) (2) Concept and Struggle of ecosystem (3) Trophic relationships (food chain, food web, ecological pyramids) (4) Functions of Ecosystem (energy flow in an ecosystem) (5) Ecological Succession (types and stage)
Unit 3: Ecological Interaction and Adaptation (7 marks)	(1) Ecological interaction and its types (2) Inter-specific interaction: (a) Positive interaction (mutualism, proto-cooperation, commensalism, symbiosis & scavenging) (b) Negative interaction (parasitism, predation, competition and ammensalism) (3) Intra-specific interaction: (a) Coopeartive interaction (b) Competitive interaction (4) Adaptations: concept and need (5) Types of adaptations (with special reference to wind, light & temperature)
Unit 4: Population Ecology (7 marks)	(1) Concept of Species, Population and Communities (2) Population Dynamics (Population size and density, dispersion, natality, mortality, age structure) (3) Population Growth (exponential and logistic growth) (4) Factors regulating population growth (competition, weather and climate, territory, predation, natural disasters and disease) (5) Human population growth (Malthusian theory and neo-Malthusian theory, Demographic Transition)

Unit 5: Energy Resources (7 marks)	(1) Concept of energy resources (2) Non-renewable energy resources: coal, petroleum, natural gas (3) Renewable energy resources (solar, wind and hydropower) (4) Nuclear energy (uses and limitations) (5) Biofuels
Unit 6: Earth's Environment & Natural Disasters (7 marks)	(1) Atmosphere: Structure and Composition (2) Hydrosphere: Distribution, Hydrological cycle (3) Lithosphere: Structure (4) Bio-geochemical cycles (Carbon, Nitrogen and Phosphorus) (5) Natural disasters (Earthquakes, Floods and Volcanoes)
Unit 7: Environmental Education and Awareness (7 marks)	(1) Concept and need of environmental education (2) Formal and Informal means of Environmental Education (3) Modes of Environmental awareness (4) Role f NGOs (5) Environmental movements (Chipko Movement, Narmada Bachao Andolan)
Unit 8: Environmental Health (7 marks)	(1) Concept of Health and Diseases (2) Water borne diseases (Cholera, Hepatitis, Typhoid) (3) Air borne diseases (Influenza, Tuberculosis) (4) Soil borne diseases (Tetanus, Botulism) (5) Occupational diseases (Silicosis, Asbestosis)
Unit 9: Natural Resources (7 marks)	(1) Forest resources (types and uses) (2) Animal resources (Fish and Livestock) (3) Water resources (Fresh and Marine). (4) Mineral resources (types and uses). (5) Medicinal plants (with special reference to J&K)
Unit 10: Managing Agriculture (7 marks)	(1) Concept of traditional and modern agriculture. (2) Green revolution and White revolution. (3) Pesticides and fertilizers (types, advantages and disadvantages) (4) Integrated pest control (5) Food security

Practical Examination ***Maximum Marks: 30***

1. Study of density and abundance of different plant species in a particular area using quadrate method.
2. Determination of water, air and soil temperature.
3. Collection of locally available herbal plants and preparation of herbarium.
4. Field work and visit to National Park / Wild life Sanctuary / STP / water body and preparation of a field report.
5. Visit to a nearby Primary or Middle School to impart environmental awareness.
6. Documentation of agricultural crops, fertilizers and pesticides used in your locality.

SUBJECT: HOW TO BE SUCCESSFUL > > >

Truth to make our Life 100% successful.....

> >If >A=1 >B=2 >C=3 >D=4 >E=5 >F=6 >G=7 >H=8 >I=9 >J=10 >K=11 >L=12 >M=13 >N=14 >O=15 >P=16 >Q=17 >R=18 >S=19 >T=20 >U=21 >V=22 >W=23 >X=24 >Y=25 >Z=26 > >

Then

H+A+R+D+W+O+R+K = 8+1+18+4+23+15+18+11 = 98% > > >

K+N+O+W+L+E+D+G+E=11+14+15+23+12+5+4+7+5= 96% >>>

L+U+C+K = 12+21+3+11 = 47% > > >

(None of them makes 100%) > >..... > >

Then what makes 100% > >

Is it Money? ..... No !!!!! > > Leadership? ..... NO !!!! > > >

Every problem has a solution, only if we perhaps change our "ATTITUDE".

>It is OUR ATTITUDE towards Life and Work that makes > > > > OUR Life 100% Successful.. > > >

A+T+T+I+T+U+D+E = 1+20+20+9+20+21+4+5=100%.

- **Reading maketh a full man; Conference a ready man; Writing an exact man.**
- Reading is to the mind what exercise is to the body
- The more we study, The more we discover our ignorance.
- *To read a book for the first time is to make an acquaintance with a new friend; to read it for a second time is to meet an old one.*
- Let books be your dining table, And you shall be full of delights; Let them be your mattress, And you shall sleep restful nights.

- **To acquire the habit of reading is to construct for yourself a refuge from almost all of the miseries of life.**
- People who read are the ones who succeed!
- If we encounter a man of rare intellect, we should ask him what books he reads.
- **The more you read the more you know; The more you know the stronger your voice; For speaking your mind and making your choice.**
- **Books are the treasured wealth of the world and the fit inheritance of generations and nations.**
- Libraries are the wardrobes of literature, whence men, properly informed may bring forth something for ornament, much for curiosity, and more for use.
- READING IS A BASIC TOOL IN THE LIVING OF A GOOD LIFE.
- He who destroys a good book kills reason itself.
- **A GOOD BOOK IS THE BEST OF FRIENDS, THE SAME TODAY AND FOREVER.**
- Be as careful of the books you read, as of the company you keep, for your habits and character will be are much influenced by the former as the latter.
- Books are the quietest and most constant of friends: they are the most accessible and wisest of counsellors, and the most patient of teachers.
- Books are not made for furniture, but there is nothing else that so beautifully furnishes a house.
- It often requires more courage to read some books than it does to fight a battle.
- If U have made mistakes, even serious ones, there is always another chance for U. What we call failure is not the failing down but the staying down.
- Great things are never done by Impulse but by a series of small things brought together
- A sin which makes one meek and humble is better than a good deed which makes one proud and arrogant.
- It is no more necessary that a man should remember the different dinners and suppers which have made him healthy, than the different books which have made him wise. Let us see the results of good food in a strong body, and the results of great reading in a full and powerful mind.