

## Locus Learning Grade 10 Official Syllabus

Our syllabus, fully updated to reflect the latest NEP 2020 guidelines.

The Mathematics and Science sections are strictly mapped to the newest NCERT textbooks. The AI and Coding section is aligned with the official CBSE Skill Education framework (Subject Codes 417) for Class 10.

### **Mathematics (NCERT: *Mathematics - Textbook for Class X*)**

This curriculum represents the culmination of secondary school math, heavily focused on rigorous problem-solving and foundational concepts essential for upcoming competitive exams.

1. **Real Numbers:** Advanced number theory, focusing on the Fundamental Theorem of Arithmetic and proving the irrationality of numbers.
2. **Polynomials:** Understanding the geometric meaning of zeroes and the relationship between zeroes and coefficients in quadratic polynomials.
3. **Pair of Linear Equations in Two Variables:** Solving simultaneous equations using algebraic methods (substitution and elimination) and graphical representations.
4. **Quadratic Equations:** Formulating and solving quadratic equations using factorization and the quadratic formula, including real-world situational problems.
5. **Arithmetic Progressions:** Deriving the  $n$ th term and the sum of the first  $n$  terms of an A.P., applied to solving practical problems.
6. **Triangles:** Proving and applying theorems related to similar triangles, specifically the Basic Proportionality Theorem.
7. **Coordinate Geometry:** Using the distance formula and section formula (internal division) to solve analytical geometry problems.
8. **Introduction to Trigonometry:** Defining trigonometric ratios of acute angles and establishing fundamental trigonometric identities like  $\sin^2 A + \cos^2 A = 1$ .
9. **Some Applications of Trigonometry:** Using angles of elevation and depression to calculate heights and distances in complex scenarios.
10. **Circles:** Proving theorems related to tangents drawn to a circle from an external point.
11. **Areas Related to Circles:** Calculating the area of sectors and segments of a circle, connecting geometry to real-world mensuration.
12. **Surface Areas and Volumes:** Finding the surface area and volume of complex solids formed by combining cubes, cuboids, spheres, hemispheres, and cylinders.
13. **Statistics:** Calculating the mean, median, and mode of grouped data to build a foundation for advanced data analysis.
14. **Probability:** Classical definition of probability, solving problems based on single events and theoretical probability.

## Science (NCERT: *Science - Textbook for Class X*)

This curriculum bridges the gap between basic concepts and high-level analytical science, focusing purely on the rationalized core.

1. **Chemical Reactions and Equations:** Writing balanced chemical equations and understanding types of reactions (combination, decomposition, displacement, oxidation-reduction).
2. **Acids, Bases and Salts:** Exploring the pH scale, chemical properties of acids/bases, and the preparation of common salts like bleaching powder and plaster of Paris.
3. **Metals and Non-metals:** Analyzing the reactivity series, ionic bonds, basic metallurgical processes, and corrosion prevention.
4. **Carbon and its Compounds:** Deep dive into covalent bonding, the versatile nature of carbon, homologous series, and the chemical properties of ethanol and ethanoic acid.
5. **Life Processes:** Understanding the fundamental biological systems of nutrition, respiration, transportation, and excretion in plants and animals.
6. **Control and Coordination:** Studying the human nervous system, reflex actions, endocrine glands, and tropic movements in plants.
7. **How do Organisms Reproduce?:** Analyzing asexual and sexual reproduction in plants and animals, reproductive health, and family planning.
8. **Heredity:** Exploring Mendelian genetics, the laws of inheritance, and how traits are passed down through generations.
9. **Light - Reflection and Refraction:** Applying mirror and lens formulas, drawing ray diagrams, and understanding the laws governing light behavior.
10. **The Human Eye and the Colourful World:** Studying defects of vision (and their corrections), the dispersion of white light, and atmospheric refraction.
11. **Electricity:** Applying Ohm's law, understanding resistance in series and parallel, and calculating electric power and the heating effect of current.
12. **Magnetic Effects of Electric Current:** Investigating magnetic fields, electromagnets, and the principles behind electric motors and generators using Fleming's rules.
13. **Our Environment:** Analyzing ecosystems, food chains, trophic levels, and the environmental impact of human activities like ozone depletion.

## Artificial Intelligence (CBSE Subject Code 417)

The Grade 10 AI curriculum is a full 100-mark Skill Subject. It is divided into Part A (Employability Skills) and Part B (Subject Specific Skills), heavily focusing on practical model evaluation and coding.

### Part A: Employability Skills

1. **Communication Skills-II:** Advanced verbal and non-verbal communication frameworks.
2. **Self-Management Skills-II:** Stress management and self-regulation techniques.
3. **ICT Skills-II:** Advanced digital literacy and computer security operations.
4. **Entrepreneurial Skills-II:** Understanding the characteristics and mindset required for successful entrepreneurship.

5. **Green Skills-II:** Exploring sustainable development and its critical importance.

### **Part B: Subject Specific Skills**

1. **Revisiting AI Project Cycle & Ethical Frameworks:** A deeper dive into data acquisition, exploration, and the ethical implications of AI models.
2. **Advanced Concepts of Modeling in AI:** Differentiating between rule-based and learning-based approaches, and exploring supervised, unsupervised, and deep learning.
3. **Evaluating Models:** Understanding advanced evaluation metrics like Accuracy, Precision, Recall, and the  $F_1$  Score.
4. **Statistical Data:** Practical module focusing on data processing and statistical analysis.
5. **Computer Vision:** Theory and practical applications of how AI models process and understand digital images and pixels.
6. **Natural Language Processing (NLP):** How machines interpret, analyze, and generate human language.
7. **Advance Python:** Hands-on practical coding using advanced lists, tuples, control flow, and AI-specific packages.