

Karnataka 2nd PUC Syllabus 2026-27

Science Stream (PCMB) — Physics, Chemistry, Mathematics, Biology

The Karnataka School Examination and Assessment Board (KSEAB), through the Department of Pre-University Education (DPUE), prescribes the syllabus for the 2nd PUC (Class 12) examinations. For 2026-27, the board has carried forward the previously rationalised/reduced syllabus for most Science-stream subjects, with only a few subjects such as Psychology, Computer Science, and Home Science receiving fresh changes. Students preparing for the 2nd PUC exam are advised to check this syllabus alongside the official blueprint on the DPUE website (pue.karnataka.gov.in) and the KSEAB site, since it forms the basis for board question papers as well as entrance exams like KCET, which draws heavily from the 1st and 2nd PUC curriculum.

For practical-based subjects such as Physics, Chemistry, Biology, and Computer Science, the 100-mark paper is split into 70 marks for the written theory exam and 30 marks for the practical/ internal assessment. For non-practical subjects such as Mathematics, the split is 80 marks theory and 20 marks internal assessment. Overall passing requirements have been eased in recent years — students now need an aggregate of 33% (down from 35%), with a subject-wise written-paper minimum of around 30%.

Physics

The Physics syllabus is organised into 10 broad units spanning 14 chapters. The theory paper carries 70 marks, with the remaining 30 marks allotted to the practical examination.

Part 1

Unit	Unit Title	Chapter	Key Topics
1	Electrostatics	Electric Charges and Fields	Electric charge, conservation and quantisation of charge, Coulomb's law, superposition principle, electric field and field lines, electric dipole, torque on a dipole, continuous charge distribution, electric flux, Gauss's law and applications, electrostatic potential and potential due to a point charge/dipole, equipotential surfaces, capacitors and capacitance, combination of capacitors, energy stored in a capacitor.
		Electrostatic Potential and Capacitance	
2	Current Electricity	Current Electricity	Electric current, drift velocity, Ohm's law, resistivity and conductivity, temperature dependence of resistance, series and parallel combinations of resistors, EMF and internal resistance of a cell, combination of cells, Kirchhoff's laws, Wheatstone bridge and meter bridge, potentiometer.
3	Magnetic Effects of Current and Magnetism	Moving Charges and Magnetism	Biot-Savart law, Ampere's circuital law and applications (straight wire, solenoid), force on a moving charge and a current-carrying conductor in a magnetic field, torque on a current loop, moving-coil galvanometer.
		Magnetism and Matter	Bar magnet as an equivalent solenoid, magnetic field lines, magnetic properties of materials — para-, dia- and ferromagnetism.
4	Electromagnetic Induction and Alternating Currents	Electromagnetic Induction	Faraday's laws, Lenz's law, motional EMF, self- and mutual-inductance, eddy currents.
		Alternating Current	AC voltage applied to resistor/inductor/capacitor, LCR circuits, resonance, power in AC circuits, transformers.

Unit	Unit Title	Chapter	Key Topics
5	Electromagnetic Waves	Electromagnetic Waves	Displacement current, characteristics of electromagnetic waves, electromagnetic spectrum (qualitative).

Part 2

Unit	Unit Title	Chapter	Key Topics
6	Optics	Ray Optics and Optical Instruments	Reflection and refraction, total internal reflection, refraction at spherical surfaces and lenses, lens-maker's formula, refraction through a prism, optical instruments — microscope and telescope.
		Wave Optics	Huygens' principle, interference, Young's double-slit experiment, diffraction, polarisation.
7	Dual Nature of Radiation and Matter	Dual Nature of Radiation and Matter	Photoelectric effect, Einstein's photoelectric equation, particle nature of light, wave nature of matter, de Broglie relation.
8	Atoms and Nuclei	Atoms	Alpha-particle scattering, Rutherford's and Bohr's models of the atom, hydrogen spectrum.
		Nuclei	Composition and size of the nucleus, mass-energy relation, mass defect, binding energy, nuclear fission and fusion.
9	Electronic Devices	Semiconductor Electronics	Energy bands in solids, intrinsic and extrinsic semiconductors, p-n junction diode, diode as a rectifier, transistor and its characteristics, logic gates.
10	Communication Systems	Communication Systems	Elements of a communication system, bandwidth of signals, modulation and its necessity.

Note: A few chapters/topics have been dropped from the full NCERT syllabus as part of the board's rationalisation over recent years. Students should cross-check the current 'deleted topics' list published by KSEAB/DPUE alongside this table.

Chemistry

The Chemistry syllabus retains 10 units after the rationalisation exercise, which removed Solid State, Surface Chemistry, General Principles and Processes of Isolation of Elements, p-Block Elements, Polymers, and Chemistry in Everyday Life. The theory paper is worth 70 marks, with 30 marks for the practical examination.

Chapter / Unit	Approx. Marks	Key Topics
Solutions	12	Types of solutions, concentration terms, solubility, vapour pressure of liquid solutions, Raoult's law, ideal and non-ideal solutions, colligative properties (relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure), abnormal molar mass and van't Hoff factor.
Electrochemistry	13	Redox reactions, EMF of a cell, standard electrode potential, Nernst equation, conductance in electrolytic solutions, molar conductivity and its variation with concentration, Kohlrausch's law, electrolysis, batteries, fuel cells, corrosion.
Chemical Kinetics	12	Rate of a reaction, factors affecting rate (concentration, temperature, catalyst), order and molecularity, rate law and rate constant, integrated rate equations, half-life, Arrhenius equation and activation energy (elementary treatment).
The d- and f-Block Elements	8	General trends in properties of transition elements — electronic configuration, oxidation states, colour, catalytic property, magnetic properties; preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$; brief mention of lanthanoids and actinoids.
Coordination Compounds	10	Werner's theory, ligands and coordination number, IUPAC nomenclature, isomerism, bonding — Valence Bond Theory and elementary Crystal Field Theory, importance of coordination compounds.
Haloalkanes and Haloarenes	6	Classification and nomenclature, nature of the C-X bond, methods of preparation, physical and chemical properties, mechanisms of substitution reactions, uses and environmental effects of dichloromethane, trichloromethane, iodoform, freons, and DDT.
Alcohols, Phenols and Ethers	8	Nomenclature, methods of preparation, physical and chemical properties, and uses of alcohols, phenols and ethers; acidic nature of phenol; distinguishing tests for primary, secondary and tertiary alcohols.
Aldehydes, Ketones and Carboxylic Acids	12	Nomenclature, structure of the carbonyl group, preparation, physical and chemical properties, nucleophilic addition reactions, uses of aldehydes/ketones; acidity and preparation/properties of carboxylic acids.
Amines	6	Structure, classification, nomenclature, preparation, physical and chemical properties, uses of amines; distinguishing tests for primary, secondary and tertiary amines; diazonium salts.
Biomolecules	8	Carbohydrates (classification, structure of glucose and fructose), proteins (amino acids, peptide bond, primary to quaternary structure, denaturation), enzymes, vitamins (classification and functions), nucleic acids (DNA and RNA, their biological functions), hormones (elementary idea).

Note: Marks weightage varies slightly year to year (a variation of 1-2% is typically allowed per objective). Electrochemistry and Aldehydes, Ketones and Carboxylic Acids tend to carry the highest weightage, followed by Solutions and Chemical Kinetics.

Mathematics

The Mathematics paper carries 100 marks in total — 80 for the written theory exam and 20 for internal assessment (there is no practical component). The syllabus spans roughly 13 chapters grouped into the units below, following the NCERT-based, rationalised curriculum.

Chapter / Unit	Key Topics
Relations and Functions	Types of relations (reflexive, symmetric, transitive, equivalence), one-one and onto functions, composite functions, invertible functions.
Inverse Trigonometric Functions	Definition, domain, range and principal value branches; elementary properties.
Matrices	Types of matrices, operations on matrices, transpose, symmetric and skew-symmetric matrices, elementary row/column operations, invertible matrices.
Determinants	Determinant of a square matrix, properties, minors and cofactors, adjoint and inverse of a matrix, applications in solving a system of linear equations.
Continuity and Differentiability	Continuity, differentiability, derivatives of composite, implicit, inverse trigonometric, exponential and logarithmic functions; logarithmic differentiation; second-order derivatives; Rolle's and Mean Value Theorems.
Applications of Derivatives	Rate of change of quantities, increasing/decreasing functions, tangents and normals, approximation, maxima and minima.
Integrals	Integration as the inverse of differentiation, methods of integration (substitution, partial fractions, by parts), definite integrals and their properties, fundamental theorem of calculus.
Applications of the Integrals	Area under simple curves, area between two curves.
Differential Equations	Definition, order and degree, general and particular solutions, formation of a differential equation, solution of first-order first-degree differential equations (variable separable, homogeneous, linear).
Vector Algebra	Basic concepts, direction cosines/ratios, types of vectors, addition, scalar and vector products of two vectors.
Three-Dimensional Geometry	Direction cosines/ratios of a line, equation of a line and a plane in space, angle between lines, planes, and a line and a plane; shortest distance between two skew lines.
Linear Programming	Mathematical formulation of linear programming problems, graphical method of solution for problems in two variables, feasible and infeasible regions/solutions, optimal feasible solution.
Probability	Conditional probability, multiplication theorem, independent events, Bayes' theorem, random variable and its probability distribution, Bernoulli trials and binomial distribution.

Note: Calculus (Continuity & Differentiability, Applications of Derivatives, Integrals, Applications of the Integrals, Differential Equations) carries the highest weightage of all units, followed by Vectors & 3-D Geometry and Algebra (Matrices & Determinants).

Biology

The Biology syllabus is organised into 5 broad units covering 13 chapters. The theory paper is worth 70 marks, with 30 marks allotted to the practical examination.

Unit	Unit Title	Chapters
1	Reproduction	Reproduction in Organisms; Sexual Reproduction in Flowering Plants; Human Reproduction; Reproductive Health.
2	Genetics and Evolution	Principles of Inheritance and Variation; Molecular Basis of Inheritance; Evolution.
3	Biology and Human Welfare	Human Health and Disease; Strategies for Enhancement in Food Production; Microbes in Human Welfare.
4	Biotechnology and its Applications	Biotechnology: Principles and Processes; Biotechnology and its Applications.
5	Ecology and Environment	Organisms and Populations; Ecosystem; Biodiversity and Conservation.

Note: Genetics & Evolution (particularly Principles of Inheritance and Variation, and Molecular Basis of Inheritance) carries the highest weightage, followed by Human Health & Disease and Reproduction. Diagram-based questions recur across nearly every chapter, so labelled-diagram practice is essential.

Students should verify the exact unit-wise mark distribution and any deleted topics for the current academic year against the official syllabus and blueprint published by KSEAB/DPUE, since minor adjustments are made most years. Solving previous years' question papers alongside this syllabus is recommended for effective, well-paced preparation.