



Aldel Education Trust's
St. John College of Humanities and Sciences

(A Christian Religious Minority Institution)

Affiliated to University of Mumbai

St. John Technical Campus, Vevoor, Manor Road, Palghar (East), District - Palghar, Maharashtra - 401404.

Tel: (02525)-297071, Mob.:7219230156 Fax: (02525)-256834 Website :www.sjchs.edu.in Email :office@sjchs.edu.in

BACHELOR OF SCIENCE

PROGRAMME OUTCOME:

PO1:	Knowledge and Communication: Learners are encouraged to apply the knowledge of mathematics and science fundamentals to various solutions of complex problems. As such, knowledge of the subject is the sole objective of any student learner.
PO2:	Problem analysis and development of solutions: Students will be able to identify, formulate and analyze scientific problems and reach concrete solutions using various principles of mathematics and sciences.
PO3:	Ethically and Socially Responsible: Students will be able to develop, internalize and exercise ethics in their professional as well as personal practices.
PO4:	Life Long Learner and Researcher: Learners will be able to recognize the need, the preparation and ability to engage in independent and life-long learning in every broad context of technological changes.
PO5:	Teamwork/ Collaborators: Students will work in team with efficiency and effectiveness of their knowledge and skills.
PO6:	Sensitive to Environment: Students will be able to identify and analyze socio-political, cultural and economic problems which act as deterrents to environmental sustainability and provide creative solutions towards the same.
PO7:	Competencies for employment: Students will be able to increase their employability through subject knowledge and additional skills.

PROGRAMME SPECIFIC OUTCOME (CHEMISTRY):

PSO1:	To gain knowledge of chemistry through theory and practicals and thus be able to develop problem solving skills.
PSO2:	To help them learn nomenclature, structures, reactivity & mechanisms and stereochemistry of the chemical reactions.
PSO3:	To develop research oriented skills and teach them to handle sophisticated instruments and equipment.
PSO4:	Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.



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Bachelor of Science

Semester	Subject		Course Outcome
FYBSc SEM-I	Foundation Course II	CO1	Students will be able to understand the Integrity and Variety of Indian Culture & Different.
		CO2	Students will be able to understand problems faced by womens in society and Problems faced by Disables.
		CO3	Students will be able to understand Problems arised due to caste system and communalism.
		CO4	Students will be able to understand Indian Constitutions overview and amendments and articles and different Provisions of Indian Constitution
		CO5	Students will be able to distinguish between Local, state and national Parties and criterias to form each. Also, Percentage of women's Participation in Politics. Students will be aware of Gram-Panchayat, Nagar Parishad & Nagar Palika (Local self Governments) .
	Chemistry - I	CO1	Students use the evidence-based comparative chemistry approach to explain chemical synthesis and analysis.
		CO2	Students characterise, identify and separate components of organic or inorganic origin and will also be able to analyse them by making use of the modern instrumental methods learned.
		CO3	Students understand the basic principle of equipment and instruments used in the chemistry laboratory.
		CO4	Students demonstrate the experimental techniques and methods of their area of specialisation in Chemistry
	Chemistry - II	CO1	Students acquire core competency in the subject Chemistry, and in allied subject areas.
		CO2	Develop critical thinking ability by way of solving problems/numerical using basic chemistry knowledge and concepts.
		CO3	Appreciate the central role of chemistry in our society and use this as a basis for ethical behaviour in issues facing chemists including an understanding of safe handling of chemicals, environmental issues, and key issues facing our society in terms of energy, health, and medicine.
		CO4	The course curriculum is designed to inculcate a habit of learning continuously through the use of advanced ICT techniques and other available Techniques/books/journals for personal academic growth as well as for increasing employability opportunity.
		CO1	Apply Newton's laws for the calculations of the motion of simple systems.



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	Physics - I	CO2	Use Work and Energy equivalence and its applications through suitable numerical.
		CO3	Use Elasticity, Viscosity and Fluid dynamics in daily life.
		CO4	Understand Real gases and validity of the laws of thermodynamics.
		CO5	Demonstrate quantitative problem solving skills in all the topics covered.
	Physics- II	CO1	Understand nuclear properties, nuclear behaviour and various types of nuclear reactions.
		CO2	Understand the concept of radioactivity, its applications and different types of equilibria in radioactive elements.
		CO3	Understand various types of nuclear detectors and their applications.
		CO4	Demonstrate and understand the quantum mechanical concepts.
		CO5	Demonstrate quantitative problem solving skills in all the topics covered.
	Maths - I	CO1	Understand the Real Number System and an approach to prove mathematical statements.
		CO2	Learn the concept of Sequences in R, nature of Sequences and limits of some standard sequences.
		CO3	Learn the difference between differential equation and first order differential equation.
		CO4	Learn terms related to first order differential equations and its applications.
	Maths - II	CO1	Understand Fundamental Properties of Integers- Divisibility, Prime numbers, Congruence Modulo n and Solve Sums based on the same.
		CO2	Identify whether a given relation is a function, Identify its type and Calculate Inverse for Bijective Functions.
		CO3	Identify if the given Operation is Binary.
		CO4	Identify if the given Relation is Equivalence and Calculate the Partitions of Equivalence Classes so formed
		CO5	Understand the relation between coefficients of a polynomial and its Roots and use the same to solve sums.
	Botany - I	CO1	Understand the Life cycle of Algae (Nostoc, Spirogyra) and its economic importance.
		CO2	Understand the Life cycle of Fungi (Rhizopus, Aspergillus) and its economic importance.
CO3		Understand general characteristic of Hepaticae, Chlorophyta and Phycomycetes.	
CO4		Understand the Life cycle of Riccia.	
Botany - II	CO1	Understand cell structure and cell organelle of prokaryotic and eukaryotic cells	
	CO2	Identify and study the difference between chloroplast and mitochondria	
	CO3	Understand energy pyramids and different types of ecosystems	
	CO4	Understand genetic inheritance, mendelian and post mendelian phenomenon and also to calculate the possibility of genetic disorders in organisms	



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FYBSc SEM-II	Foundation Course II	CO1	Overview of Globalisation and Indian society and its impact on Indian society.
		CO2	Understand the concept of Human rights, its evolution and concepts.
		CO3	Understand the Importance of Environment Studies in the current developmental context and its sustainable development.
		CO4	Understand the concept of stress and learn different methods to manage stress.
	Chemistry - I	CO1	Students able to use the evidence-based comparative chemistry approach to explain chemical synthesis and analysis.
		CO2	Characterise, identify and separate components of organic or inorganic origin and will also be able to analyse them by making use of the modern instrumental methods learned.
		CO3	Understand the basic principle of equipment and instruments used in the chemistry laboratory.
		CO4	Demonstrate the experimental techniques and methods of their area of specialisation in Chemistry
	Chemistry - II	CO1	Acquire core competency in the subject Chemistry, and in allied subject areas.
		CO2	Develop critical thinking ability by way of solving problems/numerical using basic chemistry knowledge and concepts.
		CO3	Appreciate the central role of chemistry in our society and use this as a basis for ethical behaviour in issues facing chemists including an understanding of safe handling of chemicals, environmental issues, and key issues facing our society in terms of energy, health, and medicine.
		CO4	The course curriculum is designed to inculcate a habit of learning continuously through the use of advanced ICT techniques and other available techniques/books/journals for personal academic growth as well as for increasing employability opportunity.
	Physics - I	CO1	Understand the concept of lens, lens defects and their minimization.
		CO2	Understand: Significance of combination of lenses implied to eyepiece of optical instrument.
		CO3	Understand interference of light with few well known daily life examples.
		CO4	Understand Lasers and Optical fibres, their applications in day to day life.
	Physics- II	CO1	Understand the basic concepts of Alternating current theory, AC bridges and Circuit Theorems.
		CO2	Understand the basics of Analog and Digital Electronics and apply them in real life situations.
		CO3	Demonstrate quantitative problem solving skills in all the topics covered.
		CO4	Understand the basic concepts of different number system.
	CO1	Students learn the concepts like functions, graphs of some standard function, properties and limit of functions, continuity of functions.	
	CO2	Students learn the difference between finite and infinite limits. Students will learn and understand the	



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	Maths - I		geometrical interpretation of continuous function, discontinuous function and its type.
		CO3	Students learn the concept of Differentiation of Real valued Function, its geometrical interpretation, its properties and some standard theorems based on the same. The concept of higher order derivative will be introduced to the students.
		CO4	Students learn the application of differentiation, ways to find maxima and minima of the given functions and some standard theorems like Rolle's theorem, Lagrange's Mean Value theorem, Cauchy's Mean Value theorem, L' Hospital Rule and Taylor's theorem.
		CO1	Students Understand the concept of Countable and Uncountable Sets and are able to classify given sets into their types based on Cardinality.
		CO2	Students can solve sums based on Counting Principles of Permutations, Combinations, Inclusion Exclusion and Pigeon Hole.
		CO3	Students Understand the Concept of Permutation of sets and are able to prove results on the same.
	Maths - II	CO4	Students Understand the concept of Recurrence relations, Derive Results for the same and are able to solve sums using the result
		CO1	Understand the Life cycle of Pteridophytes (Nephrolepis) and its alternation of generation.
		CO2	Understand the Life cycle of Gymnosperms (Cycas) and economic importance of Gymnosperms.
	Botany - I	CO3	Study and identify the basic Angiospermic terms and difference between leaves and their modification.
		CO4	Study angiosperm family Malvaceae and Amaryllidaceae along with their economic importance.
	Botany - II	CO1	Understand the Anatomical differences between Dicotyledonous and Monocotyledonous plants with special reference to root, leaves, epidermal outgrowth, stomata and stem.
		CO2	Understand the basic concept of Photosynthesis through different cycles like Cyclic Photophosphorylation, Non-Cyclic Photophosphorylation, C3 pathway, C4 pathway and CAM pathways.
		CO3	Understand and identify primary and secondary metabolite present in plants along with their activity.
		CO4	Study and identify plants in respect to their botanical source, part of the plant used, active constituents present and medicinal uses of Ocimum sanctum, Adhatoda vasica, Zingiber officinale, Curcuma longa, Santalum album, Aloe vera.
	Foundation Course III	CO1	Develop a basic understanding about the issues related to Human Rights of weaker sections and their legal rights and constitutional rights.
		CO2	Develop communication skills.
		12 CO3	Make them aware of disaster preparedness and after disaster measures to be taken.
		CO4	Develop understanding amongst students the values of science and what are the superstition which has science associated with it.
			Understand various thermodynamics properties and



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	Chemistry I	CO1	to develop numerical solving ability.
		CO2	Understand conductance and applications of conductance measurements and numerical associated with it.
		CO3	Understand types of bonding and to learn theories related to Valence bond theory and Molecular theory.
		CO4	Learn reactions and reactivity of halogenated hydrocarbons ,alcohols , phenols and Epoxides.
	Chemistry II	CO1	Study the rate of reaction and its application.
		CO2	Understanding about the p block elements and thus having an idea of various characteristics, properties and reactions shown by the elements.
		CO3	Introduce various carbonyl compounds and study the IUPAC nomenclature.
		CO4	Understand various reactions associated with the preparation of carbonyl compounds along with their detailed mechanisms.
	Chemistry III	CO1	Introduce the basic analytical techniques and its applications in various branches of chemistry.
		CO2	Make learners capable of solving problems related to statistical data.
		CO3	Explain the classical and non-classical methods of analysis and giving an overview of basic instrumental techniques.
		CO4	Give the learner an opportunity to get hands-on experience on various analytical techniques.
	Physics I	CO1	Understand the concepts of mechanics & properties of matter & to apply them to problems.
		CO2	Comprehend the basic concepts of thermodynamics & its applications in physical situation.
		CO3	Learn about situations in low temperatures.
		CO4	Demonstrate tentative problem solving skills in all above areas.
	Physics II	CO1	Students know about Curl, Divergence and Curl.
		CO2	Students learn about Cylindrical & Spherical Coordinates.
		CO3	Students know about in details of Transistor application.
		CO4	Students Learn Different operations of amplifie Using IC741.
Physics III	CO1	Appreciate the role of Physics in 'interdisciplinary areas related to materials, Bio Physics, Acoustics etc.	
	CO2	Exposed to contextual real life situations.	
	CO3	Understand the scope of the subject in Industry & Research.	
	CO4	Experiential learning opportunities will faster creative thinking & a spirit of inquiry.	
Maths I	CO1	Concept of Series, converging and diverging nature of some standard series will be introduced to students.	
	CO2	Students learn the Ratio, Root, Cauchy Condensation, Albel and Dirichlet test to determine convergence and divergence of series.	



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		CO3	Students learn to determine the area under the curve using Riemann Integration concept.
		CO4	Students learn the applications of integration and improper integral.
SYBSc SEM-III	Maths II	CO1	Students understand applications of Matrices in solving Linear and Non Linear Equations and can apply their knowledge to solve sums based on the same.
		CO2	Students can prove various results on Number of solutions of Linear system of equations
		CO3	Students can Identify whether a given Set over a field is a Vector Space or not. They are also able to calculate its basis and dimension
		CO4	Students learn Laplacian Expansion of determinants and are able to prove properties of Determinants.
	Maths III	CO1	Students learn the concept of higher order derivative, different methods to find general solutions of homogeneous and non-homogeneous differential equations.
		12CO2	Students learn the concept of linear system of ordinary differential equation and different methods to find general solutions of homogeneous and non-homogeneous linear differential equations.
		CO3	Various methods to find a numerical solution of ordinary differential equations introduced to the students.
		CO4	Students learn the concept of error, accuracy and Taylor series.
	Botany I	CO1	Understand and study the general characteristic features with identification of division Phaeophyta with its economic importance
		CO2	Study the life cycle of Sargassum
		CO3	Understand general characteristic features and identification of class Anthocerotae and Musci with its economic importance
		12 CO4	Study the life cycle of Anthoceros
CO5		Study the life cycle of Funaria	
CO6		Understand various Plant Nomenclature system	
CO7		Study the concept of Plant Taxonomy in relation to Anatomy, Palynology, Chemical constituents, Embryology, Cytology and Ecology	
CO8		Study and understand Bentham and Hooker system of classification	
CO9		Study the vegetative, floral characters and economic importance of family Leguminosae along with its subfamily Papilionaceae, Caesalpinaceae and Mimosoideae	
CO10		Study different preservation techniques including Wet and Dry methods	
CO11		Study principle, technique and working of light and electron microscopy	
CO12		Study principle, technique and working of Chromatography	



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		CO13	Study principle, technique and working of Horizontal and Vertical Electrophoresis
	Botany II	C1201:	Study the ultrastructure of Mitochondria, cristae and F1 particle
		CO2:	Study the ultrastructure of Peroxisome and Glyoxysomes
		CO3:	Study the ultrastructure of prokaryotic and eukaryotic ribosome
		CO4:	Understand and study cell cycle
		CO5:	Understand and study cell division and its types Mitosis and Meiosis
		CO6:	Study and understand nucleic acid DNA and RNA, its structure and function
		CO7:	Study and understand variation in chromosome structure, aberration like deletion, duplication, inversion and translocation
		CO8:	Study and understand different types of sex determination, sex linked disorder, sex influenced and sex limited traits
		12CO9:	Study different types of organelle heredity and plastid transmission in plants
		CO10:	Study and understand Streptomycin resistance in Chlamydomonas and Male sterility in Maize
		CO11	Study and understand different modes of DNA Replication
		CO12:	Study and understand DNA replication in Prokaryotic and Eukaryotic organisms
		CO13:	Study and understand DNA Transcription in Prokaryotic and Eukaryotic organisms
		CO14	Study and understand hnRNA processing Adenylation, Splicing and Capping
	Botany III	CO1:	Study the importance of Pharmacopoeia
		CO2:	Study different types of Pharmacopoeia like Indian Pharmacopoeia, Herbal Pharmacopoeia and Ayurvedic Pharmacopoeia
		CO3:	Study and understand different Monographs
		CO4:	Study and understand secondary metabolites and various adulterant
		CO5:	Study and understand the outline of forests in India
		CO6:	Study and understand urban forestry, organic farming and silviculture
		CO7:	Study and understand different forest based industry
		CO8:	Study different types of fiber and industry associated with fiber
		CO9:	Study the commercial market of spices
		CO10:	Study different types of condiments and spices
	Foundation Course IV	CO1	Students understand the right of citizen ,RTI,Protection of Citizens'/Public Interest.
		CO2	Students understand the ecology and environmental principles.
		CO3	Students get acquainted with the different technologies and their use and misuse.
		CO4	Students know about the eligibility ,pattern and different soft skills required for the various Competitive exams for Government service and professional courses.



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SYBSc SEM-IV	Chemistry I	CO1	Study the various Electrochemical cells and develop a problem solving ability amongst students.
		12 CO2	Understand the various properties associated with transition series.
		CO3	Explain coordination complexes their hybridization, VBT and its applications.
		CO4	Learn about Carboxylic acids and sulphonic acids and their various methods of preparation, derivatives, chemical and physical properties.
	Chemistry II	CO1	Explain the learner physical aspects of a solid and the properties associated with it.
		CO2	Giving the learner a general overview of Environmental chemistry of volatile oxides and oxo-acids.
		CO3	Study amines, diazonium salts and introduce heterocyclic compounds
		CO4	Make the learner capable of analysing and interpreting results of the experiments he conducts or performs.
	Chemistry III	CO1	Explain various separation techniques using demonstrative methods and practicals.
		CO2	Explain the theory of instrumental techniques, its working, instrumentations and the graphs obtained for data analysis.
		CO3	Teach various statistical analysis methods and make students capable to interpret and analyse various statistical data.
		CO4	Make the learner proficient in analysing the various observations and Chemical phenomena presented to him during the course.
	Physics I	CO1	Understand the diffraction and polarisation processes and applications of them in physical situations.
		CO2	Understand the applications of interference in design and working of interferometers.
		CO3	Understand the resolving power of different optical instruments.
		CO4	Understand the working of digital circuits.
	Physics II	CO1	Students know the difference between Classical Physics view & Quantum Mechanical View.
		CO2	Students know about Schrodinger time dependent and independent equations.
		CO3	Students know about Application of schrodinger equations.
		CO4	Students get an Introduction in brief of Quantum Physics.
Physics III	CO1	Understand the concepts of Geophysics.	
	CO2	Comprehend the basic concepts of Microprocessor.	
	CO3	Learn about geo - environmental sciences.	
	CO4	Study the concept of radiation physics.	



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	Maths I	CO1	Student learn about vector valued and scalar valued functions, ways to find limits and continuity of vector valued and scalar valued functions.
		CO2	Concept of directional derivatives, partial derivatives, gradient and mean value theorem will be introduced to the students.
		CO3	Students learn to find differentiation of scalar field. They will also learn Youngs, Eulers and Schwartz theorems.
		CO4	Students learn the application of differentiation of scalar and vector fields.
	Maths II	CO1	Concept of linear transformation, vector isomorphism, Null-space (kernel), image (range) and Nullity and rank of a linear transformation will be introduced to the students. Students will learn how to represent linear transformation using matrices.
		CO2	Students will learn the basic concept of inner product space and its properties, also they will learn about orthogonal basis and orthonormal basis.
		CO3	Students will be acquainted with the knowledge of eigen values, eigen vectors and the concept of diagonalisation.
		CO4	Invariance of the characteristic polynomial and eigenvalues of similar matrices, Spectral Theorem for Real Symmetric Matrices will be introduced to the students.
	Maths III	CO1	Students are introduced to the concept of Errors in Approximation and can calculate Absolute, Relative & % Errors.
		CO2	Students can solve Algebraic and Transcendental equations using various Numerical Methods like Newton Raphson, Regula Falsi etc.
		CO3	Students derive formulae for Various Numerical Methods and calculate the Rate of Convergence of each Method
		CO4	Students are able to Solve Linear Equations using LU Decomposition Method
	Botany I	CO1	To understand and study the general characteristic features with identification of Ascomycetae
		CO2	To study the life cycle of Erysiphe
		CO3	To study the life cycle of Xylaria
		CO4	To study the disease cycle, symptoms, causative organism and control measures of Powdery mildew
		CO5	To study the disease cycle, symptoms, causative organism and control measures of Late blight of Potato
		CO6	To study and understand the classification, structure, methods of reproduction economic importance and ecological significance of lichen
		CO7	To understand and study the general characteristic features with identification of division Psilophyta
CO8		To understand and study the general characteristic features with identification of division Lepidophyta	
CO9:		To study the life cycle of Selaginella	
CO10:		To study different types of fossil and geological time scale	
CO11:		To understand and study the general characteristic features with identification of division Coniferophyta	



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	Botany II	CO12:	To study the systematic position of form genus Cordaites
		CO13:	To study the life cycle of Pinus
		CO1	To study and understand normal secondary growth in Dicotyledonous stem and root
		CO2	To study and understand mechanical tissue system and different types of vascular bundles
		CO3	To study and understand aerobic respiration (Glycolysis, TCA cycle, ETS pathway) and anaerobic respiration
		CO4	To study and understand Photorespiration and Photoperiodism
		CO5	To study and understand Vernalization
		CO6	To study and understand various biogeochemical cycles (Carbon, Nitrogen and Water)
		CO7	To study and understand soil composition, soil formation and soil profile
		CO8	To study and understand community ecology
		CO9:	To study and understand environmental factors
			Botany III
CO2	To study and understand gardening and its types		
CO3	To study the uses of different plants used in gardening		
CO4	To study and understand the importance of botanical gardens and national parks		
CO5	To study and understand the laboratory techniques involved in plant tissue culture		
CO6	To study and understand the concept of Totipotency and Organogenesis		
CO7	To study and understand root culture, pollen culture and embryo culture using plant tissue culture		
CO8	To study and understand Recombinant DNA technology		
CO9:	To study and understand the process of Gene cloning		
CO10:	To study and understand enzymes and vectors involved in gene cloning		
CO11:	To study and understand the use of bioinformatics in botany		
CO12:	To study and understand tools for data retrieval ENTREZ		
CO13:	To study and understand the use of biostatistics keeping in view its uses in research		



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