



ST. JOSEPH'S COLLEGE (ARTS & SCIENCE)

Affiliated to University of Madras | 2(f) Status of UGC Act, 1956

ISO 9001 : 2015 Certified Institution

Kovur, Chennai – 600 128

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COURSE OUTCOMES:

FIRST YEAR

SEMESTER I

SUBJECT NAME: TAMIL –I – TAMIL ILAKKIYA VARALARU -I	
SUBJECT CODE: 100L1A	
CO1	சங்க இலக்கியத்தில் காணப்பெறும் வாழ்வியல் சிந்தனைகளை அறிந்து கொள்வர்.
CO2	அற இலக்கியம் மற்றும் தமிழ் காப்பியங்களின்வழி வாழ்வியல் சிந்தனையைப் பெறுவர்
CO3	பக்தி இலக்கியங்களைக் கற்பதன் மூலம் பக்தி நெறியினையும், பகுத்தறிவு இலக்கியங்களைக் கற்பதன் வழி நல்லிணக்கத்தையும் தெரிந்து பின்பற்றுவர்
CO4	மொழியறிவோடு சிந்தனைத்திறனைப் பெறுவர்.
CO5	மொழிப்பயிற்சிக்குத் தேவையான இலணகங்களை கற்பர்.

SUBJECT NAME: GENERAL ENGLISH - I	
SUBJECT CODE: 100L1Z	
CO1	Acquire self-awareness and positive thinking required in various life situations
CO2	Acquire the attribute of empathy.
CO3	Acquire creative and critical thinking abilities.
CO4	Learn basic grammar
CO5	Development and integrate the use of four language skills i.e., listening, speaking, reading and writing.

SUBJECT NAME: PROPERTIES OF MATTER & SOUND	
SUBJECT CODE: 138C1A	
CO1	Relate elastic behaviour in terms of three moduli of elasticity and working of torsion pendulum.
CO2	Understand and appreciate the concept of bending of beams and analyze the expression, quantify and understand nature of materials
CO3	Explain the surface tension and viscosity of fluid and support the interesting phenomena associated with liquid surface, soap films provide an analogue solution to many engineering problems.
CO4	Analyze simple harmonic motions mathematically and apply them. Understand the concept of resonance and use it to evaluate the frequency of vibration.
CO5	Justify the importance of constructing buildings with good acoustics after understanding



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the concept of acoustics. Able to apply their knowledge of ultrasonics in real life, especially in medical field and assimilate different methods of production of ultrasonic waves.

SUBJECT NAME: ELECTRONICS

SUBJECT CODE: 138C1B

CO1	Discuss the fundamental concepts involved with gates, standard representation of logic functions and arithmetic circuits. Apply De-Morgan's theorem, minimization techniques to solve and design circuits.
CO2	Understand the construction and working of various Flip-Flops and appreciate their application.
CO3	Know the principles and applications of transistors and types of transistor biasing and amplifiers.
CO4	Discuss the role of negative and positive feedback amplifiers. Explain the Constructional features, basic theory of operation and I-V characteristics of various semiconductor devices.
CO5	Classify various memory devices and their functions.

SUBJECT NAME: MATHEMATICS - I

SUBJECT CODE: 138E1A

CO1	Understand the concepts of Summation of Series.
CO2	Understand the concepts of Cayley Hamilton Theorem and inverse matrices.
CO3	Understand the concepts of finite differences.
CO4	Understand the knowledge about expansions, hyperbolic and inverse hyperbolic Functions.
CO5	Understand the concept of Leibnitz theorem and functions of two variables.

SUBJECT NAME: PHYSICS FOR EVERYDAY LIFE

SUBJECT CODE: 138S0A

CO1	Students will demonstrate a clear understanding of fundamental physics concepts, including motion, forces, energy, waves, electricity, and thermodynamics, and explain how these concepts are relevant to daily life.
CO2	Students will demonstrate the ability to design simple experiments, collect data, and analyze results using the scientific method, in order to investigate real-life physics phenomena.
CO3	Students will explain the role of physics in the development of modern technologies such as electronics, renewable energy systems, medical devices, and transportation, and understand how these technologies influence daily life.



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CO4	Students will develop scientific literacy by critically evaluating physics-related information in the media, public policy discussions.
CO5	Students will recognize the interdisciplinary nature of physics, understanding how it interacts with and contributes to fields like chemistry, biology, environmental science.

SUBJECT NAME: INTRODUCTORY PHYSICS SUBJECT CODE: 138B1A

CO1	Apply concept of vectors to understand concepts of physics and Solve problems.
CO2	Explain the theory of error analysis and estimate the percentage of errors in the experimental values.
CO3	Demonstrate the use of mechanical, electrical and electronic instruments required for performing experiments in this course.
CO4	Differentiate the various number systems in use and do the numerical conversion.
CO5	Justify the need for various semiconductor devices and understand their characteristics and working.

SEMESTER – II

SUBJECT NAME: TAMIL-II –TAMIL ILAKKIYA VARALARU -II SUBJECT CODE: 100L2A

CO1	சிற்றிலக்கியங்கின் வழி இலக்கியச் சுவையினையும் பண்பாட்டு அறிவினையும் பெறுவர்
CO2	புதுக்கவிதை வரலாற்றினை அறிந்து கொள்வர்
CO3	திராவிட இயக்க இலக்கியங்களைக்கற்பதன் மூலம் மொழி உணர்வு, இன உணர்வு, சமத்துவம் சார்ந்த சிந்தனையும் பெறுவர்
CO4	தமிழ் மொழியைப் பிழையின்றி எழுதவும், புதிய கலைச்சொற்களை உருவாக்கவும் அறிந்து கொள்வர்
CO5	போட்டித் தேர்வுகளில் வெற்றி பெறுவதற்கு தமிழ்ப் பாடத்தினைப் பயன்கொள்ளும் வகையில் பயிற்சி பெறுவர்

SUBJECT NAME: GENERAL ENGLISH -II SUBJECT CODE: 100L2Z

CO1	Realize the importance of resilience
CO2	Become good decision-makers
CO3	Imbibe problem-solving skills
CO4	Use tenses appropriately
CO5	Use English effectively at the work place.



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SUBJECT NAME: HEAT, THERMODYNAMICS AND STATISTICAL PHYSICS SUBJECT CODE: 138C2A

CO1	Outline the physical laws and principles in heat, thermodynamics and statistical Physics, identify the relationship between heat capacity, specific heat capacity and understand cryogenics, superconductivity, superfluidity and low temperature physics.
CO2	Explain the theories and experiments in statistical physics and thermodynamical applications and discuss the implications of the laws of Thermodynamics in diesel and petrol engines.
CO3	Analyze performance of thermodynamic systems viz efficiency by problems.
CO4	Apply the process of thermal conductivity to good and bad conductors. Quantify different parameters related to heat, relate them with various physical parameters and analyse them.
CO5	Interpret classical statistics concepts such as phase space, ensemble, Maxwell-Boltzmann distribution law. Develop the statistical interpretation of Bose-Einstein and Fermi-Dirac statistics.

SUBJECT NAME: ALLIED MATHEMATICS II SUBJECT CODE: 138E2A

CO1	Understand the various concepts of Bernoulli's and Reduction Formula.
CO2	: Understand the concepts of Fourier Series.
CO3	Understand the concepts of Non-Homogenous and Partial Differential Equations.
CO4	Understand the Laplace Transforms.
CO5	Understand the concepts of Vector Differentiation.

SUBJECT NAME: ASTROPHYSICS SUBJECT CODE: 138SOB

CO1	Students will demonstrate a deep understanding of astrophysical principles, including stellar formation, evolution, and death, the physics of black holes, galaxies, and the expanding universe.
CO2	Students will apply advanced mathematical methods, such as differential equations, vector calculus, and Fourier transforms, to solve astrophysical problems.
CO3	To analyse and interpret astronomical data from telescopes and space observatories.
CO4	To understand the importance of simulations in contemporary astrophysical research.
CO5	To critically evaluate and synthesize research papers in astrophysics, identify current trends



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SUBJECT NAME: PHYSICS OF MEDICAL INSTRUMENTS

SUBJECT CODE: 138SOC

CO1	To understanding of the principles behind medical instruments, including imaging devices, diagnostic tools, and therapeutic equipment.
CO2	To understand the functioning of medical instruments used in diagnosis and treatment.
CO3	To understand troubleshooting various medical instruments, such as ultrasound machines, X-ray systems, and ECG devices.
CO4	To analyze and interpret data produced by medical instruments to make informed decisions about patient care.
CO5	To understand the safety protocols associated with medical equipment and the importance of accurate measurements to ensure patient safety.

III SEMESTER

SUBJECT NAME: TAMIL –III –TAMILAGA VARALARUM PANBADUM

SUBJECT CODE: 200L3A

CO1	தமிழக வரலாற்றை அறிந்துகொள்வர்
CO2	தமிழரின் வாழ்வியல் தொன்மையை அறிவர்
CO3	தமிழரின் பண்பாட்டுக் கூறுகளை அறிந்துகொள்வர்
CO4	பிற பண்பாட்டுத் தாக்கம் மற்றும் அணுகுமுறை அறிவர்.
CO5	மொழிப்பயிற்சிக்குத் தேவையான இலக்கணங்களைக் கற்பர்.

SUBJECT NAME: GENERAL ENGLISH -III

SUBJECT CODE: 200L3Z

CO1	Determine their goals
CO2	Identify the value of integrity
CO3	Frame grammatically correct sentences
CO4	Master grammar skills
CO5	Write cohesive reports..



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SUBJECT NAME: GENERAL MECHANICS AND CLASSICAL MECHANICS SUBJECT CODE: 238C3A

CO1	Understand the Newton's Law of motion, general theory of relativity, Kepler's laws and realize the basic principles behind planetary motion.
CO2	Acquire the knowledge on the conservation laws.
CO3	Apply conservation law and calculate energy of various systems. Understand and differentiate conservative and non-conservative forces.
CO4	Gain knowledge on rigid body dynamics and solve problems based on this concept.
CO5	Understand the importance of Lagrangian system of mechanics.

SUBJECT NAME: PROGRAMMING TECHNIQUES USING C SUBJECT CODE: 238E3A

CO1	Outline the fundamental concepts of computers, programming languages and Problem-solving Techniques using C.
CO2	Demonstrate the programming methodology
CO3	Identify suitable programming constructs for problem solving.
CO4	Select the appropriate data representation, control structures, functions and concepts based on the problem requirement
CO5	Solve simple, mathematical and logical problems in „C“.

SUBJECT NAME: HOME ELECTRICAL INSTALLATION SUBJECT CODE: 238S0D

CO1	Knowledge of the basic components and functions of home electrical systems, including wiring, circuit breakers, and outlets.
CO2	To develop practical skills to install electrical wiring, fixtures, and appliances in compliance with safety standards and regulations.
CO3	To identify and troubleshoot common electrical issues in homes and perform basic repairs and maintenance.
CO4	To Understand and apply safety measures to prevent electrical hazards and ensure the safe operation of home electrical systems.
CO5	Students will become familiar with local electrical codes and regulations, ensuring all installations meet legal and safety requirements.



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SUBJECT NAME: PHYSICS OF MUSIC

SUBJECT CODE: 238S0E

CO1	Fundamental principles of sound waves, including frequency, amplitude, and wavelength, and their role in music production.
CO2	Physics behind different musical instruments, understanding how they produce sound through vibration, resonance, and air movement.
CO3	Concept of harmonics, pitch, and tone quality, and how they influence the sound characteristics of musical notes.
CO4	To Understand how sound travels through various mediums and the factors affecting sound quality, such as temperature and environment.
CO5	Students will examine how modern technology is used in music production, including audio processing, amplification, and recording techniques.

IV SEMESTER

SUBJECT NAME: TAMIL -IV

SUBJECT CODE: 200L4A

CO1	தாய்மொழி வழியாக அறிவியல் பற்றிச் சிந்திக்கும் திறன் பெற்றிருப்பர்.
CO2	அறிவியல் கலைச் சொல்லாக்கம் பற்றிய விதிகள், நுணுக்கங்களைத் தெரிந்திருப்பர்
CO3	அறிவியல் தமிழ் வளர்ச்சியில் மொழிபெயர்ப்பின் பங்கு குறித்து அறிந்திருப்பர்.
CO4	மொழியறிவோடு சிந்தனைத்திறனைப் பெறுவர்.
CO5	மொழிப்பயிற்சிக்குத் தேவையான இலணக்கங்களை கற்பர்.

SUBJECT NAME: GENERAL ENGLISH - IV

SUBJECT CODE: 200L4Z

CO1	Listen actively.
CO2	Develop interpersonal relationship skills
CO3	Acquire self-confidence to cope with stress
CO4	Master grammar skills
CO5	Carry out business communication effectively.



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SUBJECT NAME: OPTICS AND SPECTROSCOPY

SUBJECT CODE: 238C4A

CO1	Outline the basics of optics and concepts associated with lenses, prisms, eyepieces. Differentiate the resolving power of different optical instruments, and articulate their technological applications
CO2	Discuss the principle of superposition of waves, use these ideas to understand the wave nature of light through working of interferometer
CO3	Extend the knowledge about nature of light through diffraction techniques, apply mathematical principles to analyse the optical instruments
CO4	Interpret basic formulation of polarization and gain knowledge about polarimeter, appraise its usage in industries
CO5	Relate the principles of optics to various fields of IR, Raman and UV spectroscopy and understand their instrumentation and application in industries

SUBJECT NAME: JAVA PROGRAMMING

SUBJECT CODE: 238E4A

CO1	Outline the basic terminologies of OOP, programming language techniques
CO2	Solve problems using basic constructs, mechanisms, techniques and technologies of Java
CO3	Analyse and explain the behavior of simple programs involving different techniques such as Inheritance, Interfaces and Exception Handling
CO4	Assess various problem-solving strategies involved in Java.
CO5	Design Java programs using suitable OOP concepts and techniques for any given concept.

SUBJECT NAME: ELECTRONIC DEVICES

SUBJECT CODE: 238S4A

CO1	Understand the physical principles behind the behaviour of charge carriers in semiconductors and the formation of pn-junctions.
CO2	Ability to apply principles of biasing, load line analysis, and small-signal analysis in transistor circuits.
CO3	Understand the application of electronic devices in different systems such as amplifiers, voltage regulators, oscillators, rectifiers, and signal processing circuits.
CO4	Design simple analog circuits and understand their role in real-world applications like power electronics, communication systems, and digital electronics.
CO5	Develop practical skills in using laboratory instruments such as oscilloscopes, signal generators, and multimeters to measure and test electronic devices and circuits.



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SUBJECT NAME: COMMUNICATION SYSTEM

SUBJECT CODE: 238S4B

CO1	Understand the fundamental types of communication systems (e.g., point-to-point, broadcast, and mobile communication systems).
CO2	Learn about the principles of signal modulation and demodulation, bandwidth requirements, and the trade-offs involved in analog modulation techniques.
CO3	Understand the concept of multiplexing (TDM, FDM) and its application in digital systems.
CO4	Acquire knowledge of key signal processing techniques used in communication systems, including filtering, Fourier analysis, and digital signal processing.
CO5	Understand the process of demodulation and the use of carrier recovery techniques.

SUBJECT NAME: ENVIRONMENTAL STUDIES

SUBJECT CODE: ENV4B

CO1	To develop the ability to think critically and analytically about complex environmental issues, using interdisciplinary approaches to problem-solving.
CO2	Apply theoretical concepts to real-world environmental problems, using case studies, research, and practical scenarios to understand environmental challenges and solutions.
CO3	Demonstrate an awareness of the importance of sustainability in all aspects of environmental management and development, emphasizing the need for balance between ecological, social, and economic factors.
CO4	It Will provide a broad understanding of global environmental issues while recognizing the importance of local and regional environmental challenges and solutions.
CO5	It creates an understanding of the ethical implications of human actions on the environment and will be able to make informed, responsible decisions in environmental management.

V SEMESTER

SUBJECT NAME: RELATIVITY AND QUANTUM MECHANICS

SUBJECT CODE: 338C5A

CO1	Understand various postulates of special theory of relativity.
CO2	Appreciate the importance of transformation equations and also the general theory of relativity.
CO3	Realize the wave nature of matter and understand its importance
CO4	Derive Schrodinger equation and also realize the use of operators.
CO5	Apply Schrödinger equation to simple problems.



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SUBJECT NAME: SOLID STATE PHYSICS

SUBJECT CODE: 338C5B

CO1	Classify the bonding & crystal structure also learn about the crystal structure analysis using X ray diffraction.
CO2	Understand the lattice dynamics and thus learn the electrical and thermal properties of materials.
CO3	Give reason for classifying magnetic material on the basis of their behaviour.
CO4	Comprehend the dielectric behavior of materials.
CO5	Appreciate the ferroelectric and super conducting properties of materials.

SUBJECT NAME: ATOMIC PHYSICS AND LASERS

SUBJECT CODE: 338C5C

CO1	List the properties of electrons and positive rays, define specific charge of positive rays, know different mass spectrographs.
CO2	Outline photoelectric effect and the terms related to it, state laws of photoelectric emission, explain experiments and applications of photo electric effect, solve problems based on photoelectric equation
CO3	Explain different atom models, describe different quantum numbers and different coupling schemes.
CO4	Differentiate excitation and ionization potentials, explain Davis and Goucher's experiment, apply selection rule, analyse Paschen-Back effect, compare Zeeman and Stark effect.
CO5	Understand the condition for production of laser, appreciate various properties and applications of lasers.

SUBJECT NAME: MICROPROCESSOR 8085 AND MICROCONTROLLER

SUBJECT CODE: 338C5D

CO1	Understand the architecture & organization of microprocessor 8085 and familiarize the instruction set of microprocessors 8085
CO2	Apply the software instructions to write efficient assembly language programs
CO3	Illustrate the interfacing of peripheral devices with 8085 microprocessors
CO4	Acquire basic knowledge on the hardware of 8051 microcontroller
CO5	Execute assembly language programs through practical work



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SUBJECT NAME: PYTHON PROGRAMMING

SUBJECT CODE: 338E5A

CO1	Understand the fundamental concepts in python.
CO2	Acquire programming skills in python.
CO3	Apply the different data types available in python
CO4	Analyze and select proper concepts to execute python script.
CO5	To develop python script to solve the given problems.

SUBJECT NAME: RELATIONAL DATABASE MANAGEMENT SYSTEMS

SUBJECT CODE: 338E5B

CO1	Understand the model, architecture and Schema of RDBMS.
CO2	Outline the fundamental RDBMS concepts and PL/SQL.
CO3	Apply database operations, normalization, SQL and PL/SQL.
CO4	Analyze the requirements to implement relational database concepts
CO5	Evaluate the database based on various models and normalization.

SUBJECT NAME: VALUE EDUCATION

SUBJECT CODE: VAE5Q

CO1	Develop the ability to make ethical decisions in personal and professional life, guided by a strong value system.
CO2	Cultivate empathy, respect for human rights, and a sense of responsibility toward the welfare of others and the environment.
CO3	Develop holistically, balancing intellectual, emotional, physical, and social growth to become well-rounded, responsible individuals.
CO4	Demonstrate leadership skills and the ability to work effectively in teams, fostering collaborative efforts for social and environmental causes.
CO5	Enhance their critical thinking, problem-solving, and decision-making skills, applying these abilities to real-world challenges in their communities and beyond.

SEMESTER VI

SUBJECT NAME: ELECTRICITY AND ELECTROMAGNETISM

SUBJECT CODE: 338C6A

CO1	Describe the concept of electric charges and electric fields. Explain Gauss' Law, its differential form and application
CO2	Understand the basics of capacitors and dielectrics and solve relevant problems
CO3	Differentiate electric field and potential and solve problems. Explain Poisson's and Laplace's equations. Discuss the AC circuits containing resistance, Inductance and capacitance
CO4	Discuss the magnetic effect of electric current and its application
CO5	Interpret the magnetic properties of materials. Derive Maxwell's equations and discuss the nature of electromagnetic waves



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SUBJECT NAME: NUCLEAR AND PARTICLE PHYSICS

SUBJECT CODE: 338C6B

CO1	Describe various models that explain about the nuclear structures
CO2	Give reason for various kinds of radioactivity and also know laws governing them
CO3	Know the principles and applications of various particle detectors and accelerators.
CO4	Discuss the concepts used in nuclear reaction.
CO5	Classify various elementary particles and study the effect of cosmic rays

SUBJECT NAME: MOBILE APPLICATION DEVELOPMENT LAB

SUBJECT CODE: 338E6A

CO1	Chart the requirements needed for developing android application
CO2	Apply proper interface setup, styles & themes, storing and management
CO3	Apply techniques for the application activities
CO4	Analyze the problem and add necessary user interface components, graphics and multimedia components into the application.
CO5	Evaluate the results by implementing the concept behind the problem with proper code

SUBJECT NAME: INTERNET OF THINGS

SUBJECT CODE: 338E6B

CO1	Understand the fundamentals of IoT.
CO2	Outline the fundamentals and Architectural Overview of IoT.
CO3	Apply the sensors effectively for IoT application.
CO4	Analyze the challenges faced by IoT smart devices.
CO5	Design IoT applications using the technology available