

SAKET GYANPEETH
SAKET COLLEGE OF ARTS, SCIENCE AND COMMERCE KALYAN EAST
DEPARTMENT OF INFORMATION TECHNOLOGY
COURSE OUTCOMES (COs)
F.Y.B.SC (I.T.) SEM-I

1. PROGRAMMING WITH C (02)	
1	Students can build flowcharts, pseudocode for C programs
2	Students can use C language syntax and semantics in their programs
3	Students can implement loops and decision making.
4	Students can use different types of data structures in their programs.
5	Students can write well-structured, readable, and maintainable C code and debug programs if there are any errors.
2. DATABASE MANAGEMENT SYSTEM (02)	
1	Define and describe the fundamental elements of relational database management system.
2	To relate the basic concepts of relational data model, entity-relationship model, relational database.
3	Design ER-models to represent simple database application scenarios.
4	Understand the normalization and its role in the database design process
5	Transform the ER-model to relational tables, populate relational database and formulate SQL
6	Understand basic database storage structures and access techniques: file and page organizations, indexing methods and hashing.
3. MAJOR PRACTICAL 1 (02)	
1	Students can demonstrate the concepts of datatypes, variables and operators in C.
2	Students can implement the concept of control statements and looping in C program.
3	Students can demonstrate the use of arrays, strings and structures in C
4	Students can implement modular C program using functions and pointers
5	Students can demonstrate the use of arrays, strings and structures in C.
6	Students able to perform various operations such as insert, update delete and retrieve data from database using SQL queries.
7	Students able to perform alteration in tables and can restore and take backup of the database.
8	Students able to perform operations using simple SQL Queries to fetch data and learns various aggregate functions to get single value.
9	Students able to perform SQL Queries using JOIN keyword for joining two or more tables.
10	Students able to perform nested queries using in, exists operators.
11	Students able to create new table by joining one or more tables and learn how to hide attribute from end user.
12	Students able to restrict the user from accessing data in database.
13	Students should be able to create, manipulate the database management system to evaluate the business information problem.

4. COMBINATIONAL AND SEQUENTIAL DESIGN (02)	
1	Students can explain the differences between combinational and sequential circuits, and identify their different applications.
2	Students can define the concept of Boolean algebra and its importance in digital circuit design.
3	Students can explain and apply the principles of K-map simplification and other design techniques.
4	Students can design and construct combinational circuits using Boolean algebra and K-maps.
5	Students can design and implement arithmetic circuits such as adders, subtractors, and multipliers.
6	Students can design and implement data path circuits such as registers, multiplexers, and decoders.
7	Students can implement digital circuits using breadboards, logic probes, and oscilloscopes.
8	Students can troubleshoot and verify the correctness of digital circuits using real-world hardware and measure their performance using various metrics.
5. OFFICE TOOLS FOR DATA MANAGEMENT (02)	
1	Participants can explain normalization importance, identify table relationships, and justify database design choices.
2	Participants create well-structured MS Access databases with proper relationships, data types, and normalization
3	Participants execute advanced queries in MS Access, retrieving specific information based on diverse criteria.
4	Participants design intuitive MS Access forms, incorporating controls for an efficient and user-friendly data entry experience.
5	Participants produce insightful MS Access reports, organizing and presenting data effectively for analysis.
6. INTRODUCTION TO COMMUNICATION SKILLS IN ENGLISH I (02)	
1	Demonstrate an understanding of essential aspects of communication skills.
2	Exhibit the ability to Read a variety of written text using subskills such as skimming and scanning.
3	Identify and rectify common grammatical errors in English.
4	Show competence in delivering compelling presentations and engage in articulate and effective conversations in English across different contexts.
5	Display advanced formal writing skills in crafting job application letters, CVs, and Statements of Purpose.
7. LAW RELATED TO INTELLECTUAL PROPERTY RIGHTS (02)	
1	Learners will be able to study development and reform of intellectual property right institutions and their impact on creativity and innovation.
2	Learners will be able to critically analyze the principles of Tortious liability, develop familiarization of process of Intellectual Property Management (IPM) and various approaches for IPM and conducting IP and IPM auditing and explain how IP can be managed as a strategic resource and suggest IPM strategy

3	Learners will be well equipped with the extensive characteristics of judicial trend related to IPR and the remedies provided under the mechanism set up by the Government Convention of IPR
8. INDIAN KNOWLEDGE SYSTEM (02)	
1	Learner will understand and appreciate the rich Indian Knowledge Tradition
2	Lerner will understand the contribution of Indians in various fields
3	Lerner will experience increase subject-awareness and self-esteem
4	Lerner will develop a comprehensive understanding of how all knowledge is ultimately intertwined
9. INTRODUCTION TO CULTURAL ACTIVITIES (02)	
1	Understand the significance of cultural activities
2	Sensitize students towards Indian culture and its preservation
3	Apply the knowledge and skills of the cultural activities in their practical life
4	Participate in the various cultural activities
10. INTRODUCTION TO COMMERCE (2)	
1	Develop understanding about Commerce and Business
2	Help understand the different forms of Business Organisations
3	Help understand the Business Environment
4	Understand the recent trends in Commerce
11. BASICS OF FINTECH (2)	
1	Student will demonstrate a comprehensive understanding of the FinTech ecosystem, including fintech infrastructure and fintech evolution.
2	Student will evaluate the impact of FinTech innovations on traditional financial services, identifying opportunities and challenges of the industry.
3	Student will apply FinTech concepts and technologies to address real-world financial challenges and opportunities.

DEPARTMENT OF INFORMATION TECHNOLOGY
COURSE OUTCOMES (COs)
S.Y.B.SC (I.T.) SEM-III

1. PYTHON PROGRAMMING (02)	
1	Demonstrate mastery of Python features to tackle a wide range of programming challenges.
2	Utilize control flow statements to ensure accurate and logical program execution.
3	Efficiently manipulate arrays, strings, and data structures to enhance. data handling and problem-solving.
4	Design modular, efficient programs by leveraging functions, modules, and string operations.
5	Manage file operations, employ regular expressions, and manipulate date and time data to improve program functionality and performance.
2. DATA STRUCTURES (02)	
1	Demonstrate knowledge of core data structures and their operations
2	Analyze the time and space complexity of algorithms and choose the most efficient solution for a given problem.
3	Translate algorithmic solutions into correctly functioning code using their chosen programming language.
4	Implement and traverse binary trees and binary search trees, demonstrating their understanding of these structures.
3. OPERATING SYSTEM (02)	
1	Outline the basic concept of operating systems
2	Analyze the working of operating system
3	Examine the working of various scheduling approaches
4	Apply the concepts of synchronization and deadlock
5	Apply the file access mechanisms
4. MAJOR PRACTICAL 3 (02)	
1	Apply Python programming concepts like input/output, conditional statements, and loops, to solve fundamental problems effectively.
2	Demonstrate proficiency in performing basic operations, indexing, slicing, and analyzing attributes of arrays using NumPy.
3	Apply functions, recursion, and lambda expressions to solve computational problems, and implement modular programming for reusable and efficient code design.
4	Implement lists and dictionaries, perform file operations, and use functions to solve real-world problems effectively.
5	Process text, extract information, handle dates, and measure execution time for solving complex real-world problems.
6	Ability to im
7	Proficiency in writing efficient algorithms using suitable data structures for operations like searching, sorting, and traversal.
8	Capability to analyze the time and space complexity of algorithms for various data structures.

9	Enhanced problem-solving skills by applying data structures in different domains such as databases, networks, and operating systems
5. BASIC MATHEMATICS IN REAL LIFE-II (MINOR III) (02)	
1	Understand and remember the polynomials, polynomial graphs, Fibonacci sequence, platonic solids and Matrices
2	Apply the formulas and concepts to solve problems and examples related to quadratic equations recurrence relations, matrices and platonic solids
3	Examine and investigate the growth matrices, echelon form of matrices, and Kirchhoff's Law using matrices.
4	Justify and check the inverse of matrices and applications of the golden ratio.
5	Design and construct circuits using Kirchhoff's Laws
6. PM-3C BASIC MATHEMATICS IN REAL LIFE-II (MINOR III) (02)	
1	Apply the formulas and concepts to solve interpolation problems, problems, and examples related to polynomials up to degree three, equations of recurrence relations.
2	Analyse the solutions of the system of linear equations and graphs
3	Check the relation between non-planar graphs and Euler's formula and verify the Hardy-Weinberg principle.
4	Construct the recurrence relations and design circuits based on Kirchhoff's Law
7. APPLIED MATHEMATICS (02)	
1	Familiar with the various forms and operations of a complex number.
2	Find the Laplace transform of a function of using definition.
3	Find the Inverse Laplace transform of a function of using definition.
4	Solve Differential equations of first degree and higher order.
5	Solve Differential equations of first degree and first order.
8. FINANCIAL LITERACY (02)	
1	Learners will develop proficiency for personal and family financial planning.
2	Learners will develop the ability to analyse banking and insurance products.
3	Learners will Apply the concept of investment planning.
9. हिंदी भाषा व्यवहारिक प्रयोग (02)	
1	विद्यार्थियों को राजभाषा हिंदी का ज्ञान प्राप्त होगा, एवं दक्षता प्राप्त होगी।
2	विद्यार्थियों को राजभाषा हिंदी के व्याकरणिक प्रयोग की जानकारी प्राप्त होगी।
3	विद्यार्थियों को हिंदी-संज्ञा आदि का ज्ञान प्राप्त होने के साथ भाषा के शुद्ध, व्यावहारिक रूप का ज्ञान होगा।
4	विद्यार्थियों को कारकों, वाक्य रचना एवं भाषिक चिह्नों आदि का ज्ञान प्राप्त होगा।
10. INDIAN THEATRE: CLASSICAL ROOTS AND CONTEMPORARY EXPRESSIONS (02)	
1	Describe the historical and cultural development of Indian theatre across different time periods.
2	Interpret and apply the aesthetic principles from Natyashastra (such as Rasa and Abhinaya) in the analysis of theatrical performances
3	Critically evaluate classical Indian plays for their structure, themes, character development, and historical significance

4	Demonstrate understanding of street theatre and one-act plays by creating outlines or performing excerpts reflecting real-world issues.
5	Reflect on the role of performing arts in cultural preservation, education, and community engagement.
11. FIELD PROJECT (02)	
1	
2	
3	

DEPARTMENT OF INFORMATION TECHNOLOGY
COURSE OUTCOMES (COs)
T.Y.B.SC (I.T.) SEM V

1. SOFTWARE PROJECT DEVELOPMENT (02)	
1	Describe the basic concepts of software project management with its life cycle.
2	Apply project estimation and evaluation techniques to real world problem.
3	Apply Key project management system techniques like PERT, CRM.
4	Identify project risk, monitor and track project deadlines.
5	Work in teams to evaluate the different modes of communication among people.
2. INTERNET OF THINGS: THEORY AND PRACTICE (02)	
1	Explain the concept of the Internet of Things and its applications in real-life scenarios.
2	Apply design principles to create user-friendly and connected devices.
3	Understand the communication protocols of the internet and design efficient web-connected devices.
4	Prototype embedded devices and create their physical design using various tools and techniques.
5	Understand the business models and funding options available for startups in the Internet of Things domain and apply them to real-life scenarios.
3. ADVANCED WEB DEVELOPMENT (02)	
1	Learner will explore the foundations of .NET Development, .NET Ecosystem, C# and Fundamental Concepts
2	Comprehensive Understanding and Practical Application using controls.
3	ASP.NET Web Development Essentials: Tracing, Debugging, and State Management Techniques
4	Mastering Data Access in ASP.NET: ADO.NET Essentials and Azure Integration
5	Securing ASP.NET Applications: Authentication, Authorization, and Advanced Techniques with Ajax and Bootstrap
4. ARTIFICIAL INTELLIGENCE AND APPLICATIONS (02)	
1	Articulate the historical development and current trends in Artificial Intelligence, demonstrating a comprehensive understanding of its foundations and principles.
2	Demonstrate proficiency in implementing and analyzing various search algorithms, utilizing both uninformed and informed strategies to solve complex problems efficiently.
3	Apply adversarial search techniques to decision-making in competitive environments, including games, and effectively manage uncertainty and partial observability.
4	Demonstrate competency in logical reasoning and inference, utilizing propositional and first-order logic to represent and solve real-world problems in AI applications.
5	Gain practical experience in planning algorithms and generative AI techniques, enabling them to design and implement AI systems capable of planning actions and generating novel content autonomously.
5. ADVANCED JAVA TECHNOLOGIES (02)	
1	Proficiently understand and apply servlets and database connectivity concepts to develop dynamic web applications.

2	Demonstrate the ability to develop applications capable of managing cookies, sessions, and performing file operations effectively.
3	Proficient in understanding and designing applications using Java Server Pages (JSP), enabling dynamic and interactive web content creation.
4	Adept at comprehending and designing applications utilizing Enterprise Java Beans (EJB), facilitating the development of scalable and distributed enterprise-level applications.
5	Possess a thorough understanding of persistence concepts, Hibernate framework, and the ability to develop Java Persistence API (JPA) and Hibernate applications proficiently.

DEPARTMENT OF INFORMATION TECHNOLOGY
COURSE OUTCOMES (COs)
F.Y.BSC (IT) SEM-II

1. Object Oriented Programming using C++	
1	Students can explain the key concept of OOP and their application in software development
2	Students can Design and implement classes and objects to model real-world entities
3	Students can apply the concepts of polymorphism, virtual functions, inheritance and exception handling in program.
4	Students can apply operator overloading, runtime polymorphism, generic Programming
5	Students can implement file handling concepts in program
2. Web Designing	
1	Learners will be able to use the HTML programming language
2	Learners will be able to execute web pages designed using HTML
3	Describe the concepts of World Wide Web, and the requirements of effective web design
4	List various tags in html and use these to create web page
5	Gain necessary skills for designing and developing web applications
3. Major Practical II	
1	To explain the important characteristics of the C++ programming language
2	To combine components of the C++ programming language to develop structured program.
3	To demonstrate the skills essential to compile, debug, and test C++ programs correctly
4	To understand how to effectively implement HTML
5	To develop the concept of basic and advanced text formatting
6	To understand Hyper linking, Designing of webpage
4. Assembly Language Programming	
1	Explain the architecture of the 8085 microprocessor and its associated instruction set
2	Identify the different types of registers and their functions in the microprocessor
3	Describe the memory organization and addressing modes of the 8085 microprocessor
4	Write assembly language programs for the 8085 microprocessor using various instructions and addressing modes
5	Debug and troubleshoot assembly language programs for the 8085 microprocessor using simulators and debuggers.
6	Implement conditional branching and looping constructs in assembly language programs.
7	Use 8085 assembly language programming tools, such as editors, assemblers, and emulators for developing and testing programs.

8	Simulate microprocessor operations using emulators and debuggers.
9	Connect input/output devices, such as LEDs, switches, and displays, to the 8085 microprocessor
5. PLSQL Practical	
1	Use PL/SQL variables ,data types, control and conditional statement
2	Apply sequences and cursor in PL/SQL.
3	Work with Collection and Composite Data Types
4	Develop PL/SQL structures like functions, procedures and triggers for database applications
5	Handle errors and exceptions in PL/SQL programs
6	Develop PL/SQL packages
6. Basics of Mathematics in Real Life (Minor III)	
1	to derive the formulae for simple curves passing through given set of points.
2	to perform various useful operations on matrices like computing inverse, adjoint, determinant etc
3	to predict when two matrices commute.
4	to outline basic linear programming problem and steps for its solution.
5	to evaluate the polar form of complex numbers.
6	to illustrate the use of reflection and rotation matrices in computer graphics
7. TOURISM MANAGEMENT	
1	Imparting basic knowledge about tourism
2	Capacity to manage and developed the places of tourist interest.
3	Ability to organize tourism-related activities
4	Creation of Employment opportunities management
8. ENVIRONMENTAL MANAGEMENT & SUSTAINABLE DEVELOPMENT -I(02)	
1	Use principles of Environmental Science for explaining sustainable development and its related ethical concerns
2	Display scientific perspective for issues confronting our present-day environment.
3	Analyze the national and global environmental issues relating air, water, soil, and land use, biodiversity, and pollution.
4	Explain the Role of an individual in relation to human population and environmental pollution.
9. हिन्दी भाषा : कौशल के आधार	
1	विद्यार्थियों को लेखन एवं वाचन कौशल का ज्ञान प्राप्त होगा तथा उनकी मौलिक अभिव्यक्ति में सुधार आएगा।
2	विद्यार्थियों का मानसिक विकास होगा तथा पठन-शक्ति एवं लेखन शैली का विकास होगा।
3	विद्यार्थियों में लेखन एवं भाषण कौशल के माध्यम से भाषाई दक्षता एवं शैलीगत समझ विकसित होगी तथा विशेषज्ञता आएगी।
4	विद्यार्थियों को लेखन, वाचन, श्रवण एवं भाषण कौशल की विशेषताओं एवं उपयोगिता का ज्ञान प्राप्त होगा।

10. FOUNDATION AND EXPLORATION OF PERFORMING FINE ARTS	
1	Identify and trace the historical evolution of Indian performing and fine arts.
2	Analyze the transition from traditional to modern art forms in performing arts.
3	Identify and describe a range of career paths in the fine and performing arts.

11. PRINCIPAL AND PRACTICES OF MANAGEMENT	
1	The learner will understand concept of management
2	The learner will Management functions

DEPARTMENT OF COMPUTER SCIENCE
COURSE OUTCOMES (COs) AND LEARNING OUTCOME (LOs)
T.Y.BSC (IT) SEM-VI

1. Software Testing and Quality Assurance	
1	To understand the effective testing techniques for ensuring high quality software.
2	To become familiar with quality assurance metrics and comprehend test tool capabilities
3	To become proficient in test project planning, test case and data design, testing operations.
4	To understand the challenges and solutions related to software test automation
5	To understand the taxonomy of testing tools.
2. Information Security	
1	To understand the importance of Information protection
2	To learn current best practices in storage capacity
3	To understand the fundamental security aspects of network devices and learn techniques for hardening network devices against attacks.
4	To familiarize Intrusion Detection and Prevention Systems, Voice over IP(VoIP) and PBX security
5	To understand the security considerations for virtual machines and security aspects of cloud computing
3. Business Intelligence and Data Analytics	
1	To understand the importance of business intelligence in facilitating effective and timely decision-making processes within organizations.
2	Explore different classes of mathematical models and their applications in various decision making scenarios.
3	Understand the concept of classification problems and their applications in various domains.
4	Study relational marketing models and their application in building and maintaining customer relationships.
5	Study different types of organizational culture, including hierarchical, clan, adhocracy and market cultures.
4. Fundamentals of GIS	
1	To understand the principles of Geographical Information System
2	To learn Data Management and Processing Systems Hardware and Software Trends
3	To understand Spatial Referencing and Positioning

4	To understand the Classification of analytical GIS Capabilities
5	To understand Data visualization and its strategies.
5. IT Act and Cyber Laws	
1	To understand the legal framework for arrests without warrant, penalties, adjudication, and appeals in cybercrime cases under the IT Act, 2000.
2	To explore the formation, validity, and jurisdictional issues of contracts in the digital and cyber world.
3	To examine legal strategies and protections against cyber-squatting and copyright infringement in the digital realm.
4	To analyze the challenges of e-commerce taxation and understand the role of digital signatures, certifying authorities, and e-governance in the digital economy
5	To compare the Indian Evidence Act of 1872 with the IT Act of 2000 and explore protections for cyber consumers in India.

DEPARTMENT OF INFORMATION TECHNOLOGY
COURSE OUTCOMES (COs)
S.Y.IT SEM-IV

1. CORE JAVA	
1	Understand the basics of Java and its runtime environment.
2	Be proficient in using Java's data types, control flow statements, and OOP principles such as classes, inheritance, and exception handling.
3	Creating own classes and objects
4	Develop mini projects using Class, Interface and exception handling
2. SOFTWARE ENGINEERING (02)	
1	Demonstrate a comprehensive understanding of Agile concepts and Scrum practices.
2	Apply Scrum processes to effectively manage software development life cycles.
3	Create and prioritize user stories for efficient Product Backlog management
4	Utilize metrics to evaluate and enhance Sprint performance and team productivity.
5	Implement strategies for cost, customer, and risk management in Scrum projects.
6	Formulate effective Sprint retrospectives to drive continuous improvement
3. COMPUTER NETWORKS	
1	Understanding the Transport layer protocols and their utilities
2	Various application layer protocols and their implementation
3	Mailing Services and web services implementation
4. MAJOR PRACTICAL 4	
1	Write efficient Java programs to perform arithmetic operations, manage control flow, and manipulate strings.
2	Demonstrate knowledge of object-oriented concepts by implementing inheritance, polymorphism, and interfaces.
3	Apply exception handling mechanisms to create robust Java applications
4	Implement multithreading and explore dynamic initialization for advanced Java programming.
5	Solve computational problems, such as matrix operations and factorial calculation, using packages and Java constructs
6	Implementation of utility protocols
7	Understanding Basic Security features
8	Network Traffic and Packet Analysis
9	Basic Understanding of Wireless Network
5. COMPUTER GRAPHICS	
1	Understand and apply 2D transformation matrices to graphical objects.
2	Implement simple graphics primitives and manipulate them using transformations.
3	Develop basic graphical applications using lightweight tools and programming languages.
4	Understand and utilize color models, coordinate systems, and graphical libraries
5	Create basic 2D animations (e.g., bouncing ball, rotating shapes).

6. BASIC MATHEMATICS IN REAL LIFE-III	
1	Remember and understand the concept of inner product spaces
2	Calculate and find the inner products, moments, Eigenvalues Eigenvectors and orthogonal vectors
3	Analyse the Cauchy-Schwarz inequality and the symmetries of triangles
4	Verify the Cauchy-Schwarz inequality
5	Construct counterexamples related to inner product spaces
7. PM-4C BASIC MATHEMATICS IN REAL LIFE-III	
1	Calculate and find the cross product, inner product, Norm, moments of force, Eigenvalues Eigenvectors and orthogonal vectors
2	Analyse the Vector Spaces, Cauchy-Schwarz inequality and the symmetries of triangles
3	Verify the Cauchy-Schwarz inequality and permutations as a function.
4	Construct counterexamples related to inner product spaces.
8. ENVIORNMENTAL MANAGEMENT & SUSTAINABLE DEVELOPMENT -II	
1	Use principles of Environmental Science for explaining sustainable development and its related ethical concerns
2	Display scientific perspective for issues confronting our present day environment.
3	Analyze the national and global environmental issues relating air, water, soil, and land use, biodiversity, and pollution.
4	Explain the Role of an individual in relation to human population and environmental pollution
5	Recognize the importance of collective efforts for environmental sustainability as reflected in various treaties, conventions and laws
9. INTEGRATED THEATRE PRODUCTION: STAGE CRAFT, COSTUME, MUSIC AND TECHNOLOGY (02)	
1	Define and describe key theoretical concepts related to lighting and costume design in theatre.
2	Interpret the narrative and symbolic meanings conveyed through visual design elements in performance.
3	Analyze lighting and costume designs using appropriate theoretical and historical frameworks.
4	Discuss the interrelationship between text, character, and design from a theoretical standpoint.
5	Compare and contrast design practices across different theatrical genres and periods.
6	Evaluate how technological advancements have influenced theoretical approaches to stage design.
10. COMMUNITY ENGAGEMENT PROJECTS (CEP)	
1	Tackle/ Understand the societal issues more efficiently and effectively.

2	Apply concepts learned in classrooms to real-world socio-economic conditions enhancing their understanding and skills.
3	Show insights into the challenges, opportunities and culture of socioeconomic diversity, preparing them for future roles as responsible citizens.
4	Demonstrate evidence of research aptitude and skills of critical thinking, analytical skills, and ethical research conduct in field work.
5	Display problem-solving abilities in making informed decisions in complex scenarios through practical situations.
6	Work in teams and collaborate to achieve common goals in the work field environments through collaborative efforts.
7	Show integrity in their dealings with their work and the people that they interact with by upholding professional; principles and ethical standards.
11. INTRODUCTION TO COMMUNICATION SKILLS IN ENGLISH II	
1	Demonstrate an understanding of English Usage in Communication
2	Exhibit the ability to Read a variety of written text using subskills such as analyzing and interpreting text.
3	Show competence in comprehending a variety of oral texts
4	Actively participate in group discussion, and research and prepare for the interview effectively
5	Display advanced formal (email writing, report writing) and creative writing skills