PROGRAM OUTCOMES OF BA

1. The students acquire knowledge in the field of social sciences, literature and humanities which make them sensitive and sensible enough.
2. The B.A. graduates will be acquainted with the social, economical, historical, geographical, political, ideological and philosophical tradition and thinking.
3. The program also empowers the graduates to appear for various competitive examinations orchoose the post graduate Programme of their choice.
4. The B. A. program enables the students to acquire knowledge with human values framingthe base to deal with various problems in life with courage and humanity.

COURSE OUTCOMES

FYBA:

Foundation course I:

1. Students should be able to think critically, analyze information, and evaluate ideas and arguments effectively.
2. The course may aim to improve students' written and oral communication skills, including the ability to express ideas clearly and coherently.
3. Students should learn how to access and evaluate information from various sources, such as books, articles, and digital resources.
4. Basic numeracy skills, including the ability to work with numbers and data, may be a part of the course outcomes.

Communication skills in English:

1. Develop the ability to speak confidently and clearly in English.
2. Enhance pronunciation and intonation to improve overall clarity.
3. Gain fluency in spoken English.
4. Improve the ability to understand and comprehend spoken English.
5. Develop active listening skills to better engage in conversations.

History :

1. Students should develop a deep understanding of specific historical events, periods, and themes, depending on the focus of the course.
2. Students should be able to analyze and evaluate historical sources, arguments, and evidence. They should be able to assess the reliability and bias of sources and use critical thinking skills to construct well-reasoned arguments.
3. Students should be proficient in conducting historical research, including using primary and secondary sources, archival materials and digital resources. They should be able to formulate research questions, gather information and cite sources properly.

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4.Students should be able to communicate their historical knowledge and analysis effectively through written essays, oral presentations, and other forms of communication.

5.Students should understand historical events and developments in their broader social, cultural, political, and economic contexts. They should be able to explain how historical events are interconnected.

Economics :

1.To present an overview of micro economic concepts and theories.

2.To understand utility analysis, production, cost, revenue and competitive markets.

Marathi literature:

1.Understanding Marathi Literary Traditions: Students should gain a deep understanding of the historical, cultural, and literary traditions of Marathi literature, from its ancient roots to contemporary developments.

2.Analysis and Interpretation: Develop the ability to critically analyze and interpret Marathi literary texts, including poems, stories, plays, and essays.

3.Language Proficiency: Improve proficiency in the Marathi language, including vocabulary, grammar, and linguistic nuances.

4.Literary Appreciation: Gain an appreciation for the artistic and aesthetic aspects of Marathi literature, including the use of metaphors, symbolism, and literary devices.

5.Knowledge of Key Literary Figures: Become familiar with the major authors, poets, and playwrights in Marathi literature and their significant works.

Hindi:

1. Students will understand the importance of standard script and language

2. The creative power of students will develop.

3. Deep interest will be developed among the students towards Hindi literature.

4. Linguistic skills like writing, reading, communication, speech etc. will develop in the students.

Geography:

Upon successful completion of this course, the student will be able to:

i) The geographical maturity of students in their current and future courses shall develop.

ii) The student develops theoretical, applied and computational skills.

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SYBA:

Foundation course 2:

1. Critical Thinking:Develop and apply critical thinking skills to analyze complex issues and problems.

2. Information Literacy:Enhance information literacy skills, including the ability to find, evaluate, and use information from a variety of sources.

3. Communication Skills:Improve written and oral communication skills, including the ability to express ideas clearly and effectively.

4. Research Skills:Learn basic research methods and techniques, including data collection, analysis, and reporting.

5. Ethical Awareness:Explore ethical issues related to the subject matter of the course and consider ethical implications in decision-making.

Economics paper. 2, 3:

1. Understanding Economic Principles: Develop a solid understanding of fundamental economic concepts, such as supply and demand, opportunity cost, elasticity, and market structures.

2. Economic Theories: Familiarize yourself with various economic theories and schools of thought, including classical economics, Keynesian economics, and neoclassical economics.

3. Microeconomics: Analyze the behavior of individual consumers, firms, and markets, and explore how they interact in the allocation of resources.

4. Macroeconomics: Study the broader economic issues, including inflation, unemployment, economic growth, and fiscal and monetary policies.

5. Economic Analysis: Learn how to use economic models and tools to analyze real-world issues and make informed economic decisions

Geography 2, 3:

Upon successful completion of this course, the student will be able to:

1. The geographical maturity of students in their current and future courses shall develop.

2. The student develops theoretical, applied and computational skills

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History Paper 2, 3:

1.Historical Knowledge: Students will gain a broad and in-depth understanding of specific historical periods, events, and developments, depending on the focus of the course.

2.Critical Thinking: Students will develop critical thinking skills by analyzing historical sources, interpreting primary and secondary materials, and evaluating different perspectives on historical events.

3.Research Skills: Students will learn how to conduct historical research, including finding and evaluating primary and secondary sources, and using appropriate research methodologies.

4.Communication: Students will improve their written and oral communication skills, including the ability to articulate historical arguments and findings effectively.

5.Chronological Thinking: Students will be able to order and organize historical events and developments chronologically and understand the cause-and-effect relationships between them.

Mass communication:

1.Understanding of Mass Communication Theories:Demonstrate knowledge of key mass communication theories and their applications.

2.Analyze the role of mass media in society, including its impact on culture, politics, and public opinion.

3.Media Analysis and Critique:Develop the ability to critically analyze media content, including newspapers, magazines, television, radio, and digital media.Evaluate media messages, biases, and ethical issues.

4.Media Writing and Production Skills:Develop writing and production skills for various media platforms, including print, broadcast, and online.Create clear and effective news stories, features, and other types of media content.

5.Research and Reporting:Learn research techniques and tools for gathering information. Understand the principles of news reporting and feature writing, including interviewing and fact-checking.

6.Media Ethics and Law:Understand the ethical considerations in mass communication, including issues of accuracy, privacy, and objectivity.Comprehend the legal aspects of media, such as freedom of speech, libel, and copyright.

7.Media and Society:Analyze the influence of mass media on various aspects of society, including political communication, advertising, and social change.

Explore the role of media in shaping public opinion and cultural norms.

8.Media Production Projects:Engage in practical media production projects that demonstrate the application of theoretical knowledge.Create and present media content, such as news articles, radio programs, or video reports.

TYBA:

History 4,5,6,7,8,9 :

1. Develop a critical understanding of historical events, movements, and key figures.
2. Analyze and interpret primary and secondary sources to evaluate historical events and arguments critically.
3. Demonstrate the ability to conduct research and apply historical research methods to investigate specific topics.
4. Identify and explain the causes and consequences of historical events.
5. Describe and compare different historical periods and civilizations.
6. Discuss the impact of historical events on contemporary society and global affairs.
7. Develop strong written and verbal communication skills to convey historical analysis and arguments effectively.

PROGRAM OUTCOMES OF BCOM

1. The B. Com. graduates would be able to acquire basic and fundamental knowledge and skills for doing business and commercial activities of their choice.

2. The program also empowers the graduates to appear for various competitive exams or choose a profession of their choice such as CA, CS, ICWA, MBA, M. Com etc.

3. The program enables the students to acquire the accounting knowledge, management principles, retail trading, banking and insurance transactions, business economics and financial management.

4. The students also acquire knowledge in the field of management accounting, corporate accounting, statistical and mathematical techniques and knowledge relating to corporate law andbusiness laws.

5. The students become capable of doing a business of their choice or choosing a profession or can become employees having basic knowledge and skill required for such activities.

COURSE OUTCOMES

FYBCOM:

Accountancy and financial management -1:

1. Understanding of Basic Accounting Principles:Demonstrate a clear understanding of fundamental accounting concepts and principles.Apply double-entry accounting principles to record financial transactions accurately.
2. Financial Statement Preparation:Prepare basic financial statements, including the income

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statement and balance sheet.Understand the purpose and components of financial statements.

3.Financial Analysis:Analyze financial statements to assess a company's performance and financial health.Calculate and interpret common financial ratios such as liquidity, profitability, and solvency ratios.

4.Budgeting and Forecasting:Create and evaluate simple budgets for a business or organization. Understand the importance of budgeting in financial planning and control.

Commerce -1:

1.Understand the basic principles of accounting and financial reporting.

2.Analyze and interpret financial statements, including balance sheets and income statements.

3.Explain the concept of double-entry bookkeeping and apply it to record financial transactions.

4.Calculate and interpret various financial ratios to assess a company's financial performance.

5.Understand the fundamentals of business law and the legal framework in which businesses operate.

6.Identify and describe the different forms of business organizations (e.g., sole proprietorship, partnership, corporation) and their characteristics.

Business economics -1:

1.Understanding Economic Concepts: Students should develop a strong understanding of fundamental economic concepts, including supply and demand, market structures, elasticity, utility, and production.

2.Analyzing Market Behavior: Students should be able to analyze how consumers and firms make decisions in various market situations and understand how market forces affect prices and quantities.

3.Macroeconomic Concepts: Understanding basic macroeconomic concepts such as GDP, inflation, unemployment, and fiscal and monetary policies and how they impact the overall economy.

4.Economic Models: The ability to construct and interpret economic models to analyze and predict economic phenomena and outcomes.

5.Cost Analysis: Learning how to calculate and analyze production costs, including fixed costs, variable costs, and total costs, to make informed business decisions.

6.Business Decision Making: Applying economic principles to real-world business scenarios and making informed decisions related to production, pricing, and resource allocation.

Business communication -1:

1.Develop Effective Communication Skills: Enhance your ability to communicate clearly and effectively in various business contexts, including written, verbal, and non-verbal communication.

2.Understand Communication Models: Gain knowledge of communication models and theories to better understand the processes and factors that influence effective communication.

3.Improve Writing Skills: Enhance your business writing skill including your ability to write

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clear and concise business emails, memos, reports, and other business documents.
4.Enhance Listening Skills: Develop active listening skills to better understand and respond to the communication needs of others in a business setting.
5.Deliver Effective Presentations: Learn how to create and deliver persuasive and informative presentations in a business environment, including the use of visual aids and public speaking techniques.

Environmental Studies -1:

1.Understanding of Environmental Concepts:Define key environmental concepts and terminologies.Explain the principles of environmental science and ecology.
2.Environmental Issues Awareness:Identify major environmental issues, such as pollution, climate change, biodiversity loss, and resource depletion.Understand the causes and consequences of these environmental issues.
3.Sustainable Development:Define and explain the concept of sustainable development.Recognize the importance of balancing economic, social, and environmental aspects of sustainability.
4.Environmental Laws and Regulations:
Understand the role of environmental laws and regulations in protecting the environment.Identify and describe relevant environmental legislation at the local, national, and international levels.

Mathematical and statistical techniques -1:

1.Understanding of Basic Mathematical Concepts:Develop a strong foundation in fundamental mathematical concepts, including algebra, calculus, and geometry.
2.Solving Mathematical Problems:Gain proficiency in solving mathematical problems related to business and economics, such as equations, inequalities, and optimization problems.
3.Statistical Concepts:Learn the basic principles of statistics, including data collection, presentation, and interpretation.
4.Probability Theory:Understand the fundamentals of probability theory and its application in real-world scenarios.
5.Data Analysis:Learn how to analyze data using statistical techniques, including measures of central tendency, dispersion, and graphical representation.
6.Business Applications:Apply mathematical and statistical techniques to solve practical business problems, such as pricing, inventory management, and decision-making.
7.Mathematical Modeling:Develop the ability to create mathematical models for business-related issues and use them for decision support.
8.Interpretation of Results:Be able to interpret and communicate the results of mathematical and statistical analyses to make informed business decisions.

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Foundation course -1:

1. Understanding of Business Concepts: Students should have a fundamental understanding of key business concepts, including the principles of management, business ethics, and the role of business in society.
2. Financial Literacy: Students should develop basic financial literacy skills, including an understanding of financial statements, budgets, and financial analysis.
3. Communication Skills: Improved communication skills, including writing, presentation, and interpersonal communication, to effectively convey business-related information.
4. Problem-Solving: The ability to analyze and solve business-related problems using critical thinking and decision-making skills.
5. Teamwork and Collaboration: Developing the ability to work effectively in teams and understand the importance of collaboration in the business world.

Accountancy and financial management -2:

1. Understanding Financial Statements: Students should be able to analyze and interpret financial statements, including the income statement, balance sheet, and cash flow statement.
2. Financial Ratios: Students should be able to calculate and interpret various financial ratios, such as liquidity ratios, profitability ratios, and leverage ratios, to assess a company's financial health.
3. Cost Accounting: Students should understand basic cost accounting principles and techniques, including cost classification, cost behavior, and cost-volume-profit analysis.
4. Budgeting: Students should be able to prepare and analyze budgets, including the master budget, flexible budget, and variance analysis.
5. Time Value of Money: Students should comprehend the concept of time value of money and be able to perform time value of money calculations, such as present value and future value.

Commerce -2:

1. Understanding of Accounting Principles: Students should develop a solid understanding of basic accounting principles, including concepts like double-entry bookkeeping, ledger accounts, trial balance, and financial statements.
2. Financial Statement Analysis: Students should be able to analyze financial statements, including the income statement, balance sheet, and cash flow statement, to assess the financial health and performance of a business.
3. Business Law and Regulations: Students should gain knowledge of the legal framework that governs business transactions, contracts, and regulations related to commerce and trade.
4. Economics and Microeconomics: A basic understanding of economic principles and microeconomics, including supply and demand, market structures, and consumer behavior.
5. Business Communication: Development of effective written and oral communication skills for business purposes, including report writing, business letters, and communication etiquette.

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Business economics -2:

1. Understanding Economic Concepts: Students should be able to demonstrate a clear understanding of fundamental economic concepts, including supply and demand, elasticity, production, costs, and market structures.

2. Analyzing Market Behavior: Students should be able to analyze how different market structures (perfect competition, monopoly, oligopoly, etc.) affect the behavior of firms and consumers.

3. Macroeconomic Analysis: Students should be able to comprehend and analyze macroeconomic concepts such as GDP, inflation, unemployment, fiscal policy, and monetary policy.

4. Economic Decision-Making: Students should be equipped to make informed economic decisions by evaluating costs and benefits, assessing risk, and understanding the concept of opportunity cost.

5. Business Applications: Students should be able to apply economic principles to real-world business scenarios, including pricing strategies, production decisions, and market entry strategies.

6. Economic Policies: Students should understand how government policies, including taxation, subsidies, and regulations, impact business and the economy as a whole.

7. Data Analysis: Students should develop skills in gathering and analyzing economic data to support decision-making and draw meaningful conclusions.

Business communication -2:

1. Effective Written Communication: Students should be able to demonstrate the ability to write clear and concise business documents, such as emails, letters, and reports, with proper grammar, punctuation, and formatting.

2. Professional Speaking Skills: Students should develop strong oral communication skills, including the ability to present information and ideas effectively in a business context, with confidence and clarity.

3. Interpersonal Communication: Students should be able to communicate effectively in one-on-one and small group settings, demonstrating active listening, empathy, and appropriate verbal and nonverbal communication.

4. Business Etiquette: Students should understand and apply appropriate business etiquette in various communication contexts, including in-person meetings, phone calls, and digital communication.

5. Cross-Cultural Communication: Students should be aware of and sensitive to cultural differences in communication styles and adapt their communication strategies accordingly when interacting with people from diverse backgrounds.

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Environmental Studies -2:

1.Understanding Environmental Concepts: Students should develop a fundamental understanding of key environmental concepts, including ecosystem dynamics, biodiversity, climate change, and environmental degradation.

2.Awareness of Environmental Issues: Students should become aware of various environmental issues and challenges facing the world today, such as pollution, resource depletion, and habitat loss.

3.Linking Environmental and Economic Factors: Students should be able to identify the interrelationship between environmental and economic factors and understand how environmental issues can impact business and commerce.

4.Sustainability Principles: Students should grasp the principles of sustainability and how they can be applied in the context of business practices, including resource management and corporate social responsibility.

5.Environmental Laws and Regulations: Familiarity with environmental laws and regulations is important. Students should be able to understand the legal framework surrounding environmental protection and compliance for businesses.

6.Environmental Ethics: Develop an understanding of environmental ethics and the moral and ethical responsibilities of businesses in preserving and protecting the environment.

Mathematical and statistical techniques -2:

1.Understanding of Mathematical Concepts:Demonstrate a strong understanding of fundamental mathematical concepts, including algebra, calculus, and geometry.

2.Application of Mathematical Tools:Apply mathematical techniques to solve practical problems in the field of commerce, such as profit and loss calculations, interest calculations, and financial modeling.

3.Statistical Analysis:Demonstrate proficiency in basic statistical concepts, including data collection, analysis, and interpretation.

4.Probability:Understand the principles of probability and its applications in decision-making and risk assessment.

5.Data Presentation:Effectively present data using various graphical and tabular methods, such as histograms, bar charts, and pie charts.

6.Measures of Central Tendency and Dispersion:Calculate and interpret measures of central tendency (mean, median, mode) and measures of dispersion (variance, standard deviation) for data analysis.

7.Correlation and Regression Analysis:Understand and apply correlation and regression analysis techniques to assess relationships between variables.

8.Time Series Analysis:Analyze time series data to make predictions and identify trends in economic and financial data.

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Foundation course -2:

1.Understanding of Basic Concepts: Gain a fundamental understanding of key concepts related to business, economics, and commerce.

2.Critical Thinking: Develop critical thinking skills to analyze and solve problems related to business and economics.

3.Communication Skills: Improve written and verbal communication skills to effectively convey ideas and information related to commerce.

4.Ethical Awareness: Develop an awareness of ethical issues in business and commerce and an understanding of ethical decision-making.

5.Basic Mathematical and Statistical Skills: Acquire basic mathematical and statistical skills relevant to commerce, including the ability to interpret data and make basic calculations.

SYBCOM:

Foundation courses contemporary issues-3:

1.Awareness of Global Challenges: Gain awareness of major global challenges such as climate change, economic inequality, political conflicts, and more.

2.Critical Thinking: Develop critical thinking skills to analyze and evaluate contemporary issues from multiple perspectives.

3.Research and Analysis: Learn how to research and analyze data and information related to contemporary issues.

4.Effective Communication: Enhance communication skills to express ideas, opinions, and arguments on contemporary issues clearly and persuasively.

5.Ethical Considerations: Explore the ethical dimensions of contemporary issues and understand the importance of ethical decision-making in addressing these challenges.

Business law-1:

1.Understand the Legal Environment: Students should be able to explain the legal framework in which businesses operate, including the sources of law, the court system, and the role of government in business regulation.

2.Contract Law: Students should be able to comprehend the essential elements of a contract, its formation, and how to distinguish between valid and void contracts. They should also understand the remedies available for contract breaches.

3.Tort Law: Students should have a basic understanding of tort law, including negligence and liability for civil wrongs. They should be able to analyze and apply tort principles to real-world situations.

4.Business Entities: Students should be able to differentiate between various forms of business entities, such as sole proprietorships, partnerships, corporations, and limited liability companies. They should understand the advantages and disadvantages of each and the legal requirements for their formation and operation.

5.Consumer Protection: Students should be aware of consumer protection laws and regulations
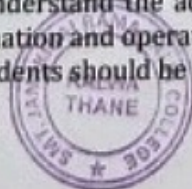
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understanding the rights and responsibilities of consumers and businesses under these laws.
6.Intellectual Property: Students should understand the fundamentals of intellectual property rights, including copyright, trademarks, patents, and trade secrets. They should be able to identify instances of infringement and protection of intellectual property.
7.Employment Law: Students should have a basic understanding of labor and employment laws, including the rights and obligations of employers and employees, employment contracts, and discrimination in the workplace.

Business economics-3:

1.Understanding Economic Principles: Gain a solid understanding of fundamental economic principles and concepts, such as supply and demand, opportunity cost, elasticity, and market structures.
2.Application of Economic Concepts: Apply economic theories and concepts to real-world business situations and decisions.
3.Cost Analysis: Analyze various cost structures, including fixed costs, variable costs, and marginal costs, to make informed business decisions.
4.Pricing Strategies: Learn how to set prices for products and services based on market conditions, cost considerations, and pricing strategies.
5.Market Research: Understand the importance of market research in making informed business decisions and evaluating market trends.

Accounting and financial management -3:

1.Understanding Financial Statements: Students should be able to interpret and analyze financial statements, including the income statement, balance sheet, and cash flow statement.
2.Financial Analysis: Students should be capable of conducting financial ratio analysis to evaluate a company's performance, profitability, liquidity, and solvency.
3.Budgeting and Forecasting: Students should be able to create budgets and financial forecasts for businesses, including revenue projections, cost estimation, and cash flow planning.
4.Cost Accounting: Understanding the principles and methods of cost accounting, including job costing, process costing, and activity-based costing.
5.Management Accounting: Students should be able to use management accounting techniques to support decision-making within an organization, such as cost-volume-profit analysis, budget variance analysis, and relevant costing.
6.Capital Budgeting: Understanding the techniques and methods used in capital budgeting, such as net present value (NPV), internal rate of return (IRR), and payback period.
7.Financial Management: Understanding the principles of financial management, including capital structure, risk, and return, and the time value of money.

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Financial account and auditing:

1. Understand the fundamentals of financial accounting principles, concepts, and standards.
2. Demonstrate proficiency in recording and summarizing financial transactions using double-entry accounting.
3. Prepare financial statements, including income statements, balance sheets, and cash flow statements, in accordance with Generally Accepted Accounting Principles (GAAP).
4. Analyze financial statements to assess a company's financial performance and position.
5. Identify and apply the principles of revenue recognition, expense recognition, and asset valuation.
6. Comprehend the role of internal controls in financial reporting and management.
7. Develop an understanding of the audit process and the key concepts related to auditing.

Commerce-3:

1. Understanding of Core Concepts: Students should have a solid understanding of fundamental concepts in commerce, such as accounting, economics, finance, and business management.
2. Analytical Skills: The ability to analyze financial statements, economic data, and business scenarios to make informed decisions.
3. Financial Literacy: An understanding of financial principles, including budgeting, financial planning, and investment.
4. Business Communication: Effective communication skills, both written and verbal, for business purposes.
5. Business Ethics: Awareness of ethical considerations and responsible business practices.
6. Legal Knowledge: Knowledge of business and commercial law relevant to commerce.

Computer programming-1:

1. Understanding Programming Concepts: Students should have a solid understanding of fundamental programming concepts, including variables, data types, control structures (if statements, loops), and functions.
2. Problem Solving Skills: Students should be able to analyze and solve problems using programming, including breaking down complex problems into smaller, manageable components.
3. Programming Languages: Proficiency in a specific programming language, such as C, C++, Java, Python, or others, depending on the course curriculum.
4. Algorithm Design: Students should be able to design and implement algorithms to solve a variety of computational problems.
5. Basic Data Structures: Familiarity with basic data structures such as arrays, lists, and simple data manipulation.

Commerce-4:

1.Understanding of Basic Concepts: Gain a solid understanding of fundamental concepts in commerce, such as accounting, finance, marketing, economics, and business management.

2.Analytical Skills: Develop the ability to analyze financial statements, economic data, and market trends to make informed business decisions.

3.Problem-Solving: Develop problem-solving skills by applying theoretical knowledge to real-world business scenarios.

4.Communication Skills: Improve written and oral communication skills, including the ability to create business reports, presentations, and proposals.

5.Financial Literacy: Acquire a strong understanding of financial principles, including budgeting, financial management, and investment strategies.

6.Business Ethics: Learn about the ethical considerations and responsibilities of businesses and professionals in the commerce field.

Computer programming-2:

1.Proficiency in Programming Languages: Students should demonstrate a strong understanding of a specific programming language, often a high-level language like C++, Java, Python, or similar. They should be able to write, debug, and maintain code in that language.

2.Algorithm Development: Students should be able to design and implement algorithms for solving complex problems. This includes understanding and using data structures and various algorithms to manipulate data effectively.

3.Software Development Skills: Students should have the ability to develop and maintain software applications. This includes working with integrated development environments (IDEs), version control systems, and writing code documentation.

4.Object-Oriented Programming (OOP): Understand and apply the principles of object-oriented programming, including encapsulation, inheritance, and polymorphism, to design and develop software solutions.

5.Error Handling and Debugging: Proficiency in identifying and debugging errors and exceptions in code. Students should be able to use debugging tools and techniques effectively.

TYBCOM:

Financial accounting -1:

1.Understanding Accounting Principles: Gain a solid understanding of the fundamental accounting principles and concepts that underlie financial accounting, such as the accrual basis of accounting, the realization principle, and the matching principle.

2.Recording Transactions: Learn how to record financial transactions accurately using double-entry bookkeeping, including journal entries and ledger postings.

3.Financial Statements: Be able to prepare and analyze financial statements, including the income statement, balance sheet, and cash flow statement.

4.Accounting for Assets: Understand how to account for different types of assets, including
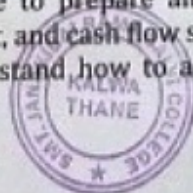
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current assets, non-current assets, and intangible assets.

Cost accounting:

1.Understand the fundamentals of cost accounting: Students should be able to grasp the basic concepts and principles of cost accounting, including cost classification, cost behavior, and cost allocation.

2.Cost analysis and decision-making: Gain the ability to analyze and interpret cost data to make informed business decisions, such as pricing, product mix, and cost control.

3.Costing methods and techniques: Learn various costing methods, such as job costing, process costing, and activity-based costing, and be able to apply them in practical scenarios.

4.Cost control and cost reduction: Understand how to control and reduce costs in an organization, and identify areas for improvement through cost variance analysis.

Commerce-5:

1.Understanding of Business Concepts: Gain a thorough understanding of fundamental business concepts, including marketing, finance, management, and accounting.

2.Financial Literacy: Develop financial literacy and the ability to analyze financial statements and make informed financial decisions.

3.Business Ethics: Explore and understand the ethical and social responsibilities of businesses.

4.Critical Thinking: Develop critical thinking and problem-solving skills relevant to the business environment.

5.Communication Skills: Enhance written and oral communication skills for effective business communication.

Business Economics:

1.Understanding Economic Concepts: Students should be able to demonstrate a solid understanding of fundamental economic concepts, such as supply and demand, elasticity, production and cost analysis, market structures, and economic systems.

2.Analyzing Market Behavior: Students should be able to analyze and interpret the behavior of consumers, producers, and markets, including factors that influence consumer choices and the strategies businesses use to maximize profits.

3.Microeconomic Analysis: Students should be able to apply microeconomic principles to real-world business scenarios. This may include understanding price determination, production decisions, and the impact of government policies on individual firms.

4.Risk Analysis: Understanding and analyzing risk in business decisions, including techniques such as probability theory and decision analysis.

5.Market Structures: Understanding the different market structures (perfect competition, monopolistic competition, oligopoly, and monopoly) and their implications for business strategies.

Computer System and applications:

1.Understand the fundamental concepts of computer systems, including hardware, software, and their interactions.

2.Describe the evolution of computer systems and their historical development.

3.Identify the major components of a computer system and their functions.

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4.Analyze and compare different operating systems and their roles in computer systems.
5.Demonstrate proficiency in using common computer applications, such as word processing, spreadsheet software, and presentation software.
6.Gain a basic understanding of computer networks, including the internet, and their significance in modern business environments.

Direct and Indirect taxes:

1.Understanding Taxation Principles: Students will gain a solid understanding of the fundamental principles of taxation, including concepts like tax liability, tax base, tax rate, and tax administration.
2.Knowledge of Direct Taxes: Students will learn about various direct taxes, such as income tax, wealth tax, and property tax. They will understand the legal provisions, exemptions, deductions, and computation of these taxes.
3.Knowledge of Indirect Taxes: Students will study indirect taxes, including Goods and Services Tax (GST), Value Added Tax (VAT), and customs duties. They will learn about the structure, rates, and compliance requirements for these taxes.
4.Tax Planning and Compliance: Students will be able to assist individuals and businesses in tax planning to minimize their tax liabilities while complying with legal requirements. They will also learn about the documentation and filing procedures for direct and indirect taxes.
5.Taxation Laws and Regulations: Understanding the relevant tax laws and regulations is crucial. Students will become familiar with the Income Tax Act, GST Act, and other related laws.

PROGRAM OUTCOMES OF BBI

1. Graduates should have a strong understanding of core business principles, including marketing, finance, management, and operations.
2. Graduates should possess a solid foundation in information technology, including skills related to programming, database management, network management, and system analysis.
3. Students should develop the ability to identify and analyze business and IT-related problems and develop effective solutions.
4. Graduates should be proficient in written and oral communication, including the ability to convey complex technical information to non-technical stakeholders.
5. Students should be able to think critically and evaluate business and technology issues from various perspectives.
6. Graduates should be aware of the ethical and legal considerations in business and information technology, including issues related to privacy, cybersecurity, and intellectual property.
7. Students should be capable of working effectively in teams and understanding the dynamics of group work in both business and IT settings.
8. Graduates should be prepared to adapt to rapidly changing technologies and business environments.
9. The program may aim to develop leadership and management skills that can be applied in various roles within the business and IT sectors.

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10. Students may gain project management skills, which are essential for planning and executing business and IT projects.

COURSE OUTCOMES

**FYBBI:**

Environment and management of financial services:

1.Understand the Financial Services Industry: Gain a comprehensive understanding of the financial services sector, including its structure, players, and the various financial products and services it offers.

2.Regulatory Environment: Learn about the regulatory framework governing financial services, including the role of central banks, government agencies, and international organizations.

3.Financial Markets: Explore different financial markets, such as stock markets, bond markets, and foreign exchange markets, and understand their functions and interconnections.

4.Banking Services: Understand the role of banks in the financial services industry, including their functions, products, and services.

Principles of management:

1.Understand the Fundamental Concepts: Students should be able to demonstrate a clear understanding of the fundamental principles and concepts of management, including the functions of management, management theories, and the role of a manager in an organization.

2.Analyze Organizational Structure: Students should be able to analyze different types of organizational structures and understand how they impact decision-making, communication, and overall efficiency within an organization.

3.Develop Planning and Decision-Making Skills: Students should be able to develop effective planning and decision-making skills, including setting goals, formulating strategies, and making informed decisions to achieve organizational objectives.

4.Improve Leadership and Communication: Students should enhance their leadership and communication skills, as these are critical in managing and motivating people within an organization.

Business Economics :

1.Understanding Economic Concepts: Gain a fundamental understanding of economic concepts, including supply and demand, opportunity cost, elasticity, and market structures.

2.Microeconomics: Study microeconomic principles that focus on individual economic agents such as consumers and firms. This may include topics like consumer behavior, production, costs, and market competition.

3.Macroeconomics: Explore macroeconomic concepts that pertain to the overall economy, such as GDP, inflation, unemployment, and fiscal and monetary policies.

4.Economic Decision-Making: Develop skills in analyzing and making economic decisions, both at the individual and business level.
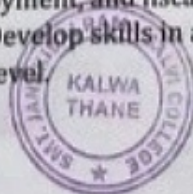
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5.Market Analysis: Learn to conduct market analysis, including factors influencing market demand and supply, and how businesses can respond to changing market conditions.

Business communication-1:

1.Develop Effective Communication Skills: By the end of the course, students should be able to demonstrate improved written and oral communication skills, including the ability to convey ideas clearly and concisely in a business context.

2.Understand Communication Principles: Students should be able to understand and explain the fundamental principles and theories of communication, including the communication process, channels, barriers, and feedback mechanisms.

3.Enhance Professional Writing Skills: Students should be proficient in writing various types of business documents such as emails, memos, reports, and business letters. They should be able to apply the principles of effective business writing.

4.Oral Communication and Presentation Skills: Students should be able to deliver effective oral presentations and public speaking in a business setting, including the use of visual aids and appropriate body language.

Quantitative methods-1:

1.Understand Fundamental Mathematical Concepts:Develop a strong foundation in basic mathematical concepts and operations, such as arithmetic, algebra, and geometry.

2.Application of Mathematical Tools:Apply mathematical tools and techniques to solve business-related problems and make informed decisions.

3.Data Analysis:Acquire the skills to collect, organize, and analyze data using various quantitative methods.

4.Statistical Analysis:Learn basic statistical techniques to summarize and interpret data, including measures of central tendency, dispersion, and probability.

Foundation course-1:

1.Understanding Business Fundamentals: Students will gain a solid understanding of the fundamental concepts and principles of business, including the various functions of business, organizational structures, and the role of business in society.

2.Communication Skills: Develop effective communication skills, including written and oral communication, to effectively convey ideas and information in a business context.

3.Critical Thinking and Problem Solving: Enhance critical thinking and problem-solving abilities by analyzing business situations, identifying issues, and proposing solutions.

4.Ethics and Social Responsibility: Explore the ethical dimensions of business decisions and understand the concept of corporate social responsibility.

5.Global Business Perspective: Gain an awareness of the global nature of business and its impact on local and international markets.

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Financial accounting:

1.Understand Financial Accounting Principles: Students should be able to grasp the fundamental principles and concepts of financial accounting, including the accounting

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Organizational behavior :

1.Understanding Organizational Behavior: Students should be able to demonstrate a comprehensive understanding of the field of organizational behavior, including its key concepts, theories, and historical development.

2.Application of Theories: Students should be able to apply various organizational behavior theories to analyze real-world organizational situations and problems.

3.Leadership Skills: Develop leadership skills by understanding different leadership styles and their impact on organizational behavior and performance.

4.Team Dynamics: Understand the dynamics of teams, group processes, and how to manage and lead teams effectively.

Business economics:

1.Understand Fundamental Economic Concepts:Demonstrate a clear understanding of fundamental economic principles, including supply and demand, elasticity, opportunity cost, and market structures.

2.Analyze Market Behavior:Analyze and interpret the behavior of markets, including how prices are determined, and the impact of factors such as government policies and external shocks.

3.Business Decision-Making:Apply economic concepts to real-world business decision-making, including pricing, production, and resource allocation.

Entrepreneurship management:

1.Understand the Concept of Entrepreneurship: Students should gain a fundamental understanding of what entrepreneurship is, including its definitions, characteristics, and importance in the business world.

2.Identify Entrepreneurial Opportunities: Students should be able to identify potential entrepreneurial opportunities in various industries and market segments.

3.Business Idea Generation: Develop the ability to generate and evaluate business ideas and concepts for entrepreneurial ventures.

4.Feasibility Analysis: Learn how to conduct feasibility studies to determine the viability of a business idea, considering market research, financial analysis, and other factors.

Cost accounting:

1.Understand Cost Concepts: Students should be able to define and explain fundamental cost concepts, such as variable costs, fixed costs, direct costs, and indirect costs.

2.Cost Classification: Students should be able to classify costs into various categories, such as product costs, period costs, controllable costs, and uncontrollable costs.

3.Cost Behavior Analysis: Students should be able to analyze and predict cost behavior, distinguishing between variable, fixed, and mixed costs.

4.Cost Accumulation and Allocation: Students should be able to understand the process of accumulating and allocating costs to products, departments, or cost centers using methods like job costing and process costing.

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TYBBI:

Research methodology:

1.Understanding Research Concepts: Students should gain a solid understanding of fundamental research concepts, including variables, hypotheses, data collection, and data analysis.

2.Research Ethics: Students should be aware of and able to adhere to ethical principles in research, including issues related to informed consent, confidentiality, and honesty in reporting results.

3.Research Design: Students should be able to design and outline a research study, including selecting research methods, defining research questions, and choosing appropriate data collection techniques.

Financial service management:

1.Understand the Financial Services Industry: Students should be able to demonstrate a solid understanding of the financial services industry, its components, and its role in the broader economy.

2.Knowledge of Financial Instruments: Gain knowledge about various financial instruments, such as stocks, bonds, derivatives, and mutual funds, and understand how they are used in financial service management.

3.Risk Management: Develop the skills to assess and manage financial risks, including credit risk, market risk, and operational risk, as well as the various risk management tools and strategies used in the financial services sector.

4.Regulatory Compliance: Comprehend the regulatory framework governing financial services and the importance of compliance with relevant laws and regulations.

5.Customer Relationship Management: Learn how to build and maintain strong customer relationships in the financial services industry, with a focus on understanding customer needs and providing appropriate solutions.

International banking and finance:

1.Understanding of International Finance Concepts:Gain a solid understanding of key international finance concepts, including exchange rates, balance of payments, and foreign exchange markets.

2.Knowledge of International Banking Operations:Learn about the operations and functions of international banks, including correspondent banking, trade finance, and international financial regulation.

3.Analytical Skills:Develop the ability to analyze international financial statements assess its impact on global markets and economies.

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Financial reporting and analysis:

1.Understanding Financial Statements: Students should be able to understand and interpret financial statements, including the balance sheet, income statement, and cash flow statement.
2.Financial Statement Analysis: Students should be able to analyze financial statements to assess a company's financial performance and financial health.
3.Ratio Analysis: Students should be able to calculate and interpret financial ratios such as liquidity ratios, profitability ratios, and leverage ratios to evaluate a company's financial condition.
4.Financial Statement Forecasting: Students should be able to use historical financial data to forecast future financial performance and make financial projections.

Strategic management:

1.Understand the Concept of Strategic Management: Gain a comprehensive understanding of what strategic management is and why it is essential for organizations.
2.Analyze Business Environments: Learn to assess and analyze the external and internal environments that influence an organization's strategic decisions.
3.Formulate and Implement Strategies: Develop the skills to formulate, evaluate, and implement effective business strategies to achieve organizational goals.
4.SWOT Analysis: Be able to conduct a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) to assess the current situation and identify potential strategies.

Central banking:

1.Understand the Role of Central Banks: Students should be able to explain the functions and roles of central banks in the economy, including their responsibilities in monetary policy, financial stability, and currency issuance.
2.Monetary Policy: Gain a comprehensive understanding of monetary policy tools and techniques, including open market operations, discount rates, and reserve requirements. Students should be able to analyze the impact of monetary policy on inflation, interest rates, and economic growth.
3.Central Bank Independence: Discuss the importance of central bank independence and its implications for monetary policy decision-making

Security analysis and portfolio management:

1.Understanding of Financial Markets: Students should gain a comprehensive understanding of the financial markets, including stock exchanges, bond markets, and other investment avenues.
2.Security Analysis: Students should learn how to analyze individual securities, such as stocks and bonds, by evaluating their fundamental and technical aspects. This may include analyzing financial statements, earnings reports, and market trends.
3.Portfolio Management: Students should learn the principles of constructing and managing investment portfolios. This includes diversification, asset allocation, and risk management.
4.Risk Assessment: Students should be able to assess the risk associated with different types of
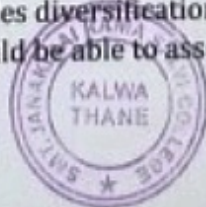
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securities and investment strategies. They should learn how to measure and manage risk in a portfolio.

Human resource management in banking and insurance:

1.Understanding HR Principles: Students should gain a fundamental understanding of human resource management principles and concepts as they apply to the banking and insurance industry.

2.Recruitment and Selection: Students should be able to explain the process of recruitment and selection in the context of banks and insurance companies, including the identification of the skills and qualities needed for success in these sectors.

3.Training and Development: Students should be able to describe the importance of employee training and development, including the specific skills and knowledge required in the banking and insurance sectors.

Turn around management:

1.Understand the concept of turnaround management: Students should be able to define and explain what turnaround management is and why it is essential for businesses facing financial distress.

2.Analyze the causes of business distress: Students should be able to identify and analyze the common reasons for a business facing financial difficulties, such as poor management, declining sales, excessive debt, etc.

3.Evaluate financial statements: Students should learn how to interpret and analyze financial statements to assess the financial health of a troubled company.

4.Develop turnaround strategies: Students should be able to propose and evaluate various strategies to turn around a distressed business, such as cost-cutting, revenue enhancement, debt restructuring, and asset divestiture.

Project in banking and insurance VI:

1.Understand Banking and Insurance Principles: Students should gain a deep understanding of the fundamental principles, concepts, and terminology related to banking and insurance.

2.Regulatory Framework: Develop an awareness of the regulatory environment and legal aspects governing the banking and insurance sectors in the respective region or country.

3.Banking Operations: Gain knowledge of various banking operations, including deposit accounts, lending, and other financial services offered by banks.

4.Insurance Practices: Explore the concepts and practices related to insurance, including underwriting, risk assessment, claims processing, and the types of insurance products available.

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PROGRAM OUTCOMES OF BSC

PO 1. The B. Sc. Programme develops scientific temperament and attitude among the science graduates.

PO 2. The qualities of a science – observation, precision, analytical mind, logical thinking, clarity of thought and expression, systematic approach, qualitative and quantitative decision making are enlarged.

PO 3. The program also empowers the graduates to appear for various competitive examinations or choose the post graduate Programme of their choice.

PO 4. This Programme train the learners to extract information, formulate and solve problems in a systematic and logical manner.

PO 5. This Programme enables the learners to perform the jobs in diverse fields such as science, engineering, industries, survey, education, banking, development-planning, business, public service, self-business etc. efficiently.

COURSE OUTCOMES:

Chemistry:

1. Knowledge of Fundamental Concepts: Students should gain a solid understanding of the fundamental concepts in chemistry, including atomic structure, chemical bonding, chemical reactions, and the periodic table.

2. Chemical Nomenclature: Students should be able to name and write chemical formulas for common inorganic compounds and understand the principles of chemical nomenclature.

3. Stoichiometry: Students should be able to perform stoichiometric calculations to determine the quantities of reactants and products in chemical reactions.

4. Chemical Equations: Students should be able to write and balance chemical equations to describe chemical reactions.

5. States of Matter: Students should understand the properties and behavior of different states of matter, such as solids, liquids, and gases.

Botany:

1. Basic Plant Biology Knowledge: Understand the fundamental concepts of plant biology, including plant structure, growth, development, and reproduction.

2. Plant Classification: Be able to classify and identify different plant species based on their characteristics, such as morphology and taxonomy.

3. Plant Physiology: Gain knowledge about the physiological processes in plants, including photosynthesis, respiration, transpiration, and nutrient uptake.

4. Plant Ecology: Understand the interactions between plants and their environment.
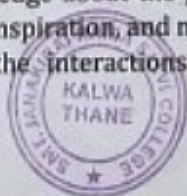
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including the study of ecosystems, plant adaptations, and environmental factors affecting plant growth.

5. Plant Diversity: Explore the diversity of plant life on Earth, including major plant groups and their evolutionary history.

6. Cell Biology: Learn about the cellular structure and function of plant cells, including organelles, cell division, and plant tissues.

Zoology:

1. Understanding of Basic Biological Concepts: Demonstrate a basic understanding of key biological concepts, such as cellular structure, genetics, and evolution, as they apply to the field of zoology.

2. Knowledge of Animal Diversity: Identify and classify major groups of animals and understand their evolutionary relationships. Describe the structural and functional diversity of animals.

3. Principles of Animal Physiology: Explain the physiological processes that allow animals to survive and thrive in their environments. Understand the fundamental principles of animal physiology, including circulation, respiration, digestion, and excretion.

PROGRAM OUTCOMES OF BSC IT

1. Graduates should have a strong understanding of various information technology concepts, tools, and technologies, including programming languages, databases, networking, and software development.

2. Students should be able to analyze and solve complex IT-related problems by applying critical thinking, logical reasoning, and problem-solving skills.

3. Communication Skills: Graduates should be proficient in both written and verbal communication, as the IT field often requires explaining technical concepts to non-technical stakeholders and writing documentation.

4. BSc IT programs often emphasize teamwork and collaboration skills, as IT projects are frequently executed by teams of professionals with diverse skills.

5. Understanding the basics of project management is important, as IT professionals are often involved in planning, executing, and delivering projects on time and within budget.

6. Graduates should be aware of the importance of information security and be able to implement security measures to protect data and systems.

7. Many programs include software development skills, allowing students to design, code, and test software applications.

8. Understanding how to design, implement, and manage databases is a common outcome, as databases are crucial in IT systems.

9. Proficiency in networking principles and technologies is essential, as IT professionals often work with computer networks.

10. Students should be aware of the ethical and legal issues in IT, such as intellectual property rights, privacy, and cybercrime.

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COURSE OUTCOMES

FYBSC IT:

Programming Principles With C:

1. Understanding of Programming Fundamentals: Students should gain a solid understanding of fundamental programming concepts, including variables, data types, operators, and control structures.
2. Proficiency in C Programming: Students should be able to write and understand C programs, including basic syntax, data manipulation, and memory management.
3. Algorithmic Problem Solving: Students should be able to formulate and solve algorithmic problems using C, including problem analysis, algorithm design, and implementation.
4. Data Structures: Familiarity with fundamental data structures like arrays, structures, and pointers, and the ability to use them effectively in C programs.
5. Modular Programming: Understanding of modular programming principles, including the creation and use of functions in C.
6. Debugging and Error Handling: Proficiency in debugging C code and handling errors effectively.

Digital Logic And Applications:

1. Understand Basic Digital Logic Concepts: Describe the fundamental concepts of digital logic, including binary representation, logic gates, and Boolean algebra.
2. Analyze and Design Combinational Logic Circuits: Analyze and design combinational logic circuits using Boolean algebra and truth tables.
3. Implement logic functions using basic gates (AND, OR, NOT, etc.): Simplify logic expressions using Karnaugh maps and algebraic techniques.
4. Analyze and Design Sequential Logic Circuits: Understand the principles of sequential logic and flip-flops. Design and analyze sequential logic circuits, including counters, registers, and state machines.
5. Understand Memory and Storage Elements: Explain the operation of various memory and storage elements, such as RAM, ROM, and registers.

Fundamentals Of Database Management Systems:

1. Understanding of Database Concepts: Students should gain a solid understanding of fundamental database concepts, including data models, data types, and database management in modern information systems.
2. Relational Database Management Systems (RDBMS): Students should be able to explain the principles of relational databases and the role of RDBMS in managing structured data.
3. SQL Proficiency: Proficiency in SQL (Structured Query Language) is a key outcome. Students should be able to write and execute SQL queries for data retrieval in

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4. Normalization: Students should understand the concept of database normalization and be able to apply normalization techniques to design efficient and well-structured relational databases.

Computational Logic And Discrete Structure:

1.Understand Basic Logic: Students should be able to grasp the fundamental principles of propositional and predicate logic and apply them to solve problems.

2.Comprehend Mathematical Structures: Students should gain an understanding of various mathematical structures, including sets, relations, functions, and their properties.

3.Develop Problem-Solving Skills: Students should be able to use logical reasoning and mathematical techniques to solve problems related to discrete structures.

4.Learn Proof Techniques: Students should become proficient in various proof techniques, such as mathematical induction, direct proof, proof by contradiction, and proof by contrapositive.

5.Understand Graph Theory: Students should be able to work with graphs, understand graph properties, and apply graph theory concepts to solve practical problems.

Technical Communication Skills:

1.Develop Effective Writing Skills:Write clear and concise technical documents, including reports, manuals, and documentation.Use proper grammar, punctuation, and spelling in written communication.

2.Improve Oral Communication:Deliver effective oral presentations related to technical topics. Communicate technical information clearly and confidently in a group or one-on-one setting.

3.Enhance Interpersonal Communication:Collaborate effectively in team projects and communicate with team members.Demonstrate active listening skills and provide constructive feedback.

4.Technical Documentation: Create and format technical documents, such as user guides, technical specifications, and project proposals.
Use appropriate technical terminology and jargon in documentation.

5.Visual Communication:Create and interpret visual aids, such as charts, graphs, diagrams, and multimedia presentations to enhance technical communication.

6.Audience Analysis:Analyze the needs and expectations of diverse audiences, such as technical and non-technical stakeholders.Tailor communication to address the specific needs and preferences of the target audience.

Object Oriented Programming With C++:

1.Understanding Object-Oriented Concepts: Students should gain a solid understanding of fundamental Object-Oriented Programming (OOP) concepts, such as classes, objects, inheritance, polymorphism, encapsulation, and abstraction.

2.C++ Language Proficiency: Develop proficiency in the C++ programming language including syntax, data types, control structures, and standard library functions.

3.Class Design: Ability to design and implement classes in C++ to model real-world entities, define attributes (data members), behaviors (member functions), and relationships between

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classes.

4.Inheritance and Polymorphism: Understand the concept of inheritance and how to create and use derived classes (subclasses). Also, grasp the concept of polymorphism and how it enables code reusability.

Fundamentals Of Micro Processor And Microcontrollers:

1.Understanding of Basic Concepts: Students should have a solid grasp of the fundamental concepts related to microprocessors and microcontrollers, including their architecture, organization, and operation.

2.Knowledge of Assembly Language Programming: Students should be able to write, understand, and debug assembly language programs for microprocessors and microcontrollers.

3.Understanding of Microprocessor Architecture: Students should be able to describe the architecture and working principles of popular microprocessors like Intel 8085, Intel 8086, or others, including memory organization, instruction set, and addressing modes.

4.Microcontroller Fundamentals: Students should be familiar with the architecture and functioning of microcontrollers, including popular ones like the Atmel AVR series or Microchip PIC series.

5.Programming Microcontrollers: The ability to write, compile, and load programs onto microcontrollers using high-level languages like C or embedded C

Web Applications Development:

1.Understand the fundamentals of web development: Gain a strong foundation in web technologies, including HTML, CSS, and JavaScript.

2.Design and create web pages: Learn to design and develop web pages that are visually appealing, responsive, and user-friendly.

3.Develop dynamic web applications: Learn how to create interactive web applications using JavaScript and other web development frameworks.

4.Database integration: Understand the basics of database management and integration to create data-driven web applications.

5.Responsive web design: Learn how to create web applications that are responsive and adapt to different screen sizes and devices.

## Numerical Methods:

1.Understanding of Numerical Techniques: Students should demonstrate a clear understanding of various numerical techniques and methods used for solving mathematical problems, including approximation, interpolation, and integration.

2.Error Analysis: Students should be able to analyze and quantify errors that arise during numerical computations and understand the sources of errors in numerical methods.

3.Selection of Appropriate Methods: Students should be able to select and apply the appropriate numerical methods for solving a wide range of mathematical problems, such as root finding, linear systems, and differential equations.

4.Algorithm Implementation: Students should be capable of implementing numerical algorithms and numerical solutions using programming languages or software tools such as
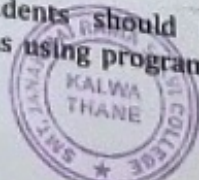
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MATLAB, Python, or C++.

Green IT:

1. Understanding of Environmental Impact: Students should gain an understanding of the environmental impact of information technology, including the energy consumption and electronic waste associated with IT equipment and operations.

2. Knowledge of Sustainable IT Practices: Students should learn about sustainable and eco-friendly practices in the field of IT, such as energy-efficient hardware and software, responsible e-waste disposal, and reducing the carbon footprint of IT operations.

3. Awareness of Regulatory Frameworks: Students should be aware of relevant laws and regulations related to green IT, such as environmental standards, e-waste disposal regulations, and data center energy efficiency guidelines.

4. Green IT Solutions: Students should be able to identify and evaluate Green IT solutions and technologies designed to minimize environmental impact, such as virtualization, cloud computing, and energy-efficient data centers.

SYBSC IT:

Python Programming:

1. Understanding Python Basics: Explain the fundamental concepts of Python programming, including data types, variables, and basic syntax.

2. Control Structures: Demonstrate the ability to use control structures such as loops and conditional statements to solve problems and implement algorithms.

3. Functions and Modules: Create and use functions in Python to modularize code and promote code reusability.

4. Understand the concept of modules and how to use them in Python programs.

5. Data Structures: Work with various data structures in Python, including lists, tuples, dictionaries, and sets. Choose the appropriate data structure for a given problem.

Data Structures:

1. Understanding of Data Structures: Students should be able to describe and explain various data structures such as arrays, linked lists, stacks, queues, trees, and graphs. They should understand the advantages and disadvantages of each data structure.

2. Implementing Data Structures: Students should be able to write code to implement and manipulate different data structures in a programming language (e.g., C++, Java, Python).

3. Analysis of Algorithms: Students should be able to analyze the time and space complexity of basic algorithms and evaluate the efficiency of different data structures.

4. Searching and Sorting: Students should understand various searching and sorting algorithms (e.g., linear search, binary search, bubble sort, quicksort) and be able to implement them.

5. Linked Lists: Students should be able to work with singly and doubly linked lists, perform basic operations like insertion, deletion, and traversal.

Computer Networks:

1. Understand Network Fundamentals: Students should be able to explain the fundamental concepts and principles of computer networks, including protocols, topologies, and network layers.

2. Analyze Networking Models: Students should be able to analyze and compare different networking models, such as the OSI (Open Systems Interconnection) model and the TCP/IP model, and understand their significance in network communication.

3. Demonstrate Knowledge of Network Devices: Students should be able to identify and describe various networking devices, including routers, switches, hubs, and network interface cards (NICs), and understand their roles in network operations.

4. Design and Implement Basic Networks: Students should be able to design and implement basic local area networks (LANs) and understand the principles of IP addressing, subnetting, and network configuration.

Operating Systems:

1. Understand Operating System Fundamentals: Students should have a solid grasp of the fundamental concepts of operating systems, including processes, threads, memory management, file systems, and I/O management.

2. Operating System Architectures: Gain knowledge of different operating system architectures, such as monolithic, microkernel, and hybrid systems, and understand their advantages and disadvantages.

3. Process Management: Learn how to manage processes and threads, including process creation, scheduling, synchronization, and interprocess communication.

4. Memory Management: Understand memory management techniques, such as virtual memory, paging, segmentation, and memory allocation strategies.

5. File Systems: Study file system structures, access methods, file operations, and disk management, as well as the concepts of directories and file permissions.

6. I/O Management: Grasp the principles of I/O devices and management, including device drivers, I/O scheduling, and buffering.

Applied Mathematics:

1. Understanding Mathematical Concepts: Develop a fundamental understanding of key mathematical concepts, including algebra, calculus, statistics, and linear algebra, and their relevance to information technology.

2. Problem-Solving Skills: Enhance problem-solving skills by applying mathematical principles to solve real-world problems commonly encountered in the field of information technology.

3. Mathematical Modeling: Learn how to create and analyze mathematical models that represent IT-related scenarios and systems, such as network performance, data analysis, or encryption algorithms.

4. Numerical Computation: Gain proficiency in numerical methods and techniques, including algorithms and software tools, for solving mathematical problems and simulations used in IT applications.

5. Data Analysis: Apply mathematical and statistical techniques to analyze and interpret data.

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which is essential for making informed decisions in IT projects.

Core Java:

1. Fundamental Java Concepts: Understand the basic concepts of Java programming, including variables, data types, operators, and control structures.

2. Object-Oriented Programming: Demonstrate a clear understanding of object-oriented programming principles, such as classes, objects, inheritance, polymorphism, and encapsulation.

3. Java Syntax and Language Features: Be proficient in Java syntax and language features, including the use of keywords, data types, and methods.

4. Java Standard Library: Utilize the Java Standard Library to work with input/output, data structures, and exception handling.

5. Graphical User Interface (GUI) Development: Develop simple GUI applications using Java's Abstract Window Toolkit (AWT) or Swing.

### Introduction To Embedded Systems:

1. Understand the fundamentals of embedded systems: Students should have a clear understanding of what embedded systems are, their components, and their role in various applications.

2. Knowledge of microcontrollers and microprocessors: Students should be able to differentiate between microcontrollers and microprocessors, understand their architecture, and be able to select the appropriate one for a given application.

3. Programming skills: Students should be proficient in programming embedded systems using languages like C or assembly language.

4. Real-time operating systems (RTOS): Students should be able to work with real-time operating systems and understand how to manage tasks and resources in embedded systems.

Computer-Oriented Statistical Techniques:

1. Understand the fundamental concepts of statistics: Demonstrate a clear understanding of basic statistical concepts, including data types, measures of central tendency, and measures of dispersion.

2. Data Collection and Preprocessing: Learn how to collect and preprocess data for statistical analysis using computer tools and software.

3. Descriptive Statistics: Apply descriptive statistics to summarize and visualize data using software like Excel or statistical software packages.

4. Inferential Statistics: Gain knowledge of inferential statistical techniques, including hypothesis testing, confidence intervals, and regression analysis.

5. Probability Distributions: Understand different probability distributions commonly used in statistics, such as the normal distribution and binomial distribution.

Software Engineering:

1. Understanding Software Engineering Concepts: Explain the fundamental concepts and principles of software engineering. Describe the software development life cycle and its phases.

2. Requirements Engineering: Identify, analyze, and document software requirements. Apply techniques for eliciting and prioritizing requirements.
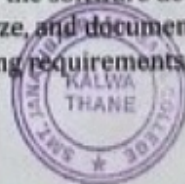
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3.Software Design:Create software design models, including architectural, structural, and behavioral diagrams.Evaluate and select appropriate design patterns for a given problem.

4.Implementation and Testing:Write code according to design specifications.Apply software testing techniques to identify and fix defects in the code.

5.Software Project Management:Understand project management principles and practices in software development.Create project plans, schedule tasks, and allocate resources effectively.

Computer Graphics And Animation:

1.Understand the fundamentals of computer graphics: Students should be able to explain the basic principles of computer graphics, including raster and vector graphics, pixel manipulation, and coordinate systems.

2.Proficiency in 2D graphics: Students should be able to create and manipulate 2D graphics using software tools, including drawing shapes, applying colors, and handling transformations.

3.Proficiency in 3D graphics: Students should be able to work with 3D graphics concepts, including 3D modeling, shading, and rendering.

4.Animation principles: Students should understand the fundamental principles of animation, including timing, keyframes, interpolation, and easing.

5.Animation software proficiency: Students should be able to use animation software to create animated sequences and apply various techniques for character animation, object movement, and special effects.

TYBSC IT:

Software project management:

1.Understand the fundamentals of project management: Students should be able to explain the basic principles and concepts of project management, including project scope, schedule, budget, quality, and risk management.

2.Software development life cycle (SDLC): Gain an understanding of different software development methodologies (e.g., Waterfall, Agile, Scrum) and be able to choose the appropriate methodology for a given project.

3.Project planning: Learn how to create project plans, including defining project objectives, work breakdown structure (WBS), resource allocation, and scheduling.

4.Risk management: Identify potential risks in software projects and develop risk mitigation strategies to ensure project success.

5.Project monitoring and control: Understand how to track project progress, identify variances, and take corrective actions to keep the project on track.

Internet of Things:

1.Understand IoT Concepts: Students should be able to explain the fundamental concepts and principles of IoT, including the components, architecture, and its significance in the modern digital landscape.

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2.IoT Protocols and Standards: Familiarity with various communication protocols and standards commonly used in IoT, such as MQTT, CoAP, HTTP, and the OSI model.

3.IoT Hardware and Software: Ability to identify and describe the hardware and software components used in IoT devices and systems, including sensors, actuators, microcontrollers, and operating systems.

4.Data Management: Understanding of data management and data processing in IoT, including data collection, storage, analysis, and visualization techniques.

Advanced web programming:

1.Understanding of Advanced Web Technologies: Students should gain a deep understanding of advanced web development technologies, including HTML5, CSS3, JavaScript, and related frameworks and libraries.

2.Proficiency in Responsive Web Design: Students should be able to create web applications that are responsive, ensuring a seamless user experience across various devices and screen sizes.

3.Server-Side Programming: Proficiency in server-side scripting languages like PHP, Python, or Ruby, and the ability to create dynamic web applications using these technologies.

4.Database Integration: Students should learn how to connect web applications to databases, retrieve and store data, and perform CRUD (Create, Read, Update, Delete) operations

Artificial intelligence:

1.Understand the fundamentals of Artificial Intelligence (AI) and its significance in the field of Information Technology.

2.Develop a solid understanding of various AI techniques, including machine learning, deep learning, natural language processing, and computer vision.

3.Gain knowledge of AI programming languages and tools, such as Python, TensorFlow, and PyTorch.

4.Learn how to design and implement AI algorithms for solving real-world problems.

5.Explore the ethical and societal implications of AI and its impact on various industries.

6.Acquire the ability to analyze and evaluate AI models and their performance.

7.Gain hands-on experience in building and training AI models for tasks like image recognition, language processing, and recommendation systems.

Next generation technologies:

1.Understand Next-Generation Technologies: Students should be able to demonstrate a comprehensive understanding of next-generation technologies, including but not limited to topics such as Internet of Things (IoT), artificial intelligence, blockchain, and 5G.

2.Analyze Emerging Trends: Students should be able to analyze and identify emerging trends in the field of information technology and how these trends are shaping the industry.

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3.Evaluate the Impact on Businesses: Students should be able to assess how next-generation technologies are impacting various businesses and industries, and identify opportunities and challenges.

4.Hands-on Experience: Depending on the course, students might gain practical experience by working with relevant technologies or tools, such as developing IoT applications, creating AI models, or understanding blockchain principles.

5.Ethical Considerations: Students should be aware of the ethical, legal, and social implications of next-generation technologies and be able to critically analyze these issues.

6.Security and Privacy: Understand the importance of security and privacy in the context of these technologies and how to implement safeguards.

Software quality assurance:

1.Understand the principles of software quality assurance (SQA) and its importance in the software development lifecycle.

2.Identify and define key quality attributes of software, such as reliability, maintainability, usability, and performance.

3.Explain the role of quality standards and frameworks in SQA, including ISO 9000 and CMMI.

4.Demonstrate knowledge of various testing methodologies, including functional testing, non-functional testing, and security testing.

5.Develop a strong understanding of software testing techniques, including manual and automated testing, and their application in practice.

Security in computing:

1.Understanding Security Fundamentals: Gain a solid understanding of the fundamental principles of computer and information security, including the CIA (Confidentiality, Integrity, Availability) triad.

2.Identifying Threats and Vulnerabilities: Be able to identify common threats and vulnerabilities in computing systems and networks, including malware, hacking, and social engineering.

3.Risk Assessment and Management: Learn how to assess and manage security risks, including the use of risk assessment methodologies and risk mitigation strategies.

4.Cryptography: Understand the principles of cryptography, including encryption and decryption techniques, and their application in securing data and communications.

5.Access Control and Authentication: Gain knowledge about access control mechanisms and authentication methods to ensure that only authorized users have access to systems and data.

6.Network Security: Learn about network security concepts, protocols, and best practices to protect data in transit and secure network infrastructure.

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Business intelligence:

1. Understand the fundamental concepts of Business Intelligence (BI), including its history, purpose, and importance in the modern business environment.
2. Explain the role of data in BI and recognize different types of data sources, including structured and unstructured data.
3. Analyze and assess the business needs for BI solutions and identify potential benefits and limitations.
4. Familiarize with various BI tools and technologies commonly used in the industry, such as data warehousing, data mining, reporting, and dashboarding.
5. Develop the ability to design and implement a data warehouse or data mart to store and manage business data efficiently.
6. Perform data extraction, transformation, and loading (ETL) processes to prepare data for analysis and reporting.
7. Create meaningful and informative reports and dashboards using BI tools and data visualization techniques.

Principles of geographic information system:

1. Understand the fundamental concepts of Geographic Information Systems (GIS), including spatial data, attributes, and their integration.
2. Describe the history and evolution of GIS and its applications in various fields, such as geography, environmental science, urban planning, and business.
3. Analyze the components of a GIS, including hardware, software, data, and users, and their roles in the GIS process.
4. Gain proficiency in using GIS software, such as ArcGIS or QGIS, to perform common GIS tasks, including data input, data editing, spatial analysis, and map production.
5. Learn about different types of spatial data, including vector data and raster data, and how to manage and manipulate them within a GIS.

IT service management:

1. Understand IT Service Management (ITSM) Fundamentals: Define ITSM and its significance in modern organizations. Explain the key principles and concepts of ITSM, including the ITIL (Information Technology Infrastructure Library) framework.
2. IT Service Strategy: Describe the importance of aligning IT services with business goals and objectives. Analyze various IT service strategies and their impact on the organization.
3. IT Service Design: Explain the processes involved in designing IT services, including service level agreements (SLAs), capacity planning, and availability management. Demonstrate the ability to create service designs that meet business requirements.
4. IT Service Transition: Understand the transition of IT services from the design phase to the operational phase. Describe the change management process, release and deployment

management, and knowledge management

PROGRAM OUTCOMES OF BSC CS

To develop an understanding and knowledge of the basic theory of Computer Science with good foundation on theory, systems and applications. To fostenecessary skills and analytical abilities for developing computer based solutions of real-life problems.To provide training in emergent computing technologies which lead to innovative solutions for industry and academia. To develop the necessary study skills and knowledge to pursue further post-graduate study in computer science or other related fields. To develop the professional skillset required for a career in an information technology oriented business or industry. To enable students to work independently and collaboratively, communicate effectively, and become responsible, competent, confident, insightful, and creative users of computing technology

COURSE OUTCOMES

FYBSC-CS:
Digital Systems & Architecture

After successful completion of this course, students would be able to
• To learn about how computer systems work and underlying principles
• To understand the basics of digital electronics needed for computers
• To understand the basics of instruction set architecture for reduced and complex instruction sets
• To understand the basics of processor structure and operation
• To understand how data is transferred between the processor and I/O devices

Introduction to Programming with Python

After successful completion of this course, students would be able to:
• Ability to store, manipulate and access data in Python
• Ability to implement basic Input / Output operations in Python
• Ability to define the structure and components of a Python program.
• Ability to learn how to write loops and decision statements in Python.
• Ability to learn how to write functions and pass arguments in Python.
• Ability to create and use Compound data types in Python

LINUX Operating System

After successful completion of this course, students would be able to
• Work with Linux file system structure, Linux Environment
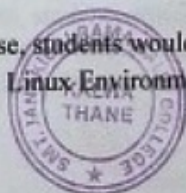
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• Handle shell commands for scripting, with features of regular expressions, redirections
• Implement file security permissions
• Work with vi, sed and awk editors for shell scripting using various control structures
• Install softwares like compilers and develop programs in C and Python programming languages on Linux Platform

Open Source Technologies

- Recognize the applications, benefits and features of Open-Source Technologies
- Gain knowledge to start, manage open-source projects.

Discrete Mathematics

After successful completion of this course, learners would be able to:
• Define mathematical structures (relations, functions, graphs) and use them to model real life situations.
• Understand, construct and solve simple mathematical problems.
• Solve puzzles based on counting principles.
• Provide basic knowledge about models of automata theory and the corresponding formal languages.
• Develop an attitude to solve problems based on graphs and trees, which are widely used in software.

Descriptive Statistics

After successful completion of this course, learners would be able to
1. Organize, manage and present data.
2. Analyze Statistical data using measures of central tendency and dispersion.
3. Analyze Statistical data using basics techniques of R.
4. Study the relationship between variables using techniques of correlation and regression

Soft Skill:

- Ability to understand the importance of stress management in their academic & professional
- Learners will be able to understand the importance and types soft skills
- Learners will develop skills for Academic and Professional Presentations.

## Design & Analysis of Algorithms :

After successful completion of this course, students would be able to
• Students should be able to understand and evaluate efficiency of the programs that they write based on performance of the algorithms used.
• Students should be able to appreciate the use of various data structures as per need
• To select, decide and apply appropriate design principle by understanding the requirements of any real life problems

Advanced Python Programming :

After successful completion of this course, students would be able to
• Ability to implement OOP concepts in Python including Inheritance and Polymorphism
• Ability to work with files and perform operations on it using Python.
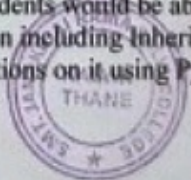
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- Ability to implement regular expression and concept of threads for developing efficient program
- Ability to implement exception handling in Python applications for error handling.
- Knowledge of working with databases, designing GUI in Python and implement networking in programs.

Introduction to OOPs using C++

After successful completion of this course, students would be able to
- Work with numeric, character and textual data and arrays.
- Understand the importance of OOP approach over procedural language.
- Understand how to model classes and relationships using UML.
- Apply the concepts of OOPS like encapsulation, inheritance and polymorphism.
- Handle basic file operations.

Database Systems

After successful completion of this course, students would be able to
- To appreciate the importance of database design.
- Analyze database requirements and determine the entities involved in the system and their relationship to one another.
- Write simple queries to MySQL related to String, Maths and Date Functions.
- Create tables and insert/update/delete data, and query data in a relational DBMS using MySQL commands.
- Understand the normalization and its role in the database design process.
- Handle data permissions.
- Create indexes and understands the role of Indexes in optimization search

Calculus

After successful completion of this course, learners would be able to:
- Develop mathematical skills and enhance thinking power of learners.
- Understand mathematical concepts like limit, continuity, derivative, integration of functions, partial derivatives.
- Appreciate real world applications which uses the learned concepts.
- Skill to formulate a problem through Mathematical modelling and simulation

Statistical Methods

After successful completion of this course, learners would be able to
- Calculate probability, conditional probability and independence.
- Apply the given discrete and continuous distributions whenever necessary.
- Define null hypothesis, alternative hypothesis, level of significance, test statistic and p value.
- Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases.
- Apply non-parametric test whenever necessary

E-Commerce & Digital Marketing

After successful completion of this course, students would be able to
- Understand the core concepts of E-Commerce.
- Understand the various online payment techniques

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- Understand the core concepts of digital marketing and the role of digital marketing in business.
- Apply digital marketing strategies to increase sales and growth of business
- Apply digital marketing through different channels and platforms
- Understand the significance of Web Analytics and Google Analytics and apply the same.

SYBSC-CS

Principles of Operating Systems:

After successful completion of this course, students would be able to

☐ Work with any type of operating system

☐ Handle threads, processes, process synchronization

Linear Algebra:

After successful completion of this course, students would be able to

- Appreciate the relevance and applications of Linear Algebra in the field of Computer Science.
- Understand the concepts through program implementation.
- Instill a computational thinking while learning linear algebra.
- Express clear understanding of the concept of a solution to a system of equations.
- Find eigenvalues and corresponding eigenvectors for a square matrix.

Data Structures:

After successful completion of this course, students would be able to-

- Create different types of data structures.
- Understand which data structure to be used based on the type of the problem.
- Apply combined knowledge of algorithms and data structures to write highly effective programs in various domains.

Advanced Database Concepts:

After successful completion of this course, students would be able to

- Master concepts of stored procedure, functions, cursors and triggers and its use.
- Learn about using PL/SQL for data management.
- Use efficiently Collections and records.
- Understand concepts and implementations of transaction management and crash

Java based Application Development:

After successful completion of this course, students would be able to

- Design basic application in java using Graphical User Interface.
- The learner will be able to develop applications using swings
- The learner will be able to develop web based applications using servlet and jsp
- The learner will be able to connect databases with java through
- The learner will be able to perform programs using JSON objects

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Web Technologies:

After successful completion of this course, students would be able to

- Design valid, well-formed, scalable, and meaningful pages using emerging technologies.
- Understand the various platforms, devices, display resolutions, viewports, and browsers that render websites
- Develop and implement client-side and server-side scripting language programs.
- Develop and implement Database Driven Websites.
- Design and apply XML to create a markup language for data and document centric applications

Creative Content Writing:

After successful completion of this course, students would be able to

- Understand the fundamentals of content creation for Blog, Website etc.
- Acquire the ability to write and edit in a variety of styles and procedures
- To develop the creative abilities.
- To acquire essential language skills for editors.

Green Technologies:

After successful completion of this course, students would be able to

- Explain drivers and dimensions of change for Green Technology
- Appreciate Virtualization; smart meters and optimization in achieving green IT
- Gain knowledge about green assets, green processes, and green enterprise architecture

Theory of Computation:

After successful completion of this course, students would be able to

- Understand Grammar and
- Learn about Automata theory and its application in Language Design
- Learn about Turing Machines and Pushdown Automata
- Understand Linear Bound Automata and its applications

Computer Networks:

After successful completion of this course, students would be able to

- Learn basic networking concepts and layered architecture.
- Understand the concepts of networking, which are important for them to be known as a 'networking professionals

Software Engineering:

After successful completion of this course, students would be able to

- Plan a software engineering process life cycle, including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements

- Analyze and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology.
- Know how to develop the code from the design and effectively apply relevant standard perform testing, and quality management and practice.

IoT Technologies:

After successful completion of this course, students would be able to
- understand SoC and IoT
- use different types of IoT Platforms and interfaces
- understand and implement an idea of various types of applications built using IoT

Android Application Development:

After successful completion of this course, students would be able to
- Build useful mobile applications using Kotlin language on Android
- Install and configure Android Studio for application development
- Master basic to intermediate concepts of Kotlin required for mobile

Advanced Application Development:

After successful completion of this course, students would be able to
- Store the data in NoSQL, document-oriented MongoDB database that brings performance and scalability.
- Use Node.js and Express Framework for building fast, scalable network applications
- Use AngularJS framework that offers declarative, two-way data binding for web applications.
- Integrate the front-end and back-end components of the MEAN stack.
- Develop robust mobile applications using Flutter.

Research Methodology:

After successful completion of this course, students would be able to
- Define research, formulate problem and describe the research process and research methods.
- Understand and apply basic research methods including research design, data analysis and interpretation.
- Understand ethical issues in research, write research report, research paper and publish the paper.

TYBSC-CS:
Artificial Intelligence :

After successful completion of this course, students would be able to
- Demonstrate knowledge of the foundations and key concepts in the field of AI.
- Analyze and design intelligent agents for specific environments.
- Apply problem-solving techniques and algorithms to find solutions to different types of problems.
- Construct knowledge representation models and use reasoning techniques to derive new knowledge.
- Implement machine-learning algorithms and evaluate their performance for classification and regression tasks.

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Information & Network Security:

After successful completion of this course, students would be able to:

- Analyze and evaluate security trends, attacks, and mechanisms, and propose effective security solutions based on the OSI security architecture.
- Apply classical encryption techniques, such as substitution and transposition ciphers, to encrypt and decrypt messages and analyze their security implications.
- Implement public-key cryptography algorithms, including RSA, and demonstrate the ability to securely exchange keys and establish secure communication channels.
- Design and implement secure authentication mechanisms, including message authentication codes and digital signatures, to ensure data integrity and non-repudiation.
- Evaluate and implement various security measures, such as IP security, web security protocols (e.g., SSL/TLS), intrusion detection systems, and firewall configurations, to protect networks and systems from unauthorized access and attacks.

Linux Server Administration:

After successful completion of this course, students would be able to

- Demonstrate proficiency in managing software packages and repositories in Linux.
- Configure and administer user accounts, groups, and permissions in a Linux system.
- Implement network services such as DNS, FTP, and web servers, ensuring proper security measures.
- Design and manage advanced network services including NFS, Samba, and LDAP for efficient file sharing and user authentication.
- Apply troubleshooting techniques to identify and resolve common issues in Linux server administration

Software Testing & Quality Assurance:

After successful completion of this course, students would be able to

- Explain the importance of software testing and its impact on software quality.
- Apply appropriate software testing techniques to identify and mitigate software defects.
- Design and execute test cases to verify the functionality and performance of software systems.
- Understand the principles of verification and validation and their application in software testing.
- Utilize software testing tools and frameworks to automate testing processes and improve efficiency.

Cyber Forensics :

After successful completion of this course, students would be able to

- Demonstrate a solid understanding of the principles and techniques used in computer forensics investigations.
- Apply systematic approaches to acquire, preserve, and analyze digital evidence from various sources.
- Utilize specialized tools and software for conducting effective computer forensics analysis.
- Develop strong skills in investigating network-related incidents, including live acquisitions and network forensics.
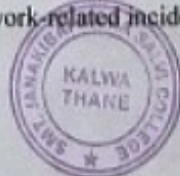
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- Generate comprehensive and well-written reports that accurately document the findings of computer forensic investigations

Game Programming:

After successful completion of this course, students would be able to

- Apply vector manipulation techniques and transformations to create and manipulate objects in 3D space.
- Utilize industry-standard tools and technologies such as Unity and DirectX for 3D game development.
- Implement advanced graphics techniques, including lighting, shading, and texturing, to create visually stunning game environments.
- Design and develop games that incorporate principles of game design to create engaging and immersive experiences.
- Deploy and showcase 3D games on various platforms, demonstrating proficiency in game development.

Project Management:

After successful completion of this course, students would be able to

- Apply project management principles, processes, and best practices to plan, execute, and control projects effectively.
- Develop project charters, define project scopes, and create work breakdown structures (WBS) to establish project objectives and deliverables.
- Create project schedules, estimate resource requirements, and monitor project progress using appropriate project management techniques.
- Employ quality assurance and control measures to ensure project deliverables meet stakeholder expectations and industry standards.
- Demonstrate effective leadership and teamwork skills, as well as the ability to manage stakeholders, resolve conflicts, and make ethical decisions in project management settings.

Operations Research:

After successful completion of this course, students would be able to

- Define and explain the key concepts and features of Operations Research.
- Formulate and solve linear programming models using appropriate techniques.
- Apply duality concepts to analyze and interpret the results of linear programming problems.
- Conduct sensitivity analysis to assess the robustness and flexibility of linear programming solutions.
- Apply advanced techniques such as goal programming, transportation problems, and assignment

Data Science:

After successful completion of this course, students would be able to

- Apply data preprocessing techniques to clean and transform raw data, handle missing values and outliers, and merge datasets.
- Implement machine-learning algorithms to perform tasks such as regression, classification, clustering, and ensemble learning.
- Evaluate and compare different machine learning models using appropriate evaluation metrics and cross-validation techniques.
- Create informative and visually appealing data visualizations to communicate insights and patterns in data.

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- Understand the principles and practices of data management, including data governance, data quality assurance, and data privacy considerations

Cloud Computing and Web Services:

After successful completion of this course, students would be able to

- Demonstrate a comprehensive understanding of cloud computing concepts, including different types of clouds and their characteristics.
- Implement and utilize web service technologies, such as SOAP and REST, to develop distributed and parallel computing applications.
- Design, deploy, and manage cloud-based applications and services using popular cloud computing platforms such as OpenStack and AWS.
- Apply secure development practices and implement cloud security policies to ensure the confidentiality, integrity, and availability of cloud software solutions.
- Utilize virtualization technologies to create and manage virtualized environments, considering the benefits and drawbacks of virtualization.

Wireless Sensor Networks:

After successful completion of this course, students would be able to

- Understand the fundamental concepts, architectural elements, and optimization goals of Wireless Sensor Networks (WSNs) and apply this knowledge to analyze and design WSN solutions.
- Evaluate and compare different medium access control protocols and routing strategies in WSNs, and make informed decisions to ensure efficient and reliable communication.
- Demonstrate knowledge of wireless transmission technologies, such as frequency, signals, antennas, and propagation, and analyze their impact on WSN performance.
- Assess the role of telecommunication systems, satellite, broadcast systems in WSNs, and understand their applications and implications for WSN deployments

Information Retrieval :

After successful completion of this course, students would be able to

- Explain the key components and principles of information retrieval systems.
- Apply indexing, storage, and retrieval techniques to efficiently retrieve relevant documents.
- Compare and contrast different retrieval models and select appropriate models for specific search scenarios.
- Develop practical skills in implementing and evaluating information retrieval systems.
- Demonstrate an understanding of advanced topics in information retrieval, including web search and machine learning techniques.

Data Mining & Warehousing:

After successful completion of this course, students would be able to

- Explain the purpose and components of a data warehouse and differentiate it from transactional databases.
- Perform OLAP operations on a multidimensional data model to analyze and query data.
- Implement data preprocessing techniques to address missing data and prepare the data for mining.
- Apply association rules mining algorithms to discover patterns and relationships in large datasets.

Ethical Hacking :

After successful completion of this course, students would be able to

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- Apply ethical hacking methodologies to conduct comprehensive security assessments and penetration tests.
- Perform effective footprinting and reconnaissance techniques to gather critical information about target systems.
- Identify and exploit vulnerabilities in various network and system components using appropriate tools and techniques.
- Evaluate the security posture of web servers, web applications, and wireless networks, and recommend appropriate countermeasures.
- Demonstrate an understanding of ethical and legal considerations in conducting ethical hacking activities and adhere to professional codes of conduct

Customer Relationship Management :

After successful completion of this course, students would be able to

- Students will be able to define and explain the various forms of CRM and their relevance to business contexts.
- Students will acquire the skills to manage the customer journey effectively, including implementing customer acquisition and retention programs.
- Students will understand the importance of customer-perceived value and its impact on customer satisfaction, loyalty, and business performance.
- Students will be able to apply strategic and operational CRM approaches, such as customer portfolio management and marketing automation, to enhance organizational effectiveness.
- Students will develop proficiency in analytical CRM techniques, including data management, analytics for strategy and tactics, and the successful implementation of CRM systems. They will also be able to analyze and draw insights from real-life case studies and success stories related to

Cyber Laws and IPR:

After successful completion of this course, students would be able to

- Demonstrate a comprehensive understanding of cyber laws and their application in the digital age.
- Evaluate legal frameworks and regulations governing cyber laws.
- Identify and assess key issues in cyber laws, such as e-commerce, e-governance, and electronic records and contracts.
- Understand cyber crimes, enforcement mechanisms, and the role of the Cyber Appellate Tribunal.
- Analyze emerging issues in cyber laws, including liability of ISPs, privacy concerns, and jurisdictional complexities.
- Recognize intellectual property rights and online regulations, including copyrights, patents, and domain name disputes

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