SIES College of Commerce and Economics (Autonomous), Sion (East)

Department of Information Technology

B.Sc. (IT) PROGRAM OUTCOMES

PO- 1: After completing three years Degree Course – Bachelor of Science (Information Technology) (B.Sc.-IT) program, Learners will develop foundational knowledge of computer programming.

PO- 2: Learners will acquire practical knowledge, training in professional skills, ethics and values to build competencies in the area of information technology.

PO- 3: Learners will achieve holistic personal growth and development in a cultural context along with commercial, communication, research, analytical and managerial skills in practical and theoretical concepts in Information Technology.

PO- 4: Learners will enhance IT skills and be able to relate to global challenges and be exposed to newer avenues in Information Technology.

PO- 5: Learners will be trained in leadership skills and social responsibilities with sensitivity towards environment and sustainability

Program: B.Sc.(Information Technology)
Year : Second Year
Semester III
Subject: Computer Networks / Computer Networks Lab
Course Code: BSIT-MJS3-101 / BSIT-MJPS3-101

Course Outcomes:
After completion of the course,

No	Course Outcomes	PO Mapping
CO 1 (Remember)	The Learner will be able to recall basic definitions and concepts related to data communication, network types, and models such as OSI and TCP/IP.	PO-1, PO-2
CO 2 (Understanding)	The Learner will be able to describe how data is transmitted using analog and digital signals, and articulate the differences between guided and unguided media.	PO-1, PO-4
CO 3 (Applying)	The Learner will be able to apply the concepts of data link control, including error detection, correction techniques, and media access control mechanisms, in practical communication scenarios.	PO-2, PO-4
CO 4 (Analyzing)	The Learner will be able to analyze the performance of network protocols such as IPv4, IPv6, TCP, UDP, and evaluate their impact on network performance and security.	PO-3, PO-4
CO 5 (Evaluating)	The Learner will be able to evaluate and compare the efficiency of different routing algorithms and network protocols (IPv4 vs IPv6, TCP vs UDP) in real-world network environments.	PO-3, PO-4
CO 6 (Creating)	The Learner will be able to design a network architecture incorporating appropriate protocols, transmission media, and routing strategies, ensuring optimal performance, scalability, and security.	PO-2, PO-5

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Program: B.Sc.(Information Technology)
Year : Second Year
Semester III
Subject: Python Programming / Python Programming Lab
Course Code: BSIT-MJS3-102 / BSIT-MJPS3-102

Course Outcomes:
After completion of the course,

No	Course Outcomes	PO Mapping
CO 1 (Remember)	The learner will be able to describe the structure and components of a Python program effectively.	PO-1,PO-2,PO-4
CO 2 (Understanding)	The learner will be able to explain and demonstrate the fundamental concepts in python such as functions, strings, object oriented programming.	PO-1,PO-2,PO-4
CO 3 (Applying)	The learner will be able to apply different data structures such as list, tuples and dictionaries.	PO-1,PO-2,PO-4
CO 4 (Analyzing)	The learner will be able to select the concepts in order to solve real world problems in python	PO-1,PO-2,PO-4
CO 5 (Evaluating)	The learner will be able to compare python with other classical programming languages.	PO-1,PO-2,PO-4
CO 6 (Creating)	Students will be able to create basic Python programs that scrape simple web data, work with Excel files, and build a small Django app.	PO-1, PO-2, PO-3, PO-4, PO-5

Program: B.Sc.(Information Technology)
Year : Second Year
Semester III
Subject: Computer Oriented Statistical Techniques / Computer Oriented Statistical Techniques with R Programming
Course Code: BSIT-MNS3-103 / BSIT-MNPS3-103

Course Outcomes:

After completion of the course ,

No	Course Outcomes	PO Mapping
CO 1 (Remember)	The learner will be able to recall the definitions, formulas, and properties of measures of central tendency, dispersion, sampling theory, hypothesis testing, correlation, and regression	PO-1, PO-2
CO 2 (Understanding)	The learner will be able to explain the concepts of averages, variation, sampling distributions, estimation, correlation, regression, and statistical tests in real-world contexts.	PO-1, PO-3
CO 3 (Applying)	The learner will be able to apply appropriate statistical measures (mean, median, mode, standard deviation, correlation, regression, etc.) and probability models to analyze datasets.	PO-2, PO-4
CO 4 (Analyzing)	The learner will be able to analyze data using hypothesis testing, chi-square tests, t-tests, and F-tests, and interpret their significance in decision-making.	PO-3, PO-4
CO 5 (Evaluating)	The learner will be able to evaluate and compare different statistical methods, select appropriate tests, and justify their use in solving practical problems.	PO-3, PO-5
CO 6 (Creating)	The learner will be able to design and implement statistical models using correlation, regression, and estimation techniques to solve applied problems in information technology and related domains.	PO-2, PO-4, PO-6

Program: B.Sc.(Information Technology)
Year : Second Year
Semester III
Subject: Intellectual Property Rights
Course Code: BSIT-OES3-105

Course Outcomes:

After completion of the course ,

No	Course outcomes	PO Mapping
CO 1 (Remember)	Learners will be able to recall and define fundamental concepts and types of intellectual property such as patents, copyrights, trademarks, and trade secrets.	PO1, PO2
CO 2 (Understanding)	Learners will be able to explain the significance of intellectual property rights in innovation, creativity, and business development.	PO3, PO4
CO 3 (Applying)	Learners will be able to apply legal provisions and procedures related to intellectual property protection in practical scenarios.	PO2, PO4
CO 4 (Analyzing)	Learners will be able to analyze case studies of intellectual property disputes and differentiate between various forms of protection available.	PO3, PO5
CO 5 (Evaluating)	Learners will be able to evaluate the ethical, economic, and social implications of intellectual property rights in national and global contexts.	PO3, PO4, PO5
CO 6 (Creating)	Learners will be able to create strategies for safeguarding intellectual property and formulate approaches to manage innovation in compliance with IPR laws.	PO2, PO5

Program: B.Sc.(Information Technology)
Year : Second Year
Semester III
Subject: Microprocessors & Microcontrollers
Course Code: BSIT-VSCS3-106

Course Outcomes:

After completion of the course,

No	Course Outcomes	PO Mapping
CO 1 (Remember)	Learner will be able to understand the architecture of microprocessors and microcomputers, including their components and operations.	PO1, PO2
CO 2 (Understanding)	Learner will be able to explain the 8085 microprocessor architecture, machine cycles, and memory interfacing techniques.	PO1, PO2
CO 3 (Applying)	Learner will be able to write and debug assembly language programs using 8085 instructions including data transfer, arithmetic, logic, and branching.	PO1, PO2, PO3
CO 4 (Analyzing)	Learner will be able to describe the concepts, characteristics, and applications of embedded systems.	PO1, PO4
CO 5 (Evaluating)	Learner will be able to apply communication protocols such as I2C, Bluetooth, Wi-Fi, and RFID for interfacing with microcontrollers.	PO2, PO4
CO 6 (Creating)	Learner will be able to understand the PIC18 microcontroller architecture and develop programs using branching, calls, delays, and pipeline instructions.	PO1, PO2, PO3

Program: B.Sc.(Information Technology)
Year : Second Year
Semester: III
Subject: Hindi
Course Code: BSIT-AECS3-107

Course Outcomes:

After completion of the course ,

No	Course Outcomes	PO Mapping
CO 1 (Remember)	छात्र प्रयोजनमूलक, वाणिज्यिक और अन्य उद्देश्यों के लिए हिंदी के महत्व को पहचान सकेंगे। Learners will be able to recognize the importance of Hindi for functional, commercial, and other purposes.	PO-1 PO - 3
CO 2 (Understanding)	छात्र विभिन्न क्षेत्रों में हिंदी भाषा की मौलिक संरचना और प्रयोजनमूलक उपयोगिता को समझ सकेंगे । Learners will understand the fundamental structure and functional utility of the Hindi language in different sectors	PO-1 PO- 2
CO 3 (Applying)	छात्र हिंदी के प्रयोग से वैश्विक विवाद और विभिन्न समसामयिक माहौल से सामंजस्य स्थापित कर सकेंगे । Learners will be able to relate to global issues and different avenues through the use of Hindi.	PO- 4
CO 4 (Analyzing)	छात्र वाणिज्यिक, संचार, अनुसंधान, विश्लेषणात्मक, वित्तीय, विपणन और प्रबंधकीय क्षेत्रों में हिंदी के प्रयोग के माध्यम से रोज़गार का चयन करने में सक्षम होंगे। Learners will be able to select careers through the use of Hindi in commercial, communication, research, analytical, financial, marketing and managerial sectors.	PO- 3
CO 5 (Evaluating)	छात्र औपचारिक और अनौपचारिक, व्यावहारिक, व्यावसायिक और नैतिक संचार के लिए हिंदी की प्रभावशीलता का आकलन करने में	PO-2 PO- 3

	सक्षम होंगे । Learners will be able to assess effectiveness of Hindi for formal and informal, practical, professional, and ethical communication.	
CO 6 (Creating)	छात्र हिंदी के प्रयोग से व्यक्तित्व और नेतृत्व कौशल विकसित कर सकेंगे तथा संस्कृति, समाज, पर्यावरण और संधारणीयता के प्रति अपनी जिम्मेदारी समझ सकेंगे। Learners will be able to develop personalities and leadership skills, and responsibilities towards culture, society, environment, and sustainability through the use of Hindi.	PO - 3 PO-5

Program: B.Sc.(Information Technology)

Year : Second Year

Semester: III

Subject: Marathi

Course Code: BSIT-AECS3-110

Course Outcomes:

After completion of the course learners will be able to,

CO- 1. मराठी भाषेच्या प्राथमिक पातळीवरील व्यावहारिक संवाद आत्मसात करणे. To acquire practical communication skills at the basic level of the Marathi language.	PO-2 PO-3
CO- 2. सूत्रसंचालन, निवेदन, मुलाखत, वक्तृत्व या क्षेत्रातील व्यावसायिक संधीसाठी कौशल्ये आत्मसात करणे. To acquire skills for professional opportunities in the fields of anchoring, narration, interviewing, and public speaking.	PO-3 PO-5
CO- 3. मराठी भाषेत व्यावहारिक आणि औपचारिक लेखनाची पायाभूत तत्त्वे आत्मसात करणे. To acquire the fundamental principles of practical and formal writing in the Marathi language.	PO-1 PO-2
CO- 4. लेखनातील संकल्पना, स्वरूप, प्रक्रिया आणि प्रकार यांचे सखोल ज्ञान मिळवणे. To gain in-depth knowledge of concepts, forms, processes, and types of writing.	PO-2 PO-4
CO- 5. लेखनातील अडथळे ओळखून त्यावर उपाययोजना करण्याची क्षमता विकसित करणे. To develop the ability to identify obstacles in writing and take corrective measures.	PO-2 PO- 3 PO- 4
CO- 6. पत्रलेखन, अहवाल लेखन आणि वृत्त लेखनातील तांत्रिक अचूकता व भाषिक परिपूर्णता साधणे. To achieve technical accuracy and linguistic perfection in letter writing, report writing, and news writing.	PO-4 PO-5

Program: B.Sc.(Information Technology)
Year : Second Year
Semester III
Subject: Environment Sustainability in IT
Course Code: BSIT-FPS3-108

Course Outcomes:

After completion of the course ,

No	Course outcomes	PO Mapping
CO 1 (Remember)	Learners will be able to recall and define key sustainability concepts and practices in IT	PO1, PO5
CO 2 (Understanding)	Learners will be able to explain and interpret environmental sustainability principles in the IT context.	PO1, PO2, PO4, PO5
CO 3 (Applying)	Learners will be able to use knowledge to implement sustainable practices and technologies in IT operations and development.	PO1, PO2, PO3, PO5
CO 4 (Analyzing)	Learners will be able to analyze how IT solutions contribute to addressing environmental issues. They will evaluate the role of IT in supporting sustainable business practices.	PO3, PO5
CO 5 (Evaluating)	Learners will be able to evaluate the environmental impact of IT products and services across their lifecycle. They will assess strategies for e-waste management and recycling.	PO2, PO4, PO5
CO 6 (Creating)	Learners will be able to create awareness campaigns, educational materials, and training programs to promote sustainable IT practices.	PO2, PO3, PO4, PO5

Program: B.Sc.(Information Technology)
Year : Second Year
Semester IV
Subject: Introduction to Data Structures / Introduction to Data Structures Lab
Course Code: BSIT-MJS4-101 / BSIT-MJPS4-101

Course Outcomes:

After completion of the course ,

No.	Course Outcomes	PO Mapping
CO 1 (Remember)	The learner will be able to identify how various data structures are helpful in data management and data organization.	PO1, PO2
CO 2 (Understanding)	The learner will be able to understand the usage of data structures in various domains and relate them to real-world problem-solving.	PO1, PO2, PO3
CO 3 (Applying)	The learner will be able to use various functions on data structures to perform insertion, deletion, traversal, and searching operations effectively.	PO2, PO3, PO4
CO 4 (Analyzing)	The learner will be able to compare and differentiate between various data structures in terms of their efficiency, time complexity, and suitability for specific problems.	PO2, PO3, PO4
CO 5 (Evaluating)	The learner will be able to discriminate and assess appropriate data structures for various applications by analyzing performance and memory utilization.	PO3, PO4, PO5
CO 6 (Creating)	The learner will be able to write programs to implement various data structures in Python for solving computational and real-life problems.	PO2, PO3, PO4

Program: B.Sc.(Information Technology)
Year : Second Year
Semester IV
Subject: Database Management Systems / Database Management Systems Lab
Course Code: BSIT-MJS4-102 / BSIT-MJPS4-102

Course Outcomes:

After completion of the course ,

No	Course Outcomes	PO Mapping
CO 1 (Remember)	The learner will be able to describe the role of database management systems in information technology domain.	PO- 1, PO-3, PO-4
CO 2 (Understanding)	The learner will be able to explain transaction management design principles.	PO- 1, PO-3, PO-4
CO 3 (Applying)	The learner will be able to execute SQL queries for defining and manipulating database information.	PO- 1, PO-3, PO-4
CO 4 (Analysing)	The learner will be able to integrate the concepts of RDBMS.	PO- 1, PO-3, PO-4
CO 5 (Evaluating)	The learner will be able to summarize the usage of functions and procedure in PL/SQL.	PO- 1, PO-3, PO-4
CO 6 (Creating)	The learner will be able to design databases for various software projects.	PO- 1, PO-2, PO- 3, PO-4, PO-5

Program: B.Sc.(Information Technology)
Year : Second Year
Semester IV

Subject: Applied Mathematics / Applied Mathematics with SAGEMATH
Course Code: BSIT-MNS4-103 / BSIT-MNPS4-103

Course Outcomes:

After completion of the course,

No	Course Outcomes	PO Mapping
CO 1 (Remember)	The learner will be able to recall and define the fundamental concepts, formulas, and properties related to matrices, complex numbers, differential equations, Laplace transforms, and multiple integrals.	**PO-1, PO-2**
CO 2 (Understanding)	The learner will be able to explain the concepts of averages, variation, sampling distributions, estimation, correlation, regression, and statistical tests in real-world contexts.	**PO-1, PO-3**
CO 3 (Applying)	The learner will be able to apply suitable mathematical techniques such as matrix operations, differential equations, and Laplace transforms to solve practical engineering problems.	**PO-2, PO-4**
CO 4 (Analyzing)	The learner will be able to analyze problems involving complex variables, linear systems, and Laplace-transformed models to interpret and validate engineering results..	**PO-3, PO-4**
CO 5 (Evaluating)	The learner will be able to evaluate and compare different solution methods for differential equations, integrals, and transforms, justifying the selection of appropriate techniques for specific problems	**PO-3, PO-5**
CO 6 (Creating)	The learner will be able to develop and construct mathematical models and computational approaches using matrices, Laplace transforms, and multiple integrals for real-world engineering applications..	**PO-2, PO-4, PO-6**

Program: B.Sc.(Information Technology)
Year : Second Year
Semester IV
Subject: Introduction to Financial Planning
Course Code: BSIT-OES4-104

Course Outcomes:

After completion of the course ,

No	Course Outcomes	PO Mapping
CO 1 (Remember)	Learners will be able to recall the meaning, importance, and objectives of financial planning, savings, and investment.	PO-1, PO-2
CO 2 (Understanding)	Learners will be able to explain various investment avenues and the role of financial planning in achieving personal and professional goals.	PO-1, PO-2, PO-3
CO 3 (Applying)	Learners will be able to apply principles of goal-based financial planning for effective resource allocation and investment decision-making.	PO-2, PO-3, PO-4
CO 4 (Analyzing)	Learners will be able to analyse personal insurance needs, types of insurance, and risk management using insurance products.	PO-2, PO-3, PO-4
CO 5 (Evaluating)	Learners will be able to evaluate tax concepts, deductions, exemptions, and create suitable tax-saving and risk management strategies.	PO-2, PO-3, PO-4, PO-5
CO 6 (Creating)	Learners will be able to design a basic financial plan integrating savings, investment, insurance, and tax planning for long-term financial stability.	PO-2, PO-3, PO-4, PO-5

Program: B.Sc.(Information Technology)
Year : Second Year
Semester IV
Subject: Core Java Lab
Course Code: BSIT-SECPS4-106

Course Outcomes:

After completion of the course ,

No	Course Outcomes	PO Mapping
CO 1 (Remember)	The learner will be able to describe the fundamental concepts of Object-Oriented Methodology and differentiate it from Procedure-Oriented Programming.	PO-1, PO-2, PO-4
CO 2 (Understanding)	The learner will be able to identify classes, objects, data members of class, methods and relationship between them for a specific problem.	PO-1, PO-2, PO-4
CO 3 (Applying)	The learner will be able to apply Java syntax, data types, operators, control flow, and looping constructs to develop basic Java programs. apply the java concepts in order to solve real world problems.	PO-1, PO-2, PO-4
CO 4 (Analyzing)	The learner will be able to explain how to achieve reusability using inheritance, interfaces and packages.	PO-1, PO-2, PO-4
CO 5 (Evaluating)	The learner will be able to analyze and handle exceptions, arrays, packages, and file operations for effective program management.	PO-1, PO-2, PO-4
CO 6 (Creating)	The learner will be able to develop and test Java programs incorporating multithreading and event handling concepts for real-world problem solving.	PO-1, PO-2, PO-3, PO-4, PO-5

Program: B.Sc.(Information Technology)
Year : Second Year
Semester: IV
Subject: Hindi
Course Code: BSIT-AECS4-107

Course Outcomes:

After completion of the course ,

No	Course Outcomes	PO Mapping
CO 1 (Remember)	छात्र प्रयोजनमूलक, वाणिज्यिक और अन्य उद्देश्यों के लिए हिंदी के महत्व को पहचान सकेंगे। Learners will be able to recognize the importance of Hindi for functional, commercial, and other purposes.	PO-1 PO - 3
CO 2 (Understanding)	छात्र विभिन्न क्षेत्रों में हिंदी भाषा की मौलिक संरचना और प्रयोजनमूलक उपयोगिता को समझ सकेंगे । Learners will understand the fundamental structure and functional utility of the Hindi language in different sectors	PO-1 PO- 2
CO 3 (Applying)	छात्र हिंदी के प्रयोग से वैश्विक विवाद और विभिन्न समसामयिक माहौल से सामंजस्य स्थापित कर सकेंगे । Learners will be able to relate to global issues and different avenues through the use of Hindi.	PO- 4
CO 4 (Analyzing)	छात्र वाणिज्यिक, संचार, अनुसंधान, विश्लेषणात्मक, वित्तीय, विपणन और प्रबंधकीय क्षेत्रों में हिंदी के प्रयोग के माध्यम से रोज़गार का चयन करने में सक्षम होंगे। Learners will be able to select careers through the use of Hindi in commercial, communication, research, analytical, financial, marketing and managerial sectors.	PO- 3
CO 5 (Evaluating)	छात्र औपचारिक और अनौपचारिक, व्यावहारिक, व्यावसायिक और नैतिक संचार के लिए हिंदी की प्रभावशीलता का आकलन करने में	PO-2 PO- 3

	सक्षम होंगे । Learners will be able to assess effectiveness of Hindi for formal and informal, practical, professional, and ethical communication.	
CO 6 (Creating)	छात्र हिंदी के प्रयोग से व्यक्तित्व और नेतृत्व कौशल विकसित कर सकेंगे तथा संस्कृति, समाज, पर्यावरण और संधारणीयता के प्रति अपनी जिम्मेदारी समझ सकेंगे। Learners will be able to develop personalities and leadership skills, and responsibilities towards culture, society, environment, and sustainability through the use of Hindi.	PO - 3 PO-5

Program: B.Sc.(Information Technology)

Year : Second Year

Semester: IV

Subject: Marathi

Course Code: BSIT-AECS4-110

Course Outcomes:

After completion of the course learners will be able to,

CO- 1. मराठी भाषेच्या प्राथमिक पातळीवरील व्यावहारिक संवाद आत्मसात करणे. To acquire practical communication skills at the basic level of the Marathi language.	PO-2 PO-3
CO- 2. सूत्रसंचालन, निवेदन, मुलाखत, वक्तृत्व या क्षेत्रातील व्यावसायिक संधीसाठी कौशल्ये आत्मसात करणे. To acquire skills for professional opportunities in the fields of anchoring, narration, interviewing, and public speaking.	PO-3 PO-5
CO- 3. मराठी भाषेत व्यावहारिक आणि औपचारिक लेखनाची पायाभूत तत्त्वे आत्मसात करणे. To acquire the fundamental principles of practical and formal writing in the Marathi language.	PO-1 PO-2
CO- 4. लेखनातील संकल्पना, स्वरूप, प्रक्रिया आणि प्रकार यांचे सखोल ज्ञान मिळवणे. To gain in-depth knowledge of concepts, forms, processes, and types of writing.	PO-2 PO-4
CO- 5. लेखनातील अडथळे ओळखून त्यावर उपाययोजना करण्याची क्षमता विकसित करणे. To develop the ability to identify obstacles in writing and take corrective measures.	PO-2 PO- 3 PO- 4
CO- 6. पत्रलेखन, अहवाल लेखन आणि वृत्त लेखनातील तांत्रिक अचूकता व भाषिक परिपूर्णता साधणे. To achieve technical accuracy and linguistic perfection in letter writing, report writing, and news writing.	PO-4 PO-5

Program: B.Sc.(Information Technology)
Year : Second Year
Semester IV
Subject: Digital Literacy
Course Code: BSIT-CEPS4-108

Course Outcomes:

After completion of the course ,

No	Course Outcomes	PO Mapping
CO 1 (Remember)	Learner will be able to understand the structure, functions, and features of email systems and demonstrate the ability to compose, manage, and secure professional email communications.	**PO-2, PO-3**
CO 2 (Understanding)	Learner will be able to use various social networking and instant messaging platforms effectively for personal, academic, and professional communication.	**PO-2, PO-3, PO-4**
CO 3 (Applying)	Learner will be able to explain the concept of e-Governance and access various government digital services through platforms like UMANG App.	**PO-2, PO-4, PO-5**
CO 4 (Analyzing)	Learner will be able to apply knowledge of digital financial tools (e.g., UPI, QR codes, eWallets) and online banking systems with an understanding of digital security.	**PO-2, PO-3, PO-4**
CO 5 (Evaluating)	Learner will be able to perform basic computer maintenance, implement security practices, and apply troubleshooting techniques to ensure secure and efficient system operations.	**PO-2, PO-3**
CO 6 (Creating)	Learner will be able to describe the purpose and functioning of platforms like Digital Locker and e-Commerce systems, and understand the importance of responsible digital behavior (netiquette).	**PO-2, PO-3, PO-5**