S.Y.B.Sc (Information Technology) 2025-26

	Semester III Subjects	Credits		Semester IV Subjects	Credits
Major			**Major**		
BSP301	Python Programming	2	**BSC401**	Core Java	2
BSD302	Data Structure	2	**BSS402**	Software Engineering	2
BSPP303	Python Programming	2	**BSCP403**	Core Java Practical	2
BSDP304	Data Structure Practical	2	**BSSP404**	Software Engineering Practical	2
Minor			**Minor**		
BSC305	Computer network	2	**BSE405**	Embedded System	2
BSCP306	Computer network Practical .	2	**BSEP406**	Embedded System Practical	2
OE			**OE**		
BSA307	Applied Mathematics	2	**BST407**	Computer Oriented Statistical Technique	2
BSM307	Basics of Marketing - I		**BSM407**	Basics of Marketing - II	
VSC **BSPL308** **BSOS308**	PL/SQL Operating System	2	**SEC** **BSTP408** **BSCG408**	Mobile Programming Practical Computer Graphics	2
AEC			**AEC**		2
BSH309/BSM309	Hindi/Marathi	2	**BSH409/BSM409**	Hindi/Marathi	
FP			**CEP**		
BSFP310	FP	2	**BSCP410**	CEP	2
CC			**CC**		2
BSN311/BSY311	NSS/ Sports/ Cultural/ Yoga	2	**BSN411/BSY411**	NSS/ Sports/ Cultural/ Yoga	
	Total	**22**			**22**

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Proramme Name: S.Y.B.Sc(Information Technology)	Semester:III
Course Category: Major	
Name of the Dept: **Science and Technology**	
Course Title: Python Programming	
Course Code: **BSP301** Course Level: 5.0	
Type : Theory	
Course Credit: 02	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives: 1. To provide a strong foundation in Python programming by covering fundamental concepts such as variables, expressions, control structures, functions, and data structures. 2. Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples.	
Course Outcomes: OC1 . Students will be able to understand and apply fundamental Python programming concepts, including variables, expressions, control structures, functions, and data structures. OC2 . To develop the ability to work with file handling, exceptions, and object-oriented programming to build efficient Python applications.	
Description the course:	This course provides a comprehensive introduction to Python programming, covering fundamental concepts such as variables, control structures, functions, and data structures. It also explores file handling, exception handling, and object-oriented programming to develop problem-solving skills and practical coding proficiency.

Syllabus: NEP 2020 w.e.f 2025-26

Unit No.	Content	Hours
I	Introduction: The Python Programming Language, History, features, The Difference Between Brackets, Braces, and Parentheses Variables and Expressions: Values and Types, Variables, Variable Names and Keywords, Type conversion, Operators and Operands, Conditional and Looping Statements: if, if-else, nested if –else Looping: for, while. Functions: Function Calls, Type Conversion Functions, Math Functions, Definitions and Uses, Flow of Execution, Parameters and Arguments, Variables and Parameters Are Local, Composition Importing with from, Return Values. Strings and lists : A String Is a Sequence, Traversal with a for Loop, String Slices, Strings Are Immutable, Searching, Looping and Counting, String Methods, The in Operator, String Comparison, String Operations. Values and Accessing Elements, Lists are mutable, traversing a List, Deleting elements from List, Built-in List Operators, Concatenation, Repetition, In Operator, Built-in List functions and methods.	15
II	Tuples and Dictionaries: Tuples, Accessing values in Tuples, Tuple Assignment, Tuples as return values, Variable-length argument tuples, Basic tuples operations, Concatenation, Repetition, in Operator, Iteration, Built-in Tuple Functions Creating a Dictionary, Accessing Values in a dictionary, Updating Dictionary, Deleting Elements from Dictionary, Properties of Dictionary keys, Operations in Dictionary, Files: Text Files, The File Object Attributes, Directories Exceptions: Built-in Exceptions, Handling Exceptions, Exception with Arguments, User-defined Exceptions Classes and Objects: Overview of OOP (Object Oriented Programming), Class Definition, Creating Objects, Instances as Arguments, Instances as return values, Built-in Class Attributes, Inheritance, Method Overriding, Data Encapsulation.	15
	Total Hours	30

References:

Sr.No.	Title	Author/s Publisher	Publisher	Edition	Year
1	Think Python	Allen owney	O'Reilly	1st	2012
2	Introduction to Problem Solving with Python	E. Balagurusamy	TMH	1st	2016
3	Object-oriented Programming in Python	Michael H. Goldwasser, David Letscher	Pearson Prentice Hall	1st	2008

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<table>
<tr><td colspan="2">Proramme Name: S.Y.B.sc(Information Technology) Semester:III</td></tr>
<tr><td colspan="2">Course Category: Major</td></tr>
<tr><td colspan="2">Name of the Dept: Science and Technology</td></tr>
<tr><td colspan="2">Course Title: Data Structures</td></tr>
<tr><td colspan="2">Course Code: BSD302 Course Level: 5.0</td></tr>
<tr><td colspan="2">Type : Theory</td></tr>
<tr><td colspan="2">Course Credit: 02</td></tr>
<tr><td colspan="2">Hours Allotted: 30 Hours</td></tr>
<tr><td colspan="2">Marks Allotted: 50 Marks</td></tr>
<tr><td colspan="2">Course Objectives:
● Introduction to the fundamental concepts of data structures and their importance such as arrays, linked lists, stacks, queues, trees, graphs.
● Understand how the choice of data structures and the algorithm design methods impact the performance of programs.</td></tr>
<tr><td colspan="2">Course Outcomes:
After the completion of the course, the learners would be able to:
CO1 . Identify and distinguish data structures classification, Implementing array, linked list and various sorting and searching techniques .
CO2 . Implement Stack,Queue,Tree and graph and their applications.</td></tr>
<tr><td>Description the course:</td><td>Data structures provide ways to organize and store data efficiently, which allows algorithms to process data faster. This can lead to optimized solutions for complex problems.</td></tr>
</table>

Unit No.	Content	Hours
I	Introduction: Data and Information, Data Structure, Classification of Data Structures, Primitive Data Types, Abstract Data Types, Data structure vs. File Organization, Operations on Data Structure, Array: Introduction, Memory Representation of Arrays ,operations performed on Arrays, Sorting and Searching Techniques : Sorting :Bubble, Selection, Insertion, Merge Sort. Searching: Sequential Search, Binary Search Linked List: Linked List, One-way Linked List, Traversal of Linked List, Searching, Memory Allocation and De-allocation, Insertion in Linked List, Deletion from Linked List, Copying a List into Other List, Merging Two Linked Lists, Splitting a List into Two Lists, Reversing One way linked List, Circular Linked List, Applications of Circular Linked List, Two way Linked List, Traversing a Two way Linked List, Searching in a Two way linked List, Insertion of an element in Two way Linked List, Deleting a node from Two way Linked List, Header Linked List, Applications of the Linked list, Representation of Polynomials, Storage of Sparse Arrays, Implementing other Data Structures.	15
II	Stack: Introduction, ,Memory Representation of Stack, Operations on the Stack Array Representation of Stack, Applications of Stack, Evaluation of Arithmetic Expression, Matching Parenthesis, infix and postfix operations, Recursion. Queue: Introduction, Operations on the Queue, Memory Representation of Queue, Array representation of queue, Linked List Representation of Queue, Circular Queue, Some special kinds of Queues : Deque, Priority Queue, Applications of Queues. Tree: Tree, Binary Tree, Properties of Binary Tree, Memory Representation of Binary Tree, Operations Performed on Binary Tree, Reconstruction of Binary Tree from its Traversals, Binary Search Tree, Operations on Binary Search Tree, Heap, Memory Representation of Heap, Operation on Heap.	15

	Graph: Introduction, Graph Terminology, Memory Representation of Graph, Adjacency Matrix Representation of Graph, Operations Performed on Graph,Applications of the Graph: Reachability, Shortest Path Problems, Spanning Trees.	
	Total Hours	30

References:

Sr. No	Title	Author/s	Publisher	Edition	Year
1.	A Simplified Approach to Data Structures	Lalit Goyal, Vishal Goyal, Pawan Kumar	SPD	1st	2014
2.	An Introduction to Data Structure with Applications	Jean – Paul Tremblay and Paul Sorenson	Tata MacGraw Hill	2nd	2007
3.	Data Structure and Algorithm	Maria Rukadikar	SPD	1st	2014

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Proramme Name: S.Y.B.sc(Information Technology)	Semester:III
Course Category/Vertical: Major	
Name of the Dept: **Science and Technology**	
Course Title: Python Programming Practical	
Course Code: **BSPP303**	Course Level: 5.0
Type: Practical	
Course Credit: 2 credits	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives(CO): 1. To learn python programming concepts and problem-solving techniques through hands-on Coding exercises. 2. To develop skills in data manipulation, file handling, and object-oriented programming.	
Course Outcomes (OC): OC 1. Demonstrate proficiency in Python programming by solving problems using functions, Loops, recursion, and data structures. OC 2. Apply object-oriented programming concepts and file handling techniques to develop efficient and maintainable Python applications.	
Description the course:	Python Programming Practical focuses on hands-on learning where students apply theoretical concepts to solve real-world problems. It involves writing, testing, and debugging Python code to work with data structures like lists, tuples, and dictionaries, as well as performing file handling tasks.

Syllabus: NEP 2020 w.e.f 2025-26

Sr. No.	Content	Hours
1	a. Enter the number from the user and depending on whether the number is even or odd, print out an appropriate message to the user. b. Write a program to generate the Fibonacci series. c. Write a function that reverses the user defined value. e. Write a function to check the input value is Armstrong and also write the function for Palindrome. d. Write a recursive function to print the factorial for a given number.	
2	a. Write a function that takes a character (i.e. a string of length 1) and returns True if it is a vowel, False otherwise. b. Define a function that computes the length of a given list or string. c. Define a procedure histogram() that takes a list of integers and prints a histogram to the screen. For example, histogram([4, 9, 7]) should print the following: **** ********* *******	
3	Take a list, say for example this one: a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89] and write a program that prints out all the elements of the list that are less than 5	
4	A pangram is a sentence that contains all the letters of the English alphabet at least once, for example: The quick brown fox jumps over the lazy dog. Your task here is to write a function to check a sentence to see if it is a pangram or not.	
5	a. Write a program that takes two lists and returns True if they have at least one common member. b. Write a Python program to print a specified list after removing the 0th, 2nd, 4th and 5th elements. c. Write a Python program to clone or copy a list	
6	a. Write a Python script to sort (ascending and descending) a dictionary by value. b. Write a Python script to concatenate following dictionaries to create a new one. Sample Dictionary : dic1={1:10, 2:20} dic2={3:30, 4:40} dic3={5:50,6:60} Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60} c. Write a Python program to sum all the items in a dictionary.	
7	a. Write a Python program to read an entire text file. b. Write a Python program to append text to a file and display the text. c. Write a Python program to read last n lines of a file.	
8	a. Design a class that store the information of student and display the same b. Implement the concept of inheritance using python	
	Total Hours	60

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Proramme Name: S.Y.B.sc(Information Technology)	Semester:III
Course Category: Major	
Name of the Dept: **Science and Technology.**	
Course Title: Data structures Practical	
Course Code: **BSDP304**	Course Level: 5.0
Type : Practical	
Course Credit: 02	
Hours Allotted: 60Hours	
Marks Allotted: 50 Marks	
Course Objectives: ● To improve coding ability by teaching you how to write cleaner, more efficient, and scalable code as well as to tackle problems that require more than basic programming skills. ● To understand the concepts of dynamic memory allocation and deallocation, particularly in the context of linked data structures.	
Course Outcomes: After the completion of the course, the learners would be able to: CO1 . Implement and manipulate various data structures (linked lists, stacks, queues using C/C++/ Java/python) CO2 . Apply different algorithms for searching, sorting, and tree traversal to solve practical problems.	
Description the course: (Including but not limited to)	Provide hands-on experience in implementing various data structures using programming languages such as C, C++, Java, or Python.

List of Practical	
1.	.Implement the following:
A.	Write a program to store the elements in 1-D array and perform the operations likes searching, sorting and reversing the elements. [Menu Driven]
B.	.Write a program to perform the Matrix addition, Multiplication and Transpose Operation. [Menu Driven]
2.	Implement the following for one way Linked List:
A.	Write a program to create a single linked list and display the node elements .
B.	Write a program to search the elements in the linked list and display the same
3.	Implement the following for two way Linked List:
A.	Write a program to create double linked list and display the elements in the linked list.
B.	Write a program to search the element in list and display the same
4.	Implement the following for circular Linked List:
A.	Write a program to create a list and display the node elements .
B.	Write a program to search the element in list and display the same.
5	Implement the following for Stack and Queue:
A.	Write a program to implement the concept of Stack with Push, Pop, Display and Exit operations.
B.	Write a program to implement the concept of Queue with Insert, Delete, Display and Exit operations.
6.	Implement the following sorting techniques:
A.	Write a program to implement selection sort.
B.	Write a program to implement insertion sort.
7.	Implement the following searching techniques:

A.	Write a program to search the element using sequential search.
B.	Write a program to search the element using binary search
8.	Implement the following for Tree:
A.	Write a program to construct the binary tree and display its inorder, postorder and preorder traversal .
B.	Write a program to insert the element into maximum heap.
9.	Implement the following data structure techniques:
A.	Write a program to implement the collision technique.
B.	Write a program to implement the concept of linear probing.
10.	Implement the following data structure techniques:
A.	Write a program to generate the adjacency matrix.
B.	Write a program for shortest path diagram.

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Programme Name: B. Sc. (Information Technology)	Semester: III
Course Category/Vertical: Minor	
Name of the Dept: **Science and Technology**	
Course Title: Computer Network	
Course Code: **BSC305**	Course Level: 5.0
Type: Theory	
Course Credit: 2 credits (1 credit = 15 Hours for Theory in a semester)	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives (CO): 1. Be able to explain and understand concept of the Data communication, Multiplexing and Data link layer 2. Be able to understand Concept of the Data Link control , Network Layer and transport layer.	
Course Outcomes (OC): OC 1. Understand concept of the Data communication, Multiplexing and Data link layer OC 2. Understand Concept of the Data Link control , Network Layer and transport layer.	
Description the course: (Including but not limited to)	The Computer Network syllabus introduces data communication, computer network and its types, describe working of ISO -OSI Model, TCP Model , Physical Layer , Data link layer , Data Link control , Network Layer , IP Protocol ,Trasport layer

Syllabus: NEP 2020 w.e.f 2025-26

Unit No.	Content	Hours
I	Computer Network and Data communications: Computer Networks, Network types, Internet history, standards and administration, Network model, Protocol layering, TCP/IP protocol suite, The OSI model, Data and signals, periodic analog signals, digital signals, transmission impairment, data rate limits, performance, Digital-to-digital conversion, analog-to-digital conversion, transmission modes, digital-to-analog conversion, analog-to-analog conversion. Physical layer Bandwidth Utilization and Multiplexing Spread Spectrum Transmission media, Guided Media, Unguided Media Switching, circuit switched networks, packet switching, structure of a switch, Data Link Layer: Structure of Data Link Layer, Link layer addressing, Data Link Layer Design Issues, Error detection and correction, block coding, cyclic codes, checksum, forward error correction, error correcting codes, error detecting codes.	15
II	Data Link Control: DLC services, data link layer protocols, HDLC, Point-to-point protocol, Media Access Control Protocol, Random access, controlled access, channelization, Wired LANs – Ethernet Protocol, standard ethernet, fast ethernet, gigabit ethernet, 10 gigabit ethernet, Wireless LANs, Introduction to IEEE 802.11 project, Bluetooth, WiMAX, Cellular telephony, Satellite networks. Connecting devices and Virtual LANs. Network Layer and IP Protocol: Network layer services, packet switching, network layer performance, IPv4 addressing, forwarding of IP packets, Internet Protocol, ICMPv4, Mobile IP Unicast Routing, Routing algorithms, Unicast routing protocols, Next generation IP, IPv6 addressing, IPv6 protocol, ICMPv6 protocol, transition from IPv4 to IPv6. Transport Layer: Transport layer protocols, Simple protocol, Stop-and-wait protocol, Go-Back-n protocol, Selective repeat protocol, Bidirectional protocols, Transport layer services, User datagram protocol, Transmission control protocol, Standard Client-Server Protocols, World Wide Web and HTTP, FTP, Electronic mail, Telnet, Secured Shell, Domain name system.	15
	Total Hours	30

References:

1. Edition Data Communication and Networking Behrouz A. Forouzan Year Tata McGraw Hill
2. TCP/IP Protocol Suite Behrouz A. Forouzan Tata McGraw Hill Fifth Edition 2013
3. Fourth Edition Computer Networks Andrew Tanenbaum Pearson 2010 Fifth 2013

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Programme Name: B.Sc (Information Technology)	Semester: III
Course Category/Vertical: Minor	
Name of the Dept: **Science and Technology**	
Course Title: Computer Network Practical	
Course Code: **BSCP306**	Course Level: 5.0
Type: Practical	
Course Credit: 2 credits	
Hours Allotted: 60 Hours	
Marks Allotted: 50 Marks	
Course Objectives (CO): 1. Be able to explain and understand concept of the Data communication, Multiplexing and Data link layer 2. Be able to understand Concept of the Data Link control, Network Layer and transport layer.	
Course Outcomes (OC): OC 1. Understand concept of the Data communication, Multiplexing and Data link layer OC 2. Understand Concept of the Data Link control , Network Layer and transport layer.	
Software Using: Cisco Packet Tracer 6.0.1	

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Sr.NO	Content	Hours
1.	IPv4 Addressing and Subnetting a) Given an IP address and network mask, determine other information about the IP address such as: • Network address • Network broadcast address • Total number of host bits • Number of hosts b) Given an IP address and network mask, determine other information about the IP address such as: • The subnet address of this subnet • The broadcast address of this subnet • The range of host addresses for this subnet • The maximum number of subnets for this subnet mask • The number of hosts for each subnet • The number of subnet bits • The number of this subnet	30
2.	Use of ping and tracert / traceroute, ipconfig / ifconfig, route and arp utilities.	
3.	Configure IP static routing.	
4.	Configure IP routing using RIP.	
5.	Configuring Simple OSPF.	
6.	Configuring DHCP server and client.	
7.	Create virtual PC based network using virtualization software and virtual NIC.	
8.	Configuring DNS Server and client.	
9.	Configuring OSPF with multiple areas.	
10.	Use of Cisco Packet tracer to scan and check the packet information of following protocols • HTTP • ICMP • TCP • SMTP • POP3	
	Total Hours	60

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Programme Name: S.Y.BSc (Information Technology)	Semester: III
Course Category/Vertical: Open Elective	
Name of the Dept: **Science and Technology**	
Course Title: Applied Mathematics	
Course Code: **BSA307**	Course Level:5.0
Type: Theory	
Course Credit: 2 credit	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives(CO): 1. This course aims to provide a comprehensive understanding of matrices and complex numbers, equipping students with the knowledge and skills to perform operations, solve problems, and apply these concepts in various field 2. This course aims to equip students with a strong foundation in differential equations and multiple integrals, enabling them to solve various mathematical problems and understand their applications in diverse fields.	
Course Outcomes (OC): (List the course outcomes) CO1. After completing a course on matrices and complex numbers, students should be able to perform matrix operations, solve systems of linear equations, understand complex number representation, and apply these concepts to solve problems in various fields. CO2. Upon completing a course on Differential Equations and Multiple Integrals, students should be able to solve various types of differential equations, evaluate multiple integrals, and apply these concepts to practical problems, including understanding vector calculus and its applications.	
Description the course: (Including but not limited to)	Applied mathematics is the application of mathematical methods and techniques to solve real-world problems in various fields like science, engineering, and business, often involving the development of new mathematical tools and models.

Syllabus: NEP 2020 w.e.f 2025-26

Unit No.	Content	Hours
I	Matrices and Complex Number Matrices: Definition and types of matrices, Inverse of a matrix, Properties of matrices, Elementary Transformation, Rank of Matrix, Echelon or Normal form of Matrix, Linear equations, Linear dependence and linear independence of vectors, Linear transformation, Characteristics roots and characteristics vectors, Properties of characteristic vectors, Caley Hamilton Theorem, Similarity of matrices. Complex Numbers: Definition of Complex number, Conjugate of Complex number, Equality of complex numbers, Graphical representation of complex number(Argand's Diagram), Polar form of complex numbers, Polar form of x+iy for different signs of x,y. Exponential form of complex numbers, De-Moivre's theorem.	15
II	Equation of the first order and of the first degree: Separation of variables, Equations homogeneous in x and y, Non-homogeneous linear equations, Exact differential Equation, Integrating Factor, Linear Equation and equation reducible to this form, Method of substitution. Differential equation of the first order of a degree higher than the first: Introduction, Solvable for p (or the method of factors), Solve for y, Solve for x, Clairaut's form of the equation, Methods of Substitution, Method of Substitution. Multiple Integral: Double Integral, Change of the order of the integration, Double integral in polar co-ordinates, Triple integrals. Applications of integration: Areas, Volumes of solids.	15
	Total Hours	30

References:

Sr. No.	Title	Author/s	Publisher	Edition
1.	A text book of Applied Mathematics Vol I	P. N. Wartikar and J. N. Wartikar	Pune Vidyathi Graha	
2.	Applied Mathematics II	P. N. Wartikar and J. N. Wartikar	Pune Vidyathi Graha	
3.	Higher Engineering Mathematics	Dr. B. S. Grewal	Khanna Publications	
4.	Applied Mathematics	Kubra T.K., AJAY R GUPTA, Sudhakar C. Vishwakarma.	Sheth Publication Pvt. Ltd.	

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<table>
<tr><td colspan="2">Programme Name: S.Y. B.Sc. (Information Technology) Semester: III</td></tr>
<tr><td colspan="2">Course Category/Vertical: Open Elective</td></tr>
<tr><td colspan="2">Name of the Dept: B.Com (Management Studies)</td></tr>
<tr><td colspan="2">Course Title: Basics of Marketing - I</td></tr>
<tr><td colspan="2">Course Code: BSM307 Course Level:5.0</td></tr>
<tr><td colspan="2">Type: Theory</td></tr>
<tr><td colspan="2">Course Credit: 02</td></tr>
<tr><td colspan="2">Hours Allotted: 30 Hours</td></tr>
<tr><td colspan="2">Marks Allotted: 50 Marks</td></tr>
<tr><td colspan="2">Course Objectives(CO): (List the course objectives)
CO.1 To make learners aware of the basic concepts of marketing
CO.2 Make learners aware about the importance of marketing research</td></tr>
<tr><td colspan="2">Course Outcomes (OC): (List the course outcomes)
OC 1.Gain knowledge about the concepts of marketing and its implications in the business
OC 2.Understand the importance of marketing research and its contribution in analysing the market and decision making</td></tr>
<tr><td>Description the course:
(Including but not limited to)
The course introduces the learners to the concept of marketing and its practical application in the current competitive world. The learners could upgrade their current understanding of marketing and get themselves ready for the workforce. Students would be able to explore new areas of marketing, such as executive MIS, marketing research, and much more, which are in high demand right now in the business world.</td><td>Introduction, relevance, Usefulness, Application, interest, connection with other courses, demand in the industry, job prospects etc.</td></tr>
</table>

Syllabus: NEP 2020 w.e.f 2025-26

Unit No.	Content	Hours
I	Introduction to Marketing Introduction to Marketing: Definition, features, advantages and scope of marketing. The 4P's and 4C's of marketing. Marketing v/s Selling, functions of marketing Concepts of Marketing: Needs, wants and demands, transactions, transfer and exchanges Orientations of a firm: Production concept; Product concept; selling concept and marketing concept, social relationship, Holistic marketing	15
II	Marketing Environment, Research and Consumer Behaviour The micro environment of business: Management structure; Marketing Channels; Markets in which a firm operates; competitors and stakeholders. Macro environment: Political Factors; Economic Factors; Socio-Cultural Factors , Technological Factors (PEST Analysis) Marketing research: Meaning, features, Importance of marketing research. Types of marketing research: Product research; Sales research; consumer/customer research; production research MIS: Meaning, features and Importance Consumer Behaviour: Meaning, feature, importance, factors affecting Consumer Behaviour	15
	Total Hours	30

References:

1. Saxena, Rajan. Marketing Management. Fourth edition, Tata McGraw Hill Publishing Co., New Delhi
2. Ramaswamy V.S. and Namakumari S. Marketing Management – Planning, Implementation and Control. Fourth edition, Macmillan
3. Kumar Arun & N Meenakshi. Marketing Management. Second Edition; Vikas Publications
4. Michael Vaz – Manan Prakashan
5. Kale – Vipul Publication

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Programme Name: S.Y.B.Sc (Information Technology)	Semester: III
Course Category: VSC	
Name of the Dept: **Science and Technology**	
Course Title: PL/SQL	
Course Code: **BSPL308**	Course Level:5.0
Course Credit: 02	
Total Marks: 50	
Total Hours Allotted: 60 Hrs	
Course Objectives: 1. To Understand the basic of PL/SQL 2. To Understand control and conditional statement in PL/SQL. 3. To Understand working of sequence and cursor in PL/SQL. 4. To Understand the concept of stored procedure & functions & trigger.	
Course Outcomes: Learners will be able to, 1. Write and execute basic PL/SQL program`using control statements, sequences, and cursors. 2. Design and implement stored procedures and functions, trigger in PL/SQL for database management and problem-solving.	
Course Description:	This course covers the fundamentals of PL/SQL, focusing on variables, executable statements, and interacting with the Oracle server. Students will learn control structures, conditional statements, and how to create sequences, cursors, procedures, and functions. The course also includes hands-on experience with triggers, both row-level and statement-level. By the end, students will be able to write efficient PL/SQL code for database management and automation.

Syllabus: NEP 2020 w.e.f 2025-26

Sr No.	Content	Hours
1	PL/SQL Basic: a. Use of variable b. Write executable statement c. Interacting with Oracle Server d. Create anonymous PL/SQL Block	
2	Control Statement in PL/SQL: a. Using While loop b. For Loop c. Use of GOTO Statement	
3	Create Conditional Statement using PL/SQL: a. Using if statement b. Using if else statement c. Using elseif ladder d. Using case expression	
4	Creation of Sequence in PL/SQL	
5	Create a Cursor in PL/SQL a. Implicit Cursor b. Explicit Cursor	
6	Creation of Procedure in PL/SQL	
7	Creation of Function in PL/SQL: a. Computer and return the maximum value b. Compute factorial of given number.	
8	Create a Recursive function:	
9	Creation of Trigger **a.** Create a Row level trigger **b.** Create Statement level trigger	
10	Creation of Package in PL/SQL:	
	Total Hours	30

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Programme Name: **S.Y.B.Sc(Information Technology)** **Semester:III**	
Course Category: VSC	
Name of the Dept: **Science and Technology**	
Course Title: Operating System	
Course Code: **BSOS308** Course Level:5.0	
Type : Theory	
Course Credit: 02	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives: • Learners must understand proper working of operating system. • To provide a sound understanding of Computer operating system, its structures, functioning and algorithms.	
Course Outcomes: After the completion of the course, the learners would be able to: CO1 : To provide a understanding of operating system, its structures and functioning CO2 : Develop and master understanding of algorithms used by operating systems for various purposes.	
Description the course: **(Including but not limited to)**	Introduction, relevance, Usefulness, Application, interest, connection with other courses, demand in the industry, job prospects etc.

Syllabus: NEP 2020 w.e.f 2025-26

Unit No.	Content	Hours
I	**Introduction and Operating-Systems Structures:** Definition of Operating system, Operating System's role, Operating-System Operations, Functions of Operating System, Computing Environments, Operating-System Structures: Operating-System Services, User and Operating-System Interface, System Calls **Processes:** Process Concept, Process Scheduling, Operations on Processes, Interprocess Communication **Threads:** Overview, Multicore Programming, Multithreading Models **Process Synchronization:** General structure of a typical process, race condition, The Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Mutex Locks, Semaphores, Classic Problems of Synchronization, Monitors	15
II	**CPU Scheduling:** Basic Concepts, Scheduling Criteria, Scheduling Algorithms **Deadlocks:** System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock **Main Memory:** Background, Logical address space, Physical address space, MMU, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Structure of the Page Table **Virtual Memory** **Mass-Storage Structure:** Overview, Disk Structure, Disk Scheduling, Disk Management **File-System Interface: File** Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing **File-System Implementation:** File-System Structure, File-System Implementation	15
	Total Hours	30

References:

1. Abraham Silberschatz, Peter Galvin, Greg Gagne, Operating System Concepts, Wiley,8th Edition

Additional Reference(s):

1. Achyut S. Godbole, Atul Kahate, Operating Systems, Tata McGraw Hill

2. Naresh Chauhan, Principles of Operating Systems, Oxford Press

3. Andrew S Tanenbaum, Herbert Bos, Modern Operating Systems, 4e Fourth Edition, Pearson Education, 2016

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(Autonomous)

Programme Name: S.Y.B.Sc. (Information Technology) Semester:III
Course Category: CC
Name of the Department: **Sociology**
Course Title: Fundamentals of Social Service and Volunteering
Course Code: **BSN311** Course Level: 5.0
Type: Theory / Practical
Course Credit: 2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
Hours Allotted: 30 Hours
Marks Allotted: 50 Marks
Course Objectives: 1. To introduce students to the fundamental principles of social service and volunteering. 2. To develop a sense of social responsibility and commitment to community development.
Course Outcomes: 1. Gain an understanding of the significance of social service in nation-building. 2. Develop an appreciation for volunteerism and its role in addressing social issues. .
Introduction: Social service and volunteering are essential aspects of a responsible and engaged society. They provide individuals with opportunities to contribute to the well-being of their communities while fostering personal growth and social awareness. This course aims to instill a spirit of volunteerism and service in students by equipping them with theoretical knowledge and practical experience in social service initiatives. Relevance and Usefulness: In today's world, social inequalities, environmental concerns, and community challenges require active engagement from individuals. Volunteering bridges the gap between the privileged and the underprivileged, offering solutions to pressing social issues. Through structured participation in social service activities, students develop empathy, teamwork, and leadership skills, making them responsible citizens and change-makers. Interest and Connection with Other Courses: This course complements various disciplines such as sociology, social work, public administration, psychology, and political science. The knowledge and skills gained through social service and volunteering enhance students' understanding of social structures, human behavior, and policy-making. Additionally, it fosters civic engagement, making it valuable for students aspiring to careers in social work, public service, or non-governmental organizations (NGOs).

Unit No.	Content	Hours
I	UNIT I: Introduction to Social Servicing and Volunteering A. Meaning and Importance of Social Service B. Role of Youth in Social Service C. Challenges and Ethical Considerations in Voluntary Work	15
II	UNIT II: Community Engagement and Social Change A. Different Forms of Community Service (Health, Education, Environment, Disaster Relief) B. Government and Non-Government Organizations in Social Service C. Impact of Volunteerism on Society	15
	Total Hours	30

References:

• National Service Scheme Manual (Revised) 2006, Government of India, Ministry of Youth Affairs and Sports, New Delhi.

• University of Mumbai National Service Scheme Manual 2009.

• http://nss.nic.in

• https://www.rccmindore.com/wp-content/uploads/2023/04/NSS-Notes-II.pdf

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(Autonomous)

Programme Name: S.Y.B.Sc. (Information Technology)	Semester: IV
Course Category/Vertical: Co-Curricular (CC)	
Name of the Dept: **Psychology**	
Course Title: Yoga	
Course Code: **BSY311**	Course Level: 5
Type: Theory / Practical	
Course Credit: 2 credits	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Learning Objectives: 1. To impart to the students the knowledge of teachings and philosophy of yoga tradition. 2. To provide the knowledge of various Yoga therapy practices like asana (posture), pranayama (voluntarily regulated breathing techniques).	
Course Outcomes (CO): OC 1. Students will be able to understand the basic principles and applications of Yoga. OC 2. Students will be able to use the Practical knowledge in their day to day life.	
Description the course: (Including but not limited to)	Yoga practices will be important for the upcoming lifestyle hence students can seek a career in the same. Students will understand the importance of yoga in life. Students will be having practical exposure. Hence, practicing yoga will help students to maintain their health.

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Syllabus: NEP 2020 w.e.f 2024-25

Unit No.	Content	Hours
I	Theory of Yoga A) Yogic Sanchalan (Yogic Movements), Kapalbhati (Cleansing Breath Technique), Suryanamaskar (Sun Salutation) B) Anulom-Vilom (Alternate Nostril Breathing), Dirgha Shwasan (Deep Breathing), Bhramari (Humming Bee Breath)	15
II	Practical A) Vajrasana (Thunderbolt Pose), Paschimottanasana (Seated Forward Bend), Parivritta Janushirasana (Revolved Head-to-Knee Pose), Vakrasana (Twisting Pose), Marjarasana (Cat Pose), Naukasana (Boat Pose) B) Shalabhasana (Locust Pose), Dronasana (Warrior Boat Pose), Pavanmuktasana (Wind-Relieving Pose), Bramha Mudra (Sacred Gesture for Neck Strength), Utthita Dwipadasana (Raised Two-Leg Pose), Netra Sanchalan - 1 (Eye Movement Exercise - 1), Netra Sanchalan - 2 (Eye Movement Exercise - 2)	15
	Total Hours	30

References:

1. G. V Kadam - Yoga Life Sutra, Girish Vasant Kadam (2012)
2. ajayoga - Swami Vivekananda - Ramakrishna Ashrama Publications
3. C.D. Sharma: Critical Survey of Indian Philosophy, Motilal Banarsidass Publications 2003