NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

NAAC Reaccredited 'B++' Grade

Affiliated to the

UNIVERSITY OF MUMBAI

Program: Bachelor of Science (Information Technology)

A-U.G. Certificate in Information Technology 2025-26

B- U.G. Diploma in Information Technology 2026-27

C-Degree-B.Sc. (Information Technology) 2027-28

D-B.Sc. (Honours) in Information Technology 2028-29

E- B.Sc. (Honours with Research) in Information Technology 2027-28

F.Y.B.Sc. (Information Technology)

Semester I and II

Choice Based Credit System (CBCS) with effect from the Academic year 2025-2026

Academic Council No:

Agenda No:

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

(As per NEP 2020)

Sr. No.	Heading	Particulars	
1	**Title of program** **O. _____A**	A	Title of the program U.G. Certificate in Information Technology
	O. _____B	B	U.G. Diploma in Information Technology
	O. _____C	C	B.Sc. (Information Technology)
	O. _____D	D	B.Sc. (Honours) in Information Technology
	O. _____E	E	B.Sc. (Honours with Research) in Information Technology
2	**Eligibility** **O. _____A**	A	10+2 (A learner must have completed HSC or equivalent with 45% of aggregate for open category and 40% of aggregate in case of reserved candidates in one attempt with Mathematics and/or Statistics as one of the subjects (OR) Passed Equivalent Academic Level 4.0 with CGPA equivalent to 45% for open category and 40% in case of reserved candidates with Mathematics and/or Statistics as one of the subjects
	O. _____B	B	Under Graduate Certificate in Information Technology Academic Level 4.5
	O. _____C	C	Under Graduate Diploma in Information Technology Academic Level 5.0
	O. _____D	D	Bachelors of Science in Information Technology with minimum CGPA of 7.5 Academic Level 5.5
	O. _____E	E	Bachelors of Science in Information Technology with minimum CGPA of 7.5 Academic Level 5.5
3	**Duration of program** **R. _____**	A	One Year
		B	Two Years
		C	Three years
		D	Four years

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

4	**Intake Capacity** **R. _____**		
5	**Scheme of Examination** **R. _____**	NEP 40% Internal 60% External, Semester End Examination Individual Passing in Internal and External Examination	
6	**Standards of Passing** **R. _____**	40% in each component	
7	**Sem. I & II Credit Structure R: _____A** **R: _____B** **Sem. III & IV Credit Structure R: _____C** **R: _____D** **Sem. V & VI Credit Structure R: _____E** **R: _____F**	Attached herewith	
8	**Semesters**	A	Sem I & II
		B	Sem I, II, III& IV
		C	Sem I, II, III, IV, V & VI
		D	Sem I, II, III, IV, V, VI, VII & VIII
		E	Sem I, II, III, IV, V, VI, VII & VIII
9	**Program Academic Level**	A	4.5
		B	5.0
		C	5.5
		D	6.0
		E	6.0
10	**Pattern**	Semester	
11	**Status**	New	
12	**To be implemented from Academic Year Progressively**	From Academic Year: 2025-26	

<table>
<tr><td colspan="3"> 
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<tr><td colspan="3">Syllabus for
Vertical – 1 to 6</td></tr>
<tr><td colspan="3">Name of the Programme – B.Sc. (Information Technology)</td></tr>
<tr><td colspan="3">Faulty of Science and Technology</td></tr>
<tr><td colspan="3">Board of Studies in Information Technology</td></tr>
<tr><td>U.G. Second Year Programme</td><td>Exit Degree</td><td>U.G. Diploma in Information Technology</td></tr>
<tr><td colspan="2">Semester</td><td>I & II</td></tr>
<tr><td colspan="2">From the Academic Year</td><td>2025-26</td></tr>
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Preamble

Introduction

Information technology (IT) continues to be a dynamic and rapidly evolving field with high demand for skilled professionals. The demand for IT workers is driven by various factors, and the landscape may have evolved over a period of time. NEP envisages the multidisciplinary approach thus making IT much more applicable in all fields of life. This facilitates multi-institutional mobility of the students within India as well as abroad thus making the students attain different proficiency levels right from certificate to B.Sc Honours with Research. This new syllabus under NEP will thus enables the students for higher education, research and career in the field of IT

Aims and Objectives

The aims and objectives of a Bachelor of Science (B.Sc) program in Information Technology (IT) generally revolve around providing students with a comprehensive understanding of the principles, technologies, and applications within the field of information technology. The entire program collectively aims to produce graduates who are well-rounded IT professionals, capable of contributing to the design, development, and management of information technology systems in various industries. The specific details of the curriculum may vary among institutions offering B.Sc in Information Technology programs.

Program Outcome

- **Knowledge of Business Disciplines**

Develop a strong foundation in core areas of commerce such as accounting, economics, business law, management, and statistics, enabling students to understand and respond to contemporary business challenges.

- **Problem-Solving and Decision-Making Skills**

Apply logical reasoning and quantitative techniques to analyze business problems and make informed decisions in diverse organizational settings.

- **Communication and Interpersonal Skills**

Demonstrate proficiency in written, verbal, and digital communication, essential for effective collaboration and negotiation in business environments.

- **Ethical, Social, and Environmental Awareness**

Recognize ethical issues, social responsibilities, and environmental sustainability in business operations and decision-making.

- **Lifelong Learning and Adaptability**

Develop the ability to adapt to a dynamic global business environment by engaging in continuous learning, embracing technology, and cultivating personal and professional growth.

Program Specific Outcome

- **Technical Proficiency:**

Demonstrate a comprehensive understanding of fundamental concepts, principles, and technologies in information technology. Apply programming and software development skills to design and implement IT solutions.

- **System Thinking and Analysis:**

Apply system analysis and design methodologies to analyze and address complex problems. Design and develop IT systems that meet user requirements and organizational needs.

- **Database Management:**

Design, implement, and manage relational databases to store and retrieve information effectively. Demonstrate proficiency in using database management systems and querying languages.

- **Networking and Security:**

Understand and implement computer networks, protocols, and security measures.
Evaluate and implement security solutions to protect information systems.

- **Web Technologies:**

Develop web applications using a variety of technologies and programming languages.
Design and create user interfaces that adhere to web design principles.

- **Project Management:**

Apply project management principles to plan, execute, and deliver IT projects.
Demonstrate the ability to work effectively within project teams.

- **Emerging Technologies:**

Stay informed about and adapt to emerging technologies in the IT field.
Apply concepts of artificial intelligence, machine learning, cloud computing, and IoT to solve real-world problems.

- **Critical Thinking and Problem-Solving:**

Analyze and solve complex IT problems using critical thinking skills.

Apply problem-solving strategies to troubleshoot and resolve technical issues.

- **Communication Skills:**

Effectively communicate technical information to diverse audiences, both orally and in writing. Collaborate with team members and stakeholders to achieve common goals.

- **Ethics and Professionalism:**

Demonstrate ethical behavior and professionalism in all aspects of the IT profession.
Adhere to ethical standards and legal considerations related to information technology.

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

(Credit Structure Semester I & II)

			Semester- I		Semester- II	
Verticals	**Type**		**Course**	**Credits**	**Course**	**Credits**
Vertical 1	**Major Subjects**	MJ 1	Foundation of Programming Skills	2	Programming with C++ using OOP	2
		MJ 2	Database Management System	2	Web Technologies	2
		MJ 3	Programming Skills + Database Management System Practical	2	C++ Programming + Web Technologies Practical	2
Vertical 2 (ANY ONE BASED ON MAJOR)	**Minor Subject**	MN1	****	**	Descriptive Statistics	2
Vertical 3	**Open Elective**	OE 1	Indian Financial System - I	2	Introduction to Stock Market	2
		OE 2	Social Media and Communication	2	Basic Concepts in Research	2
Vertical 4	**VSC**		Digital Logic Application	2	Linux Practical	2

(ANY ONE BASED ON MAJOR)			Practical			
	SEC		Quantitative Foundations for Data Analysis	2	Microprocessor and Microcontroller Practical	2
Vertical 5	**AEC**		Introduction to Communication Skills in English-I	2	Introduction to Communication Skills in English-II	2
	VEC		Environmental Systems and Management-I	2	Environmental Systems and Management-II	2
	IKS		Indian Knowledge System	2	***	**
Vertical 6	**CC**		Sports and Fitness	2	Yoga Certification	2
			Total Credits	**22**	**Total Credits**	**22**

[Abbreviation - OE – Open Electives, VSC – Vocation Skill Course, SEC – Skill Enhancement Course, (VSEC), AEC – Ability Enhancement Course, VEC – Value Education Course, IKS – Indian Knowledge System, OJT – on Job Training, FP – Field Project, CEP – Continuing Education Program, CC – Co-Curricular, RP – Research Project]

B.Sc. (Information Technology)

SEMESTER- I

Vertical – 1
Major

Name of the Course: Foundation of Programming Skills

Sr.No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to:**	This course allows the students to understand the fundamental concepts of programming which will allow them to program applications in C.
2	**Vertical :**	Major
3	**Type :**	Theory
4	**Credits :**	2 credits (1 credit = 15 Hours for Theory in a semester, Total 30 hours)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO1**: Gain foundational knowledge of computer programming principles and logic development. **CO2**: Explore and interpret the structure, rules, and syntax of C language programs. **CO3**: Develop the ability to construct programs using conditional statements and iterative constructs. **CO4:** Apply array, structure, union, and pointer concepts to solve real-world Programming problems. **CO5**: Design modular programs using functions and integrate basic error handling Techniques.	
8	**Course Outcomes (OC):** **OC1:** To develop the ability to design algorithms using flowcharts and pseudocode as a precursor to C programming. **OC2:** To help students accurately implement the syntax and grasp the meaning of C language elements in coding tasks. **OC3:** To enable students to apply decision-making and looping techniques in real-world programming scenarios. **OC4:** To introduce students to the effective use of arrays, structures, unions, and pointers for data handling. **OC5:** To encourage writing clear, organized, and modular C code that adheres to software development standards. Code and debug programs if there are any errors.	
9	**Modules:-** **Module 1:**	

	1. Introduction: Overview of Programming and Introduction to C, Structure of a C Program, Constants, Variables, and Data Types, Managing Input and Output (scanf, printf, getchar, putchar), 2. Type of operators: Arithmetic operators, relational and logical operators, Increment and Decrement operators, assignment operators, the conditional operator, Assignment operators and expression, Precedence and order of Evaluation Block Structure, Initialization, C Preprocessor	**15 Hrs**
	Module 2:	
	1. Control Flow: Statements and Blocks, If-Else, Else-If, Switch, Loops- While and For Loops Do-while, Break and Continue, Goto and Labels **2.** Basics of functions. User defined and Library functions **3.** Pointer and Addresses, Pointer and Function Arguments, Pointer and Arrays. **4.** File Input/Output: File Operations,Opening a File, Reading from a File, Closing the File	**15 Hrs**
10	**Books and References:** 1. C Programming Language, Brian W. Kernighan, Dennis M. Ritchie , 2017 2. Let Us C, Yashvant Kanetkar, BPB Publications,2008. 3. Mastering in C, K. R. Venugopal and Sudeep R. Prasad, Tata McGraw-Hill Publications. 4. A Computer Science –Structure Programming Approaches using C, Behrouz Forouzan, Cengage Learning. 5.. Schaum's outlines Programming with C, Byron S. Gottfried, Tata McGraw- Hill Publications.	
11	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
12	**Continuous Evaluation through:** Class test: 15 marks Quizzes/ Presentations/ Assignments: 5 marks Total: 20 marks	**Format of Question Paper: External Examination (30 Marks)– 1 hr duration**
13	**Format of Question Paper:** (**Semester End Examination: 30 Marks. Duration:1 hour)** Q1: Attempt any three (out of five) from Module 1 (15 marks) Q2: Attempt any three (out of five) from Module 2 (15 marks)	

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Database Management System

Sr.No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to:**	The objective of the course is to present an introduction to fundamentals of database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.
2	**Vertical :**	Major
3	**Type :**	Theory
4	**Credits :**	2 credits (1 credit = 15 Hours for Theory in a semester, Total 30 hours)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** To introduce the fundamental concepts of database systems, including data abstraction, database architecture, and transaction management. **CO 2** To explain the importance of data models and their components in designing effective and scalable databases. **CO 3** To provide a comprehensive understanding of the Entity-Relationship (ER) model, relational schemas, and relational algebra for database design. **CO 4**. To develop the ability to design normalized database schemas by understanding functional dependencies and eliminating data redundancy. **CO 5**. To enable students to write and optimize SQL queries, including the use of indexing, views, triggers, joins, and other query operations. **CO 6.** To impart knowledge of transaction processing, concurrency control, and recovery techniques to ensure data consistency and fault tolerance in multi-user environments.	
8	**Course Outcomes (OC):** **OC1**: Describe the fundamental concepts of database systems including data abstraction, database architecture, and transaction management. **OC2:** Explain the importance and components of data models and their role in designing a database. **OC3**: Apply Entity-Relationship (ER) modeling techniques to design database schemas and represent relationships and constraints. **OC4:** Analyze the relational database model, integrity constraints, and relational algebra operations to ensure data consistency and reliability.	

<table>
<tr><td></td><td colspan="2">OC5: Analyze functional dependencies and normalization techniques to eliminate redundancy and improve database design.
OC6: Construct and execute SQL queries involving DDL, DML, triggers, views, joins, and indexing for efficient data retrieval and manipulation.
OC7: Explain transaction processing concepts, concurrency control mechanisms, and recovery techniques to maintain data integrity in multi-user environments.</td></tr>
<tr><td rowspan="4">9</td><td colspan="2">Modules:-
Module 1:</td></tr>
<tr><td>Introduction to Databases
What is database management system, view of data, relational databases, database architecture, database languages
Data Models
The importance of data models, Basic building blocks, The evolution of data models, Degree/level of data abstraction
Database Design, ER-Diagram
Database design and ER Model: ER-Model, Constraints, ER-Diagrams, Codd’s rules, Relational Schemas, Relational Algebra, Keys in DBMS, Integrity rules</td><td>15 Hrs</td></tr>
<tr><td colspan="2">Module 2:</td></tr>
<tr><td>Normalization:
Basics of functional dependencies and normalization for relational databases, The Problem of Redundancy in Database (Anomaly).
SQL:
Introduction to SQL, SQL Commands, queries, triggers, views, indexing, joining database tables, SQL Operators Query Processing and optimization.
Transaction Management and Recovery:
Transaction in DBMS, Transaction States in DBMS, ACID Properties of Transaction, Database recovery technique.</td><td>15 Hrs</td></tr>
<tr><td>10</td><td colspan="2"></td></tr>
</table>

	Books and References: 1. "Fundamentals of Database System", Elmasri Ramez, Navathe Shamkant, Pearson Education, Seventh edition, 2017 2. Database Management Systems", Raghu Ramakrishnan and Johannes Gehrke, 3rd Edition, 2014 3. Database Systems: Design implementation and management by Carlos Coronel, Steven Morris, Peter Rob 4. "Database System Concepts", Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw Hill, 2017 5. "MySQL: The Complete Reference", Vikram Vaswani , McGraw Hill, 2017 6. "Learn SQL with MySQL: Retrieve and Manipulate Data Using SQL Commands with Ease", Ashwin Pajankar, BPB Publications, 2020	
11	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
12	**Continuous Evaluation through:** Class test: 15 marks Quizzes/ Presentations/ Assignments: 5 marks Total: 20 marks	**Format of Question Paper: External Examination (30 Marks)– 1 hr duration**
13	**Format of Question Paper: (Semester End Examination : 30 Marks. Duration:1 hour)** Q1: Attempt any three (out of five) from Module 1 (15 marks) Q2: Attempt any three (out of five) from Module 2 (15 marks)	

Name of the Course:
Programming Skills + Database Management System Practical

Sr.No.	Heading	Particulars
1	**Description the course : Including but Not limited to:**	**Foundation of Programming Skills Practical** This course is a stepping stone to learn other languages. This course provides students hands-on experiences of coding exercises and projects. . **Database Management System's practical** approach is useful to gain the knowledge for software backend development. It benefits to user by providing data definition, data access, reduced data redundancy, data integrity, data sharing, data organizing, data consistency, data accuracy, and security
2	**Vertical :**	Major
3	**Type :**	Practical
4	**Credits :**	2 credits (60 hours practical work in a semester)
5	**Hours Allotted :**	30 Hours (Foundation of Programming Skills Practical)+ 30 Hours (DBMS practical)
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1**. To provide exposure in developing algorithm, flowchart and to write efficient code. **CO 2.** To understand loops and decision making in programming. **CO 3**. To understand the arrays, structures, union. **CO 4.** To understand the use of function and pointers. **CO 5.** To Identify entities and its relationship with relational model structure. **CO 6.** To understand relational database using SQL and constraints implementation using create table queries. **CO 7.** To Understand DML operations and backing of database **CO 8.**To understand how to retrieve data from database and learn how to retrieve single value after performing calculations on group of values **CO 9.** To understand built-in functions to perform operations on data **CO 10.** To understand how to fetch data from two or more tables, which is joined to appear as single set of data **CO 11.**To understand nested and larger query as advanced fetching of data to understand the concept of virtual table. **CO 12.** To understand how to control user access in a database.	
8	**Course Outcomes (OC):** **OC 1**. Students can demonstrate the concepts of datatypes, variables and operators in C.	

<table>
<tr><td></td><td colspan="2">OC 2. Students can implement the concept of control statements and looping in a C program.
OC 3. Students can demonstrate the use of arrays, strings and structures in C
OC 4. Students can implement modular C programs using functions and pointers.
OC 5. Students can demonstrate the use of arrays, strings and structures in C.
OC 6. Students are able to perform various operations such as insert, update, delete and retrieve data from a database using SQL queries.
OC 7. Students are able to perform alteration in tables and can restore and take backup of the database.
OC 8. Students are able to perform operations using simple SQL Queries to fetch data and learn various aggregate functions to get a single value.
OC 9. Students are able to perform SQL Queries using JOIN keywords for joining two or more tables.
OC 10. Students able to perform nested queries using in, exists operators.
OC 11. Students are able to create new tables by joining one or more tables and learn how to hide attributes from the end user.
OC 12. Students are able to restrict the user from accessing data in the database.
OC 13. Students should be able to create, manipulate the database management system to evaluate the business information problem.</td></tr>
<tr><td rowspan="2">9</td><td colspan="2">Modules:-
Module 1:</td></tr>
<tr><td>Practical 1:-
a. To calculate simple interest taking principal, rate of interest and number of years as input from the user. Write algorithm & draw flowchart for the same.
b. Write a program to find the greatest of three numbers using the conditional operator. Write algorithm & draw flowchart for the same.
c. Write a program to check if the year entered is leap year or not. Write algorithm & draw flowchart for the same.
Practical 2:-
a. Write a program to calculate roots of a quadratic equation.
b. Write a menu driven program using switch case to perform add / subtract / multiply / divide based on the user's choice.
c. Write a program to print the pattern of asterisks.
Practical 3:-
a. Write a program using a while loop to reverse the digits of a number.
b. Write a program to calculate the factorial of a given number.
c. Write a program to print the Fibonacci series.
Practical 4 :-
a. Write a program to print the area of a square using a function.
b. Write a program using a recursive function.
c. Write a program to square root, abs() value using function.
d. Write a program using a goto statement .</td><td>30 Hrs</td></tr>
</table>

	Practical 5 :- a. Write a program to print rollno and names of 10 students using an array. b. Write a program to sort the elements of array in ascending or descending order **Practical 6 :-** a. Write a program to extract the portion of a character string and print the extracted part. b. Write a program to find the given string is palindrome or not c. Write a program using strlen(), strcmp() function . **Practical 7 :-** Write a program to swap two numbers using a function. Pass the values to be swapped to this function using call-by-value method and call-byreference method. **Practical 8 :-** a. Write a program to read a matrix of size m*n. b. Write a program to multiply two matrices using a function. **Practical 9 :-** Write a program to print the structure using Title Author Subject Book ID Print the details of two students. **Practical 10 :-** Create a mini project on "Bank management system". The program should be menu driven.	
	Module 2:	
	Practical 1:- Conceptual Designing using ER Diagrams (Identifying entities, attributes, keys and relationships between entities, cardinalities, generalization, specialization etc.) **Practical 2:-** Perform the following: ● Creating a Database ● Viewing all databases ● Viewing all Tables in a Database ● Creating Tables (With and Without Constraints) ● Inserting/Updating/Deleting Records in a Table **Practical 3:-** Perform the following: ● Altering a Table ● Dropping/Truncating/Renaming Tables **Practical 4:-** Perform the following: ● Simple Queries ● Simple Queries with Aggregate functions **Practical 5:-** Queries involving ● Date Functions ● String Functions ● Math Functions ● AND and OR Operators	**30 Hrs**

	Practical 6:- SQL Clauses ● WHERE, WITH, ORDER BY and HAVING Clause **Practical 7:-** Join Queries ● Inner Join ● Outer Join **Practical 8 :-** Subqueries ● With IN clause ● With EXISTS clause **Practical 9:-** Views ● Creating Views (with and without check option) ● Selecting from a view ● Dropping views **Practical 10:-** DCL statements ● Granting and revoking permissions ● Saving (Commit) and Undoing (rollback)	
10	**Books :** 1.Text Books: "Fundamentals of Database System", Elmasri Ramez, Navathe Shamkant, Pearson Education, Seventh edition, 2017 . 2. Database Management Systems", Raghu Ramakrishnan and Johannes Gehrke, 3rd Edition, 2014 **Reference Books:** 1.MASTERING C, K. R. Venugopal and Sudeep R. Prasad, Tata McGraw-Hill Publications. 2. "A Computer Science –Structure Programming Approaches using C",Behrouz Forouzan, Cengage Learning. 3. Schaum outlines "Programming with C", Byron S. Gottfried, Tata McGraw-Hill Publications. 4."Basics of Computer Science", Behrouz Forouzan , Cengage Learning. "ProgrammingTechniques through C", M. G. Venkateshmurthy, Pearson Publication. 5."Programming in ANSI C", E. Balaguruswamy, Tata McGraw-Hill Education. 6."MySQL: The Complete Reference", Vikram Vaswani , McGraw Hill, 2017. 7."Learn SQL with MySQL: Retrieve and Manipulate Data Using SQL Commands with Ease", Ashwin Pajankar, BPB Publications, 2020	
11	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
12	**Continuous Evaluation through:** Students are expected to attend each practical and submit the written practical of the previous session.	**30 marks practical exam of 2 hours duration**

	Performing Practical and writeup submission will be continuous internal evaluation. 2.5 marks can be awarded for each practical performance and writeup submission totalling to 50 marks and can be converted to 20 marks.	
13	**Format of Question Paper: Duration 2 hours. Certified copy of Journal is compulsory to appear for the practical examination** **Practical Slip:** **Q1. From Module 1 13 marks** **Q2. From Module 2 12marks** **Q3. Journal and Viva 05 marks**	

Vertical – 3

Open Electives

(OE)

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Indian Financial System -I

Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Continuous Assessment (CA)(Marks - 20)**	**Semester End Examinations (SEE) (Marks- 30 in Question Paper)**
2	**-**	**-**	**2**	**20**	**30**

Learning Objectives:

CO1 Understand the basic structure and role of the Indian financial system in the economy.
CO2 Identify the key functions of banks and the services they offer to individuals.
CO3 Recognize the importance of the Reserve Bank of India (RBI) as a regulatory authority.
CO4 Explain the concept of insurance and its relevance in personal financial planning.
CO5: Develop basic awareness of saving, budgeting, and investment as essential financial habits.

Course Outcomes:

After completing this course, students will have the knowledge and skills to

CO1: Describe the structure and components of the Indian financial system.
CO2: Explain the roles and functions of various banking institutions and the regulatory framework.
CO3: Understand the concept and significance of insurance in financial planning.
CO4: Gain awareness of essential financial habits such as saving, budgeting, and basic investment concepts.
CO5: Build a foundational understanding of financial services relevant to individuals in everyday life.

Outline of Syllabus:

Module	Description	No of Hours
1	Overview of Indian Financial System	10

2	Banks and Banking Services	10
3	Insurance and Financial Planning Basics	10
Total		**30**

Unit	Topic	No. of Hours/Credits
Module 1	**1. Overview of Indian Financial System** What is a financial system? Importance of financial systems in the economy Basic components: Institutions, markets, instruments, and services (in simple language)	10
Module 2	**2. Banks and Banking Services** Types of banks: Public, private, cooperative Basic services: Savings account, fixed deposits, loans, credit cards Role of RBI in regulating banks	10
Module 2	**3. Insurance and Financial Planning Basics** What is insurance? Types: Life and general insurance Importance of insurance in financial planning Basic idea of budgeting, saving, and investment	10

Reference Books:

- Halan, Monika. *Let's Talk Money*, Harper Business
- Pathak, Bharati V. *The Indian Financial System* (selected basic chapters)
- RBI's "Financial Literacy" booklets and SEBI's student guides

Internal Assessment (20 Marks)

Sr. No	Particular	Marks
1.	Class Test	15
2.	Class participation	05

	Total	**20**

External Assessment (30 Marks)

Attempt any 2 out of 3 questions.

Questions	**Type & Module**	**Marks**
Q1.	Objective Question A) Multiple choice questions B) True or False	08 Marks 07 Marks

Q2.	Theory Question	15 Marks
Q3.	Theory Question	15 Marks
	Total	**30**

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Social Media and Communication

Sr. No.	Heading	Particulars
1	**Description of the course :**	The course will introduce students to the world of social media and communication past and present. It will help students to navigate the digital landscape and explore social media usage for interpersonal communication and academic purpose. The course equips students with skills to pursue higher studies and career opportunities in social media such as social media management, content creator and others.
2	**Vertical :**	**Open Elective 1**
3	**Type :**	**Theory**
4	**Credit**:	**2 credits**
5	**Hours Allotted :**	**30 Hours**
6	**Marks Allotted**:	**50 Marks**
7	**Course Objectives**: 1. To understand traditional and modern social media. 2. To understand the relation between social media and academics. 3. To recognize the importance of social media	
8	**Course Outcomes:** After completion of the course, learners would be able to: 1. Recognize the difference between traditional and modern social media. 2. Establish a co-relation between social media and academics. 3. Develop better understanding of various uses of social media platforms.	
9	**Modules**:-	
	Module 1: Social Media: Past and Present	
	1. Concept of social media 2. Brief history of social media 3. Early social media platforms	
	Module 2: Modern Social Media Landscape	
	1. Instagram, Twitter, Tik Tok and Snap Chats 2. Use of social media in interpersonal communication 3. Use of social media in Academics	

10	**References:** 1. Boyd, D, and Ellison, N., 2007, Social network sites: Definition, history, and scholarship. Journal of computer-mediated communication, 13(1), 210-230 2. Burton, G. (2010). Media and Society: Critical Perspectives. New York; Mc Graw-Hill Publication. 3. Lipschultz, J.H. (2020). Social Media Communication Concepts, Practices, Data, Law and Ethics. Routledge. 4. Kaplan, A.M. and Haenlein, M. (2010) Users of the World, Unite! The Challenges and Opportunities of Social Media. Business Horizons, 53, 59-68. 5. Williams, R, and Gulati, G. J, 2017, Social Media Communication: Concepts, Practices Data, Law and Ethics. 6. https://slejournal.springeropen.com/articles/10.1186/s40561-020-00118-7
11.	**Internal Evaluation** : 20 Marks 1-Classroom Presentations/ Assignments - 10 Marks 2-Essay Submission/ Book review/ 10 Marks Field Visit Report / Educational Activity Report
12.	**Format of Question Paper:** for the final examination Time: 1hour Marks: 30 **Note:** Q.1. Essay Type Questions (Based on Unit I).Marks 15 Q.2. Essay Type Questions (Based on Unit II).Marks 15 Q.3. Short Notes/Problem(Attempt any two out of four Based on all Units).Marks 15

Vertical – 4

Skill Enhancement Course

(SEC)

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Quantitative Foundations for Data Analysis

Sr.No.	Heading	Particulars
1	**Description the course :**	This course introduces the essential mathematical and statistical concepts necessary for data analysis. It covers foundational topics such as sets, logic, sequences, and matrix operations, along with introductory probability theory. The course emphasizes the application of quantitative tools for exploring, summarizing, and visualizing data, including measures of central tendency, dispersion, and data visualization techniques. Through practical examples and real-world applications, students will learn to structure data logically, perform exploratory data analysis, and apply quantitative reasoning in data-driven environments. **Applications:** Used in building search algorithms, real-time data filters, recommendation systems, exploratory data analysis (EDA), and decision-support frameworks in industries such as technology, finance, and business analytics.
2	**Vertical :**	Skill Enhancement Course(SEC)
3	**Type :**	Theory
4	**Credits :**	2 credits (1 credit = 15 Hours for Theory in a semester, Total 30 hours)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives (CO)** **CO1:** To introduce the fundamental concepts of sets, relations, functions, logic, and sequences as essential tools for structuring and modeling data. **CO2:** To develop logical reasoning skills through propositional logic and its applications in data querying and decision-making frameworks. **CO3:** To familiarize students with quantitative tools such as vectors, matrices, and basic linear algebra operations for representing and transforming data. **CO4:** To provide foundational knowledge of probability theory, conditional probability, and basic probabilistic models used in data analysis. **CO5:** To enable students to perform descriptive statistical analysis and data visualization, interpreting measures of central tendency, dispersion, and distribution characteristics.	
8	**Course Outcomes (OC):** After successful completion of this course, learners will be able to:	

	OC1: Organize and model data using sets, relations, functions, sequences, and logical reasoning relevant to data-driven applications. **OC2:** Apply logical reasoning and propositional logic to design and interpret data queries, rules, and decision models. **OC3:** Represent, manipulate, and analyze data structures using vectors, matrices, and perform basic matrix operations in practical contexts. **OC4:** Apply probability concepts including conditional probability and independence to model uncertainty and solve real-world data problems. **OC5:** Compute, interpret, and visualize descriptive statistics for univariate data, including measures of central tendency, dispersion, skewness, kurtosis, and graph-based representations.	
9	**Modules:-** **Module 1: Foundations of Logic and Discrete Structures for Data**	
	a. Sets, Relations, and Functions a. Types of sets and operations b. Cartesian products, mappings c. Domain and range — foundational for data models **b. Logic and Propositional Reasoning** a. Propositions, truth tables, logical equivalence b. Implications, predicates, quantifiers c. Applications in data queries and rule-based systems **c. Sequences, Series, and Summations** a. Arithmetic and geometric sequences b. Series and sigma notation c. Data stream processing and aggregations	15 Hrs
	Module 2: Quantitative, Probabilistic, and Exploratory Data Analysis Tools	
	. Vectors and Matrices (Basics) 1. Scalars, vectors, matrix operations (addition, multiplication) 2. Transpose, identity, zero matrices 3. Relevance in representing datasets, images, networks **a. Probability Theory Basics** 1. Events, sample space, frequency interpretation 2. Conditional probability, independence 3. Bayes' theorem and simple probabilistic modeling **b. Descriptive Statistics and Visualization** 1. Measures of central tendency (mean, median, mode) 2. Quartiles, deciles, percentiles 3. Measures of spread (range, variance, standard	15 Hrs

	deviation, quartile deviation) 4. Skewness and kurtosis — definition, interpretation, applications 5. Graphical representation: histograms, boxplots, bar charts	
10	**Books and References:** **TextBooks:** **Schaum's Outline of Discrete Mathematics** *By Seymour Lipschutz, Marc Lipson — McGraw-Hill* *Covers: Sets, logic, propositional reasoning, sequences, matrices, and combinatorics fundamentals.* **Statistics Made Simple: Do It Yourself on PC** *By K.V.S. Sarma — PHI Learning* *Covers: Descriptive statistics, data summarization, and basic probability concepts with applications.* **Fundamentals of Mathematical Statistics** *By S.C. Gupta and V.K. Kapoor — Sultan Chand & Sons* *Covers: Probability theory basics, descriptive measures, skewness, kurtosis, and data visualization.* **Programmed Statistics (Questions–Answers)** *By B.L. Agarwal — New Age International Publishers* *Covers: Descriptive and inferential statistics with worked examples* **Reference Books** **Discrete Mathematics and Its Applications** *By Kenneth H. Rosen — McGraw-Hill* *Excellent for sets, logic, propositional reasoning, functions, sequences, and basic matrix theory.* **Theory and Problems of Statistics (Schaum's Series)** *By Murray R. Spiegel — McGraw-Hill* *Covers: Descriptive statistics, probability, and data visualization with problems and solutions.* **Descriptive Statistics** *By R.J. Shah — Seth Publication* *Dedicated book for descriptive data summarization, measures of central tendency, and dispersion.* **Basic Statistics** *By B.L. Agarwal — New Age International Ltd* *Good coverage of foundational statistics, probability, and data interpretation.*	
11	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**

12	**Continuous Evaluation through:** Class test : 15 marks Quizzes/ Presentations/ Assignments: 5 marks Total: 20 marks	**Format of Question Paper: External Examination (30 Marks)– 1 hr duration**
13	**Format of Question Paper: (Semester End Examination : 30 Marks. Duration:1 hour)** Q1: Attempt any three (out of five) from Module 1 (15 marks) Q2: Attempt any three (out of five) from Module 2 (15 marks)	

Vertical – 4

Vocational Skill Course

(VSC)

Name of the Course: Digital Logic Application Practical

Sr.No.	Heading	Particulars
1	**Description the course : Including but Not limited to:**	**Combinational and Sequential Design** is a course focused on the principles and techniques of digital circuit design. It covers both combinational and sequential circuits, using tools like Boolean algebra and Karnaugh maps for simplification. This course is essential for students in electronics, computer engineering, and related fields, as digital circuits form the foundation of modern devices like computers and smartphones. Students will gain practical skills in designing, analyzing, and optimizing digital circuits, with applications in areas such as telecommunications, robotics, and semiconductors. Connected to courses like Digital Logic Design and Computer Organization, it offers strong career prospects in industries where digital electronics are key.
2	**Vertical :**	Major
3	**Type :**	Practical
4	**Credits :**	2 credits (30 Hours of Practical work in a semester)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted:**	50 Hours
7	**Course Objectives(CO):** **CO1.**To provide students with a comprehensive understanding of combinational and sequential circuit design principles and techniques. **CO2.**To enable students to apply Boolean algebra, K-map simplification, and other design techniques to create optimized digital circuits. **CO3.**To equip students with the necessary tools and skills to implement arithmetic circuits, data path circuits, and memory circuits. **CO4.**To enable students to analyze and troubleshoot digital circuits to ensure optimal performance. **CO5.**To provide students with hands-on practical experience in designing and implementing digital circuits using simulation software and real-world hardware.	
8	**Course Outcomes (OC):** **OC1.** Students can explain the differences between combinational and sequential circuits, and identify their different applications. **OC2.** Students can define the concept of Boolean algebra and its importance in digital circuit design. **OC3.** Students can explain and apply the principles of K-map simplification and other design techniques.	

<table>
<tr><td></td><td colspan="2">OC4. Students can design and construct combinational circuits using Boolean algebra and K-maps.
OC5. Students can design and implement arithmetic circuits such as adders, subtractors, and multipliers.
OC6. Students can design and implement data path circuits such as registers, multiplexers, and decoders.
OC7. Students can implement digital circuits using breadboards, logic probes, and oscilloscopes.
OC8. Students can troubleshoot and verify the correctness of digital circuits using real-world hardware and measure their performance using various metrics.</td></tr>
<tr><td rowspan="2">9</td><td colspan="2">Modules:-
Module 1:</td></tr>
<tr><td>Practical 1:- Study of Logic gates and their ICs and universal gates:
. Study of AND, OR, NOT, XOR, XNOR, NAND and NOR gates
a. Implement AND, OR, NOT, XOR, XNOR using NAND gates or NOR gates.

Practical 2:- Implement the given Boolean expressions using minimum number of gates.
. Verifying De Morgan’s laws.
a. Implement other given expressions using minimum number of gates.
Practical 3:- Implement combinational circuits and code converter.
. Design and implement Half adder and Full adder.
a. Design and implement Half subtractor.
Practical 4:- Implement code converters.
a. Design and implement Binary – to – Gray code converter.
b. Design and implement Gray – to – Binary code converter.
Practical 5:- Implement Arithmetic circuits.
. Design and implement a 2-bit by 2-bitmultiplier.
a. Design and implement a 2-bit comparator.
Practical 6:- Implement Multiplexer and Demultiplexers.
c. Design and implement 4:1 multiplexer. Study of IC 74153, 74157
d. Design and implement 1:4 demultiplexer. Study of IC 74139

Practical 7:- Study of flip-flops and counters.
. Study of RS flip-flops.
a. Design of 3-bit synchronous counter using 7473 and</td><td>30 Hrs</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">required gates.
b. Design of 3-bit ripple counter using IC 7473.
Practical 8:- Study of counter ICs and designing Mod-N counters.
. Study of IC 7490, 7492, 7493 and designing mod-n counters using these.
a. Designing mod-n counters using IC 7473 and 7400 (NAND gates)
Practical 9:- Design of shift registers
. Design serial – in serial – out, serial – in parallel – out, using IC 7474.
a. Design parallel – in serial – out ,parallel – in parallel – out and bidirectional shift registers using IC 7474.
Practical 10:- Design of shift register counters.
. Study of ID 7495.
a. Implementation of digits using seven segment displays.</td><td></td></tr>
<tr><td>10</td><td colspan="3">Text Books
1. Digital Electronics and Logic Design, N. G. Palan, Technova
Reference Books
1. Digital Principles and Applications, Malvino and Leach, Tata McGrawHill
2. Modern Digital Electronics, R. P. Jain, Tata McGrawHill.
3. Digital Design, M. Morris R. Mano, Michael D. Ciletti, Pearson Education, 2012</td></tr>
<tr><td>11</td><td>Internal Continuous Assessment: 40%</td><td colspan="2">Semester End Examination: 60%</td></tr>
<tr><td>12</td><td>Continuous Evaluation through:
Students are expected to attend each practical and submit the written practical of the previous session. Performing Practical and write-up submission will be continuous internal evaluation. 2.5 marks can be awarded for each practical performance and write-up submission totaling to 50 marks and can be converted to 20 marks.</td><td colspan="2">30 marks practical exam of 2 hours duration</td></tr>
<tr><td>13</td><td colspan="3">Format of Question Paper: Duration 2 hours. Certified copy of Journal is compulsory to appear for the practical examination Practical Slip:
Q1. From Module 1 13 marks
Q2. From Module 2 12marks
Q3. Journal and Viva 05 marks</td></tr>
</table>

Vertical – 5

Ability Enhancement Course

(AEC)

Name of the Course: Introduction to Communication Skills in English-I

Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Continuous Assessment (CA)(Marks - 20)**	**Semester End Examinations (SEE) (Marks-30 in Question Paper)**
2	-	-	2	20	30

Learning Objectives:

CO1 To enhance the English language proficiency of students by familiarizing them with Listening, Speaking, Reading, and Writing (LSRW) skills

CO2 To introduce learners to different perspectives of looking at a text or passage

CO3 To equip learners in the functional aspects of English so that they use the acquired language skills correctly and confidently

CO4 To guide learners in the effective use of the digital medium of communication

Course Outcomes:

After completion of the course, learners would be able to:

OC1 Understand and interpret any text they are reading from different perspectives

OC2 Arouse the interest of learners in listening to and watching good-quality audio and visual media

OC3 Acquire proficiency in the skills of listening, speaking, reading, and writing that will help them meet the challenges of the world

OC4 Develop good oral and written skills of communication in the English language

Outline of Syllabus:

Module	Description	No of Hours
1	Introduction to Communication Skills, Reading Skills, and Listening Skills	15
2	Speaking Skills and Writing Skills	15
Total		**30**

Unit	Topic	No. of Hours/Credits

Module 1 Introduction to Communication Skills, Reading Skills, and Listening Skills	1. Introduction to Communication Skills • English as an international language and varieties of English • Verbal and Non-Verbal Communication • Features of Effective Writing Skills • Characteristics of an Effective Speech • Effective Listening Skills This section provides a theoretical base for the following units that are practical in nature. 2. Reading Skills: • Scanning a text for information • Skimming a passage to look for main ideas, understanding text type	
	•Passages of around 200- 250 words from fables, folk stories, short stories, non-fiction, history, business or environment could be chosen in this section. 3. Listening Skills • Listening for main ideas/Gist • Listening for details • Listening for text organization features • Listening for tone, accent, style and register Listening skills in English should be developed through various activities, along with the practice done while teaching in the class.	15
Module 2: Speaking Skills and Writing Skills	1. Speaking Skills in English i) Public Speaking in English • Introduction • Characteristics of an effective speech • Analysis of model speeches • Drafting and presenting a speech in formal and informal gatherings ii) Conversation skills • Opening a conversation • Introducing oneself in various contexts • Introducing others formally and informally 2. Formal Writing Skills: • Job applications with biodata (solicited and unsolicited) • RTI applications • Applications for duplicate documents (I-cards / mark sheet, etc.)	15

References:

1. Bellare, Nirmala. Reading & Study Strategies. Books. 1 and 2. Oxford
2. University Press, 1997, 1998
3. 2. Bellare, Nirmala. Easy Steps to Summary Writing and Note-Making. Amazon
4. Kindle Edition, 2020
5. 3. Comfort, Jeremy, et al. Speaking Effectively: Developing Speaking Skills for
6. Business English. Cambridge University Press, 1994.
7. 4. Das, Bikram K., et. al. An Introduction to Professional English and Soft Skills.
8. Cambridge University Press India Pvt. Ltd., 2010
9. 5. Das, Yadjnaseni& R. Saha (eds.) English for Careers. Pearson Education
10. India, 2012.
11. 6. Dimond-Bayir, Stephanie. Unlock Level 2 Listening and Speaking Skills
12. Student's Book and Online Workbook: Listening and Speaking Skills
13. Student's Book+ Online Workbook. Cambridge University Press, 2014.
14. 7. Doff, Adrian and Christopher Jones. Language in Use (Intermediate and
15. Upper Intermediate). CUP, 2004.

INTERNAL EVALUATION METHODOLOGY (20 MARKS):

10 marks Role Play/ Skits

05 marks Resume Writing,

05 marks Class Participation and Attendance

SEMESTER END EXAMINATION: 30 MARKS **Time: 1 hr**

Question Paper Pattern

Each question carries 15 Marks

Question No.	Questions	Marks
Q 1	Writing Skills/ Comprehension	15 marks
Q 2	Practical/ Theory	15 marks

Vertical – 5

Value Education Course

(VEC)

Name of the Course: Environmental Systems and Management-I

Sr. No.	Heading	Particulars
1	Description the course: Including but Not limited to:	Environmental awareness is no longer limited to science — it's a key concern for businesses, policymakers, and future managers. This course goes beyond academic boundaries to introduce students to essential environmental concepts such as ecosystems, biodiversity, and the impact of human activities on natural resources and climate.Learners will explore pressing issues like pollution, resource depletion, and climate change — and learn how these challenges directly affect business operations, economic policies, and global markets. The course also highlights sustainable solutions that are shaping responsible business practices and corporate strategies today By linking environmental knowledge with fields like economics, business management, and public policy, this course builds a strong foundation for careers in sustainable business, environmental management, and green entrepreneurship — all of which are gaining traction in today's job market. Prepare for an engaging learning experience with interactive lectures, practical group discussions, and real-life case studies that examine how businesses adapt to and address environmental challenges in the real world.
2	Vertical:	Open Elective
3	Type:	Theory
4	Credit:	2 Credits / (1 Credit = 15 Hours for Theory or 30 Hours of Practical Work in a Semester

5	Hours Allotted:	30 Hours
6	Marks Allotted:	50 Marks
7	**Course Objectives:** 1. To introduce students to fundamental environmental concepts including ecosystems, biodiversity, and the human-nature relationship. 2. To sensitize students to the causes and consequences of environmental degradation and pollution. 3. To develop awareness about global issues like climate change and the loss of biodiversity and their impact on commerce and society. 4. To encourage students to understand the importance of environmental education and conservation in promoting sustainability.	

8	**Course Outcomes:** 1. Students will be able to explain the structure and function of ecosystems, and understand how energy flows through food chains and food webs. 2. Students will identify various types of environmental pollution and their sources, and suggest prevention and control strategies. 3. Students will analyze the factors contributing to biodiversity loss and describe the importance of conservation efforts. 4. Students will demonstrate an understanding of human impact on the environment, emphasizing the need for sustainable resource use and the role of environmental education in promoting sustainability.
9	**MODULES: -**
	Unit I: Introduction to Environmental Concepts (15 Lectures)

	· Environment: Meaning and Components of Environment · Ecosystem and Ecology: The Structure and Function of Ecosystem. Food chains and food webs as illustrations of energy flow and ecological balance. Real-life case studies that illustrate the impact of imbalance in the food chain · Resources: Meaning, Classification (Renewable and Non-Renewable), Conservation of Natural Resources in a Sustainable Manner · Human-Nature Relationship and Environmental Awareness: The changing role of humans in nature-from coexistence to exploitation. Importance of environmental education and awareness programs in organizations and among youth
	Unit II: Threats to the Environment (15 Lectures)
	· Loss of Biodiversity: Understanding biodiversity and its importance. Factors leading to Extinction of Species, Loss of Habitat, and Biodiversity Loss. Conservation efforts at global and local levels · Degradation of Environment: Meaning, Causes and Effects · Pollution: Meaning and Types of Pollution (Air, Water, Noise, Land, and Radio-active). Causes and Preventive Techniques · Climate Change and Global Warming: Causes and its Impacts on ecosystems, agriculture, health, and global weather patterns
10	**Text Books** 1. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006. 2. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders. 3. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi. 4. Chiras, D. D and Reganold, J. P. (2010). Natural Resource Conservation: Management for a Sustainable Future.10th edition, Upper Saddle River, N. J. Benjamin/Cummins/Pearson. 5. John W. Twidell and Anthony D. (2015). Renewable Energy Sources, 3rd Edition, Weir Publisher (ELBS) 6. Singh, J.S., Singh, S.P. & Gupta, S.R. 2006. Ecology, Environment

and Resource Conservation. Anamaya Publications
https://sdgs.un.org/goals

7. Down to Earth, Centre of Science and Environment ®.

8. Hawkins R. E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay ®.
9. Harper, Charles L. (2017) Environment and Society, Human Perspectives on Environmental Issues 6th Edition. Routledge.
10. Rajagopalan, R. (2011). Environmental Studies: From Crisis to Cure. India: Oxford University Press.

11. Harris, Frances (2012) Global Environmental Issues, 2nd Edition. Wiley-

Blackwell.

11

Reference Books

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.

6. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.

7. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.
8. Wilson, E. O. 2006. The Creation: An appeal to save life on earth. New York: Norton.
9. World Commission on Environment and Development.

1987. Our Common Future. Oxford University Press.

12	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**

<table>
<tr><td rowspan="2">13</td><td rowspan="2">Continuous Evaluation through:</td><td>Project Work</td><td>15 Marks</td><td rowspan="2">Report Submission based on Suggested Practical Activities by Faculty Members for 30 Marks.</td></tr>
<tr><td>Attendance and Participation in Seminar, Workshop,

and Activity, etc.</td><td>05 Marks</td></tr>
<tr><td>14</td><td colspan="4">Suggested Practical Activities:

● A guest lecture by a disaster management official or NGO working in disaster relief.
● Project work involves conducting a waste audit in their own homes or college vicinity for a week and proposing ways to reduce waste.
● Project to develop a business plan for a fictional "eco-friendly" product or service, incorporating principles of green marketing and sustainable packaging.
● Mangroves Conservation Activity
● Environment Conservation Activity</td></tr>
</table>

Vertical – 5

Indian Knowledge System

(IKS)

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Indian Knowledge System

Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Continuous Assessment (CA)(Marks - 20)**	**Semester End Examinations (SEE) (Marks- 30 in Question Paper)**
2	-	-	2	20	30

Learning Objectives:

1. To sensitize the students about context in which they are embedded i.e. Indian culture and civilisation including its Knowledge System and Tradition.
2. To help students to understand the knowledge, art and creative practices, skills and values in the ancient Indian system.
3. To help to study the enriched scientific Indian heritage.
4. To introduce the contribution from Ancient Indian system & tradition to modern science & Technology.

Course Outcomes:
After studying this course :

1. Learner will understand and appreciate the rich Indian Knowledge Tradition
2. Learner will understand the contribution of Indians in various fields
3. Learner will experience increase subject-awareness and self-esteem
4. Learner will develop a comprehensive understanding of how all knowledge is ultimately intertwined

Pedagogy : Lectures, PowerPoint Presentations, Case Studies, Articles and Book Reviews, Class Discussions, Simulations, Role Plays and Screening of Audio Visual Content

Outline of Syllabus

Outline of Syllabus:

Module	Description	No of Hours
1	**Introduction to IKS**	15
2	**Indian Knowledge System - II**	15

Reference Books

- Concise history of science in India- D.M. Bose, S.N Sen, B.V. Subbarayappa.
- Positive sciences of the Ancient Hindus- Brajendranatha seal, Motilal Banrasidas, Delhi1958.
- History of Chemistry in Ancient India & Medieval India, P.Ray- Indian ChemicalsSociety, Calcutta 1956
- Charaka Samhita- a scientific synopsis, P. Ray & H.N Gupta National Institute of Sciences of India, New Delhi 1965.
- Ramkrishna Mission- cultural heritage of India Vol. I, II & III.
- Varadachari V- History of Sanskrit literature Chaitanya Krishna- A new History of Sanskrit

Format of Question Paper: For the External examination

Continuous Internal Assessment: 20 Marks	**Semester End Examination : 30 Marks**
Field Visit Report : **10 Marks** Class Test / MCQ Test :**10 Marks**	External examination: **30 Marks**

Q1 Q2	A B	Objectives (MCQs) Concept/One Sentence	5 5
Q3 Q4		A OR B A OR B	10 10

Vertical – 6

Co-Curricular-Course

CC

Name of the Course: SPORTS AND FITNESS

1.1 Preamble:

India is growing rapidly as a global super-power. To face the challenges of the century and to keep up with the pace of the world, maintaining health is of prime importance. Giving thrust to healthy society, Physical Education, Sports, Health & fitness and Yoga are of great significance in today's world. The Government of India insists on Physical Fitness, Mental Health and Overall Development of Personality for every citizen. In these lines, the Government has launched Fit India Movement, Khelo India, TOPS and National Sports Day, International Day of Yoga etc. These initiatives have given impetus and awareness among general public, professional and academicians. However, creating efficient and skilled human resource in the field of Physical Education, Sports and Yoga is identified as the need of the hour. Thus, the Governments of India and Government of Maharashtra have included Physical Education, Sports and Yoga as a key area under the NEP 2020.

1.2 Objectives of the Course:

- To make students familiarize with concepts of Health, Fitness, Yoga, Sports & Physical Literacy. To sensitize the students about background knowledge of Sports structure of Sports Federations, Indian Olympic Association, Khelo India Schemes, FIT India movement, National Sports Day, Intercollegiate Sports structure of University of Mumbai.
- To familiarize the students with the various physical education concepts and information regarding various Olympic Sports.
- To make students aware about famous sports personalities and various awards given to Sportsperson and coaches.
- To educate students regarding various career opportunities in the sports management, sports coaching, sports industry, health and fitness, sports infrastructure, yoga, etc.
- The course is designed primarily to educate those interested in becoming a Physical Literacy Trainer/Ambassador as well as those who wish to stay lifelong active and want to influence others to be active for life.

1.3 Salient features of the course:

The course is designed to enhance the Competency, attitude and skills related knowledge to Physical Literacy, health & fitness, Sports & Yoga.
The course is design to implemented as per CBCS pattern .

1.4 Utility of the course:

The course may provide opportunity in the field of physical education, sports management, health & fitness, yoga, etc.
The course is significant to enhance the abilities of the student to work in the different fields of physical education in the area of coaching, event management, health & fitness, yoga etc. 3.The professional abilities and personality of the students may be enhanced.

1.5 Program outcomes:

By the end of the program the students will be able to:
CO1 The curriculum would enable the pass out students to be entrepreneur (to start their own fitness center, gym, yoga studio etc.) and device appropriate fitness program for different genders and age groups at all level

CO2 The curriculum would enable them to officiate, supervise various sports events and organize sports events.
CO3 Students acquire the knowledge of Physical Education, Sports and Yoga and understand the purpose and its development.
CO4 The student learns to plan, organize and execute sports events.
CO5 Students will learn theoretical and practical aspects of the game of his choice to apply at various levels for teaching, learning and coaching purposes efficiently.
CO6 Students acquire the knowledge of opted games, sports and yoga and also learn the technical and tactical experience of it.
CO7 Students will learn to apply knowledge of Physical fitness and exercise management to lead a better quality life.
CO8 Students will understand and learn different dimensions of an active lifestyle.
CO10 Students will learn the knowledge of nutrition and diet.
CO11 Students will be able to assess physical fitness in a scientific way.
CO12 The students will be able to continue professional courses and research in Physical Education, sports and yoga.
CO13 It helps the student to understand theory and practical aspects of physical literacy.
1.6 Programme Duration: The structure of Sports & Physical Literacy has two semesters in total covering a period of two years.
1.7 Duration of the Course:. First Year comprises two semesters. Each semester will have theory paper 30 marks for End Semester Examination and 20 marks for Internal Evaluation for each paper.
1.8 Modes of Internal Evaluation: Assignment, Tutorial, Presentation, MCQs via Google, Field Visits, any other suitable mode along with marks for Attendance of the students.
1.9 Medium of Instruction: English
1.10 Course Structure

Credits: 02 Lectures: 30 Marks: 50

Unit Number	Title of the Unit	No. of Lecture	No. of Credits
1	**Introduction to Sports, Physical Literacy, Health & fitness and Yoga** 1.1 Meaning and Definition of Sports, Physical Literacy, Health & Fitness and Yoga 1.2 Aim, Objectives & Importance of Sports, Physical Literacy, Health & Fitness and Yoga 1.3 History of Sports, Physical Literacy, Physical Education and Yoga 1.4 Modern trends of Sports, Physical Literacy, Health & Fitness and Yoga	15	1
2	**Introduction to Structure of Sports associations, Fitness Training & Yogic Asanas** 2.1 Various government schemes, awards and famous sports personalities 2.2 Sports Structure of Sports Federations, Khelo India, Sports Tournaments of University of Mumbai and Indian Olympic Association 2.3 Fundamental Principles of Fitness training and Yoga 2.4 Components of health related and skill related physical fitness 2.5 Types of Yogic practices – Asanas, Pranayama and Meditation	15	1

References –

1. Bucher, C. A. (n.d.) Foundation of physical education. St. Louis: The C.V. Mosby Co. Deshpande, S. H. (2014). Physical Education in Ancient India. Amravati: Degree college of Physical education.
2. Mohan, V. M. (1969). Principles of physical education. Delhi: Metropolitan Book Dep. Nixon, E. E. & Cozen, F.W. (1969). An introduction to physical education. Philadelphia: W.B. Saunders Co.
3. William, J. F. (1964). The principles of physical education. Philadelphia: W.B. Saunders Co.
4. Coalter, F. (2013) Sport for Development: What game are we playing? .Routledge.
5. Singh Hardayal (1991), Science of Sports Training, DVS Publication, New Delhi
6. Muller, J. P.(2000). Health, Exercise and Fitness. Delhi : Sports.
7. Russell, R.P.(1994). Health and Fitness Through Physical Education. USA : Human Kinetics.
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10. Kumar, Ajith. (1984) Yoga Pravesha. Bengaluru: Rashtrothanna Prakashana.
11. D.M Jyoti, Yoga and Physical Activities (2015) lulu.com3101, Hills borough, NC27609, United States
12. D.M Jyoti, Athletics (2015) lulu.com3101, Hills borough, NC27609, United States
13. Gharote, M. L. & Ganguly, H. (1988). Teaching methods for yogic practices. Lonawala: Kaivalyadhama.
14. Pinto John and Roshan Kumar Shetty (2021) Introduction to Physical Education, Louis Publications, Mangalore
15. Shekar, K. C. (2003). Yoga for health. Delhi: Khel Sahitya Kendra.
16. Amit Arjun Budhe, (2015) Career aspects and Management in Physical Education, Sports Publication, New Delhi
17. Pinto John and Ramachandra K (2021) Kannada Version, Daihika Shikshanada Parichaya, Louis Publications, Mangalore

B.Sc. (Information Technology)

SEMESTER- II

Vertical – 1
Major

Name of the Course: Programming with C++ using OOP

Sr.No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to:**	This course provides students knowledge and skills to understand and implement the object oriented skills. It will help them to implement OOP solutions to real-world problems.
2	**Vertical :**	Major
3	**Type :**	Theory
4	**Credits :**	2 credits (1 credit = 15 Hours for Theory in a semester, Total 30 hours)
5	**Hours Allotted :**	30 Hr
6	**Marks Allotted:**	50
7	**Course Objectives(CO):** **CO1:** Distinguish between Object-Oriented Programming and Procedural Programming approaches. **CO2:** Apply the core principles of OOP to write code that is modular, maintainable, and reusable. **CO3:** Grasp essential OOP concepts such as polymorphism, virtual functions, inheritance, and handling exceptions. **CO4:** Gain knowledge of file management and input/output operations using C++. **CO5:** Develop and implement classes and objects effectively to model real-world problems. **CO6:** Utilize debugging and testing techniques to ensure correctness and robustness of C++ programs.	
8	**Course Outcomes (OC):** **CO1:** Understand and articulate the core principles of Object-Oriented Programming and their role in software engineering. **CO2:** Design and construct classes and objects to effectively represent real-world scenarios in software applications. **CO3:** Utilize advanced OOP features such as polymorphism, virtual functions, inheritance, and exception handling in programming. **CO4:** Implement concepts like operator overloading, dynamic polymorphism, and generic programming to write flexible and reusable code. **CO5:** Apply file input/output operations to manage data persistence within applications.	
9	**Modules:-** **Module 1:**	
	Introduction to OOP: Objects, Classes, Data Abstraction and Data Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing. **Classes and Objects**: Simple classes (Class specification, class members accessing), Defining member functions, passing object as an argument, Returning object from functions, friend classes, friend function. **Constructors and Destructors**: Introduction, Default Constructor, Parameterized Constructor and examples, Destructors. **Inheritance**: Introduction, Advantages provided by inheritance, choosing the access specifier, Derived class declaration, derived	15 Hrs

<table>
<tr><td></td><td colspan="2">class constructors, class hierarchies, multiple inheritance, multilevel inheritance, hybrid inheritance.</td><td></td></tr>
<tr><td></td><td colspan="3">Module 2:</td></tr>
<tr><td></td><td colspan="2">Polymorphism: Types, Concept of function overloading, overloaded operators, overloading unary and binary operators.

Virtual Functions: Introduction and need, Pure Virtual Functions, this Pointer, abstract classes, virtual destructors.

Exception Handling: Introduction, Exception Handling Mechanism, Concept of throw & catch with example.

Working with Files: Introduction, File Operations, Various File Modes, File Pointer and their Manipulation.</td><td>15 Hrs</td></tr>
<tr><td>10</td><td colspan="3">Books and References:
1. Object Oriented Programming in C++ , E Balagurusamy
2. Object-Oriented Programming in C++ , Robert Lafore, Pearson Education.
3. Programming with ANSI C++ , Bhushan Trivedi
4. Oriented Programming with C++, Ravichandran</td></tr>
<tr><td>11</td><td>Internal Continuous Assessment: 40%</td><td colspan="2">Semester End Examination: 60%</td></tr>
<tr><td>12</td><td>Continuous Evaluation through:
Class test : 15 marks
Quizzes/ Presentations/ Assignments: 5 marks
Total: 20 marks</td><td colspan="2">Format of Question Paper: External Examination (30 Marks)– 1 hr duration</td></tr>
<tr><td>13</td><td colspan="3">Format of Question Paper: (Semester End Examination : 30 Marks. Duration:1 hour)
Q1: Attempt any two (three of five) from Module 1 (15 marks)
Q2: Attempt any two (three of five) from Module 2 (15 marks)</td></tr>
</table>

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Web Technology

Sr.No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to:**	The objective of the Web Technology course is to provide instructions on creating and maintaining a web page for publishing on the Internet. Students will be able to use HTML editor to author pages that include text and graphics.
2	**Vertical :**	Major
3	**Type :**	Theory
4	**Credits :**	2 credits (1 credit = 15 Hours for Theory in a semester, Total 30 hours)
5	**Hours Allotted :**	30 Hr
6	**Marks Allotted:**	50
7	**Course Objectives(CO):** **CO 1.** To understand the fundamentals of Internet, and the principles of web design **CO 2.** To develop basic websites using HTML and Style Sheets. **CO 3.** To understand different style sheets used in web designing. **CO 4.** To implement JavaScript as a tool to add dynamism to static HTML pages.	
8	**Course Outcomes (OC):** **OC 1.** Learners will be able to use the HTML programming language **OC 2.** Learners will be able to execute web pages designed using HTML **OC 3.** Describe the concepts of World Wide Web, and the requirements of effective web design **OC 4.** List various tags in html and use these to create web page **OC 5 :** Gain necessary skills for designing and developing web applications	
9	**Modules:-** **Module 1:**	
	Introduction to HTML 5: Definition of HTML, HTML Tags,Element, HTML Document Structure, Formatting Text by Using Tags: Headings ,Bold and Italic, Superscript, Subscript, Monospace and Preformatted Text Formatting, Using Lists: Creating Bulleted and Numbered Lists,Definition Lists, Inserting Special Characters, Inserting Horizontal Lines, Choosing Background and Foreground Colors. Creating Hyperlinks and Anchors- Hyperlinking to a Web Page, Creating Hyperlinking to an E-Mail Address, Hyperlinking to Other Content.**Style Sheets and Graphics:** Definition, type, Style Rules, Creating Styles for Nested Tags, Applying Styles to Hyperlinks, Creating and Linking to External Style Sheets. **Formatting Text by Using Style Sheets:** Font Family, Font Size and Color, Applying Bold ,Italics, Strikethrough and Underlining, Inline Spans, Spacing	**15 Hrs**

	Between Letters. Formatting Paragraphs by Using Style Sheets: Indenting Paragraphs, Applying a Border to a Paragraph, Specifying the Horizontal Alignment of a Paragraph. Displaying Graphics Selecting a Graphics Format, Preparing Graphics for Web Use, Inserting Graphics, Arranging Elements on the Page, Controlling Image Size and Padding, Hyperlinking from Graphics, Using Thumbnail Graphics, Including Alternate Text for Graphics, Adding Figure Captions **2.Page Layout and Navigation**- Creating Navigational Aids , Creating a Text-Based and Graphical Navigation Bar, Creating an Image Map, Creating Tables, Specifying the Size of a Table, Specifying the Width of a Column, Merging Table Cells. Formatting Tables-Applying Table Borders, Applying Borders by Using Attributes, Applying Borders by Using Styles, Changing Cell Padding, Spacing, and Alignment. Setting Horizontal and Vertical Alignment **Creating User Forms-** Creating a Text Box, Text Area, Submit or Clear Button, Check Boxes and Option Buttons, Embedding Video Clips- Introducing the Tag, The Tag: Your Fallback Plan, Placing a Video Clip on a Web Page. Incorporating Audio on a Web Page- Playing Audio with the Tag, Placing an Audio Clip on a Web Page.	
	Module 2:	
	JavaScript: What is JavaScript?: Variable, statements, Operators, Comments, constructs, Functions, expressions, JavaScript console, Scope, Events, Strings, String Methods, Numbers, Number Methods, Dates, Date Formats, Date,Methods,Arrays, Array Methods, Booleans, Comparisons, Control Structures: Conditions, Switch, Loop For, Loop While, Break. Operators: Arithmetic Operators, Assignment Operators, Comparison Operators, Logical Operators, Bitwise Operators Statements: Conditional Statements – if else, switch, Loops – while, do while, for, for in, for of, Loop Control – break, continue, labels JavaScript Objects: User-defined Objects, with Keyword, Native Objects – Array, String, Date, Math, Number, RegExp, Cookies Events and Event Handlers: HTML Events, DOM Events, DOM Event Listener,onAbort, onBlur, onChange, onClick, onDblClick, onError, onFocus, onKeyDown,onKeyPress, onKeyUp, onLoad, onMouseDown, onMouseMove, onMouseOut,onMouseOver, onMouseUp, onReset, onResize, onSelect, onSubmit, onUnload Basics of JQuery, JQuery selection and events, JQuery Effects, JQuery traversal and manipulation, Data attributes and templates, jQuery Plugins. **JSON**: Introduction, JSON Grammar, JSON Values, JSON Tokens, Syntax, JSON vs. XML, Data Types, Objects, Arrays, Creating JSON, JSON Object, Parsing JSON, Persisting JSON, Data Interchange, JSON HTML, JSONP **Introduction to Laraval (the PHP Framework)** Introduction to Angular(single-page web application framework)	**15 Hrs**

<table>
<tr><td>10</td><td colspan="2">Books and References:
1. Step by Step HTML5 by Faithe Wempen, Microsoft Press,2011
2. The Complete Reference HTML & CSS, Thomas A. Powell. McGrawHill, 5 th Edition,2010
3. The Complete Reference JavaScript Thomas A. Powell &Fritz Schneider McGrawHill 3rd 2012
4. Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, XML and AJAX, Black Book Kindle Edition,by Kogent Learning Solutions Inc 5. HTML
5 Black Book, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and jQuery, 2ed Kindle Edition,by DT Editorial Services 6. JSON at work ,Tom MArrs,O'REILLY,First edition,2017
6. Learning Web Design A Beginner’s Guide to Html, CSS, JavaScript, And Web Graphics, Jennifer Niederst Robbins, O’Reilly, 5th Edition,2018.
7.Ivan Bayross, “Web Enabled Commercial Applications Development using HTML, DHTML, Javascript, Perl CGI”, BPB, 2004
8. HTML 5 for Web Designers (By: Jeremy Keith) – http:// freepdf-books.com
9. Introduction to JavaScript Object Notation: A To-the-Point Guide to JSON kindle Edition by Lindsay Bassett, O'REILLY
10 Web Resources: https://www.w3schools.in/laravel, https://angular.io/tutorial</td></tr>
<tr><td>11</td><td>Internal Continuous Assessment: 40%</td><td>Semester End Examination: 60%</td></tr>
<tr><td>12</td><td>Continuous Evaluation through:
Class test : 15 marks
Quizzes/ Presentations/ Assignments: 5 marks
Total: 20 marks</td><td>Format of Question Paper: External Examination (30 Marks)– 1 hr duration</td></tr>
<tr><td>13</td><td colspan="2">Format of Question Paper: (Semester End Examination : 30 Marks. Duration:1 hour)
Q1: Attempt any two (three of five) from Module 1 (15 marks)
Q2: Attempt any two (three of five) from Module 2 (15 marks)</td></tr>
</table>

Name of the Course:
C++ Programming + Web Technologies Practical

Sr.No.	Heading	Particulars
1	**Description the course : Including but Not limited to:**	**C++ Programming Practical** This course provides hands-on programming experience in Object-Oriented Programming using C++. Students will develop structured, reusable, and maintainable software through real-world problems focusing on C++ features like classes, inheritance, polymorphism, file handling, templates, and exception handling. Emphasis is placed on writing clean, modular code following object-oriented design principles. **Web Technologies Practical** Web Designing Practical Applying basic programming principles to the construction of websites
2	**Vertical :**	Major
3	**Type :**	Practical
4	**Credits :**	2 credits (60 hours practical work in a semester)
5	**Hours Allotted :**	30 Hours (C++ Programming Practical)+ 30 Hours (Web Technologies Practical)
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO1:** Understand the core concepts and unique features of the C++ programming language. **CO2**: Apply object-oriented programming techniques to solve practical problems. **CO3**: Develop well-structured C++ applications using features like classes, inheritance, templates, and exceptions. **CO4**: Demonstrate competency in compiling, debugging, and testing C++ programs. **CO5**: To understand how to effectively implement HTML. **CO6**: To develop the concept of basic and advanced text formatting. **CO7**: To understand Hyper linking, Designing of webpage.	
8	**Course Outcomes (OC):** **OC1**: Understand and use object-oriented principles such as encapsulation, inheritance, and polymorphism. **OC2**: Design and implement C++ programs using constructors, destructors, friend functions, and operator overloading. **OC3**: Utilize C++ features like dynamic memory allocation, templates, and exception handling. **OC4**: Apply stream and file I/O operations effectively in C++. **OC5**: Design modular and reusable software using advanced C++ features.. **OC6:** Design static web pages using Hyper Text Markup Language (HTML). **OC7:** Use their learned skills, knowledge and abilities to develop web sites **OC8:** Collect information from the user with HTML Forms. **OC9:** Enhance the look of web pages by implementing audio and video	

9	**Modules:-** **Module 1:**	
	Practical 1:- a. Write a C++ program to find the volume of a cube, cone, and rectangle. b. Write a C++ program to convert seconds into hours, minutes, and seconds. c. Write a C++ program to find the greatest of three numbers **Practical 2:-** a. Write a C++ program to generate all the prime numbers between 1 and n. b. Write a C++ program to find the sum of even and odd n natural numbers. c. Write a C++ program using classes and objects to print student details **Practical 3:-** a. Write a C++ program to demonstrate object counting using a static member function. b. Write a C++ program to find the maximum of two values using a friend function. c. Write a C++ program that allocates memory dynamically using a constructor. **Practical 4 :-** a. Write a C++ program to represent complex numbers and perform operations using operator overloading. b. Write a C++ program to overload new and delete operators. c. Write a C++ program to access class members using a pointer to object members. **Practical 5 :-** a.Write a C++ program to demonstrate single inheritance. b. Write a C++ program to demonstrate multiple inheritance. c. Write a C++ program to demonstrate multilevel inheritance. **Practical 6 :-** a. Write a C++ program to demonstrate hierarchical inheritance. b. Write a C++ program to show constructor calling order in multiple inheritance. c. Write a C++ program to calculate a student's final result using multilevel inheritance combining academic and sports scores. **Practical 7 :-** a.Write a C++ program to illustrate the use of virtual functions. b Write a C++ program to use this pointer to find the eldest person from a group. c. Write a C++ program to create a digital library system using runtime polymorphism. **Practical 8 :-** a. Write a C++ program to convert string to integer and vice versa. b. Write a C++ program demonstrating formatting using self, unself, and precision.	**30 Hrs**

	c. Write a C++ program to perform string I/O operations with file storage. **Practical 9 :-** a. Write a C++ program to perform binary read/write operations on a file using objects. b. Write a C++ program to implement exception handling with multiple catch blocks. c. Write a C++ program to implement exception handling with rethrowing in Exception. **Practical 10 :-** a. Write a C++ program to create a simple calculator using class templates. b. Write a C++ program to get the maximum of two numbers using class templates.	
	Module 2:	
	Practical 1:- Design a webpage that makes use of Document Structure Tags ,Various Text Formatting Tags ,List Tags ,Image and Image Maps **Practical 2:-** Design a webpage that makes use of Table tags ,Form Tags (forms with various form elements), Navigation across multiple pages, Embedded Multimedia elements **Practical 3:-** Design a webpage that make use of Cascading Style Sheets with CSS properties to change the background of a Page, CSS properties to change Fonts and Text Styles, CSS properties for positioning an element **Practical 4 :-** Write JavaScript code for Performing various mathematical operations such as calculating factorial / finding Fibonacci Series / Displaying Prime Numbers in a given range / Evaluating Expressions / Calculating reverse of a number , Validating the various Form Elements **Practical 5 :-** Write JavaScript code for Demonstrating different JavaScript Objects such as String, RegExp, Math, Date. Demonstrating different JavaScript Objects such as Window, Navigator, History, Location, Document, Storing and Retrieving Cookies. **Practical 6 :-** Write JavaScript code for Validating User fields , Write a JavaScript program to create a calculator, Write a JavaScript program that prompts the user to enter a student's name and age, then checks whether the student is eligible to vote or not . **Practical 7 :-** JQuery: Use JQuery effect in page, Write a JQuery code to find the data passed with the on() method for each element, Use JQuery Events **Practical 8 :-** JSON basics and working with JSON, Demonstrate us of JSON objects in array, print array on web page using document object, Read a data from JSON file and convert it into JavaScript object and display the data in web page using document object. **Practical 9 :-** Angular JS: Create a simple HTML “Hello World” Project using AngularJS**,** Write a program to perform validation	**30 Hrs**

	of a form using AngularJS. **Practical 10 :-** Laravel: Create a route in Laravel that returns "Hello, World", Define a route that accepts a parameter (e.g., /user/{id}) and passes it to a controller, Create a form that submits data to a controller and saves it in the database.	
10	**Books :** 1.Step by Step HTML5, Faithe Wempen, Microsoft Press,2011 2.The Complete Reference HTML & CSS, Thomas A. Powell. McGraw Hill, 5th Edition,2010 **Reference Books:** 1.MASTERING C, K. R. Venugopal and Sudeep R. Prasad, Tata McGraw-Hill Publications. 2. "A Computer Science –Structure Programming Approaches using C",Behrouz Forouzan, Cengage Learning. 3. Schaum outlines "Programming with C", Byron S. Gottfried, Tata McGraw-Hill Publications. 4."Basics of Computer Science", Behrouz Forouzan , Cengage Learning. "ProgrammingTechniques through C", M. G. Venkateshmurthy, Pearson Publication. 5."Programming in ANSI C", E. Balaguruswamy, Tata McGraw-Hill Education. 6. Learning Web Design A Beginner's Guide to Html, CSS, JavaScript, And Web Graphics, Jennifer Niederst Robbins, O'Reilly, 5th Edition,2018. 7. Web Enabled Commercial Applications Development using HTML, DHTML, Javascript, Perl CGI", Ivan Bayross, BPB, 2004 8.HTML 5 for Web Designers (By: Jeremy Keith) – http:// freepdf-books.com	
11	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
12	**Continuous Evaluation through:** Students are expected to attend each practical and submit the written practical of the previous session. Performing Practical and writeup submission will be continuous internal evaluation. 2.5 marks can be awarded for each practical performance and writeup submission totalling to 50 marks and can be converted to 20 marks.	**30 marks practical exam of 2 hours duration**
13	**Format of Question Paper: Duration 2 hours. Certified copy of Journal is compulsory to appear for the practical examination** **Practical Slip:** **Q1. From Module 1 13 marks** **Q2. From Module 2 12marks** **Q3. Journal and Viva 05 marks**	

Vertical – 2
Minor

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Descriptive Statistics

Sr.No.	Heading	Particulars
1	**Description the course:**	• **Introduction:** Descriptive Statistics simplifies complex data, revealing patterns through measures like central tendency and data visualizat io n, forming the foundation for data understanding. • **Relevance and Usefulness:** Descriptive Statistics is essential in today's data-driven world, turning raw data into clear insights. Used across fields like business and healthcare, it helps professionals make infor med decisions through measures like mean, median, and visualizations. • **Applications:** Widely applicable, Descriptive Statistics is employed in finance, healthcare, sociology, and beyond, making it an essential skill for professionals in data analysis. • **Interest and Connection with Other Courses:** Descriptive Statistics unravels complex data visually, appealing to both analytical and creative minds. It lays the groundwork for advanced studies like inferential statistics and machine learning. • **Demand in the Industry:** With industries becoming more data-driven, the demand for professionals skilled in Descriptive Statistics is rising—particularly in roles such as data analysts, business analysts, and statistica l consultants. • **Job Prospects:** Professionals proficient in Descriptive Statistics are highly sought after, contributing significantly to organizational success through data-driven decision-making.
2	**Vertical :**	Minor
3	**Type :**	Theory
4	**Credits :**	2 credits (1 credit = 15 Hours for Theory)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1:** To understand different types of Data, and to analyze and present the data. **CO 2** : To compute various Measures of Central Tendencies. **CO 3** : To compute various Measures of Dispersion. **CO 4** : To understand the concept of Skewness and Kurtosis. **CO 5**: To compute Correlation Coefficient for bivariate data and further apply the regression analysis .	

8	**Course Outcomes (OC):** **CO 1.** Able to organize, manage and present the data. **CO 2.** To understand the use Measures of Central Tendencies and Dispersion. **CO 3.** Able to understand and compute the consistent and inconsistent data **CO 4.** Able to identify the association between variables **CO 5.** Able to understand forecasting techniques and to find cause and effect relationship between variable through regression analysis.
9	**Modules:-** **Module 1: (15 Hrs)**
	1. Introduction of Statistics: Meaning of Statistics, Importance of Statistics, Different types of Scales: Nominal, Ordinal, Interval and ratio. Univariate frequency distribution of discrete and continuous variables and Cumulative frequency distribution. Data Presentation: Frequency Distribution, Frequency Curve, Frequency Polygon Histogram and Ogives Curves. **2. Measures of Central Tendencies**: Concept of Central Tendency: Mean, Median, Mode, characteristics of good measures of Central Tendency, Partition values: Quartiles, Deciles and Percentiles -examples of ungrouped and grouped data **3. Measures of Dispersion:** Concept of Dispersion, measures of Dispersion: Range, Quartile Deviation, Mean Absolute Deviation, Standard Deviation, Combined Standard Deviatio n- examples of ungrouped and grouped data, Variance. **4. Moments:** Raw and Central Moments, relation between Raw and Central moments, concept of Coefficient of Skewness and Kurtosis.
	Module 2: (15 Hrs)
	1. Correlation: Concept of Correlation, its properties, Scatter Diagram, Karl Pearson's Coefficient of Correlation and Spearman's Rank Correlation, and Spearman' s Rank Correlation (with and without ties) **2. Concept of multiple correlation:** example for three variables **3. Regression:** Linear regression: Coefficients of regression, Concept of Linear Regression, Principle of Least Square, Fitting a straight line by method of least square. Non-linear regression: Fitting a quadratic polynomial, exponential function and multiple regression by method of least square. **4. Relation between Correlation and Regression**
10	**Text Books** **1.** Sarma, K. V. S. (2001). Statistics Made it Simple: Do it yourself on PC. Prentce Hall of India, NewDelhi. **2.** Agarwal, B. L. (2003). Programmed Statistics, Second Edition, New Age International Publishers, NewDelhi. **3.** Purohit, S. G., Gore S. D., Deshmukh S. R. (2008). Statistics Using R, Narosa Publishing House, NewDelhi. **4.** Schaum‟s Outline Of Theory And Problems Of Beginning Statistics, Larry J. Stephens,

<table>
<tr><td></td><td colspan="2">Schaum‟s Outline Series Mcgraw-Hill
5. Gupta, S.C. and Kapoor, V.K. (1987): Fundamentals of Mathematical Statistics, S. Chand and Sons, New Delhi</td></tr>
<tr><td>11</td><td colspan="2">Reference Books
1. Goon AM, Gupta MK, Das Gupta B: Fundamentals of Statistics, Vol-I, the World Press Pt. Ltd, Kolkata
2. Shah R.J: Descriptive Statistics: Seth Publication, Eight Edition
3. Spiegel M.R: Theory and Problems of Statistics, Schaum’s Publishing Series, Tata McGraw-Hill, First Edition
4. Basic Statistics: Agarwal B.L: New Age International Ltd</td></tr>
<tr><td>12</td><td>Internal Continuous Assessment: 40%</td><td>Semester End Examination: 60%</td></tr>
<tr><td>13</td><td>Continuous Evaluation through:
Class test of 15 marks
Quizzes/ Presentations/ Assignments: 5 marks
Total: 20 marks</td><td>Format of Question Paper: External Examination (30 Marks)– 1 hr duration</td></tr>
<tr><td>14</td><td colspan="2">Format of Question Paper: (Semester End Examination: 30 Marks. Duration:1 hour) Questions
<table>
<tr><th></th><th>Marks</th><th>Based On</th><th>Options</th></tr>
<tr><td>Q.1</td><td>Module 1</td><td>Any 2 out of 4</td><td>10</td></tr>
<tr><td>Q.2</td><td>Module 2</td><td>Any 2 out of 4</td><td>10</td></tr>
<tr><td>Q.3</td><td>Module 1 & 2</td><td>Any 2 out of 4</td><td>10</td></tr>
</table></td></tr>
</table>

Vertical – 3

Open Elective

(OE)

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course:Introduction to stock market

Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Continuous Assessment (CA)(Marks - 20)**	**Semester End Examinations (SEE) (Marks- 30 in Question Paper)**
2	**-**	**-**	**2**	**20**	**30**

Learning Objectives:

CO1 Understand the concept and function of stock markets.
CO2 Identify the key participants and their roles in the stock market.
CO3 Familiarize with Indian stock exchanges (NSE & BSE).
CO4 Recognize common stock market terms such as shares, IPO, and dividends.
CO5 Compare features of stocks, bonds, mutual funds, ETFs, and SIPs.
CO6 Understand the concept of risk vs return.

Course Outcomes:

OC1 Explain the basic structure of stock markets, key participants, and commonly used investment terms.
OC2 Differentiate between various investment options and evaluate them based on risk and return, with basic understanding of portfolio diversification.

Outline of Syllabus:

Module	Description	No of Hours
1	Introduction to Stock Markets	15
2	Investment Instruments	15
Total		**30**

Module	Content	No. of Hours/Credits
I	**Module 1: Introduction to Stock Markets** What is a stock market? Types of markets: Primary vs Secondary Key participants: Investors, Brokers, SEBI Indian stock exchanges: NSE, BSE Basic terms: stock, share, equity, IPO, index, dividend	**15**
II	**Module 2: Investment Instruments** Types of investment options: Stocks, Bonds, Mutual Funds, ETFs, SIPs Risk vs Return: Low-risk vs High-risk options Diversification and Portfolio basics	**15**

Reference Books:

- "Investment Analysis and Portfolio Management" – Prasanna Chandra
- Security Analysis and Portfolio Management" – Punithavathy Pandian
- Financial Markets and Institutions" – L.M. Bhole & Jitendra Mahakud
- Investment Management" – V.K. Bhalla

Internal Assessment (20 Marks)

Sr. No	Particular	Marks
1.	Class Test	15
2.	Class Participation	05
	Total	**20**

External Assessment (30 Marks)

Attempt any 2 out of 3 questions.

Questions	Type & Module	Marks
Q1.	Objective Question A) Multiple Questions B) True and False	 08 Marks 07 Marks
Q2.	Theory Question	15 Marks
Q3.	Theory Question	15 Marks
	Total	**30**

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Introduction to stock market

Sr. No.	Heading	Particulars
1	**Description of the course :**	The course aims to familiarize students with the basic concepts in social research. Students will explore both quantitative and qualitative research and learn various steps in the research process and conceptualization of research ideas. The course will equip students with necessary skills to engage in research in future.
2	**Vertical :**	**Open Elective**
3	**Type :**	**Theory**
4	**Credit**:	**2 credits**
5	**Hours Allotted :**	**30 Hours**
6	**Marks Allotted**:	**50 Marks**
7	**Course Objectives**: 1. Introduce basic concepts in research methodology in the social sciences. 2. Address issues related to selecting a research problem. 3. Discuss techniques and tools essential for completing a research project.	
8	**Course Outcomes:** After completion of the course, learners would be able to: 1. Understand and comprehend the basics in research methodology. 2. Apply research methodology concepts to research and project work. 3. Select an appropriate research design based on the research problem.	

9	**Modules**:-
	Module 1: Introduction to Research
	1. Definition and purpose of research 2. Qualitative research 3. Quantitative research 4. The research process: from idea to publication
	Module 2: Research Design

	1. Experimental research designs 2. Exploratory research designs 3. Preparing research proposals: Selection of the topic, Review of literature, Identifying Objectives of the Study, preparing Research Questions 4. Formulation of Hypothesis
10	**References:** 1. Booth, W. C. Colomb, G. G. and Williams, J. M. (2016). *The Craft of Research.* 4th edition, University of Chicago Press. 2. Bryman, Alan. (2018). *Social Research Methods*, London: OUP. Creswell, J.W.(2014). *Research Methods: A Practical Guide*. 9th Edition, Pearson 3. Creswell, J.W.(2014). *Research Methods: A Practical Guide*. 9th Edition, Pearson. 4. Creswell, J.W. and Creswell, D. J. (2017). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* , 5th edition, SAGE Publications. 5. Creswell, J.W. and Creswell, D. J. (2017). *Research Design*, New Delhi: SAGE Publications. 6. Ghosh, B.N. (1984). *Scientific Method and Social Research*, New Delhi: Sterling. 7. Goode, W. J. and Hatt, P. K. (1952). *Methods in Social Research*, New York: Mc Graw-Hill Book Co. 8. Gupta, S. P. (2012). *Statistical Methods*, New Delhi: Sultan Chand & Sons. 9. Kothari, C.R. (2004). *Research Methodology: Methods and Techniques*. New Delhi: New Age International. 10. McNaab, D. (2010). *Research Methods for political Science*, New York. Routledge. 11. King, G. & et al. (1994). *Designing Social Inquiry; Scientific Interference in Social Research*, Princeton: Princeton University Press. 12. Mycoff, J. D. (2019). *Working with Political Science Research Methods*, London: Sage Publications. 13. Pierce, R. (2008). *Research methods In Politics: A Practical Guide*, New Delhi: Sage Publications. 14.O'Leary, Z. (2010). *The Essential Guide to Doing Your Research Project*, New Delhi: Sage Publications. 15. Sharma, Prasad and Satyanarayan, P. (1983). (Ed). *Research Methods in Social Sciences*, New Delhi. Sterling.
11	**Internal Evaluation** : 20 Marks 1-Classroom Presentations/ Assignments - 10 Marks 2-Essay Submission/ Book review/ 10 Marks Field Visit Report / Educational Activity Report
12	**Format of Question Paper:** for the final examination Time: 1hour Marks: 30 **Note**Q.1. Essay Type Questions (Based on Unit I).Marks 15 Q.2. Essay Type Questions (Based on Unit II).Marks 15 Q.3. Short Notes/Problem(Attempt any two out of four Based on all Units).Marks 15

Vertical – 4

Skill Enhancement Course

(SEC)

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Microprocessor and Microcontroller Practical

Sr.No.	Heading	Particulars
1	**Description the course : Including but Not limited to:**	This course teaches how to write low-level software for the 8085 microprocessor, covering its architecture, instruction set, and program development. It is vital for students in computer science and engineering, especially those interested in embedded systems and microprocessor programming. The course builds foundational skills for careers in firmware development, embedded software, and hardware control. It connects with key subjects like Computer Architecture, Operating Systems, and Embedded Systems Design. Industry demand is strong across sectors like automotive, aerospace, and healthcare, offering roles such as embedded engineer, firmware developer, and more.
2	**Vertical :**	Skill Enhancement Course(SEC)
3	**Type :**	Practical
4	**Credits :**	2 credits
5	**Hours Allotted :**	60 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1**. To gain a thorough understanding of the 8085 microprocessor architecture and its associated instruction set. **CO 2.** To develop the ability to write and debug assembly language programs for the 8085 microprocessor. **CO 3**. To learn the principles of computer organization and how they relate to the 8085 microprocessor. **CO 4.** To become proficient in the use of 8085 assembly language programming tools, simulators, and debuggers. **CO 5**. To learn how to interface different input/output devices with the 8085 microprocessor. **CO 6.** To understand the concept of interrupts and how they are used in 8085 assembly language programming.	
8	**Course Outcomes (OC):** **OC 1.** Explain the architecture of the 8085 microprocessor and its associated instruction set. **OC 2.** Identify the different types of registers and their functions in the microprocessor. **OC 3.** Describe the memory organization and addressing modes of the 8085 microprocessor. **OC 4.** Write assembly language programs for the 8085 microprocessor using various instructions and addressing modes. **OC 5.** Debug and troubleshoot assembly language programs for the 8085 microprocessor using simulators and debuggers. **OC 6.** Implement conditional branching and looping constructs in assembly language programs. **OC 7.** Use 8085 assembly language programming tools, such as editors, assemblers, and emulators for developing and testing programs. **OC 8.** Simulate microprocessor operations using emulators and debuggers.	

	OC 9. Connect input/output devices, such as LEDs, switches, and displays, to the 8085 microprocessor.	
9	**Modules:-** **Module 1:**	
	Practical 1:- Perform the following Operations related to memory locations. • Addition and Subtraction of a two 8 bit number stored in D001H and D002H and Store result in D003H. • Exchange the contents of memory locations D050H and D051H. **Practical 2:-** Simple assembly language programs. b. Find the 1's & 2's complement of the number stored at memory location 4400H and store the complemented number at memory location 4300H. c. Find the absolute difference of two 8-bit numbers. **Practical 3:-** Unpacking operations. a. Two digit BCD number is stored in memory location 4200H. Unpack the BCD number and store the two digits in memory locations 4300H and 4301H such that memory location 4300H will have lower BCD digit. **Practical 4 :-** Register Operations 1. Write a program to shift an eight bits data four bits right. Assume that data is in register C. 2. Write a program to count number of 1's in the contents of D register and store the count in the B register. **Practical 5 :-** Multiple memory locations. a. Multiply two 8-bit numbers stored in memory locations 2200H and 2201H by repetitive addition and store the result in memory locations 2300H and 2301H. b. Divide 16-bit number stored in memory locations 2200H and 2201H by the 8-bit number stored at memory location 2202H. Store the quotient in memory locations 2300H and 2301H and remainder in memory locations 2302H and 2303H. **Practical 6 :-** 1. Find the number of negative elements (most significant bit 1) in a block of data. The length of the block is in memory location 2200H and the block itself begins in memory location 2201H. Store the number of negative elements in memory location 2300H. 2. Find the largest number in a block of data. The length of the block is in memory location 2200H and the block itself starts from memory location 2201H. Store the maximum number in memory location 2300H. Assume that the numbers in the block are all 8 bit unsigned binary numbers.	**60 Hrs**

<table>
<tr><td></td><td colspan="2">Practical 7 :-
Calculate the sum of series of even numbers as well as odd numbers from the list of numbers. The length of the list is in memory location 2200H and the series itself begins from memory location 2201H. Assume the sum to be 8 bit number so you can ignore carries and store the sum at memory location.
Find the square of the given numbers from memory location 6100H and store the result from memory location 7000H.
Practical 8 :-
Search the given byte in the list of 50 numbers stored in the consecutive memory locations and store the address of memory location in the memory locations 2200H and 2201H. Assume byte is in the C register and starting address of the list is 2000H. If byte is not found store 00 at 2200H and 2201H.
Write an assembly language program to separate even numbers from the given list of 50 numbers and store them in the another list starting from 2300H. Assume starting address of 50 number list is 2200H
Practical 9 :-
b. Write an assembly language program to generate Fibonacci number.
c. Program to calculate the factorial of a number between 0 to 8.
Practical 10 :-
1. Interface 8051 with D/A Converter and generate a square wave and triangular wave of given frequency on oscilloscope.
2. Interface stepper motor with 8051 and write a program to move the motor through given angel in clockwise or counterclockwise direction.</td></tr>
<tr><td>10</td><td colspan="2">Books :
Text Books
a. 8080A/8085 Assembly Language Programming, Lance A. Leventhel, Osborne, 1978
Reference Books:
(1) Microprocessors Architecture, Programming and Applications with the 8085, Fifth Edition, Penram Publications, 2012</td></tr>
<tr><td>11</td><td>Internal Continuous Assessment: 40%</td><td>Semester End Examination: 60%</td></tr>
<tr><td>12</td><td>Continuous Evaluation through:
Students are expected to attend each practical and submit the written practical of the previous session. Performing Practical and write-up submission will be continuous internal evaluation. 2.5 marks can be</td><td>30 marks practical exam of 2 hours duration</td></tr>
</table>

	awarded for each practical performance and write-up submission totaling to 50 marks and can be converted to 20 marks.	
13	**Format of Question Paper: Duration 2 hours. Certified copy of Journal is compulsory to appear for the practical examination Practical Slip:** **Q1. From Module 1 13 marks** **Q2. From Module 2 12marks** **Q3. Journal and Viva 05 marks**	

Vertical – 4

Vocational Skill Course

(VSC)

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Linux Practical

Sr.No.	Heading	Particulars
1	**Description the course : Including but Not limited to:**	This practical course introduces students to fundamental operations and utilities of modern operating systems through hands-on exercises. It emphasizes the installation and configuration of virtual machines and operating systems (Linux and Windows), command-line proficiency for files and process management, and usage of desktop environments and system utilities. The course aims to develop practical skills in navigating Linux and Windows OS, managing files and directories, executing process control commands, and handling system-level tasks. These practicals serve as a foundation for understanding the real-world functioning of operating systems.
2	**Vertical :**	Vocational Skill Course(VSC)
3	**Type :**	Practical
4	**Credits :**	2 credits
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO1**. Install and configure virtual machines and operating systems (Linux and Windows). **CO2**. Execute essential Linux and Windows commands for managing files, directories, and processes. **CO3**. Navigate and utilize Linux and Windows desktop environments and system utilities. **CO4**. Perform system administration tasks including file permissions, process control, and software installation. **CO5**. Understand and apply basic OS tools to gather system information and manage system resources. **CO6**. Develop practical proficiency in operating system utilities and command-line interfaces for effective system management.	
8	**Course Outcomes (OC):** **OC1.** Install virtual machines and operating systems (Linux and Windows) and configure their basic settings. **OC2.** Use Linux commands to efficiently manage files, directories, and system processes. **OC3.** Execute Windows DOS commands to perform file management, system configuration, and process control. **OC4.** Operate and customize Linux and Windows desktop environments using graphical utilities and tools. **OC5.** Install and manage software utilities on Linux and Windows operating systems. **OC6.** Retrieve and interpret system information using command-line and graphical tools on both Linux and Windows platforms.	
9	**Modules:-** **Module 1:**	

	Practical 1:-Installation of virtual machine software. **Practical 2:-**Installation of Linux operating system (RedHat / Ubuntu) on virtual machine. **Practical 1:-**Installation of Windows operating system on virtual machine **Practical 4:-**Linux commands: Working with Directories: a. pwd, cd, ls, mkdir, rmdir, b. file, touch, rm, cp. mv, rename, head, tail, chmod **Practical 5:-**Linux commands: Working with files: 1. ps, top, kill, pkill, bg, fg, 2. grep, locate, find, locate. 3. date, cal, uptime, w, whoami, finger, uname, man. **Practical 6:-**Windows (DOS) Commands – 1 a. Date, time, prompt, md, cd, rd, path. b. Chkdsk, copy, xcopy, format, fidsk, cls, defrag, del, move. **Practical 7:-**Windows (DOS) Commands – 2 a. doskey, echo, systeminfo, Diskcomp, diskcopy, diskpart,. b. Edit, fc, find, rename, set, type, ver, hostname, tasklist, taskkill, ipconfig /all. **Practical 8:-**Working with Linux Desktop and utilities 1. The vi editor. 2. Graphics 3. Terminal 4. Adjusting display resolution 5. Using the browsers **Practical 9:-**Working with Windows Desktop and utilities 1. Notepad 2. Use File Explorer 3. Paint 4. Taskbar 5. Adjusting display resolution **Practical 10:-**Installing utility software on Linux and Windows	**30 Hrs**
10	**Books :** **Text Books** b. 8080A/8085 Assembly Language Programming, Lance A. Leventhel, Osborne, 1978 **Reference Books:** (2) Microprocessors Architecture, Programming and Applications with the 8085, Fifth Edition, Penram Publications, 2012	
11	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
12	**Continuous Evaluation through:** Students are expected to attend each practical and submit the written practical of the previous session.	**30 marks practical exam of 2 hours duration**

	Performing Practical and write-up submission will be continuous internal evaluation. 2.5 marks can be awarded for each practical performance and write-up submission totaling to 50 marks and can be converted to 20 marks.	
13	**Format of Question Paper: Duration 2 hours. Certified copy of Journal is compulsory to appear for the practical examination Practical Slip:** **Q1. From Module 1 13 marks** **Q2. From Module 2 12marks** **Q3. Journal and Viva 05 marks**	

Vertical – 5

Ability Enhancement Course

(AEC)

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Communication Skills in English II

Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Continuous Assessment (CA)(Marks - 20)**	**Semester End Examinations (SEE) (Marks- 30 in Question Paper)**
2	-	-	2	20	30

Learning Objectives:

CO1 To equip the learners with confidence and proficiency in spoken and written English in and professional and social context

CO2 To enhance confidence in public speaking, interpersonal exchanges and professional interactions

CO3 To enable the learners to adapt to diverse audiences, cultural frameworks and workplace setups

CO4 To equip them with deftness in use of different digital platforms to communicate efficiently in every situation

Course Outcomes:

After completion of the course, learners would be able to:

OC1 Acquire proficiency in English for media-specific platforms and forums

OC2 Speak and write effectively for diverse media platforms

OC3 Enhance critical abilities to present effective social media content

OC4 Understand the roles and functions of English in global media framework

OC5 To attain proficiency in understanding media trends at a global level

Outline of Syllabus:

Module	Description	No of Hours
1	Applied English for Professional Communication	15
2	Digital Communication Skills and Global Level Communication	15
Total		**30**

Module 1 Applied English for Professional Communication	**Professional English Language Development** Vocabulary Building Punctuation and Style Close Reading of Content for Different Genre Phrasal Verbs and Idioms Business English for Letters, Emails, Reports Paraphrasing **Essentials for Effective Communication** The Seven C's of Effective Communication The 4 C's of 21st Century Skills 'You' Attitude and Professional Etiquette Conflict Management **Public Speaking and Presentation Skills** Organizing a speech	15

	Presentation skills with visual aids like PowerPoint Overcoming stage fright Use of visual aids and storytelling	
Module 2: Digital Communication Skills and Global Level Communication	**Digital Communication Skills** Communicating in online platforms Managing digital identity Virtual meetings etiquette (Zoom, Teams) Understanding Video scripts and Podcast Scripts Social Media Marketing **Digital Writing and Content Creation** Writing Blogs, Articles, and Online Features SEO Writing and Keyword Optimization Writing for Social Media Writing Captions, White Paper And Headline **Cross-cultural Communication** Cultural Quotient and Cultural Intelligence Cultural differences in communication styles Global communication etiquette Dining Etiquette in Professional and Social Setup	15

References:

1. Effective Communication Skills" – by M.S. Rao
2. Mass Communication in India (4th Edition): Keval J. Kumar
3. Taylor, Grant. English Conversation Practice. 1967. Tata McGraw-Hill, 2013
4. Labade,Sachin,KatreDeepaetal. *CommunicationSkillsinEnglish*.OrientBlackswan, Pvt Ltd, 2021
5. Sethi, J. Standard English and Indian usage: Vocabulary and grammar. PHI Learning Pvt. Ltd., 2011
6. The Secret of Viral Content Creation- Priyanka Agarwal
7. Mohan,RCSharmaKrishna.Business Correspondence and Report Writing. Third edition. Tata McGraw-Hill Education, 2002
8. Writing Skills For Technical Purposes: Raj Mohan Josh
9. Cross-Cultural Communication: Concepts, Cases and Challenges: Francisca O. Norales
10. Fundamentals of Writing: How to Write Articles, Media Releases, Case Studies, Blog Posts and Social Media Content: Paul Lima

INTERNAL EVALUATION METHODOLOGY (20 MARKS):

10 marks Assignment,

05 marks Viva,

05 marks Class Participation and Attendance

SEMESTER END EXAMINATION: 30 MARKS **Time: 1 hr**

Question Paper Pattern

Each question carries 15 Marks

Question No.	Questions	Marks
Q 1	Writing Skills/ Comprehension	15 marks
Q 2	Practical/ Theory	15 marks

Vertical – 5

Value Education Course

(VEC)

NIRMALA MEMORIAL FOUNDATION COLLEGE OF COMMERCE AND SCIENCE (AUTONOMOUS)

Name of the Course: Environmental Systems and Management-II

Sr. No.	Heading	Particulars
1	Description the course: Including but Not limited to:	This course introduces students to the vital link between the environment and the world of commerce. It offers an essential understanding of how ecological systems interact with economic activities, preparing future professionals to make informed, responsible decisions in business and society. **What They Will Learn:** • Ecosystems and Biodiversity: Understand the balance of natural systems and the economic value of biodiversity in sectors like agriculture, tourism, and healthcare. • Human Impact on the Environment: Analyze how industries, trade, and consumer behavior contribute to environmental challenges such as resource depletion, pollution, and climate change. • Sustainability and Commerce: Explore sustainable business practices and how commerce can play a role in achieving long-term environmental and economic goals. **Why It Matters for First Year Undergraduate Students:** In any specialization, environmental awareness is essential in today's global business environment. This course empowers students to: • Become socially responsible citizens: Make ethical decisions that consider environmental impact and sustainability. • Understand environmental challenges in business contexts: Gain insight into how issues like climate change, waste management, and pollution affect business operations, supply chains, and policy. • Explore emerging green career paths: Discover opportunities in environmental consulting, sustainable business strategy, and green entrepreneurship.
2	Vertical:	Open Elective
3	Type:	Theory
4	Credit:	2 Credits / (1 Credit = 15 Hours for Theory or 30 Hours of Practical Work in a Semester
5	Hours Allotted:	30 Hours
6	Marks Allotted:	50 Marks
7	**Course Objectives:** 1. To provide knowledge on types of disasters and their impact on human life and the economy. 2. To equip students with the principles of disaster management and waste management strategies. 3. To promote understanding of sustainable development models and eco-friendly innovations.	

	4. To introduce key environmental movements, ethics, and legal frameworks relevant to environmental conservation.
8	**Course Outcomes:** 1. Students will describe different types of disasters and outline the phases of disaster management. 2. Students will apply concepts of waste reduction, reuse, and recycling in real-life scenarios. 3. Students will evaluate sustainable development initiatives and propose eco-friendly business strategies. 4. Students will critically assess environmental movements, laws, and policies, and their role in conservation and management.
9	**MODULES: -**
	Unit I: Dealing with Environmental Concerns
	• Concept and Classification of Disaster (Natural, Man-made and Hybrid Disaster). General effects of Disaster on Human Life- Physical, Psychological, Economic and Social • Disaster Management: Meaning and Phases of Disaster Management (Prevention, Mitigation, Preparedness, Response, and Recovery) • Waste Management: Meaning and Types of Waste (biodegradable, non-biodegradable, hazardous, e-waste, etc). • Waste Management- Reduce, Reuse, and Recycle Strategies in Daily Life
	Unit II: Sustainable Development and Environmental Conservation
	• Introduction to Sustainable Development: Meaning and Importance. Case Studies • Environmental Movements and Ethics: Chipko, Silent Valley, Bishnoi of Rajasthan. Role of Religion and Culture in Environmental Conservation. • Innovative Models: Eco Tourism, Green Marketing, Organic Farming, and Eco-Friendly Packaging • Environmental Legislation and Policies: Major environmental laws and policies at national and international levels, and their effectiveness in environmental conservation
10	**Text Books** 1. Ahluwalia, V. K. (2015). Environmental Pollution, and Health. The Energy and Resources Institute (TERI). 2. Central Pollution Control Board Web page for various pollution standards. https://cpcb.nic.in/standards/ 3. Masters, G. M., & Ela, W. P. (2008). Introduction to environmental engineering and science (No. 60457). Englewood Cliffs, NJ: Prentice Hall. 4. Jørgensen, Sven Marques, Erik João Carlos and Nielsen, Søren Nors (2016) Integrated Environmental Management, A transdisciplinary Approach. CRC Press. 5. Barrow, C. J. (1999). Environmental management: Principles and practice. Routledge. 6. Theodore, M. K. and Theodore, Louis (2021) Introduction to Environmental Management, 2nd Edition. CRC Press. 7. Richard A. Marcantonio, Marc Lame (2022). Environmental Management: Concepts and Practical Skills. Cambridge University Press. 8. UNEP (2007) Multilateral Environmental Agreement Negotiator's Handbook, University of Joensuu, ISBN 978-952-458-992-5

<table>
<tr><td></td><td colspan="3">9. Ministry of Environment, Forest and Climate Change (2019) A Handbook on International Environment Conventions & Programmes. https://moef.gov.in/wp content/uploads/2020/02/convention-V-16-CURVE-web.pdf
10. Ministry of Environment, Forest and Climate Change (2019) A Handbook on International Environment Conventions & Programmes. https://moef.gov.in/wp content/uploads/2020/02/convention-V-16-CURVE-web.pdf
11. India Code – Digital repository of all Central and State Acts: https://www.indiacode.nic.in/
12. University Grants Commission, D.O.No.F. 14-5/2015(CPP-II) dated 2nd August1 2019.</td></tr>
<tr><td>11</td><td colspan="2">Internal Continuous Assessment: 40%</td><td>Semester End Examination: 60%</td></tr>
<tr><td>12</td><td rowspan="2">Continuous Evaluation through:</td><td>Project Work</td><td>15 Marks</td><td rowspan="2">Report Submission based on Suggested Practical Activities by Faculty Members for 30 Marks.</td></tr>
<tr><td>Attendance and Participation in Seminar, Workshop, and Activity, etc.</td><td>05 Marks</td></tr>
<tr><td>13</td><td colspan="3">Suggested Practical Activities:
A field visit to observe and identify different environmental components (e.g., land, water bodies, air, flora, fauna) in a local park or urban green space.
Develop a mini-awareness campaign (e.g., posters, short video, etc.) on a chosen environmental issue for their college or local community.
Report on an endangered species in India and the conservation efforts being undertaken.
Hands-on experiment involving simple water quality testing (e.g., pH, turbidity) of different water samples (e.g., tap water, pond water).
A debate or discussion on the role of individual actions vs. governmental policies in combating climate change.
Beach Cleaning Activity
Tree Plantation (One Student – One Plant)
Environment Conservation Activity</td></tr>
</table>

Vertical – 5

Co-Curricular-Course

CC

Name of the Course: Yoga Certification

1.1 Preamble:

India is growing rapidly as a global super-power. To face the challenges of the century and to keep up with the pace of the world, maintaining health is of prime importance. Giving thrust to healthy society, Physical Education, Sports, Health & fitness and Yoga are of great significance in today's world. The Government of India insists on Physical Fitness, Mental Health and Overall Development of Personality for every citizen. In these lines, the Government has launched Fit India Movement, Khelo India, TOPS and National Sports Day, International Day of Yoga etc. These initiatives have given impetus and awareness among general public, professional and academicians.

However, creating efficient and skilled human resource in the field of Physical Education, Sports and Yoga is identified as the need of the hour. Thus, the Governments of India and Government of Maharashtra have included Physical Education, Sports and Yoga as a key area under the NEP 2020.

1.2 Objectives of the Course:

1. To understand the importance of Physical Education, Sports, & Physical Activity
2. To increase participation of students in various games and sports and fitness activities
3. To develop the physical as well as mental health through physical activity
4. To create interest regarding sports , physical fitness to inculcate healthy habits for lifelong

1.3 Program outcomes:

By the end of the program the students will be able to:

1. The student will participate in various games, sports and physical activities and they will also learn the technical and tactical experience of it.
2. Students will understand the importance and benefits of participation in any fitness activity or sports.
3. Own choice based activities will be the stress buster for the students and this will inculcate healthy habits in the students
4. Students will able to organize, plan activities and will develop administrative qualities through these events
5. Students acquire the knowledge of Physical Education, Sports and Yoga and understand the purpose and its development.
6. The student learns to plan, organize and execute sports events.
7. Student will learn theoretical and practical aspects of game of his choice to apply at various levels for teaching, learning and coaching purposes efficiently.
8. Student acquires the knowledge of opted games, sports and yoga and also learns the technical and tactical experience of it.
9. Student will learn to apply knowledge of Physical fitness and exercise management to lead better quality life.

1.4 Programme Duration: The structure of the Credit Couse in Sports has two semesters in total covering a period of two years i.e. 2 credits in each semester till the fourth semester as per the guidelines of NEP 2020.

1.5 Modes of Internal & External Evaluation: Students will submit a hard copy of the report of total 60 hours spent for semester II in any physical activities/ training sessions/ Sports events/ yoga/ adventure activities/ any sports/ gym or pilates / to the teacher. Students will be evaluated on the basis of activities participated for the semester II.

1.6 Modules at Glance

Module No.	Unit	Content	No. of Practical Hours
1	I	**Importance of Physical Education and Sports**	15
	II	**Participation in any physical activities**	15
2	III	**Volunteering in any sports events or fitness events**	15
	IV	**Participation in University or any other Sports competitions**	15
Total No. of Hours			**60**

Module No.	Unit	Content
1	**I**	**1.1 Importance of Physical Education and Sports & Yoga** · Development of physical health as well as mental health through Physical Activities. · Group Sports & Fitness Activities · Fitness activities conducted by any sports/fitness instructor such as Yoga, Zumba, Aerobics etc.

	II	**1.2 Participation in any Physical activities** · Participation in any sports practice sessions conducted by our college/ any club / any institution · Completion of any Yoga/ Pilates/ Gym course/ any fitness related course · Participation in any other physical activities of the interest of student
2	**III**	**2.1 Volunteering in any sports events or fitness events** · Volunteering done in sports or fitness events organized by the college · Volunteering in any other fitness or sports activities organized by NGO or local clubs
	IV	**2.2 Participation in University or any other Sports competitions** · Participation in University Intercollegiate/ Inter Zonal / West Zone/ All India / National / State tournaments organized by University of Mumbai or State or District Sports Federation · Participation in any other intra college competition organized by college · Participation in any recognized Sports or Fitness competitions

Scheme of Evaluation

The Scheme of Examination shall be of 50 marks. It will be divided into Internal Evaluation (20 marks) and Semester End Examination (30 Marks).

Students will submit a brief report of 60 hours spent for Semester II in any of the physical activities along with geo tagged photo, receipt, sports training session's attendance, course certificates, etc. Report should include the explanation of the following questions. A report can have multiple physical activities done for the completion of 60 hours per semester. For eg. A student can enroll himself/ herself in Yoga/ Gym and any sport simultaneously and can give proof of the attendance for the same in the report. A student must complete 60 hours in any physical activity. Students should also enroll themselves as volunteers for any sports and fitness events held in the college.

1. Why did the student select a physical activity mentioned in the report?
2. What were the benefits and experience after the completion of the 60 hours of physical activity?

3. What were the challenges faced by the student during the activity?
4. Geotagged photos of the activity clicked in the beginning, during and on the last day of the activity.
5. Enrollment receipts, ID card, certificate of the activity.
6. Conclusion remark by the student.

Semester II (50 Marks - 2 Credits)
Internal Evaluation (20 Marks)

Sr. No.	Particulars	Marks
1	Presentation **OR** Project **OR** Assignment **(Students must include the Geo Tagged photos, Enrolment receipt, Certificate etc. in the report)**	10
2	Volunteering in any Sports / Fitness activities conducted by college or local clubs or NGO	10

Semester End Examination (30 Marks)

Question No.	Particulars	Marks
1	VIVA Conducted by teacher/ Sports In charge/ Sports Director regarding participation in Physical / Sports / Fitness activities / Fitness or Yoga Course completed by students **OR** Participation in Sports Competitions Conducted by University at State or National Level (Students who have represented Mumbai University or College at Intercollegiate / Inter Zonal / West Zone Inter University / All Indi Inter University/ International tournament) Students who have represented in the above mentioned competitions should be exempted from VIVA and should be evaluated on the basis of his/ her performance in the above mentioned competitions.	30
Total		30

References –

1. Bucher, C. A. (n.d.) Foundation of physical education. St. Louis: The C.V. Mosby Co. Deshpande, S.H. (2014). Physical Education in Ancient India. Amravati: Degree college of Physical education.

2. Mohan, V. M. (1969). Principles of physical education. Delhi: Metropolitan Book Dep. Nixon, E. E. & Cozen, F.W. (1969). An introduction to physical education. Philadelphia: W.B. Saunders Co.

3. William, J. F. (1964). The principles of physical education. Philadelphia: W.B. Saunders Co.

4. Coalter, F. (2013) Sport for Development: What game are we playing? .Routledge. 5. Singh Hardayal (1991), Science of Sports Training, DVS Publication, New Delhi 6. Muller, J. P.(2000). Health, Exercise and Fitness. Delhi : Sports.

7. Russell, R.P.(1994). Health and Fitness Through Physical Education. USA : Human Kinetics.

8. Uppal, A.K. (1992). Physical Fitness. New Delhi : Friends Publication.

9. Nagendra, H. R. & Nagarathna, R. (2002). Samagra Yoga Chikitse. Bengaluru: Swami Vivekananda Yoga Prakasana.

10. Uppal, A.K.(1992) Physical Fitness. New Delhi: Friend Publication

11. D.M Jyoti, Yoga and Physical Activities (2015) lulu.com3101, Hills borough, NC27609, United States

12. D.M Jyoti, Athletics (2015) lulu.com3101, Hills borough, NC27609, United States