Nirmala Memorial Foundation College of Commerce and Science

(Autonomous)

Re-accredited by NAAC with B++, ISO 9001-2015 Certified, Recognised under section 2(f) & 12(B) of the UGC Act 1956

Permanently Affiliated to the University of Mumbai,

Syllabus

Bachelor of Science in Information Technology

(B.Sc. Information Technology)

(Semester I and II)

(Programme Code: UGIT01)

As Per New Education Policy (NEP) 2020

(To be implemented from the Academic Year 2025-2026)

Approved in the Academic Council Meeting held on **5th July 2025**

INTRODUCTION OF THE PROGRAMME

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.

SEMESTER I
COURSE STRUCTURE

VERTICAL		COURSE CODE	SUBJECT	CREDIT
Vertical 1	Major	NUIT101	Foundation of Programming Skills	2
	Major	NUIT102	Database Management System	2
	Major	NUIT103	Programming Skills + Database Management System Practical	2
Vertical 2	Minor	***		
Vertical 3	OE1	NUIT104	Indian Financial System - I	2
	OE2	NUIT105	Social Media and Communication	2
Vertical 4	VSC	NUIT106	Digital Logic Application Practical	2
	SEC	NUIT107	Quantitative Foundations for Data Analysis	2
Vertical 5	AEC	NUEN101	Communication Skills in English-I	2
	VEC	NUES101	Environmental Systems and Management-I	2
	IKS	NUIK101	Indian Knowledge System	2
Vertical 6	CC	NUCC103	Fitness and Sports - I	2
			Total Credits	**22**

SEMESTER II
COURSE STRUCTURE

VERTICAL		COURSE CODE	SUBJECT	CREDIT
Vertical 1	Major	NUIT201	Programming with C++ using OOP	2
	Major	NUIT202	Web Technologies	2
	Major	NUIT203	C++ Programming + Web Technologies Practical	2
Vertical 2	Minor	NUIT204	Linear Algebraic Structures and Predictive Modelling	2
Vertical 3	OE1	NUIT205	Basics of Stock Market	2
	OE2	NUIT206	Research Principles and Practices	2
Vertical 4	VSC	NUIT207	Linux Practical	2
	SEC	NUIT208	Microprocessor and Microcontroller Practical	2
Vertical 5	AEC	NUEN201	Communication Skills in English- II	2
	VEC	NUES201	Environmental Systems and Management-II	2
Vertical 6	CC	NUCC203	Fitness and Sports - II	2
			Total Credits	**22**

Vertical – I

Semester- I

Mandatory Courses

Name of the Course: Foundation of Programming Skills - NUIT101

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** 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**
5	**Hours Allotted:**	**30 Hours**
6	**Marks Allotted:**	**50 Marks**
7	**Course Objectives:** 1. Gain foundational knowledge of computer programming principles and logic development. 2. Explore and interpret the structure, rules, and syntax of C language programs. 3. Develop the ability to construct programs using conditional statements and iterative constructs. 4. Apply array, structure, union, and pointer concepts to solve real-world Programming problems. 5. Design modular programs using functions and integrate basic error handling Techniques..	
8	**Course Outcomes:** CO1: To develop the ability to design algorithms using flowcharts and pseudocode as a precursor to C programming. CO2: To help students accurately implement the syntax and grasp the meaning of C language elements in coding tasks. CO3: To enable students to apply decision-making and looping techniques in real-world programming scenarios. CO4: To introduce students to the effective use of arrays, structures, unions, and pointers for data handling. CO5: 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 (15 hours):**	
	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)	

	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	
	Module 2 (15 hours):	
	Control Flow: Statements and Blocks, If-Else, Else-If, Switch, Loops- While and For Loops Do-while, Break and Continue, Goto and Labels **Basics of functions**. User defined and Library functions Pointer and Addresses, Pointer and Function Arguments, Pointer and Arrays. **File Input/Output:** File Operations,Opening a File, Reading from a File, Closing the File	
10	**Text Books** 1. M. Mano, Computer System Architecture 3rd edition, Pearson 2. Carl Hamacher et al., Computer Organization and Embedded Systems, 6 ed., McGraw-Hill 2012 3. R P Jain, Modern Digital Electronics, Tata McGraw Hill Education Pvt. Ltd. , 4th Edition, 2010	
11	**Reference Books** 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. .	
12	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
13	**Continuous Evaluation through:** Class test of 15 marks Quizzes/ Presentations/ Assignments: 5 marks Total: 20 marks	**External Examination (30 Marks)– 1 hr duration**
14	**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: Database Management System - NUIT102

Sr. No.	Heading	Particulars
1	**Description the course:**	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**
5	**Hours Allotted:**	**30 Hours**
6	**Marks Allotted:**	**50 Marks**
7	**Course Objectives:** 1. To introduce the fundamental concepts of database systems, including data abstraction, database architecture, and transaction management. 2. To explain the importance of data models and their components in designing effective and scalable databases. 3. To provide a comprehensive understanding of the Entity-Relationship (ER) model, relational schemas, and relational algebra for database design. 4. To develop the ability to design normalized database schemas by understanding functional dependencies and eliminating data redundancy. 5. To enable students to write and optimize SQL queries, including the use of indexing, views, triggers, joins, and other query operations. 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:** **CO1**: Describe the fundamental concepts of database systems including data abstraction, database architecture, and transaction management. **CO2:** Explain the importance and components of data models and their role in designing a database. **CO3**: Apply Entity-Relationship (ER) modeling techniques to design database schemas and represent relationships and constraints. **CO4:** Analyze the relational database model, integrity constraints, and relational algebra operations to ensure data consistency and reliability. **CO5**: Analyze functional dependencies and normalization techniques to eliminate redundancy and improve database design. **CO6:** Construct and execute SQL queries involving DDL, DML, triggers, views, joins, and indexing for efficient data retrieval and manipulation.	
9	**Modules:-** **Module 1 (15 hours):**	
	Introduction to Databases What is database management system, view of data, relational databases, database architecture, and 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.	
	Module 2 (15 hours):	
	Normalization: Basics of functional dependencies and normalization for relational databases, The Problem c 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.	
10	**Text Books** 1. **Database System Concepts** by Avi Silberschatz, Henry F. Korth & S. Sudarshan. 2. **Database Systems: The Complete Book** by Garcia-Molina, Ullman & Widom (2nd ed, 2008).	
11	**Reference Books** 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. "MySQL: The Complete Reference", Vikram Vaswani , McGraw Hill, 2017 5. "Learn SQL with MySQL: Retrieve and Manipulate Data Using SQL Commands with Ease", Ashwin Pajankar, BPB Publications, 2020	
12	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
13	**Continuous Evaluation through:** Class test of 15 marks Quizzes/ Presentations/ Assignments: 5 marks Total: 20 marks	**External Examination (30 Marks)– 1 hr duration**
14	**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:**	**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:** 1. To provide exposure in developing algorithm, flowchart and to write efficient code. 2. To understand loops and decision making in programming. 3. To understand the arrays, structures, union and use of function and pointers. 4. To Identify entities and its relationship with relational model structure. 5. To understand relational database using SQL and constraints implementation using create table queries. 6. To Understand DML operations and backing of database. 7. To understand how to retrieve data from database and learn how to retrieve single value after performing calculations on group of values. 8. To understand built-in functions to perform operations on data. 9. To understand how to fetch data from two or more tables, which is joined to appear as single set of data.	
8	**Course Outcomes:** **CO1**. Students can demonstrate the concepts of datatypes, variables and operators, the use of arrays, strings and structures in C. **CO2.** Students can implement the concept of control statements and looping in a C program. **CO3.** Students can implement modular C programs using functions and pointers. **CO4.** Students can demonstrate the use of arrays, strings and structures in C. **CO5**. Students are able to perform various operations such as insert, update, delete and retrieve data from a database using SQL queries. **CO6**. Students are able to perform alteration in tables and can restore and take backup of the database. **CO7.** Students are able to perform operations using simple SQL Queries to fetch data and learn various aggregate functions to get a single value. **CO8.** Students are able to perform SQL Queries using JOIN keywords for joining two or more tables. **CO9**. Students able to perform nested queries using in, exists operators.	

	CO10. Students are able to create new tables by joining one or more tables and learn how to hide attributes from the end user. **CO11**. Students are able to restrict the user from accessing data in the database. **CO12.** Students should be able to create, manipulate the database management system to evaluate the business information problem.
9	**Modules:-** **Module 1 (30 hours):**
	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 . **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 (30 hours):

	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 **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	**Text Books** 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
11	**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.

12	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
13	**Continuous Evaluation through:** Performance and write-up submission of 20 marks.	**30 marks practical exam of 2 hours duration**
14	**Format of Question Paper: (Semester End Examination: 30 Marks. Duration:2 hour)** **Practical Slip:** Q1. From Module 1 13 marks Q2. From Module 2 12marks Q3. Journal and Viva 05 marks	

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Syllabus

Vertical – III

Open Electives(OE)

Semester I

(To be implemented from the Academic Year 2025-2026)

Approved in the Academic Council Meeting held on ***5th July 2025***

Name of the Course: Indian Financial System – NUIT104

Sr. No.	Heading	Particulars
1	**Description the course:**	This course provides a comprehensive introduction to the Indian financial system, offering foundational knowledge of its structure, components, and functioning. It delves into the role of banks and other financial institutions in economic development and explores various banking services available to individuals and businesses. The course also introduces students to the basics of insurance and personal financial planning, enabling them to make informed financial decisions and develop sound saving and investment strategies. Through real-world examples, case studies, and practical insights, students will gain a deeper understanding of how financial instruments, services, and institutions interact to support the financial stability of individuals and the economy.
2	**Vertical:**	**Open Electives**
3	**Type:**	**Theory**
4	**Credits:**	**2 credits**
5	**Hours Allotted:**	**30 Hours**
6	**Marks Allotted:**	**50 Marks**
7	**Course Objectives:** 1. Understand the basic structure and role of the Indian financial system in the economy. 2. Identify the key functions of banks and the services they offer to individuals. 3. Recognize the importance of the Reserve Bank of India (RBI) as a regulatory authority. 4. Explain the concept of insurance and its relevance in personal financial planning. **5.** Develop basic awareness of saving, budgeting, and investment as essential financial habits.	
8	**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.	

<table>
<tr><td>•</td><td>Modules:- Module 1 (10 hours):

• Overview of Indian Financial System

o What is a financial system?
o Importance of financial systems in the economy
o Basic components: Institutions, markets, instruments, and services (in simple language)</td></tr>
<tr><td></td><td>Module 2 (10 hours):

• Banks and Banking Services
o Types of banks: Public, private, cooperative
o Basic services: Savings account, fixed deposits, loans, credit cards
o Role of RBI in regulating banks</td></tr>
<tr><td></td><td>Module 3 (10 hours):

• Insurance and Financial Planning Basics
o What is insurance? Types: Life and general insurance
o Importance of insurance in financial planning
o Basic idea of budgeting, saving, and investment</td></tr>
<tr><td>10</td><td>Text Books

1. Halan, Monika. Let's Talk Money, Harper Business
2. Pathak, Bharati V. The Indian Financial System (selected basic chapters)
3. RBI's "Financial Literacy" booklets and SEBI's student guides</td></tr>
<tr><td>11</td><td>Reference Books
1. William Stallings (2010), Computer Organization and Architecture designing for performance, 8th edition, Prentice Hall, New Jersy.
2. Anrew S. Tanenbaum (2006), Structured Computer Organization, 5th edition, PearsonEducation Inc,
3. John P. Hayes (1998), Computer Architecture and Organization, 3rd edition, Tata McGrawHill
4. Ramesh Gaonkar (2013), Microprocessor Architecture, Programming and Application with 8085, 6th edition, Penram.</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:

<table><tr><th>Sr. No</th><th>Particular</th><th>Marks</th></tr><tr><td>1.</td><td>Class Test</td><td>15</td></tr><tr><td>2.</td><td>Class participation</td><td>05</td></tr><tr><td></td><td>Total</td><td>20</td></tr></table></td><td>Semester End Examination (30 Marks)</td></tr>
</table>

14	**Format of Question Paper: (Semester End Examination: 30 Marks. Duration:1 hour)**

Questions	Type & Module	Marks
Q1.	Objective Question A) Multiple choice questions B) True or False	 08 Marks 07 Marks
Q2.	Theory Question	15 Marks
	OR	
Q2.	Theory Question	15 Marks
	Total	**30**

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Vertical – III

Open Electives(OE)

Semester I

(To be implemented from the Academic Year 2025-2026)

Approved in the Academic Council Meeting held on ***5th July 2025***

Name of the Course: Social Media and Communication – NUIT105

Sr. No.	Heading	Particulars
1	**Description of the course :**	This course offers a comprehensive overview of the evolution, structure, and impact of social media from its early platforms to the modern digital ecosystem. Students will explore the historical development of social media, the rise of mobile-based platforms, and the societal transformations driven by these technologies. The course also examines contemporary trends, including algorithmic curation, data privacy, ethical concerns, and the growing role of AI and machine learning in shaping digital interactions. Emphasis is placed on the application of social media in academic, professional, and interpersonal communication, equipping students with both theoretical understanding and practical insight.
2	**Vertical :**	**Open Electives**
3	**Type :**	**Theory**
4	**Credit**:	**2 credits**
5	**Hours Allotted :**	**30 Hours**
6	**Marks Allotted**:	**50 Marks**
7	**Course Objectives**: 1. **To introduce** students to the evolution and historical development of social media platforms and digital communication tools. 2. **To familiarize** students with modern social media platforms, their key features, and their influence on communication, culture, and society. 3. **To explore** the role of algorithms, artificial intelligence, and machine learning in shaping user experiences on social media. 4. **To sensitize** students to issues of digital ethics, data privacy, and the responsible use of social media. 5. **To enable** students to critically assess the use of social media in academic, interpersonal, and professional settings.	
8	**Course Outcomes:** By the end of this course, **students will be able to**: CO1. Describe the historical evolution and foundational concepts of social media platforms and their societal impact. CO2. Analyze the features and influence of major modern social media platforms, including their role in shaping digital interactions. CO3. Evaluate the ethical, privacy, and algorithmic challenges associated with social media usage in contemporary digital society. CO4. Apply knowledge of social media tools and technologies in academic, interpersonal, and professional contexts.	

9	**Modules**:-
	Module 1: Social Media – Past and Present 1. Concept and Scope of Social Media 2. Brief History and Evolution of Social Media 3. Early Platforms: Orkut, Friendster, MySpace 4. Evolution of Digital Communication Tools 5. Societal and Cultural Impact of Early Social Media
	Module 2: Modern Social Media Landscape and Applications 1. Overview of Major Platforms: Instagram, Twitter, TikTok, Snapchat 2. Recommendation Systems and Algorithmic Influence 3. Data Privacy, Ethics, and Digital Footprint 4. Social Media in Interpersonal and Academic Communication 5. Influencer Economy and Monetization Models 6. Academic and Research Applications of Social Media 7. Copyright Acts
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. https://slejournal.springeropen.com/articles/10.1186/s40561-020-00118-7
12	**Internal Continuous Assessment: 40%** | **Semester End Examination : 60%**
	Internal Evaluation: 20 Marks 1. Classroom Presentations/ Assignments 10 Marks 2. Essay Submission/ Book review/ Field Visit Report /Educational Activity Report 10 Marks
	External Evaluation : 30 Marks **Format of Question Paper:** for the final examination Time: 1hour Marks: 30 **Q.1 Answer the following: (ATTEMPT ANY 2 OUT OF 4) (10 Marks)** **Q.2 Answer the following: (ATTEMPT ANY 2 OUT OF 4) (10 Marks)** **Q.3 Answer the following: (ATTEMPT ANY 2 OUT OF 4) (10 Marks)**

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Bachelor of Science in Information Technology

(B.Sc. Information Technology)

Semester – I

(Programme Code: UGIT01)

As Per New Education Policy (NEP) 2020

(To be implemented from the Academic Year 2025-2026)

Approved in the Academic Council Meeting held on **5th July 2025**

Vertical – IV

Semester- I

Vocational & Skill Enhancement Courses (VSEC)

Name of the Course: Digital Logic Application Practical - NUIT106

Sr. No.	Heading	Particulars
1	**Description the course:**	**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:**	**Vocational Skill Course (VSC)**
3	**Type:**	**Practical**
4	**Credits:**	**2 credits**
5	**Hours Allotted:**	**30 Hours**
6	**Marks Allotted:**	**50 Marks**
7	**Course Objectives:** 1. To provide students with a comprehensive understanding of combinational and sequential circuit design principles and techniques. 2. To enable students to apply Boolean algebra, K-map simplification, and other design techniques to create optimized digital circuits. 3. To equip students with the necessary tools and skills to implement arithmetic circuits, data path circuits, and memory circuits. 4. To enable students to analyze and troubleshoot digital circuits to ensure optimal performance. 5. To provide students with hands-on practical experience in designing and implementing digital circuits using simulation software and real-world hardware.	
8	**Course Outcomes (CO):** **CO1.** Students can explain the differences between combinational and sequential circuits, and identify their different applications. **CO2.** Students can define the concept of Boolean algebra and its importance in digital circuit design. **CO3.** Students can explain and apply the principles of K-map simplification and other design techniques. **CO4.** Students can design and construct combinational circuits using Boolean algebra and K-maps. **CO5.** Students can design and implement arithmetic circuits such as adders, subtractors, and multipliers. **CO6.** Students can design and implement data path circuits such as registers, multiplexers,	

	and decoders. **CO7.** Students can implement digital circuits using breadboards, logic probes, and oscilloscopes. **CO8**. Students can troubleshoot and verify the correctness of digital circuits using real-world hardware and measure their performance using various metrics.	
9	**Modules:-** **Module 1 (15 hours):**	
	Practical 1:- Study of Logic gates and their ICs and universal gates: a) Study of AND, OR, NOT, XOR, XNOR, NAND and NOR gates b) Implement AND, OR, NOT, XOR, XNOR using NAND gates or NOR gates. **Practical 2:-** Implement the given Boolean expressions using minimum number of gates. a) Verifying De Morgan's laws. b) Implement other given expressions using minimum number of gates. **Practical 3:-** Implement combinational circuits and code converter. a) Design and implement Half adder and Full adder. b) 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. a) Design and implement a 2-bit by 2-bitmultiplier. b) Design and implement a 2-bit comparator. **Practical 6:-** Implement Multiplexer and Demultiplexers. a) Design and implement 4:1 multiplexer. Study of IC 74153, 74157 b) 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 required gates. b) Design of 3-bit ripple counter using IC 7473. **Practical 8:-** Study of counter ICs and designing Mod-N counters. a) Study of IC 7490, 7492, 7493 and designing mod-n counters using these. b) Designing mod-n counters using IC 7473 and 7400 (NAND gates) **Practical 9:-** Design of shift registers a) Design serial – in serial – out, serial – in parallel – out, using IC 7474. b) Design parallel – in serial – out ,parallel – in parallel – out and bidirectional shift registers using IC 7474. **Practical 10:-** Design of shift register counters. a) Study of ID 7495. b) Implementation of digits using seven segment displays.	
10	**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	
11	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
12	**Continuous Evaluation through:** Performance and write-up submission of 20 marks.	**Format of Question Paper: External Examination (30 Marks)– 2 hr 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

Skill Enhancement Course (SEC)

Name of the Course: Quantitative Foundations for Data Analysis - NUIT107

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**
5	**Hours Allotted:**	**30 Hours**
6	**Marks Allotted:**	**50 Marks**
7	**Course Objectives:** **1:** To introduce the fundamental concepts of sets, relations, functions, logic, and sequences as essential tools for structuring and modeling data. **2:** To develop logical reasoning skills through propositional logic and its applications in data querying and decision-making frameworks. **3:** To familiarize students with quantitative tools such as vectors, matrices, and basic linear algebra operations for representing and transforming data. **4:** To provide foundational knowledge of probability theory, conditional probability, and basic probabilistic models used in data analysis. **5:** To enable students to perform descriptive statistical analysis and data visualization, interpreting measures of central tendency, dispersion, and distribution characteristics.	
8	**Course Outcomes (CO):** **CO1:** Organize and model data using sets, relations, functions, sequences, and logical reasoning relevant to data-driven applications. **CO2:** Apply logical reasoning and propositional logic to design and interpret data queries, rules, and decision models. **CO3:** Represent, manipulate, and analyze data structures using vectors, matrices, and perform basic matrix operations in practical contexts. **CO4:** Apply probability concepts including conditional probability and independence to model uncertainty and solve real-world data problems. **CO5:** 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 (15 hours): Foundations of Logic and Discrete Structures for Data**

	• **Sets, Relations, and Functions**
	  ○ Types of sets and operations
	  ○ Cartesian products, mappings
	  ○ Domain and range — foundational for data models
	• **Logic and Propositional Reasoning**
	  ○ Propositions, truth tables, logical equivalence
	  ○ Implications, predicates, quantifiers
	  ○ Applications in data queries and rule-based systems
	• **Sequences, Series, and Summations**
	  ○ Arithmetic and geometric sequences
	  ○ Series and sigma notation
	  ○ Data stream processing and aggregations

	Module 2 (15 hours): Quantitative, Probabilistic, and Exploratory Data Analysis Tools

	• **Vectors and Matrices (Basics)**
	  ○ Scalars, vectors, matrix operations (addition, multiplication)
	  ○ Transpose, identity, zero matrices
	  ○ Relevance in representing datasets, images, networks
	• **Probability Theory Basics**
	  ○ Events, sample space, frequency interpretation
	  ○ Conditional probability, independence
	  ○ Bayes' theorem and simple probabilistic modeling
	• **Descriptive Statistics and Visualization**
	  ○ Measures of central tendency (mean, median, mode)
	  ○ Quartiles, deciles, percentiles
	  ○ Measures of spread (range, variance, standard deviation, quartile deviation)
	  ○ Skewness and kurtosis — definition, interpretation, applications
	  ○ Graphical representation: histograms, boxplots, bar charts

10	**Text Books** 1. **Schaum's Outline of Discrete Mathematics** *By Seymour Lipschutz, Marc Lipson — McGraw-Hill Covers: Sets, logic, propositional reasoning, sequences, matrices, and combinatorics fundamentals.* 2. **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.* 3. **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.* 4. **Programmed Statistics (Questions–Answers** *By B.L. Agarwal — New Age International Publishers Covers: Descriptive and inferential statistics with worked examples*

<table>
<tr><td>11</td><td colspan="2">Reference Books

1. Discrete Mathematics and Its Applications By Kenneth H. Rosen — McGraw-Hill Excellent for sets, logic, propositional reasoning, functions, sequences, and basic matrix theory.
2. 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.
3. Descriptive Statistic By R.J. Shah — Seth Publication Dedicated book for descriptive data summarization, measures of central tendency, and dispersion.
4. Basic StatisticBy B.L. Agarwal — New Age International Ltd ,Good coverage of foundational statistics, probability, and data interpretation.</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 : 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:

Q1: Attempt any three (out of five) from Module 1 (15 marks)

Q2: Attempt any three (out of five) from Module 2 (15 marks)</td></tr>
</table>

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Vertical – V

Ability Enhancement Courses(AEC)

Semester I

(To be implemented from the Academic Year 2025-2026)

Approved in the Academic Council Meeting held on ***5th July 2025***

Name of the Course: Communication Skills in English I- NUEN101

Sr. No.	Heading	Particulars
1	**Description of the course :**	This course aims to develop foundational communication skills in English through both theoretical and practical approaches. It begins with an introduction to the nature of communication, including verbal and non-verbal forms, effective writing and speech, and listening techniques. Learners will enhance their reading and listening skills through guided practice using varied texts and listening materials. The second part of the course focuses on speaking and formal writing. It includes training in public speaking, conversational English for different contexts, and practical writing tasks such as job applications, RTI requests, and formal letters. The course is designed to build confidence and competence in real-world communication scenarios.`
2	**Vertical :**	**Ability Enhancement Courses(AEC)**
3	**Type :**	**Theory**
4	**Credit**:	**2 credits**
5	**Hours Allotted :**	**30 Hours**
6	**Marks Allotted**:	**50 Marks**
7	**Course Objectives**: • To enhance the English language proficiency of students by familiarizing them with • Listening, Speaking, Reading, and Writing (LSRW) skills • To introduce learners to different perspectives of looking at a text or passage • To equip learners in the functional aspects of English so that they use the • acquired language skills correctly and confidently • To guide learners in the effective use of the digital medium of communication	
8	**Course Outcomes:** After completion of the course, learners would be able to: CO1. Understand and interpret any text they are reading from different perspectives CO2. Arouse the interest of learners in listening to and watching good-quality audio and visual media CO3. Acquire proficiency in the skills of listening, speaking, reading, and writing that will help them meet the challenges of the world CO4. Develop good oral and written skills of communication in the English language	
9	**Modules**:-	
	Module 1: 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.
	Module 2 : 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.)
10	**References:** 1. Bellare, Nirmala. Reading & Study Strategies. Books. 1 and 2. Oxford University Press, 1997, 1998 2. Bellare, Nirmala. Easy Steps to Summary Writing and Note-Making. Amazon Kindle Edition, 2020 3. Comfort, Jeremy, et al. Speaking Effectively: Developing Speaking Skills for Business English. Cambridge University Press, 1994. 4. Das, Bikram K., et. al. An Introduction to Professional English and Soft Skills.Cambridge University Press India Pvt. Ltd., 2010 5. Das, Yadjnaseni& R. Saha (eds.) English for Careers. Pearson Education India, 2012. 6. Dimond-Bayir, Stephanie. Unlock Level 2 Listening and Speaking Skills Student's Book and Online Workbook: Listening and Speaking Skills Student's Book+ Online Workbook. Cambridge University Press, 2014. 7. Doff, Adrian and Christopher Jones. Language in Use (Intermediate and Upper Intermediate). CUP, 2004.

<table>
<tr><td>11</td><td>Internal Continuous Assessment: 40%</td><td>Semester End Examination : 60%</td></tr>
<tr><td></td><td colspan="2">Internal Evaluation: 20 Marks
<table>
<tr><td>Role Play/ Skits</td><td>10 marks</td></tr>
<tr><td>Resume Writing,</td><td>05 marks</td></tr>
<tr><td>Class Participation and Attendance</td><td>05 marks</td></tr>
</table></td></tr>
<tr><td></td><td colspan="2">External Evaluation: 30 Marks
Semester End Examination
<u>Question Paper Pattern</u>
<table>
<tr><th>Question No.</th><th>Questions</th><th>Marks</th></tr>
<tr><td>Q 1</td><td>Writing Skills/ Comprehension</td><td>15 marks</td></tr>
<tr><td>Q 2</td><td>Practical/ Theory</td><td>15 marks</td></tr>
</table></td></tr>
</table>

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Vertical – V

Value Education Course(VEC)

Semester I

(To be implemented from the Academic Year 2025-2026)

Approved in the Academic Council Meeting held on ***5th July 2025***

Name of the Course : Environmental Systems and Management-I - NUES101

Sr. No.	Heading	Particulars
1	**Description of the course :**	Environmental awareness transcends academic boundaries. This course transcends academic boundaries, equipping you with a foundational understanding of ecosystems, biodiversity, and the human impact on natural resources and climate. Students will learn about critical issues like pollution and explore solutions for a sustainable future. The knowledge you gain here connects with diverse fields such as biology, economics, and even engineering. It is a foundation for further exploration in environmental science, conservation biology, and environmental policy. This course ignites your interest in environmental issues and opens doors to exciting careers in environmental management, conservation, and sustainable development – fields with growing demand across industries. Prepare for an interactive learning experience through engaging lectures, stimulating group discussions, and insightful case studies examining real-world environmental challenges and solutions.
2	**Vertical :**	**Value Education Course(VEC)**
3	**Type :**	**Theory**
4	**Credit**:	**2 credits**
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:** After studying this course student will be in position to: CO1. Students will be able to explain the structure and function of ecosystems, and understand how energy flows through food chains and food webs. CO2. Students will identify various types of environmental pollution and their sources, and suggest prevention and control strategies. CO3. Students will analyze the factors contributing to biodiversity loss and describe the importance of conservation efforts. CO4. 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 Hours) • 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 Hours)** • 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.
10	**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	
11	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
12	**Continuous Evaluation through:** Project Work – 15 Marks Attendance and Participation in Seminar, Workshop, and Activity, etc. – 05 Marks Total – 20 Marks	***Report Submission based on Suggested Practical Activities by Faculty Members for 30 Marks***
13	**Suggested Practical Activities:** ➢ A guest lecture by a disaster management official or NGO working in disaster relief. ➢ Project work involving 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	

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Vertical – V

Indian Knowledge System(IKS)

Semester I

(To be implemented from the Academic Year 2025-2026)

Approved in the Academic Council Meeting held on **5th July 2025**

Name of the Course: Indian Knowledge System – NUIK101

Sr. No.	Heading	Particulars
1	**Description the course :**	This course offers a comprehensive introduction to the Indian Knowledge System (IKS), exploring its core principles, historical context, and contemporary relevance. It examines the impact of colonial education policies and emphasizes the need to revisit ancient Indian traditions. The course highlights traditional Indian entrepreneurship through handloom, khadi, tribal handicrafts, herbal products, and culturally rooted food ventures. It also showcases sustainable practices like the use of clay bottles, banana leaf plates, and the repair-and-reuse culture. Students will further explore key domains of IKS such as Ayurveda, ancient sports, astronomy, yoga, traditional banking, trade, commerce, and governance models from texts like the Arthashastra.
2	**Vertical :**	IKS
3	**Type :**	Theory
4	**Credit**:	2 credits
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives**: The student should be able to: 1. To sensitize the students about context in which they are embedded i.e. Indian culture and civilization including its Knowledge System and Tradition. 2. To help student to understand the knowledge, art and creative practices, skills and values in 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.	
8	**Course Outcomes**: CO1. Learner will understand and appreciate the rich Indian Knowledge Tradition CO2. Learner will understand the contribution of Indians in various fields CO3. Learner will experience increase subject-awareness and self-esteem CO4. Learner will develop a comprehensive understanding of how all knowledge is ultimately intertwined	
9	**Module:** Module 1: (15 Hours) 1. Introduction to IKS: What is knowledge System, Characteristic Features of Indian Knowledge System 2. Why IKS? Macaulay's Education Policy and its impact, Need of revisiting Ancient Indian Traditions 3. IKS and Entrepreneurship: Handloom, Khadi, Tribal Handicrafts and Herbal Products, Food-based start-ups rooted in tradition 4. Sustainable Indian Practices: Clay bottles, Banana leaf plates, Cloth Bags-Repair culture (Reuse, Patchwork, Jugaad)	

	Module 2: (15 Hours) 1. Medicine (Ayurveda) 2. Ancient Sports 3. Astronomy 4. Yoga and Wellbeing 5. Banking 6. Trade and Commerce 7. Art of Governance (Arthashastra)
10	**Reference Books:** 1. Concise history of science in India- D.M. Bose, S.N Sen, B.V. Subbarayappa. 2. Positive sciences of the Ancient Hindus- Brajendranatha seal, Motilal Banrasidas, Delhi1958. 3. History of Chemistry in Ancient India & Medieval India, P.Ray- Indian Chemicals 4. Society, Calcutta 1956 5. Charaka Samhita- a scientific synopsis, P. Ray & H.N Gupta National Institute of Sciences of India, New Delhi 1965. 6. MacDonnell A.A- History of Sanskrit literature 7. Winternitz M- History of Indian Literature Vol. I, II & III 8. Dasgupta S.N & De S.K- History of Sanskrit literature Vol. I. 9. Ramkrishna Mission- cultural heritage of India Vol. I, II & III. 10. Majumdar R. C & Pushalkar A.D- History & culture of the Indian people, Vol. I, II & III. 11. Keith A.B- History of Sanskrit literature. 12. Varadachari V- History of Sanskrit literature Chaitanya Krishna- A new History of Sanskrit
11	**Internal Continuous Assessment: 40%** **Continuous Internal Assessment: 20 Marks** ❖ Field Visit Report: **10 Marks,** ❖ Class Test / MCQ Test :**10 Marks,**
12	**External Assessment: 60% : (30 Marks)** **Format of Question Paper:** For the External examination

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

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Vertical – VI

Co-Curricular Courses (CC)

Semester I

(To be implemented from the Academic Year 2025-2026)

Approved in the Academic Council Meeting held on **5th July 2025**

Title of Paper: Fitness and Sports I - NUCC103

Sr. No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to :**	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. 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.
2	**Vertical :**	Co-Curricular
3	**Type :**	Activity Based
4	**Credit**:	2 credits
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks
7	**Course Objectives**: The student should be able to: • **To understand the core components of physical fitness** and learn basic techniques for assessing and improving personal health and endurance. • **To gain knowledge of various sports classifications, rules, and techniques** for both individual and team-based indoor and outdoor games. • **To develop life skills such as discipline, teamwork, and leadership** through active	
8	**Course Outcomes**: • **Understanding of physical fitness components** and apply appropriate assessment techniques like BMI, flexibility, and endurance tests. • **Identify and explain the rules, techniques, and classifications** of major indoor and outdoor sports, including both individual and team games. • **Exhibit improved teamwork, discipline, and personal growth** through participation in physical activities and application of sportsmanship values.	

9	**Module:** This module introduces the fundamentals of physical fitness, including strength, endurance, flexibility, body composition, and cardiovascular health. It emphasizes the importance of fitness for students and explains basic assessment methods like BMI and endurance tests. It also covers the classification of sports into indoor/outdoor and individual/team. Basic rules and techniques of popular games like cricket, football, volleyball, and athletics are explained. The module highlights how sports encourage discipline, teamwork, and contribute to personality development.
10	**Reference Books:** 1. Uppal, A.K. (1992). Physical Fitness. New Delhi: Friends Publication. 2. Muller, J.P. (2000). Health, Exercise and Fitness. Delhi: Sports. 3. Russell, R.P. (1994). Health and Fitness Through Physical Education. USA: Human Kinetics. 4. Kamlesh, M.L. (2007). Physical Education and Sports. New Delhi: Metropolita Book **5.** Singh Hardayal (1991), Science of Sports Training, DVS Publication, New Delhi
11	**Internal Continuous Assessment: 40%(20 Marks)** ❖ Assignment/Report Writing
12	**External Assessment: 60% (30 Marks)** **Certificate Submission Guidelines** *Each student must submit at least* **three certificates** *from the following approved categories:* 1. Attending **Zumba or Aerobics** sessions conducted by a certified fitness trainer. 2. Participation in **Team Sports** such as Cricket, Volleyball, Football, Kabaddi, Basketball, or Kho-Kho. 3. Participation in **Indoor Sports** like Carrom, Chess, or Badminton. 4. Participation in **Marathons or Walkathons**. 5. Serving as a **Volunteer** in roles such as Event Coordinator, Scorekeeper, Timekeeper, or Referee. *Note: Students participating 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 India Inter University/ International tournament are exempt from submission of report.*

Letter Grades and Grade Points:

Semester GPA/ Program CGPA Semester/ Program	% of Marks	Alpha-Sign / Letter Grade Result		Grade Points
9.00-10.00	90.0-100	O	(Outstanding)	10
8.00-<9.00	80.0-<90.0	A+	(Excellent)	9
7.00-<8.00	70.0-<80.0	A	(Very Good)	8
6.00-<7.00	60.0-<70.0	B+	(Good)	7
5.50-<6.00	55.0-<60.0	B	(Above Average)	6
5.00-<5.50	50.0-<55.0	C	(Average)	5
4.00-<5.00	40.0-<50.0	P	(Pass)	4
Below 4.00	Below 40	F	(Fail)	0
Ab (Absent)	-	AB	(Absent)	0

Signature of BOS Chairman	***Signature of Faculty Member***	***Signature of I/C Principal***
Ms. Vaishali Mishra	***Ms. Hiral Parakhiya***	***Dr. Swiddle D'Cunha***
BOS (Information Technology)	*(Information Technology)*	