R. E. Society's

R. P. Gogate College of Arts & Science And
R. V. Jogalekar College of Commerce (Autonomous), Ratnagiri

Department of Information Technology

Name of Programme	**B.Sc. Information Technology**
Level	UG
No of Semesters	06
Year of Implementation	**2023-24**

Programme Specific Outcomes (PSO)	1. Programming Proficiency:
	   a. PSO1: Proficient in Python and Java.
	   b. PSO2: Design real-world applications.
	   c. PSO3: Apply programming libraries for data analysis.
	2. Networking, Database, and Data Structures:
	   a. PSO4: Understand computer networks and databases.
	   b. PSO5: Configure and troubleshoot networks.
	   c. PSO6: Implement data structures and algorithms.
	3. Applied Mathematics and Statistics:
	   a. PSO7: Apply math and statistics for problem-solving.
	4. Embedded Systems and Real-Time Applications:
	   a. PSO8: Develop real-time applications.
	   b. PSO9: Utilize microcontrollers and sensors.

Relevance of PSOs to the local, regional, national, and global developmental needs (200 words)	The PSOs align with India's growing IT industry, Konkan region's local needs, national development, and global technology demands. Proficient programmers support the country's digital transformation, and networking expertise enhances connectivity. Applied math aids local challenges, while embedded systems find applications in healthcare and smart cities. These PSOs contribute to India's IT leadership, regional industries, and global tech market presence, addressing developmental needs at all levels.

Under Choice Based Credit System (CBCS)
Course Structure (Autonomous)
Department of Information Technology

No. of Courses	Semester I	Credits	No. of Courses	Semester II	Credits
	Discipline Specific Course (DSC)			*Discipline Specific Course (DSC)*	
	Major			*Major*	
USIT101	C Programming	**02**	USIT201	Object Oriented Programming with C++	**02**
USIT102	Web Programming	**02**	USIT202	Operating System	**02**
USIT103	Programming Practical 1	**02**	USIT203	Programming Practical 2	**02**
	Minor			*Minor*	
USIT104	Digital logic and Applications	**02**	USIT204	Data Communication and Networking	**02**
USIT105	Practical M1	**02**	USIT205	Microprocessor Architecture	**02**
			USIT206	Practical M2	**02**
	Indian Knowledge System(IKS)				
USIT106	Vedic Mathematics	**02**			---
	Vocational Skill Course (VSC)			*Skill Enhancement Course (SEC)*	
USIT107	Computer Skills-1 practical	**02**	USIT207	Computer Skills-2 Practical	**02**
	Ability Enhancement Course (AEC)			*Ability Enhancement Course (AEC)*	
USIT108	Technical Communication Skills I	**02**	USIT208	Technical Communication Skills II	**02**
	Generic / Open Elective			*Generic / Open Elective*	
	One from the pool of Open elective courses	**02**		One from the pool of Open elective courses	**02**
	Value Education Course (VEC)			*Value Education Course (VEC)*	
USES1	Environmental studies 1	**02**	**USES2**	Environmental studies 2	**02**
	Co-Curricular			*Co-Curricular*	
	Any one course from CC courses	**02**		Any one course from CC courses	**02**
Total Credits		**22**	**Total Credits**		**22**

(To be implemented from Academic Year- 2023-24)

SEMESTER I

SEMESTER I (Major)				
Course Code	Course Name	Course Nature	Credits	No. of Hrs./Week
USIT101	C Programming	Theory	2	2
USIT102	Web Programming	Theory	2	2
USIT103	Programming Practical 1	Practical	2	4

SEMESTER I (Minor)				
Course Code	Course Name	Course Nature	Credits	No. of Hrs./Week
USIT104	Digital Logic and Applications	Theory	2	2
USIT105	M1 Practical	Practical	2	4

SEMESTER I (Indian Knowledge System)				
Course Code	Course Name	Course Nature	Credits	No. of Hrs./Week
USIT106	Vedic Mathematics	Theory	2	2

SEMESTER I (Vocational Skill Enhancement Course)				
Course Code	Course Name	Course Nature	Credits	No. of Hrs./Week
USIT107	Computer Skills-1 Practical	Practical	2	4

SEMESTER I (Ability Enhancement Course)				
Course Code	Course Name	Course Nature	Credits	No. of Hrs./Week
USIT108	Technical Communication Skills I	Theory	2	2

SEMESTER I(Open Elective Course)(Any One to be Opted by IT Students)				
Course Code	Course Name	Course Nature	Credits	No. of Hrs.
USOE101	Astronomy for Beginners	Theory/Practical	2	2
USOE102	Discrete Mathematics	Theory/Practical	2	2
USOE103	Google workspace and multimedia applications	Tutorial+Practical	1+1	1+2
USOE104	Health and Hygiene - I	Theory/Practical	2	2
USOE105	Health and Nutrition	Theory/Practical	2	2
USOE106	Social media marketing	Theory/Practical	2	2
USOE107	Plants in Human Welfare - I	Theory/Practical	2	2

SEMESTER I (Value Education Course)Offered by Botany Department				
Course Code	Course Name	Course Nature	Credits	No. of Hrs./Week
USES1	Environmental Studies I	Theory	2	2

Name of the Course	**C Programming**
Course Code (refer to student handbook)	**USIT101**
Class	**F.Y.B.Sc.IT**
Semester	**I**
No of Credits	**2**
Nature	**Theory**
Type (applicable to NEP only)	**Major**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	Restructuring of syllabus has been done to ensure a smooth and logical flow of content throughout the curriculum. It also facilitates the logical progression of subjects which allows learners to build their understanding of the subject progressively and systematically and to grasp contents more effectively. The syllabus also focuses on practical programming exercises that require learners to apply the theory concepts and principles to real world scenarios. This will emphasize skill development among learners and will encourage learners to think critically and to analyze technical concepts from different perspectives. Additionally, some of the topics in this theory course will be covered in following Practical courses which will reinforce learners' theoretical understanding to real world applications.

Nomenclature: C Programming

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Learn the basic principles of programming.
2. Develop logic using algorithms and flowchart.
3. Acquire the information about data types.
4. Understand input and output functions.
5. Enhance advanced concepts using programs.

Curriculum:

Unit	Title	Learning Points	No of Hours
I	**Introduction**	What is Programming? Program Characteristics, Algorithms, Flowchart symbols, Algorithm Practice.	10
	Foundation Of C	History of C, Compiler, C Character Set, identifiers and keywords, data types and sizes , constants and its types ,variables, Character and character strings	
	Type of operators	Arithmetic operators, relational and logical operators, Increment and Decrement operators, assignment operators, the conditional operator, Assignment operators.	
II	**Control Flow**	Statements and Blocks, if-else, else-if, switch, Loops- while, for loops, do-while, break and continue, goto statement and Labels	10
	Pointer, Arrays And Structure	Pointer and Addresses, 1D, 2D, Multidimensional Array. Structure Definition	
III	**Functions and Program**	Basics of functions. User defined and Library functions, Types of functions, Function parameters, Return values, Recursion, Pointers to Functions, Dynamic memory allocation.	10
	File management in C	Defining and Opening file, Closing a file, Input / Output operations on file.	

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Programming in ANSI C	E.Balagurusamy	Tata McGraw-Hill	7th	1982
2.	Let us C	Yashwant P. Kanetkar	BPB publication		
3.	Programming with C	Byron Gottfried	Tata McGRAW-Hill	2nd	1996
4.	Mastering C	K R Venugopal	Tata McGraw-Hill	6th	2007
5.	Programming Language	Brian W. Kernighan and Denis M. Ritchie.	PHI	2nd	1988

Evaluation Pattern:

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline – 1 unit test of 20 marks	20
Assignments	10
Attendance and active participation in classroom	10

B. Semester End Evaluation (Paper Pattern) (60 Marks – 2 hours):

Question No	Unit	Marks
1	I	15
2	II	15
3	III	15
4	I II III	05 05 05

Guidelines for paper pattern for Semester End Evaluation:
1. All questions will be compulsory.
2. Descriptive type of questions, programming-based questions, problem solving / numericals based questions,single line answers,etc., will contain internal options.
3. Refer **Appendix I** for Paper pattern.

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Name of the Course	**Web Programming**
Course Code (refer to student handbook)	**USIT102**
Class	**F.Y.B.Sc.IT**
Semester	**I**
No of Credits	**2**
Nature	**Theory**
Type (applicable to NEP only)	**Major**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	

Nomenclature: Web Programming

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Understand basic concepts of Internet and World Wide Web.
2. Comprehend different HTML elements that can be used to develop static web pages.
3. Become familiar with the concept of stylesheets and various CSS effects.
4. Pursue JavaScript as a tool to add dynamism to static HTML pages.
5. Explore how server-side script works on the web.

Curriculum:

Unit	Title	Learning Points	No of Hours
I	Internet and the World Wide Web:	What is the Internet? Applications of Internet, E-mail, Telnet, FTP, E-commerce and E-business. Internet Service Providers, Domain Name Server, Internet Address, World Wide Web (WWW): World Wide Web and its Evolution, Uniform Resource Locator (URL), Browsers, Common Features of Browsers, Search Engine, Web Server, HTTP Protocol.	10
	HTML5:	Introduction, Formatting Text by using Tags, Using Lists, Creating Hyperlinks and Bookmarks, Defining Metadata about an HTML Document, Redirecting to another URL.	
	CSS:	Implementing Styles using CSS – Stylesheets, Formatting Text and Links using CSS, CSS Selectors, Changing Background, Adding Border, Margin and Padding, Setting Dimensions, Using Inline Container to mark up a part of a text	
II	HTML5 Page layout and navigation:	HTML Page Layout: Using Layout Elements, Semantic Elements, Creating, Positioning and Formatting Divisions, Floating Divisions next to each other, Responsive Web Design, Inline Frames. HTML Media, Embedding Images, Creating Client-side and Server-side Image Map, adding Favicon, Embedding audio and video on web page.	10
	Tables and Forms:	Creating Simple Table, Table Dimension, Merging Table Cells, Formatting Tables: Applying Borders, Background and Foreground fills, Changing Cell Padding, Spacing and Alignment Collecting user input with HTML Forms, Additional Input Types in HTML5.	
III	JavaScript:	Introduction, Difference between Client-side and Server-side Scripting, JavaScript Variables and Constants, Data Types, Statements, Comments,	10

		Functions, Variable Scope, Hoisting, Strict Mode, JavaScript Objects, Dialog Boxes, void Keyword 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	
		DOM: Introduction, DOM Properties and Methods. 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	
	Introduction to PHP	PHP: Introduction, Server-side Scripting, PHP Syntax and Comments, Variables and Constants, Data Types, Control Structures, Looping, Loop Termination, Functions, PHP Form Handling, PHP Form Validation, Superglobals, PHP Arrays, PHP Strings, PHP RegEx, PHP Numbers, PHP Math, Basic PHP Errors	

Learning Resources recommended:

Sr. No	Title	Author/s	Publisher	Edition	Year
1.	The Complete Reference HTML & CSS	Thomas A. Powell	McGrawHill	5 th	-
2.	Step by Step HTML5	Faithe Wempen	Microsoft Press	-	2011
3.	The Complete Reference JavaScript	Thomas A. Powell & Fritz Schneider	McGrawHill	3 rd	2012
4.	Learning Web Design A Beginner's Guide to Html, CSS, JavaScript, And Web Graphics	Jennifer Niederst Robbins	O'Reilly	5th	2018

5.	PHP & MySQL Novice to Ninja	Tom Butler	SPD	7th	2022

Evaluation Pattern:

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline – 1 unit test of 20 marks	20
Assignments	10
Attendance and active participation in classroom	10

B. Semester End Evaluation (Paper Pattern) (60 Marks – 2 hours):

Question No	Unit	Marks
1	I	15
2	II	15
3	III	15
4	I II III	05 05 05

Guidelines for paper pattern for Semester End Evaluation:
4. All questions will be compulsory.
5. Descriptive type of questions, programming-based questions, problem solving / numericals based questions,single line answers,etc., will contain internal options.
6. Refer **appendix I** for Paper pattern

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Name of the Course	**Programming Practical 1**
Course Code (refer to student handbook)	**USIT103**
Class	**F.Y.B.Sc.IT**
Semester	**I**
No of Credits	**2**
Nature	**Practical**
Type (applicable to NEP only)	**Major**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	**In the previous Syllabus, a Mini project was added as a part of the practical list. As it is important in the sense of employability, entrepreneurship and skill development, it is decided to assign one credit to application development so that students will get deep knowledge and enough time for that.**

Nomenclature: Programming Practical 1

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Work with textual information, characters and strings.
2. Understanding of a functional hierarchical code organization
3. Debug the program
4. Understand the differences between syntax errors, runtime errors, and logic errors.
5. Develop the application using C Programming language.

Section I: C Programming Practical

Curriculum:

Sr. No.	Title	Learning Points	No of Hours
1	**Algorithm and Flowchart**	a. Write an algorithm and draw flowchart for Area of circle. b. Write an algorithm and draw flowchart to print the given no. is even or odd. c. Write an algorithm and draw flowchart to print 1 to 10 numbers. d. Write an algorithm and draw flowchart for sum of 1 to 5 numbers. e. Write an algorithm and draw flowchart to compute the addition of digits of a given number.	2
2	**Conditional Statements ,Goto Statements**	a. Write a program in C to check entered character vowel or consonant b. Write a program to C program to print day name of week using switch-case c. Write a program to read three values from the keyboard and print out the largest of them without using the if statement. d. Write a program using goto statement.	2+2
3	**Loops**	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.	

4	Programs on Patterns	a. Write a program to print the pattern of asterisks as shown below : * * * * * * * * * * b. Write a program to print the pattern of asterisks as shown below : * * * * * * * * * * * * * * * c. Write a program to print Floyd's Triangle.	2+2
5	Arrays	a. Write a program to print roll no and names of 10 students using an array. b. Write a program to read a matrix of size m*n. c. Write a program to find largest element of array.	2+2
6	Built-in and User Defined Functions	a. Write a program to print the area of a square using a function. b. Write a program to square root, abs() value using function.	2
7	Recursive Function	a. Write a program using a recursive function.	2
8	Pointers	a. Write a program to display the values using different data types and its address using a pointer. b. Write a program to perform addition and subtraction using a pointer.	2+2
9	Files	a. Write a program to copy the contents of the file from one file into another.	2
10	Files	a. Write a program to read text from the user and store that text into a file.	2

This is sample Practical list. Course instructor may change the practical as per syllabus.

Section II: Application Development using C

Curriculum:

1. Each student has to select one topic for their application.
2. Application should be developed using C programming.
3. Individual students have to submit the project report (soft copy and executable application) **(Refer Appendix II)**

Sr. No.	Title	Learning Points	No. of Hours
0	**Feasibility Studies**	Decide Topic, Requirement Gathering Phase	4
1	**Design Phase-I**	Decide Module and Draw Algorithm	4
2	**Design Phase-II**	Design system, Draw Flowchart	4
3	**Implementation Phase**	Develop Module by coding phase	8
4	**Integration Phase**	Integration of modules	6
5	**Documentation**	Create a Documentation	4

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Programming in ANSI C	E.Balagurusamy	Tata McGraw-Hill	7th	1982
2.	Let us C	Yashwant P. Kanetkar	BPB publication		
3.	Programming with C	Byron Gottfried	Tata McGRAW-Hill	2nd	1996
4.	Mastering C	K R Venugopal	Tata McGraw-Hill	6th	2007
5.	Programming Language	Brian W. Kernighan and Denis M. Ritchie.	PHI	2nd	1988

Evaluation Pattern

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Certified Journal (section I)	10
Project Documentation(Section II)	10
Attendance and active participation in both Laboratory	20

B. Semester End Evaluation (Paper Pattern) (60 Marks – 4 hours):

Section I: (30 Marks - 2 Hours)

Question No	Unit	Marks
1	Program 1	10
2	Program 2	15
3	Viva	05

Section II: (30 Marks - 2 Hours)

Question No	Unit	Marks
1	User Interaction	05
2	C Syllabus Coverage	05
3	Running Application	15
4	Viva	05

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Name of the Course	**Digital Logic and Applications**
Course Code (refer to student handbook)	**USIT104**
Class	**F.Y.B.Sc.IT**
Semester	**I**
No of Credits	**2**
Nature	**Theory**
Type (applicable to NEP only)	**Minor(Interdisciplinary)**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	

Nomenclature: Digital Logic and Applications

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. To introduce the basics of logic in digital electronics as an entry level course.
2. To interpret and assess number systems and the conversions of number systems
3. To analyze the boolean expressions and reduce the expression to the minimum.
4. To design simple logic circuits using tools such as Boolean algebra and Karnaugh Mapping.
5. To design and implement a variety of logical devices using combinational and sequential circuits concepts.
6. To introduce different applications of sequential circuits.

Curriculum:

Unit	Title	Learning Points	No of Hours
I	**Digital Systems and Binary numbers**	Introduction to Number systems, Positional Number systems, Conversions (converting between bases), Non positional number systems, Unsigned and Signed binary numbers, Binary Codes, Number representation and storage in computer system.	10
	Logic gates and Logic Circuits	Basic and Universal Gates	
II	**Boolean algebra and Gate level minimization**	Introduction, Postulates of Boolean Algebra, Two Valued Boolean Algebra, Principle of Duality, Basic Theorems of Boolean Algebra, Boolean Functions and their Representation, Gate-Level Minimization (Simplification of Boolean Function), Quine- McCluskey Method, Review questions	10
	Combinational logic	Introduction, Analysis and Design Procedure for Combinational Logic Circuits, Types of Combinational Circuit, Review Questions	
III	**Sequential circuits**	Introduction, Latch, Flip-Flops, Registers, Counters, Review Questions	10
	Applications	Bit Arithmetic and Logic unit, Carry look ahead generator, Binary Multiplication and Division algorithm, Booth's multiplication algorithm.	

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1	Digital Logic Design	Sonali Singh	BPB publications	1st	2015
2	Fundamentals of Digital Electronics and Logic Design	Subir Kumar Sarkar, Asish Kumar De, Souvil Sarkar	Pan Stanford Publishing	1st	2014
3	Digital Electronics Principles, Design and Applications	Anil K Maini	Wiley	1st	2007
4	Fundamentals of Logic Design	Charles H Roth, Jr., Larry L Kinney	Cengage Learning	7th	2014

Evaluation Pattern:

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline – 1 unit test of 20 marks	20
Assignments	10
Attendance and active participation in classroom	10

B. Semester End Evaluation (Paper Pattern) (60 Marks – 2 hours):

Question No	Unit	Marks
1	I	15
2	II	15
3	III	15
4	I II III	05 05 05

Guidelines for paper pattern for Semester End Evaluation:
1. All questions will be compulsory.
2. Descriptive type of questions, programming-based questions, problem solving / numerical based questions, single line answers, etc., will contain internal options.
3. Refer **appendix I** for Paper pattern.

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Name of the Course	**M1 Practical**
Course Code (refer to student handbook)	**USIT105**
Class	**F.Y.B.Sc.IT**
Semester	**I**
No of Credits	**2**
Nature	**Practical**
Type (applicable to NEP only)	**Minor(Interdisciplinary)**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	

Nomenclature: M1 Practical

Course Outcomes:

On the successful completion of this course, the learner will be able

1. To apply and test the gates learnt using various IC's .
2. To evaluate the Boolean expression to reduce and minimize the gates used
3. To understand different commands and functions of SCILAB.
4. To use tools to compute solutions of various discrete mathematical structures.

Curriculum:

Section I: Digital Logic and Applications Practical

Unit	Title	Learning Points	No of Hours
1	**Study of basic gates and Universal gates**	a. To verify the truth tables of OR, AND, NOR, NAND, EX-OR, EX-NOR gates b. To study IC 7400, 7402, 7404, 7408, 7432, 7486, 74266 c. To implement and verify NAND and NOR as Universal gates	2+2
2	**Study of Boolean expressions**	a. To verify De Morgan's laws b. Implement the given expression using a minimum number of gates. c. Implement the given expression using a minimum number of ICs.	2+2
3	**Design of Combinational Circuits using K-maps**	a. Design and implement combinational circuits for the given problem/problems using minimization techniques of K-maps.	2
4	**Design and implement code converters**	a. Design the circuit and implement Binary to gray code converter b. Design the circuit and implement Gray to Binary code converter c. Design the circuit and implement Binary to BCD code converter d. Design the circuit and implement Binary to XS-3 code converter	2+2
5	**Implement Adder and Subtractor circuits**	a. Design the circuit and implement Half Adder and Full Adder b. Design the circuit and implement BCD Adder, XS-3 Adder , Binary Subtractor	2
6	**Design and implement**	a. Design and implement 2-by-2 bit multiplier	2

	Arithmetic circuits		
7	**Implement Encoders and Decoders**	a. Design and implement 8: 3 encoder b. Design and implement 3:8 decoder	2
8	**Multiplexers and Demultiplexers**	a. Design and Implement 4:1 multiplexer b. Design and Implement 1:4 demultiplexer c. Study IC 74151 8: 1 multiplexer and implement the expression d. Study IC 74138 3: 8 decoder and implement the expression	2+2
9	**Study of Flip Flops and Counters**	a. Study of IC's 7473, 7474, and 7476 b. Design a 3-bit ripple/ synchronous counter using IC 7473 and required gates	2+2
10	**Design of Shift Registers**	a. Design of Shift registers using IC 7474 b. Implementation of digits using seven segment displays	2

This is sample Practical list. Course instructor may change the practical as per syllabus.

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1	Digital Logic Design	Sonali Singh	BPB publications	1st	2015
2	Fundamentals of Digital Electronics and Logic Design	Subir Kumar Sarkar, Asish Kumar De, Souvil Sarkar	Pan Stanford Publishing	1st	2014
3	Digital Electronics Principles, Design and Applications	Anil K Maini	Wiley	1st	2007
4	Fundamentals of Logic Design	Charles H Roth, Jr. , Larry L Kinney	Cengage Learning	7th	2014

Section II: Introduction to Scilab tool Practical

Unit	Title	Learning Points	No of Hours
1	**Introduction to Scilab**	a. Basics of variables,operators b. Inbuilt functions c. Branches and looping statements	2+2
2	**Set Theory**	a. Inclusion Exclusion principle b. Cardinality and Power Sets c. Set Operations d. Properties of Sets	2+2
3	**Functions and Algorithms**	a. Recursively defined functions b. Roots of Polynomial c. Polynomial evaluation d. Greatest Common Divisor	2+2
4	**Probability Theory 1**	a. Sample space and events b. Finite probability spaces c. Equiprobable spaces d. Addition Principle	2+2
5	**Probability Theory 2**	a. Conditional Probability b. Multiplication theorem for conditional probability c. Independent events d. Repeated trials with two outcomes	2+2
6	**Counting 1**	a. Sum rule principle b. Product rule principle c. Factorial	2
7	**Counting 2**	a. Permutations b. Permutations with repetitions c. Combinations d. Combinations with repetitions	2
8	**Counting 3**	a. Ordered partitions b. Unordered partitions	2
9	**Graph Theory**	a. Paths and connectivity b. Minimum spanning tree c. Isomorphism	2
10	**Directed Graphs**	a. Adjacency matrix b. Path matrix	2

This is sample Practical list. Course instructor may change the practical as per syllabus.

Learning Resources recommended:

https://www.scilab.org/about/community/books

Evaluation Pattern

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Certified Journal (section I and II)	20
Attendance and active participation in both Laboratory	20

B. Semester End Evaluation (Paper Pattern) (60 Marks – 4 hours):

Section I: (30 Marks - 2 Hours)

Question No	Unit	Marks
1	Program 1	10
2	Program 2	15
3	Viva	05

Section II:(30 Marks - 2 Hours)

Question No	Unit	Marks
1	Program 1	10
2	Program 2	15
3	Viva	05

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Name of the Course	**Vedic Mathematics**
Course Code (refer to student handbook)	**USIT106**
Class	**F.Y.B.Sc.IT**
Semester	**I**
No of Credits	**2**
Nature	**Theory**
Type (applicable to NEP only)	**Indian Knowledge System**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	Vedic Mathematics will help to eliminate math-phobia and increase speed and accuracy. It will give the student flexibility, fun and immense satisfaction, provides a powerful checking tool and saves precious time in examinations. It will develop Left & Right Sides of the brains by increasing visualization and concentration abilities. Knowledge of Vedic Mathematics will be helpful to crack the Numerical Aptitude part for students appearing for Competitive Examinations.

Nomenclature: Vedic Mathematics

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Make critical thinking.
2. Recognize and understand simple techniques of Arithmetic Calculations.
3. Use the ideas of Vedic Mathematics in daily calculations and make those calculations with accuracy and speed.

Curriculum:

Unit	Title	Learning Points	No of Lectures
I	**Introduction**	History and Evolution of Vedic Mathematics, Techniques in Multiplication (Series of 9, Series of 1 etc.), Tables etc.,	10
	Basic Operations	Various techniques to carry out basic operations covering Addition, Subtraction, Multiplication(Vertically Crosswise), Division, Complements and Bases, Vinculum number	
II	**Techniques of Multiplication and Division**	Multiplications by numbers near base, Verifying answers by use of digital roots, Divisibility tests, Division of numbers near base, Comparison of fractions, Applications of Vinculum, Different methods of Squares (General method, Base method, Duplex method etc.)	10
III	**Equations**	Cubes, Cube roots, Square roots, Quadratic Equations, Simultaneous Equations	10
	Numerical Aptitude	Use of various Vedic Techniques for answering numerical aptitude questions from Competitive Examinations	

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1	The Power of Vedic Maths	Atul Gupta	Jaico Publishing House	2nd	
2	Vedic Mathematics Made Easy	Dhaval Bhatiya	Dhaval Bhatiya		

Evaluation Pattern:

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline – 1 unit test of 20 marks	20
Assignments	10
Attendance and active participation in classroom	10

B. Semester End Evaluation (Paper Pattern) (60 Marks – 2 hours):

Question No	Unit	Marks
1	I	15
2	II	15
3	III	15
4	I II III	05 05 05

Guidelines for paper pattern for Semester End Evaluation:
1. All questions will be compulsory.
2. Descriptive type of questions, programming-based questions, problem solving / numericals based questions, single line answers,etc., will contain internal options.
3. Refer **appendix I** for Paper pattern.

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Name of the Course	**Computer Skills-1 Practical**
Course Code (refer to student handbook)	**USIT107**
Class	**F.Y.B.Sc.IT**
Semester	**I**
No of Credits	**2**
Nature	**Practical**
Type (applicable to NEP only)	**Vocational Skill Course**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	To demonstrate a basic understanding of computer hardware and software and ability of problem-solving skills. To apply logical skills to programming in a variety of languages and utilize web technologies. To present conclusions effectively, orally, and in writing. Developing profiles and email features.

Nomenclature: Computer Skills-1 Practical

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Understand how to effectively implement HTML.
2. Write CSS effectively to create well organized, styled web pages.
3. Add versatility to a web page with client-side scripting.
4. Deploy a local web server and run a simple web application.
5. Learn basic features of MS Word.
6. Articulate formal and informal reports.
7. Analyze and interpret data and learn visualization of data.
8. Learn effective tools of presentation.
9. Learn mail formation and create profiles.

Section I: Web Programming Practical

Curriculum:

Sr. No.	Title	Learning Points	No of Hours
1	**Use of Basic Tags**	a. Design a web page using different text formatting tags. b. Design a web page with links to different pages and allow navigation between web pages. c. Design a web page that automatically redirects the user to another page.	2+2
2	**Use of CSS**	a. Design a web page demonstrating different stylesheet types. b. Design a web page demonstrating grouping selectors.	2+2
3	**Layout and Media**	a. Design a web page demonstrating different semantics. b. Design a web page embedding image, audio and video.	2
4	**Image Maps**	a. Design a web page with Image Maps.	2
5	**Tables and Forms**	a. Design a web page with different tables. b. Design a web page with a form that uses all types of controls.	2+2
6	**JavaScript**	a. Using JavaScript, design a web page to accept a number from the user and print its Factorial. b. Using JavaScript, a web page that prints Fibonacci series/any given series. c. Write a JavaScript program to display all the prime numbers between 1 and 100. d. Write a JavaScript program to accept a number from the user and display the sum of its digits.	2+2
7	**JavaScript Objects**	a. Using JavaScript, design a web page demonstrating different native objects of JavaScript.	2

		b. Write a program in JavaScript to accept a sentence from the user and display the number of words in it. (Do not use split () function).	
8	**JavaScript Events**	a. Write a JavaScript program to design a simple calculator. b. Design a form and validate all the controls placed on the form using JavaScript.	2
9	**PHP - Basic**	a. Write a PHP code to find the greater of 2 numbers. Accept the no. from the user. b. Write a PHP Program to accept a number from the user and print it factorial. c. Write a PHP program to accept a number from the user and print whether it is prime or not.	2
10	**PHP - Advanced**	a. Write a PHP program to demonstrate different string functions. b. Write a PHP program to demonstrate different array functions.	2+2

This is sample Practical list. Course instructor may change the practical as per syllabus.

Learning Resources recommended:

Sr. No	Title	Author/s	Publisher	Edition	Year
1.	The Complete Reference HTML & CSS	Thomas A. Powell	McGrawHill	5 th	-
2.	Step by Step HTML5	Faithe Wempen	Microsoft Press	-	2011
3.	The Complete Reference JavaScript	Thomas A. Powell & Fritz Schneider	McGrawHill	3 rd	2012
4.	Learning Web Design A Beginner's Guide to Html, CSS, JavaScript, And Web Graphics	Jennifer Niederst Robbins	O'Reilly	5th	2018
5.	PHP & MySQL Novice to Ninja	Tom Butler	SPD	7th	2022

Section II: Basic Computer Skills Practical

Curriculum:

Sr.No.	Title	Learning Points	No of Hours
1	**Various Components of Computer**	CPU, Parts of CPU, Keyboard, Mouse, Monitor and its types, Printer and its types,Storage devices- Pen drive, Memory card,CD and hard disc	2+2
2	**Memories and its Types**	RAM,ROM,Cache,Sequential,Virtual, Solidstate, Magnetic, Optical	2+2
3	**Windows Operating System**	Elements of Windows OS,Recycle bin, accessories, Calculator, Paint, Notepad, Wordpad, Control Panel	2+2
4	**Use of word processing tools**	What is word processing, Advantages of word processing,Saving New Document, Saving New Changes, View Buttons	2
5	**Features of word processing**	Building resumes in MS Word	2
6	**Basics of MS Excel**	Introduction to Microsoft Excel 2007, Workbook Details, Basic features and operations, Worksheets, Printing	2
7	**Use of presentation tools like PowerPoint**	Features of MS-Powerpoint	2
8	**Web Browser And E-mail**	Purpose, Protocols and Standards, Popular Browsers and Creating a Email and Use of Email	2+2
9	**Use of Mail etiquette for writing effective mails.**	Do's and Don'ts of Professional Emails	2
10	**Use of Mail merge**	a) Features of mail merge and steps b) Creating profile using LinkedIn.	2+2

This is sample Practical list. Course instructor may change the practical as per syllabus.

Learning Resources recommended:

Following websites were taken for reference:

1. **https://www.tutorialspoint.com**
2. **https://en.wikipedia.org**

Evaluation Pattern

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Certified Journal (section I and II)	20
Attendance and active participation in both Laboratory	20

B. Semester End Evaluation (Paper Pattern) (60 Marks – 4 hours):

Section I: (30 Marks - 2 Hours)

Question No	Unit	Marks
1	Program 1	10
2	Program 2	15
3	Viva	05

Section II:(30 Marks - 2 Hours)

Question No	Unit	Marks
1	Program 1	10
2	Program 2	15
3	Viva	05

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Name of the Course	**Technical Communication Skills I**
Course Code (refer to student handbook)	**USIT108**
Class	**F.Y.B.Sc.IT**
Semester	**I**
No of Credits	**2**
Nature	**Theory**
Type (applicable to NEP only)	**Ability Enhancement Course**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	

Nomenclature: Technical Communication Skills I

Course Outcomes:

On the successful completion of this course, the learner will be able

1. To recognize the importance of various types of communication in technical set up.
2. To understand the dynamics in different forms of formal communication.
3. To learn about active listening and the art of giving presentations and interviews.
4. To learn the art of business writing and ethics in business communication across functional areas.
5. To evaluate, analyze and interpret technical data.

Curriculum:

Unit	Title	Learning Points	No of Lectures
I	**The Seven Cs of Effective Communication:**	Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness	10
	Fundamentals of Communication	Introduction, The process of communication, Functions of communication	
	Barriers to communication	Introduction, Types of Barriers	
II	**Non-verbal Communication**	Introduction, Definition, significance of nonverbal, forms of non -verbal communication, types of non-verbal communication	10
	Conversations	Introduction, Conversation Management, Non-verbal cues in conversation	
	Meeting and conferences	Introduction, Purpose of Meeting, planning a meeting, Meeting Process, types of teleconferences, advantages and disadvantages.	
III	**Group Discussion and team presentation**	Introduction, Benefits of GD, Assessment of group discussion , Business and Purpose of Team presentation	10
	Email communication	Introduction, Email etiquettes, Techniques of writing Effective Email	
	Active Listening	Introduction, Type of listening, Barriers to effective listening	

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1	Business Communication	Meenakshi Raman & Prakash Singh	Oxford- Higher Education	2nd edition	2006
2	Professional Communication	Aruna Koneru	McGraw Hill		2008
3	Professional Communication Skills	Laila Dias	Vipul Prakashan	1st edition	2010

Evaluation Pattern:

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline – 1 unit test of 20 marks	20
Assignments	10
Attendance and active participation in classroom	10

B. Semester End Evaluation (Paper Pattern) (60 Marks – 2 hours):

Question No	Unit	Marks
1	I	15
2	II	15
3	III	15
4	I II III	05 05 05

Guidelines for paper pattern for Semester End Evaluation:
1. All questions will be compulsory.
2. Descriptive type of questions, programming-based questions, problem solving / numericals based questions,single line answers,etc., will contain internal options.
   Refer **appendix I** for Paper pattern.

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SEMESTER II

SEMESTER II (Major)				
Course Code	**Course Name**	**Course Nature**	**Credits**	**No. of Hrs./Week**
USIT201	Object Oriented Programming with C++	Theory	2	2
USIT202	Operating System	Theory	2	2
USIT203	Programming Practical 2	Practical	2	4

SEMESTER II (Minor)				
Course Code	**Course Name**	**Course Nature**	**Credits**	**No. of Hrs./Week**
USIT204	Data Communication and Networking	Theory	2	2
USIT205	Microprocessor Architecture	Theory	2	2
USIT206	M2 Practical	Practical	2	4

SEMESTER II (Skill Enhancement Course)				
Course Code	**Course Name**	**Course Nature**	**Credits**	**No. of Hrs./Week**
USIT207	Computer Skills-2 Practical	Practical	2	4

SEMESTER II (Ability Enhancement Course)				
Course Code	**Course Name**	**Course Nature**	**Credits**	**No. of Hrs./Week**
USIT208	Technical Communication Skills II	Theory	2	2

SEMESTER II (Open Elective Course)(Any one to be Opted by IT Students)				
Course Code	**Course Name**	**Course Nature**	**Credits**	**No. of Hrs.**
USOE201	Observational Astronomy	Theory	2	2
USOE202	Numerical Methods	Theory	2	2
USOE203	Basic computer system	Theory	2	2
USOE204	Health and Hygiene - II	Theory	2	2
USOE205	Health and Nutrition	Theory	2	2
USOE206	Introduction to Bioinformatics	Theory	2	2
USOE207	Plants in Human Welfare – II	Theory	2	2
USOE208	Advance Excel	Theory	2	2
USOE209	Food Science	Theory	2	2
USOE210	Social Media Awareness	Tutorial+Practical	1+1	1+2

SEMESTER II (Value Education Course)Offered by Botany Department				
Course Code	**Course Name**	**Course Nature**	**Credits**	**No. of Hrs./Week**
USES2	Environmental Studies II	Theory	2	2

Name of the Course	**Object Oriented Programming with C++**
Course Code (refer to student handbook)	**USIT201**
Class	**F.Y.B.Sc.IT**
Semester	**II**
No of Credits	**2**
Nature	**Theory**
Type (applicable to NEP only)	**Major**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	Restructuring of syllabus has been done to ensure a smooth and logical flow of content throughout the curriculum. It also facilitates the logical progression of subjects which allows learners to build their understanding of the subject progressively and systematically and to grasp contents more effectively. The syllabus also focuses on practical programming exercises that require learners to apply the theory concepts and principles to real world scenarios. This will emphasize skill development among learners and will encourage learners to think critically and to analyze technical concepts from different perspectives. Additionally, some of the topics in this theory course will be covered in following Practical courses which will reinforce learners' theoretical understanding of real world applications.

Nomenclature: Object Oriented Programming with C++

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Understand the concept of OOPs, features of C++ language.
2. Understand and apply various types of Data Types, Operators, Conversions while designing the program.
3. Understand and apply the concepts of Classes & Objects, friend function, constructors & destructors in program design.
4. Design & implement various forms of inheritance, String class, calling base class constructors.
5. Apply & Analyze operator overloading, runtime polymorphism, Generic Programming.
6. Analyze and explore various Stream classes, I/O operations and exception handling.

Curriculum:

Unit	Title	Learning Points	No of Hours
I	**Starting With C++**	C++ Overview, C++ Character Set, C++ Tokens,Variables, Counting Tokens, Data Types, Qualifiers, Range of Data Types, Your First C++ Program, Programming Examples	10 hrs
	Features Of C++	Introduction, Operators and Expressions, Declaring Constants,Type Conversion, Decision Making: An Introduction, Unconditional Branching Using Goto, Introduction to Looping	
	Operators And References In C++	Introduction, Scope Resolution Operator, Reference Variables, The Bool Data Type, The Operator New and Delete, Malloc Vs. New ,Pointer Member Operators	
	Introduction to Object-Oriented Concepts	Introduction To Structure,Structure vs. class, Objects, Class and Instance, Abstraction, Encapsulation,Polymorphism, Inheritance,Message Passing, Dynamic Binding,	
II	**Function In C++**	Call by Reference ,Inline Function ,Function Overloading ,Function with Default Arguments	10 hrs
	Class and Objects In C++	Working with Class, Structure in C++, Accessing Private Data Passing and Returning Object , Array of Object, Introduction Friend Function ,Static Class Members,Constant Member Function	

	Working With Constructor And Destructor	Introduction,Constructor with Parameters, Implicit and Explicit Call to Constructor, Copy Constructor, Dynamic Initialization of Objects, Dynamic Constructor, Destructor		
	Working With Operator Overloading	Introduction, Operator Overloading		
III	**Working With Inheritance In C++**	Introduction, Types of Inheritance, Public, Private and Protected Inheritance, Multiple Inheritance, Hierarchical Inheritance, Virtual Base Class, Constructor and Destructor in Inheritance		
	Pointers To Objects And Virtual Functions	Pointer to Objects, The This Pointer, Virtual Functions ,Working of a Virtual Function ,Rules for Virtual Function ,Pure Virtual Function and Abstract Class	10 hrs	
	File Handling In C++	Introduction, File Streams, Opening and Closing a File,File Opening Modes Checking End of File		
	Template Programming	Introduction , Function Template , Class Template		
	Exception Handling In C++	Introduction , Basics of Exception Handling ,Exception Handling Mechanism ,		

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Object Oriented Programming in C++	E Balagurusamy	Tata McGraw-Hill	5th Edition	2011
2.	Object-oriented Programming C++ Simplified	Hari Mohan Pandey	University Science Press	1st Edition	2017
3.	Object-Oriented Programming in C++	Robert Lafore	Sams	4th Edition	2002
4.	Programming with ANSI C++	Bhushan Trivedi	Oxford University Press	2nd Edition	2012
5.	Demystified Object-Oriented Programming with C++	Dorothy R. Kirk	Packt Publishing Lt	1st Edition	2021

GJC (Autonomous) B. Sc. I.T. Semester I and II Syllabus

6.	C++ Programming: An Object-Oriented Approach	Behrouz A. Forouzan , Richard F. Gilberg	McGraw-Hill Education	1st edition	2020
7.	C++ How to Program	Paul Deitel, Harvey Deitel	Pearson Education	10th Edition	2017

Evaluation Pattern:

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline – 1 unit test of 20 marks	20
Assignments	10
Attendance and active participation in classroom	10

B. Semester End Evaluation (Paper Pattern) (60 Marks – 2 hours):

Question No	Unit	Marks
1	I	15
2	II	15
3	III	15
4	I II III	05 05 05

Guidelines for paper pattern for Semester End Evaluation:
1. All questions will be compulsory.
2. Descriptive type of questions, programming-based questions, problem solving / numericals based questions,single line answers,etc., will contain internal options.
3. Refer **appendix I** for Paper pattern.

Name of the Course	**Operating System**
Course Code(refer to student handbook)	**USIT202**
Class	**F.Y.B.Sc.IT**
Semester	**II**
No of Credits	**2**
Nature	**Theory**
Type(applicable to NEP only)	**Major**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	Restructuring of syllabus has been done to ensure a smooth and logical flow of content throughout the curriculum. It also facilitates the logical progression of subjects which allows learners to build their understanding of the subject progressively and systematically and to grasp contents more effectively. The syllabus also focuses on problem solving exercises that require learners to apply the theory concepts and principles to real world scenarios. This will emphasize skill development among learners and will encourage learners to think critically and to analyze technical concepts from different perspectives. Additionally, some of the topics in this theory course will be covered in following Practical courses which will reinforce learners' theoretical understanding to real world applications

Nomenclature: Operating Systems

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Understand Functions, Services and structure of Operating Systems.
2. Understand processes, threads, schedulers and explanation of CPU scheduling.
3. Understand issues related to Process Synchronization and focus on principles of Deadlock and related problems.
4. Comprehend the mechanisms used in Memory Management and Virtual Memory.
5. Understand the concepts of File System, secondary storage management and Disk Scheduling

Curriculum:

Unit	Title	Learning Points	No of Hours
I	**Introduction**	What Is An Operating System? History Of Operating System, Computer Hardware, Different Operating Systems, Operating System Concepts, System Calls, Operating System Structure.	10
	Processes and Threads	Processes, Threads, Interprocess Communication, Scheduling, IPC Problems.	
II	**Memory Management**	No Memory Abstraction, Memory Abstraction: Address Spaces, Virtual Memory, Page Replacement Algorithms, Design Issues For Paging Systems, Implementation Issues, Segmentation.	10
	File Systems	Files, Directories, File System Implementation, File-System Management And Optimization, Ms-Dos File System, Unix V7 File System, CD-ROM File System.	
III	**Deadlock**	Resources, Introduction To Deadlocks, The Ostrich Algorithm, Deadlock Detection And Recovery, Deadlock Avoidance, Deadlock Prevention, Issues.	10
	Study of LINUX and ANDROID	History Of Unix And Linux, Linux Overview, Processes In Linux, Memory Management In Linux, I/O In Linux, Linux File System, Security In Linux. Android.	

| | **Study of Windows** | History Of Windows Through Windows 10, Programming Windows, System Structure, Processes And Threads In Windows, Memory Management, Caching In Windows, I/O In Windows, Windows Nt File System, Windows Power Management, Security In Windows | |

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Modern Operating Systems	Andrew S. Tanenbaum, Herbert Bos	Pearson	4th	2014
2.	Operating Systems – Internals and Design Principles	Willaim Stallings	Pearson	8th	2009
3.	Operating System Concepts	Abraham Silberschatz, Peter B. Galvineg Gagne	Wiley	8th	
4.	Operating Systems	Godbole and Kahate	McGraw Hill	3rd	

Evaluation Pattern:

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline – 1 unit test of 20 marks	20
Assignments	10
Attendance and active participation in classroom	10

B. Semester End Evaluation (Paper Pattern) (60 Marks – 2 hours):

Question No	Unit	Marks
1	I	15
2	II	15
3	III	15
4	I II III	05 05 05

Guidelines for paper pattern for Semester End Evaluation:
1. All questions will be compulsory.
2. Descriptive type of questions, programming-based questions, problem solving / numericals based questions,single line answers,etc., will contain internal options.
3. Refer **appendix I** for Paper pattern.

Name of the Course	**Programming Practical 2**
Course Code (refer to student handbook)	**USIT203**
Class	**F.Y.B.Sc.IT**
Semester	**II**
No of Credits	**2**
Nature	**Practical**
Type (applicable to NEP only)	**Major**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	In the previous Syllabus,a Mini project was added as a part of the practical list. As it is important in the sense of employability, entrepreneurship and skill development, it is decided to assign one credit to application development so that students will get deep knowledge and enough time for that.

Nomenclature: Programming Practical 2

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Utilize C++ characteristics in software design and development.
2. Explain object-oriented techniques and explain how C++ supports them.
3. Employ C++ to demonstrate practical skill developing object-oriented solutions.
4. Examine a problem statement and design and develop object-oriented software using good Coding practices and procedures.
5. Use common software patterns and recognize their relevance in other software development contexts.

Section I: Object Oriented Programming with C++ Practical

Curriculum:

Sr.No.	Title	Learning Points	No of hrs
1	**C++ Basics Programs**	a. Write a C++ program to create a simple calculator. b. Write a C++ program to convert seconds into hours, minutes and seconds. c. Write a C++ program to find the volume of a square, cone, and rectangle.	2
2	**Conditional Statement and Looping using C++**	a. Write a C++ program to find the greatest of three numbers. b. Write a C++ program to find the sum of even and odd n natural numbers c. Write a C++ program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.	2+2
3	**Classes and Methods**	a. Write a C++ program using classes and object Student to print the name of the student, roll_no.Display the same. b. Write a C++ program for Structure bank employee to print name of the employee,account_no. & balance. Display the same also display the balance after withdraw and deposit c. Write a C++ Program to design a class having static member function named showcount() which has the property of displaying the number of objects created of the class. d. Write a Program to find Maximum out of Two Numbers using the friend function. (Note: Here one number is a member of one class and the other number is member of some other class.)	2+2

		e. Write a C++ Program using a copy constructor to copy data of an object to another object.	
4	**Constructor and Overloading**	a. Write a C++ program to design a class of performing addition & multiplication of two numbers using operator overloading. b. Write a C++ program to overload new/delete operators in a class. c. Write a C++ Program to generate Fibonacci Series by using Constructor to initialize the Data Members.	2+2
5	**Inheritance I**	a. Write a C++ Program that illustrates single inheritance. b. Write a C++ Program that illustrates multiple inheritance. c. Write a C++ Program that illustrates multilevel inheritance. d. Write a C++ Program that illustrates Hierarchical inheritance.	2+2
6	**Inheritance II**	a. Write a C++ Program to design a student class representing student roll no. and a test class (derived class of student) representing the scores of the student in various subjects and sports class representing the score in sports. The sports and test class should be inherited by a result class having the functionality to add the scores and display the final result for a student.	2+2
7	**Use of this pointer**	a. Write a C++ program to maintain the records of person with details (Name and Age) and find the eldest among them. The program must use this pointer to return the result.	2
8	**File Handling**	a. Write a C++ program to copy the contents of one file to another.	2
9	**Exception Handling**	a. Write a C++ program to implement the exception handling with multiple catch statements.	2
10	**Template Programming**	a. Write a C++ Program to create Simple calculator using a Class template. b. Write a C++ Program to get a maximum of two numbers using the Class template.	2

This is sample Practical list. Course instructor may change the practical as per syllabus.

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Object Oriented Programming in C++	E Balagurusamy	Tata McGraw-Hill	5th Edition	2011
2.	Object-oriented Programming C++ Simplified	Hari Mohan Pandey	University Science Press	1st Edition	2017

Section II: Application Development using C++

Curriculum:

1. Each student has to select one topic for their application.
2. Applications should be developed using C++ programming.
3. Individual students have to submit the project report (soft copy and executable application) **(Refer Appendix II)**

Practical list:

Sr. No.	Title	Learning Points	No. of Hours
0	Feasibility Studies	Decide Topic, Requirement Gathering Phase	4
1	Design Phase-I	Decide Module and Draw Algorithm	4
2	Design Phase-II	Design system, Draw Flowchart	4
3	Implementation Phase	Develop Module by coding phase	8
4	Integration Phase	Integration of modules	6
5	Documentation	Create a Documentation	4

Evaluation Pattern

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Certified Journal (section I)	10
Project Documentation(Section II)	10
Attendance and active participation in both Laboratory	20

B. Semester End Evaluation (Paper Pattern) (60 Marks – 4 hours):

Section I: (30 Marks - 2 Hours)

Question No	Unit	Marks
1	Program 1	10
2	Program 2	15
3	Viva	05

Section II: (30 Marks - 2 Hours)

Question No	Unit	Marks
1	User Interaction	05
2	C++ Syllabus Coverage	05
3	Running Application	15
4	Viva	05

Name of the Course	**Data Communication and Networking**
Course Code (refer to student handbook)	**USIT204**
Class	**F.Y.B.Sc.IT**
Semester	**II**
No of Credits	**2**
Nature	**Theory**
Type (applicable to NEP only)	**Minor (Interdisciplinary)**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	Basics of Data Communication and networking is introduced to learners through the course. It will help learners to choose "Networking" as their employable field in early stages of the curriculum.

Nomenclature: Data Communication and Networking

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Identify various data communication standards, topologies and terminologies
2. Describe how signals are used to transfer data and communication aspects between nodes
3. Study of underlying Technologies for networking.

Curriculum:

Unit	Title	Learning Points	No of Hours
I	**Introduction**	Data communications,Networks,The Internet, Protocols and Standards	10
	Network Models	Layered tasks,The OSI model,Layers in the OSI Model,TCP/IP protocol suite,Addressing,	
	Data and Signals	Analog and Digital,Periodic Analog signals,Digital signals,Transmission Impairment,Data rate limits,Performance	
II	**Digital and Analog Transmission**	Digital-To-Digital Conversion, Analog-To-Digital Conversion, Transmission Modes, Digital-To-Analog Conversion,Analog-To-Analog Conversion	10
	Bandwidth Utilization and Transmission Media	Multiplexing,Spread Spectrum,Guided Media,Unguided Media: Wireless, Circuit-Switched Networks, Packet Switching	
III	**Data Link Layer**	Introduction, Error Detection And Correction-Introduction, Block Coding,Cyclic Codes,Checksum,Forward Error Correction,Data-Link Layer Protocols, HDLC,Point-To-Point Protocol (PPP) ,Data Link Control, Multiple Access, Random Access,Controlled Access, Channelization	10
	Wired LANs	Ethernet Protocol, Standard, Fast, Gigabit,10 Gigabit Ethernet, Telephone, Cable Networks	
	Wireless LANs and WANs	Introduction,IEEE 802.11 Project, Bluetooth,WiMAX, Cellular Telephony, Satellite Networks	

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Data Communication and Networking	Behrouz A. Forouzan	Tata McGraw Hill	Fiffth	-----
2.	Computer Networks	Andrew Tanenbaum	Pearson	Fifth	2013
3.	TCP/IP Protocol Suite	Behrouz A. Forouzan	Tata McGraw Hill	Fourth Edition	2010

Evaluation Pattern:

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline – 1 unit test of 20 marks	20
Assignments	10
Attendance and active participation in classroom	10

B. Semester End Evaluation (Paper Pattern) (60 Marks – 2 hours):

Question No	Unit	Marks
1	I	15
2	II	15
3	III	15
4	I II III	05 05 05

Guidelines for paper pattern for Semester End Evaluation:
1. All questions will be compulsory.
2. Descriptive type of questions, programming-based questions, problem solving / numericals based questions,single line answers,etc., will contain internal options.
3. Refer **appendix I** for Paper pattern.

Name of the Course	**Microprocessor Architecture**
Course Code (refer to student handbook)	**USIT205**
Class	**F.Y.B.Sc.IT**
Semester	**II**
No of Credits	**2**
Nature	**Theory**
Type (applicable to NEP only)	**Minor (Interdisciplinary)**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	In this revision of Microprocessor Architecture, a strong focus is placed on enhancing employability and fostering entrepreneurship through skill development. The chapter "Microprocessor Architecture and Microcomputer System" explores the practical applications of microprocessors in real-world systems, providing students with valuable industry-relevant knowledge. "Interfacing of I/O Devices" equips learners with hands-on experience in connecting peripherals to microprocessors, enhancing their technical competence. "Introduction to 8085 Assembly Language" and "Programming Techniques" foster critical problem-solving skills and algorithmic thinking, making students proficient in programming microprocessors for various applications. Additionally, "Interrupts" and "Stacks and Subroutines" empower students to design efficient and responsive microprocessor-based systems, creating a solid foundation for future employability or entrepreneurial endeavors.

Nomenclature: Microprocessor Architecture

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Understand the basic concepts of Micro Computer Systems
2. Understand the architecture and hardware aspects of 8085
3. Write assembly language programs in 8085

Curriculum:

Unit	Title	Learning Points	No of Hours
I	**Introduction**	Microprocessor, microcomputers, and Assembly Language: Microprocessor,Microprocessor Instruction Set and Computer Languages, From Large Computers to Single-Chip Microcontrollers, Applications.	10
	Microprocessor Architecture and Microcomputer System	Microprocessor Architecture and its operations, Memory, I/O Devices, Microcomputer System, Logic Devices and Interfacing, Microprocessor-Based System Application.	
	8085 Microprocessor Architecture and Memory Interface	Introduction, 8085 Microprocessor unit, 8085-Based Microcomputer, Memory Interfacing, Interfacing the 8085 Memory Segment.	
II	**Interfacing of I/O Devices**	Basic Interfacing concepts, Interfacing Output Displays, Interfacing Input Devices, Memory Mapped I/O, Testing and Troubleshooting I/O Interfacing Circuits.	10
	Introduction to 8085 Assembly Language	The 8085 Programming Model, Instruction Classification, Instruction, Data and Storage, Writing assembling and Execution of a simple program, Overview of 8085 Instruction Set, Writing and Assembling Program.	
	Introduction to 8085 Instructions:	Data Transfer Operations, Arithmetic Operations, Logic Operation, Branch Operation, Writing Assembly Languages Programs, Debugging a Program.	

III	Programming Techniques	Programming Techniques With Additional Instructions: Looping, Counting and Indexing, Additional Data Transfer and 16-Bit Arithmetic Instructions, Arithmetic Instruction Related to Memory, Logic Operations: Rotate, Logics Operations: Compare, Dynamic Debugging.	10	
	Counters and Time Delays	Counters and Time Delays, Illustrative Program: Hexadecimal Counter, Illustrative Program: zero-to-nine (Modulo Ten) Counter, Generating Pulse Waveforms, Debugging Counter and Time-Delay Programs.		
	Stacks and Subroutines	Stack, Subroutine, Restart, Conditional Call, Return Instructions, Advanced Subroutine concepts.		
	Interrupts	The 8085 Interrupt, 8085 Vectored and Non vectored Interrupts, Restart as S/W Instructions.		

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1	Microprocessors Architecture, Programming and Applications with the 8085.	Ramesh Gaonkar	PENRAM	5th	2012
2	8080A/8085 Assembly Language Programming	Lance A. Leventhel	Osborne		1978

Evaluation Pattern:

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline – 1 unit test of 20 marks	20
Assignments	10
Attendance and active participation in classroom	10

B. Semester End Evaluation (Paper Pattern) (60 Marks – 2 hours):

Question No	Unit	Marks
1	I	15
2	II	15
3	III	15
4	I II III	05 05 05

Guidelines for paper pattern for Semester End Evaluation:
1. All questions will be compulsory.
2. Descriptive type of questions, programming-based questions, problem solving / numericals based questions,single line answers,etc., will contain internal options.
3. Refer **appendix I** for Paper pattern.

Name of the Course	**M2 Practical**
Course Code (refer to student handbook)	**USIT206**
Class	**F.Y.B.Sc.IT**
Semester	**II**
No of Credits	**2**
Nature	**Practical**
Type (applicable to NEP only)	**Minor(Interdisciplinary)**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	**employability/ entrepreneurship/ skill development**

Nomenclature: M2 Practical

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Apply concepts of 8085 to single & Multiple Memory Locations
2. Apply concepts of microprocessor register operations
3. Implement assembly language programs
4. Find fast and accurate solution to simple and complex numerical problems using scilab programs

Section I: Microprocessor Architecture Practical

Curriculum:

Sr. No.	Title	Learning Points	No of Hours
1	**Perform the following Operations related to memory locations**	a. Store the data byte 32H into memory location 4000H. b. Exchange the contents of memory locations 2000H and 4000H c. Find the l's complement of the number stored at memory location 4400H and store the complemented number at memory location 4300H. d. Find the 2's complement of the number stored at memory location 4200H and store the complemented number at memory location 4300H.	2+2
2	**Simple assembly language programs**	a. Add the contents of memory locations 4000H and 4001H and place the result in the memory locations 4002H and 4003H. b. Subtract the contents of memory location 4001H from the memory location 4000H and place the result in memory location 4002H. c. Add the 16-bit number in memory locations 4000H and 4001H to the 16-bit number in memory locations 4002H and 4003H. The most significant eight bits of the two numbers to be added are in memory locations 4001H and 4003H. Store the result in memory locations 4004H and 4005H with the most significant byte in memory location 4005H. d. Subtract the 16-bit number in memory locations 4002H and 4003H from the 16-bit number in memory locations 4000H and 4001H. The most significant eight bits of the two numbers are in memory locations 4001H	2+2

		and 4003H. Store the result in memory locations 4004H and 4005H with the most significant byte in memory location 4005H.	
3	**Packing and unpacking operations**	a. Pack the two unpacked BCD numbers stored in memory locations 4200H and 4201H and store the result in memory location 4300H. Assume the least significant digit is stored at 4200H. b. 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.	2
4	**Register Operations**.	a. Write a program to shift an eight bit data four bits right. Assume that data is in register C. b. Program to shift 16-bit data 1 bit left. Assume data is in the HL register pair. c. Write a set of instructions to alter the contents of the flag register in 8085. d. Write a program to count number of I's in the contents of D register and store the count in the B register	2+2
5	**Multiple memory locations**	a. Calculate the sum of a series of numbers. The length of the series is in memory location 4200H and the series begins from memory location 4201H. I. Consider the sum to be an 8 bit number. So, ignore carries. Store the sum at memory location 4300H. II. Consider the sum to be a 16 bit number. Store the sum at memory locations 4300H and 4301H. b. 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. c. Divide the 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.	2+2

6	Calculations with respect to memory locations	a. 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. b. Write a program to sort given 10 numbers from memory location 2200H in the ascending order. c. Calculate the sum of a series of even/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 2 Sample problem.	2+2
7	Assembly programs on memory locations.	a. Write an assembly language program to separate even/odd numbers from the given list of 50 numbers and store them in another list starting from 2300H. Assume starting address of 50 number list is 2200H. b. Find the square of the given numbers from memory location 6100H and store the result from memory location 7000H. c. A list of 50 numbers is stored in memory, starting at 6000H. Find number of negative, zero and positive numbers from this list and store these results in memory locations 7000H, 7001H, and 7002H respectively.	2
8	String operations in assembly programs.	a. Multiply the 8-bit unsigned number in memory location 2200H by the 8-bit unsigned number in memory location 2201H. Store the 8 least significant bits of the result in memory location 2300H and the 8 most significant bits in memory location 2301H. b. Divide the 16-bit unsigned number in memory locations 2200H and 2201H (most significant bits in 2201H) by the B-bit unsigned number in memory location 2300H store the quotient in memory location 2400H and remainder in 2401H	2
9	Calculations on memory locations	a. Arrange an array of 8 bit unsigned no in descending order. b. Transfer ten bytes of data from one memory to another memory block. Source memory block starts from memory location 2200H whereas destination memory block starts from memory location 2300H.	2

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| 10 | **Operations on BCD numbers.** | a. Add two 4 digit BCD numbers in HL and DE register pairs and store the result in memory locations, 2300H and 2301H. Ignore carry after 16 bit.
 b. Subtract the BCD number stored in E register from the number stored in the D register.
 c. Write an assembly language program to multiply 2 BCD numbers | 2 |

This is sample Practical list. Course instructor may change the practical as per syllabus.

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1	Microprocessors Architecture, Programming and Applications with the 8085.	Ramesh Gaonkar	PENRAM	Fifth	2012
2	8080A/8085 Assembly Language Programming	Lance A. Leventhel	Osborne		1978

Section II: Numerical Methods Practical

Curriculum:

Sr. No.	Title	Learning Points	No of Hours
1	**Error Calculation**	a. Program to calculate the roots of a quadratic equation using the formula b. Program for error calculation c. Program to evaluate ex using infinite series	2+2
2	**Solution of algebraic and transcendental equations**	a. Program to solve algebraic and transcendental equation by bisection method. b. Program to solve algebraic and transcendental equation by false position method. c. Program to solve algebraic and transcendental equation by Secant method. d. Program to solve algebraic and transcendental equation by Newton Raphson method.	2+2
3	**Interpolation**	a. Program for Newton's forward interpolation. b. Program for Newton's backward interpolation. c. Program for Lagrange's interpolation.	2+2
4	**Solving linear system of equations by iterative methods**	a. Program for solving linear systems of equations using Gauss Jordan method. b. Program for solving linear systems of equations using Gauss Seidel method.	2
5	**Numerical Differentiation**	a. Program to obtain derivatives numerically.	2
6	**Numerical Integration**	a. Program for numerical integration using Trapezoidal rule. b. Program for numerical integration using Simpson's 1/3rd rule. c. Program for numerical integration using Simpson's 3/8th rule.	2+2
7	**Solution of differential equations 1**	a. Program to solve differential equations using Euler's method. b. Program to solve differential equations using modified Euler's method.	2
8	**Solution of differential equations 2**	a. Program to solve differential equations using Runge-kutta 2nd order and 4th order methods.	2
9	**Regression 1**	a. Program for Linear regression. b. Program for Polynomial Regression.	2
10	**Regression 2**	a. Program for multiple linear regression. b. Program for non-linear regression.	2

This is sample Practical list. Course instructor may change the practical as per syllabus.

Learning Resources recommended:

https://www.scilab.org/about/community/books

Evaluation Pattern

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Certified Journal (section I and II)	20
Attendance and active participation in both Laboratory	20

B. Semester End Evaluation (Paper Pattern) (60 Marks – 4 hours):

Section I: (30 Marks - 2 Hours)

Question No	Unit	Marks
1	Program 1	10
2	Program 2	15
3	Viva	05

Section II:(30 Marks - 2 Hours)

Question No	Unit	Marks
1	Program 1	10
2	Program 2	15
3	Viva	05

Name of the Course	**Computer Skills -2 Practical**
Course Code (refer to student handbook)	**USIT208**
Class	**F.Y.B.Sc.IT**
Semester	**II**
No of Credits	**2**
Nature	**Practical**
Type (applicable to NEP only)	**Vocational Skill Course**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	Restructuring is done to demonstrate a basic understanding of Operating Systems and ability of web designing also to get understanding of advanced web designing technologies.

Nomenclature: Computer Skills -2 Practical

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Study different operating systems.
2. Analyze the working of an operating system, its programming interface and file system.
3. Develop algorithms for process scheduling, memory management, page replacement algorithms and disk scheduling
4. Use Bootstrap to create websites quickly.
5. Access, setup and use Bootstrap in web projects.
6. Create websites from scratch using Bootstrap.
7. Create responsive websites rapidly.

Section I: Operating System Practical

Curriculum:

Sr. No.	Title	Learning Points	No of hrs
1	**Installation 1**	a. Installation of virtual machine software.	2
2	**Installation 2**	a. Installation of Linux operating system (RedHat / Ubuntu) on virtual machine.	2
3	**Installation 3**	a. Installation of Windows operating system on virtual machine.	2
4	**Linux commands: Working with Directories**	a. pwd, cd, absolute and relative paths, ls, mkdir, rmdir, b. file, touch, rm, cp. mv, rename, head, tail, cat, tac, more, less, strings, chmod	2+2
5	**Linux commands: Working with files**	a. ps, top, kill, pkill, bg, fg, b. grep, locate, find, locate. c. date, cal, uptime, w, whoami, finger, uname, man, df, du, free, whereis, which. d. Compression: tar, gzip.	2+2
6	**Windows (DOS) Commands 1**	a. Date, time, prompt, md, cd, rd, path. b. Chkdsk, copy, xcopy, format, fidsk, cls, defrag, del, move.	2+2
7	**Windows (DOS) Commands 2**	a. Diskcomp, diskcopy, diskpart, doskey, echo b. Edit, fc, find, rename, set, type, ver	2

8	**Working with Linux Desktop and utilities**	a. The vi editor. b. Graphics c. Terminal d. Adjusting display resolution e. Using the browsers f. Configuring simple networking g. Creating users and shares	2+2
9	**Programming with Linux**	a. Installing utility software on Linux and Windows Running C/C++ Programs with command line argument in linux	2+2
10	**Introduction to Shell Scripting**	a. Basic Operators b. Decision Making c. Looping	2

This is sample Practical list. Course instructor may change the practical as per syllabus.

Section II: Responsive Web Designing Practical

Curriculum:

Sr. No	Title	Learning Points	No of Hrs.
1	**Setting Up Bootstrap**	a. Install bootstrap framework and understand various tags. b. Design webpage that shows department name, college name at center of web page by using bootstrap framework and without using bootstrap framework.	2
2	**Container Class**	a. Display student information content on responsive webpage by using container and container fluid classes. b. Use offset column recording column and nesting column to create responsive web page for given format.	2+2
3	**Grid System**	a. Create a responsive web page of your class time table by using the bootstrap grid system.	2
4	**Table & Events**	a. Show at least 3 to 4 co-curricular, extracurricular activities of students that includes responsive tables with style such as overstate when Mouse over different colors of each row table with strip row.	2
5	**Text-Decoration & Form Layout**	a. Use Bootstrap typography to create responsive web pages on a given topic. b. Design responsive web page for student registration form using bootstrap form layout form control bootstrap button	2+2
6	**Glyphicons & Components**	a. Create various types of menus using bootstrap menu components such as right aligned drop down menu drop of menu adding headers of each item and glyphicons component. b. Design responsive webpage that should show odd semesters and even semesters considered as a menu course of 8th semester as sub menu using button groups and button toolbar component.	2+2
7	**Bootstrap input groups components**	a. Used different bootstrap input groups components to create responsive web pages for job applications or any other kind of application.	2
8	**Different types of components**	a. Create responsive web pages of education websites using bootstrap breadcrumb, pagination, labels, JumboTron, page header, thumbnail component.	2

9	**Progress Bar & Components**	a. Following task to be performed using bootstrap progress bars components i. creating progress bar ii. adding label to progress bar iii. creating multi color stripped and animated progress bars	2+2
10	**Carousel bootstrap plugin**	a. Design animated photo gallery page Using Carousel bootstrap plugin with minimum 7 photos	2+2

This is sample Practical list. Course instructor may change the practical as per syllabus.

Evaluation Pattern

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Certified Journal (section I and II)	20
Attendance and active participation in both Laboratory	20

B. Semester End Evaluation (Paper Pattern) (60 Marks – 4 hours):

Section I: (30 Marks - 2 Hours)

Question No	Unit	Marks
1	Program 1	10
2	Program 2	15
3	Viva	05

Section II:(30 Marks - 2 Hours)

Question No	Unit	Marks
1	Program 1	10
2	Program 2	15
3	Viva	05

Name of the Course	**Technical Communication Skills II**
Course Code (refer to student handbook)	**USIT208**
Class	**F.Y.B.Sc.IT**
Semester	**II**
No of Credits	**2**
Nature	**Theory**
Type (applicable to NEP only)	**Ability Enhancement Course**
Highlight revision specific to employability/ entrepreneurship/ skill development (if any) 100 words	**employability/ entrepreneurship/ skill development**

Nomenclature: Technical Communication Skills II

Course Outcomes:

On the successful completion of this course, the learner will be able to

1. Recognize the importance of various types of communication in technical set up.
2. Understand the dynamics in different forms of formal communication.
3. Learn about active listening and the art of giving presentations and interviews.
4. Learn the art of business writing and ethics in business communication across functional areas.
5. Evaluate, analyze and interpret technical data.

Curriculum:

Unit	Title	Learning Points	No. of hrs
I	**Effective presentation Strategies**	Introduction, Defining purpose, Analyzing audience and Locale, Organizing contents, preparing outline, Visual Aids, Understanding Nuances of delivery, Kinesics	10
	Interview	Introduction, objectives, types of interview, job interviews	
	Business writing	Introduction, Importance of written Business, Five main strategies of writing business messages	

II	Business correspondence	Business letter writing, common component of Business letter, Strategies for writing body of a letter, Types of Business letter, writing memos	10
	Business reports and proposal	What is a report? Steps in writing routine Business report, parts of report, corporate reports and Business proposals	
	Careers and Resume	Introduction to career building, resume format, traditional, electronic and video resumes, sending resume, follow up letters and online recruitment process	
III	Communication across Functional areas	Financial communication, MIS	10
	Ethics in Business Communication	Ethical communication, Values, ethics and communication, ethical dilemmas facing manager, strategic approaches to corporate ethics	
	Creating and Using Visual Aids	Object, Models, Handouts, Charts and Graphs, Text Visuals , Formatting Computer generated charts, graphs and visuals	

Learning Resources recommended:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1	Business Communication	Meenakshi Raman & Prakash Singh	Oxford-Higher Education	2nd edition	2006
2	Professional Communication	Aruna Koneru	McGraw Hill		2008
3	Professional Communication Skills	Laila Dias	Vipul Prakashan	1st edition	2010

Evaluation Pattern:

A. Continuous Internal Evaluation (40 Marks):

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline – 1 unit test of 20 marks	20
Assignments	10
Attendance and active participation in classroom	10

B. Semester End Evaluation (Paper Pattern) (60 Marks – 2 hours):

Question No	Unit	Marks
1	I	15
2	II	15
3	III	15
4	I II III	05 05 05

Guidelines for paper pattern for Semester End Evaluation:
1. All questions will be compulsory.
2. Descriptive type of questions, programming-based questions, problem solving / numerical based questions, single line answers, etc., will contain internal options.
3. Refer **appendix I** for Paper pattern.