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

**Bachelor of Science
In Information Technology
(B.Sc. I.T.)**

Three Year Integrated Programme
Six Semesters Course Structure
Revised Scheme of Examination

Faculty of Science
(Under-graduate Programme)

Choice Based Credit System (CBCS)
Academic Year- 2024-25

Preamble

The Bachelor of Science in Information Technology (BSc IT) program is designed to provide students with a comprehensive understanding of the theory, principles, and practical applications of information technology in contemporary society. Rooted in a commitment to academic excellence, innovation, and professional development, the program aims to prepare students for dynamic careers in the rapidly evolving field of IT.

The main objectives of the programme are:

1. Technical Proficiency:Equip students with a strong foundation in core IT concepts, methodologies, and technologies, empowering them to analyze, design, develop, and implement innovative solutions to real-world problems.

2. Critical Thinking and Problem-Solving: Foster critical thinking skills essential for analyzing complex IT issues, evaluating alternative solutions, and making informed decisions to address technological challenges effectively.

3. Communication and Collaboration:Cultivate effective communication skills, both written and oral, and foster collaborative teamwork abilities, essential for successful interaction within multidisciplinary teams and effective dissemination of information.

4. Ethical and Social Responsibility: Instill ethical awareness and social responsibility among students, emphasizing the importance of integrity, respect, and accountability in the ethical use of technology and its impact on individuals, organizations, and society.

5. Professional Development: Provide opportunities for students to develop essential professional skills, including project management, leadership, and lifelong learning habits, preparing them for successful careers and continued personal and professional growth in the field of IT.

The syllabus is restructured according to the New Education Policy 2020 and is aimed to achieve the objectives.

The syllabus spanning three years-Six Semesters covers the industry relevant courses. The students will be ready for the jobs available in different fields like:

- ☐ Software Development (Programming)
- ☐ Website Development
- ☐ Mobile app development
- ☐ IoT
- ☐ Software Testing
- ☐ Networking
- ☐ Database Administration
- ☐ System Administration
- ☐ Cyber Law Consultant
- ☐ GIS (Geographic Information Systems)
- ☐ IT Service Desk
- ☐ Security
- ☐ And many others

Name of Programme	**B.Sc. Information Technology**
Level	UG
No of Semesters	06
Year of Implementation	**2024-25**

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.

R.E. Society's
R. P. Gogate College of Arts & Science and
R. V. Jogalekar College of Commerce (Autonomous), Ratnagiri
Board of Studies in Information Technology
Academic Year 2024-25

No. of Courses	Semester I	Cred its	No. of Courses	Semester II	Cred its
	Discipline Specific Course (DSC)			*Discipline Specific Course (DSC)*	
	Major			*Major*	
USIT101	C Programming	02	USIT201	Object Oriented Programming with C++	02
USIT102	Digital logic and Applications	02	USIT202	Operating System	02
USIT103	Programming Practical 1	02	USIT203	Programming Practical 2	02
	Minor			*Minor*	
USIT104	Discrete Mathematics	02	USIT204	Numerical Methods	02
USIT105	Practical M1	02	USIT205	Data Communication and Networking	02
			USIT206	Practical M2	02
	Indian Knowledge System(IKS)				
USIT106	Vedic Mathematics	02			---
	Vocational Skill Course (VSC)/			*Vocational Skill Course (VSC)/*	
USIT107	Computer Skills-1 practical	02			
	Skill Enhancement Course (SEC)			*Skill Enhancement Course (SEC)*	
			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*	
	Select any one from OE	02		Select any one from OE	02

	list			list	
	Value Education Course (VEC)			*Value Education Course (VEC)*	
USVECBOT101	Environmental studies 1	**02**	**USVECBOT201**	Environmental studies 2	**02**
	Co-Curricular			*Co-Curricular*	
	Any one course from the CC Basket	**02**		Any one course from the CC Basket	**02**
Total Credits		**22**	**Total Credits**		**22**

(To be implemented from Academic Year- 2024-25)

Table 1. Open Electives (Offered by Science & Arts faculty)

Open Elective (Any One)		*Open Elective (Any One)*	
USOEIT101	**Google workspace and multimedia apps**	USOECS201	**Basics of Excel**
USOEBT102	**Introduction to Food Science**	USOEBT202	**Introduction to Bioinformatics**
USOEZO103	**Health and Hygiene I**	USOEZO203	**Health and Hygiene II**
USOEPH104	**Introduction to Basic Astronomy**	USOEPH204	**Observational Astronomy**
		USOECS205	**Basic Computer System**
		USOEIT206	**Social Media Awareness**
UAOEMAR 101	*भाषिक कौशल्ये* (Language Skills): *भाग १*	UAOEMAR 201	*भाषिक कौशल्ये* (Language Skills): *भाग २*
UAGESF101	**Science Fiction I**	UAGESF201	**Science Fiction II**
UAGEAP102	**Art of Presentation I**	UAGEAP202	**Art of Presentation II**

Table 2. Skill enhancement courses for Science, IT, BT, CS Faculty

Skill Enhancement Courses	
USCHS204	Skills in Classical Methods of Analysis I
USZOS204	Aquarium Fish Keeping
USBOTS204	Propagation practices for garden plants
USPHS204	Basic Measurement skills and data analysis
USMAS204	Basic Maths for competitive Exams
USCSS207	LINUX Practical
USBTS207	Bio-analytical Techniques
USITS208	Computer Skills-2 Practical

Table 3: Co-curricular Course

Course Code	Semester I	Course Code	Semester II
GJCC101	National Social Service (NSS)	GJCC201	National Social Service (NSS)
GJCC102	National Cadet Corps (NCC)	GJCC202	National Cadet Corps (NCC)
GJCC103	Sports & Yoga	GJCC203	Sports & Yoga
GJCC104	Cultural	GJCC204	Cultural
GJCC105	Career Katta	GJCC205	Career Katta
GJCC106	Life Long Learning	GJCC206	Life Long Learning
GJCC107	Shodhvedh / Avishkar Projects	GJCC207	Shodhvedh / Avishkar Projects
GJCC108	Science Association	GJCC208	Science Association
GJCC109	Film Club	GJCC209	Film Club
GJCC110	Infotech Courses	GJCC210	Infotech Courses

SEMESTER I

Syllabus for Bachelor of Science in Information Technology

for the year 2024-25

Nomenclature of the Course	C Programming
Class	F.Y.B.Sc.I.T
Semester	I
Course Code	USIT101
No. of Credits	2 (2 Hours Per Week)
Nature	Theory
Type	Major (Mandatory)

Course Outcomes:
CO1: Learn the basic principles of programming.
CO2: Develop logic using algorithms and flowchart.
CO3: Acquire the information about data types.
CO4: Learn and apply programming constructs
CO5: Understand functional programming with library and user defined functions.
CO6: learn syntax and semantics of Array, Pointer, Structure using programs.
CO7: Handle the operations on files

Syllabus:

Unit No.	Unit Title	Subtitles (Learning Points)
I	Introduction	What is Programming? Program Characteristics, Algorithms,Flowchart symbols, Algorithm Practice.
	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
II	Type of operators	Arithmetic operators, relational and logical operators, Increment and Decrement operators, assignment operators, the conditional operator, Assignment operators.
	Control Flow	Statements and Blocks, If-Else, Else-If, Switch, Loops-While,For Loops-Do-while, Break and Continue, Goto statement and Labels
III	Pointer, Arrays And Structure	Pointer and Addresses,1D, 2D,Multidimensional Array. Structure Definition
	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
	File management in C	Defining and Opening file, Closing a file, Input / Output operations on file.

Prescribed Text/s (If any):
- Programming in ANSI C - E.Balagurusamy, Tata McGraw-Hill, 7th Edition, 1982
- Let us C - Yashwant P. Kanetkar, BPB publication
- Programming with C - Byron Gottfried, Tata McGRAW-Hill, 2nd Edition, 1996

Other Learning Resources recommended:
- Mastering C - K R Venugopal, Tata McGraw-Hill, 6th Edition, 2007
- Programming Language - Brian W. Kernighan and Denis M. Ritchie., PHI, 2nd Edition, 1988

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
I	Introduction, Foundation Of C	Chalk and board, Audio – Visual aids, Problem solving sessions	10
II	Type of operators,Control Flow	Chalk and board, Audio – Visual aids, Problem solving sessions	10
III	Pointer, Arrays And Structure,Functions and Program,File management in C	Chalk and board, Audio – Visual aids, Problem solving sessions	10

Evaluation Pattern

A. AContinuous Internal Evaluation: Maximum Marks:20

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline	**10**
Assignments	**05**
Attendance and active participation in classroom	**05**

B. Semester End Examination: Maximum Marks: 30

Question No. and Sub questions (If any)	Unit and sub unit (with number and title)	Type of Question (Essay / short note / Objective / Diagram, etc.)	Marks
Q.1) A)	Unit 1(Introduction, Foundation Of C)	Short Note / Diagram / Program	06
Q.1) B)	Unit 1(Introduction, Foundation Of C)	Short Note / Diagram/ Program	04

Q.2) A)	Unit 2(Type of operators, Control Flow)	Short Note / Diagram/ Program	06
Q.2) B)	Unit 2(Type of operators, Control Flow)	Short Note / Diagram/ Program	04
Q.3) A)	Unit 3(Pointer, Arrays And Structure,Functions and Program,File management in C)	Short Note / Diagram/ Program	06
Q.3) B)	Unit 3(Pointer, Arrays And Structure,Functions and Program,File management in C)	Short Note / Diagram/ Program	04

Nomenclature of the Course	Digital Logic and Applications
Class	F.Y.B.Sc.I.T.
Semester	I
Course Code	USIT102
No. of Credits	2 (2 Hours Per Week)
Nature	Theory
Type	Major (Mandatory)

Course Outcomes:

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

CO1: Introduce the basics of logic in digital electronics as an entry level course.
CO2: Interpret and assess number systems and the conversions of number systems
CO3: Analyze the boolean expressions and reduce the expression to the minimum.
CO4: Design simple logic circuits using tools such as Boolean Algebra and Karnaugh Mapping.
CO5: Understand the state of a memory cell and its types using flip-flops.
CO6: Create simple digital systems using counters, registers etc.

Syllabus:

Unit No.	Unit Title	Subtitles (Learning Points)
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
	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
	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
	Applications and microprocessor	Bit Arithmetic and Logic unit, Carry lookahead generator, Binary Multiplication and Division algorithm, Booth's multiplication algorithm.

		Introduction to 8085 Microprocessor, Architecture, Pin Diagram

Prescribed Text/s (If any):
- Digital Logic Design - Sonali Singh, BPB publications,1st Edition, 2015
- Fundamentals of Digital Electronics and Logic Design - Subir Kumar Sarkar, Asish Kumar De, Souvil Sarkar, Pan Stanford Publishing,1st Edition, 2014

Other Learning Resources recommended:
- Digital Electronics Principles, Design and Applications - Anil Maini, Wiley, 1st Edition, 2007
- Fundamentals of Logic Design - Charles H Roth, Jr., Larry L Kinney, Cengage Learning, 7th Edition, 2014

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
I	Digital Systems and Binary numbers, Logic gates and Logic Circuits	Chalk and board, Audio – Visual aids, Problem solving sessions	10
II	Boolean algebra and Gate level minimization, Combinational logic	Chalk and board, Audio – Visual aids, Problem solving sessions	10
III	Sequential circuits, Applications	Chalk and board, Audio – Visual aids, Problem solving sessions	10

Evaluation Pattern

A. Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline	**10**
Assignments	**05**
Attendance and active participation in classroom	**05**

B. Semester End Examination: Maximum Marks: 30

Question No. and Sub questions (If any)	Unit and sub unit (with number and title)	Type of Question (Essay / short note / Objective / Diagram, etc.)	Marks
Q.1) A)	Unit 1(Digital Systems and Binary numbers, Logic gates and Logic Circuits)	Short Note / Diagram	06
Q.1) B)	Unit 1(Digital Systems and Binary numbers, Logic gates and Logic Circuits)	Short Note / Diagram	04
Q.2) A)	Unit 2(Boolean algebra and Gate level minimization, Combinational logic)	Short Note / Diagram	06
Q.2) B)	Unit 2(Boolean algebra and Gate level minimization, Combinational logic)	Short Note / Diagram	04
Q.3) A)	Unit 3(Sequential circuits, Applications)	Short Note / Diagram	06
Q.3) B)	Unit 3(Sequential circuits, Applications)	Short Note / Diagram	04

Nomenclature of the Course	Programming Practical 1
Class	F.Y.B.Sc.I.T.
Semester	I
Course Code	USIT103
No. of Credits	2 (4 Hours Per Week)
Nature	Practical
Type	Major (Mandatory)

Course Outcomes:	

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

CO1: Work with textual information, characters and strings.
CO2: Understanding of a functional hierarchical code organization
CO3: Debug the program
CO4: Understand the differences between syntax errors, runtime errors, and logic
     errors.
CO5: Develop the application using C Programming language.

Section I: C Programming Practical

Syllabus:

Sr. No.	Title	Subtitles (Learning Points)
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	**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.
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.
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
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
7	Recursive Function	a. Write a program using a recursive function.
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
9	Files	a. Write a program to copy the contents of the file from one file into another.
10	Files	a. Write a program to read text from the user and store that text into file.

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

Prescribed Text/s (If any):
- Programming in ANSI C - E.Balagurusamy, Tata McGraw-Hill, 7th Edition, 1982
- Let us C - Yashwant P. Kanetkar, BPB publication
- Programming with C - Byron Gottfried, Tata McGRAW-Hill, 2nd Edition, 1996

Teaching Plan:

Sr. No.	Title	Teaching Methods	No. of Hours
1	Algorithm and Flowchart	Practical	2
2	Conditional Statements, Goto Statements	Practical	2+2
3	Loops	Practical	2+2
4	Programs on Patterns	Practical	2+2
5	Arrays	Practical	2+2

6	Built-in and User Defined Functions	Practical	2
7	Recursive Function	Practical	2
8	Pointers	Practical	2+2
9	Files	Practical	2
10	Files	Practical	2

Section II: Application Development using C

Guidelines:

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)**

Syllabus:

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

Teaching Plan:

Sr. No.	Title	Teaching Methods	No. of Hours
0	Feasibility Studies	Practical	4
1	Design Phase-I	Practical	4
2	Design Phase-II	Practical	4
3	Implementation Phase	Practical	8
4	Integration Phase	Practical	6
5	Documentation	Practical	4

Evaluation Pattern

A. Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Certified Journal (section I)	05
Project Documentation(Section II)	05
Attendance and active participation in both Laboratory	10

B. Semester End Examination: Maximum Marks: 30*
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

(*Addition of marks of both the sections will be converted to marks out of 30)

Nomenclature of the Course	Discrete Mathematics
Class	F.Y.B.Sc.I.T.
Semester	I
Course Code	USIT104
No. of Credits	2 (2 Hours Per Week)
Nature	Theory
Type	Minor

Course Outcomes:

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

CO1: Perform set operations
CO2: Apply concepts of Relations and functions
CO3: Apply basic and advanced principles of counting
CO4: Calculate discrete probabilities
CO5: Use graphs and trees

Syllabus:

Unit No.	Unit Title	Subtitles (Learning Points)
I	**Set Theory**	Introduction, Sets and Elements, Subsets, Venn Diagrams, Set Operations, Algebra of Sets, Finite Sets, Counting Principle, Power Sets, Partitions, Mathematical Induction
	Relations	Introduction, Product Sets, Relations, Pictorial Representation of Relations, Composition of Relations, Types of Relations, Closure Properties, Equivalence Relations, Partial Ordering Relations
	Functions	Introduction, Functions, One-to-One, Onto, and Invertible Functions, Mathematical Functions, Exponential and Logarithmic Functions
II	**Techniques of Counting**	Introduction, Basic Counting Principles, Permutations, Combinations, the Pigeonhole Principle, Tree Diagrams, Combinations with Repetitions, Ordered and Unordered Partitions
	Probability	Introduction, Sample Space and Events, Finite Probability Spaces, Conditional Probability, Independent Events
III	**Graph Theory**	Graphs and Multigraphs, Subgraphs, Directed Graphs, Isomorphic Graphs, Paths, Connectivity, Eulerian Graphs, Labeled and Weighted Graphs, Complete, Regular and Bipartite Graphs, Tree Graphs, Planar Graphs, Representing Graphs in

		Computer Memory, Graph Algorithms: Depth-First and Breadth-First Searches
	Binary Trees	Introduction, Binary Trees, Complete and Extended Binary Trees, Representing Binary Trees in Memory, Traversing Binary Trees, Binary Search Trees, Path Lengths, Huffman's Algorithm

Prescribed Text/s (If any):
- Discrete Mathematics,Schaum's Outlines Series - Seymour Lipschutz, Marc Lipson, Tata MCGraw Hill, 3rd Edition, 2007
- Discrete Mathematics with Applications - Sussana S. Epp,Cengage Learning, 5th Edition, 2018

Other Learning Resources recommended:
- Discrete Mathematics and its Applications - Kenneth H. Rosen, Tata MCGraw Hill, 8th Edition, 2019

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
I	Set Theory, Relations, Functions	Chalk and board, Audio – Visual aids, Problem solving sessions	10
II	Techniques Of Counting, Probability	Chalk and board, Audio – Visual aids, Problem solving sessions	10
III	Graph Theory, Binary Trees	Chalk and board, Audio – Visual aids, Problem solving sessions	10

Evaluation Pattern

A. Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline	**10**
Assignments	**05**
Attendance and active participation in classroom	**05**

B. Semester End Examination: Maximum Marks: 30

Question No. and Sub questions (If any) (E.g. Q. 1 a) …	Unit and sub unit (with number and title)	Type of Question (Essay / short note / Objective / Diagram, etc.)	Marks
Q.1) A)	Unit 1(Set Theory, Relations, Functions)	Short Note / Diagram / Problem Solving	06
Q.1) B)	Unit 1(Techniques Of Counting, Probability)	Short Note / Diagram / Problem Solving	04
Q.2) A)	Unit 2(Techniques Of Counting, Probability)	Short Note / Diagram / Problem Solving	06
Q.2) B)	Unit 2(Techniques Of Counting, Probability)	Short Note / Diagram / Problem Solving	04
Q.3) A)	Unit 3(Graph Theory, Binary Trees)	Short Note / Diagram / Problem Solving	06
Q.3) B)	Unit 3(Graph Theory, Binary Trees)	Short Note / Diagram / Problem Solving	04

Nomenclature of the Course	M1 Practical
Class	F.Y.B.Sc.I.T.
Semester	I
Course Code	USIT105
No. of Credits	2 (4 Hours Per Week)
Nature	Practical
Type	Minor

Course Outcomes:

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

CO1: Apply and test the gates learnt using various IC's .
CO2: Evaluate the Boolean expression to reduce and minimize the gates used
CO3: Understand different commands and functions of SCILAB.
CO4: Use tools to compute solutions of various discrete mathematical structures.

Section I: Digital Logic and Applications Practical

Syllabus:

Sr.No	Unit Title	Subtitles (Learning Points)
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	**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.
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.
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
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
6	**Design and implement Arithmetic circuits**	a.	Design and implement 2-by-2 bit multiplier
7	**Implement Encoders and Decoders**	a. b.	Design and implement 8: 3 encoder Design and implement 3:8 decoder
8	**Multiplexers and Demultiplexers**	a. b. c. d.	Design and Implement 4:1 multiplexer Design and Implement 1:4 demultiplexer Study IC 74151 8: 1 multiplexer and implement the expression Study IC 74138 3: 8 decoder and implement the expression
9	**Study of Flipflops and Counters**	a. b.	Study of IC's 7473, 7474, and 7476 Design a 3-bit ripple/ synchronous counter using IC 7473 and required gates
10	**Design of Shift Registers**	a. b.	Design of Shift registers using IC 7474 Implementation of digits using seven segment displays

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

Prescribed Text/s (If any):
- **https://cdn.hackaday.io/files/1814287762215552/logisim_tutorial.pdf**

Other Learning Resources recommended:
- **http://www.cburch.com/logisim/docs/2.1.0/guide/index.html**

Teaching Plan:

Sr.No.	Title	Teaching Methods	No. of Hours
1	Study of basic gates and Universal gates	Practical	2+2
2	Study of Boolean expressions	Practical	2+2
3	Design of Combinational Circuits using K-maps	Practical	2
4	Design and implement code converters	Practical	2+2
5	Implement Adder and Subtractor circuits	Practical	2
6	Design and implement Arithmetic circuits	Practical	2
7	Implement Encoders and Decoders	Practical	2
8	Multiplexers and Demultiplexers	Practical	2+2
9	Study of Flipflops and	Practical	2+2

	Counters		
10	Design of Shift Registers	Practical	2

Section II: Introduction to Scilab tool Practical

Syllabus:

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

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

Prescribed Text/s (If any):
- **https://www.scilab.org/sites/default/files/Scilab_beginners.pdf**
- **https://www.scilab.org**

Teaching Plan:

Sr. No.	Title	Teaching Methods	No. of Hours
1	Introduction to Scilab	Practical	2+2
2	Set Theory	Practical	2+2
3	Functions and Algorithms	Practical	2+2
4	Probability Theory 1	Practical	2+2
5	Probability Theory 2	Practical	2+2
6	Counting 1	Practical	2
7	Counting 2	Practical	2
8	Counting 3	Practical	2
9	Graph Theory	Practical	2
10	Directed Graphs	Practical	2

Evaluation Pattern

A. Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Certified Journal (section I & II)	10
Attendance and active participation in both Laboratory	10

B. Semester End Examination: Maximum Marks: 30*

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

(*Addition of marks of both the sections will be converted to marks out of 30)

Nomenclature of the Course	Vedic Mathematics
Class	F.Y.B.Sc.I.T.
Semester	I
Course Code	USIT106
No. of Credits	2 (2 Hours Per Week)
Nature	Theory
Type	IKS

Course Outcomes:

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

CO1: Make critical thinking.
CO2: Enable to recognize and understand simple techniques of Arithmetic Calculations.
CO3: Use various methods of multiplication and division
CO4: Find square, square roots, cubes and cube roots
CO5: Use the ideas of Vedic Mathematics in daily calculations and make those calculations with accuracy and speed.

Syllabus:

Unit No.	Unit Title	Subtitles (Learning Points)
I	Introduction	History and Evolution of Vedic Mathematics, Techniques in Multiplication (Series of 9, Series of 1 etc), Tables etc.
	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.)
III	Equations	Cubes, Cube roots, Square roots, General division, Quadratic Equations, Simultaneous Equations
	Numerical Aptitude	Use of various Vedic Techniques for answering numerical aptitude questions from Competitive Examinations

Prescribed Text/s (If any):
- The Power of Vedic Maths - Atul Gupta, Jaico Publishing House, 2nd Edition
- Vedic Mathematics Made Easy - Dhaval Bhatiya

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
I	Introduction, Basic Operations	Chalk and board, Audio – Visual aids, Problem solving sessions	10
II	Techniques of Multiplication and Division	Chalk and board, Audio – Visual aids, Problem solving sessions	10
III	Equations, Numerical Aptitude	Chalk and board, Audio – Visual aids, Problem solving sessions	10

Evaluation Pattern

A. Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline	**10**
Assignments	**05**
Attendance and active participation in classroom	**05**

B. Semester End Examination: Maximum Marks: 30

Question No. and Sub questions (If any)	Unit and sub unit (with number and title)	Type of Question (Essay / short note / Objective / Diagram, etc.)	Marks
Q.1) A)	Unit 1(Introduction, Basic Operations)	Short Note / Diagram / Problem Solving	06
Q.1) B)	Unit 1(Introduction, Basic Operations)	Short Note / Diagram / Problem Solving	04
Q.2) A)	Unit 2(Techniques of Multiplication and Division)	Short Note / Diagram / Problem Solving	06
Q.2) B)	Unit 2(Techniques of Multiplication and Division)	Short Note / Diagram / Problem Solving	04
Q.3) A)	Unit 3(Equations, Numerical Aptitude)	Short Note / Diagram / Problem Solving	06
Q.3) B)	Unit 3(Equations, Numerical Aptitude)	Short Note / Diagram / Problem Solving	04

Nomenclature of the Course	Computer Skills-1 practical
Class	F.Y.B.Sc.I.T.
Semester	I
Course Code	USIT107
No. of Credits	2 (4 Hours Per Week)
Nature	Practical
Type	VSC

Course Outcomes:

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

CO1: Design static web pages using HyperText Markup Language (HTML).
CO2: Enhance the look of web pages by implementing CSS.
CO3: Collect information from the user with HTML Forms.
CO4: Design interactive web pages using client-side script (JavaScript).
CO5: Implement Document Object Model and events in web pages using JavaScript.
CO6: Write and deploy basic PHP code to simplify web development.
CO7: Store and retrieve data from a server using PHP.

Syllabus:Web Programming practical

Serial No.	Title	Subtitles (Learning Points)
1	Introduction to HTML5 syntax	Design a web page to study HTML5 basic structure tags
2	Use of basic tags and attributes	a. Design a web page using different text formatting tags. b. Design a web page using different colors and styles.
3	Hyperlinks	Design a web page with links to different pages and allow navigation between web pages.
4	Navbar	Design a web page to create a navbar.
5	Tables	Design a web page to create different tables.
6	Use of table attributes	Design a web page to create tables using different table attributes.
7	Forms-I	Design a web page with a form that uses all types of controls.
8	Forms-II	Design a web page to structure a form using a table.
9	Lists	Design a web page to create different types of lists.
10	Layout and Media	a. Design a web page demonstrating different semantics. b. Design a web page embedding image, audio and video.
11	Imagemaps	Design a web page with Imagemaps.
12	Use of CSS	Design a web page demonstrating different stylesheet types.
13	CSS selectors	Design a web page demonstrating grouping selectors.
14	JavaScript basics and Functions	a. Write a JavaScript program to check if a number is even or odd. b. Write a JavaScript function to add two numbers.

15	JavaScript Programs-I	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.
16	JavaScript Programs-II	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.
17	JavaScript Objects	Using JavaScript, design a web page demonstrating different native objects of JavaScript.
18	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.
19	Basic PHP-I	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.
20	Basic PHP-II	a. Write a PHP program to display the following Binary Pyramid: 1 0 1 1 0 1 0 1 0 1 1 0 1 0 1 b. Write a PHP program to demonstrate different string functions. c. Write a PHP program to demonstrate different array functions.
21	Advanced PHP	Write a PHP program to demonstrate use of sessions and cookies.
22	PHP and MySQL-I	Write a PHP program to: a. Create a database College b. Create a table Department (Dname, Dno, Number_of_faculty) c. Insert 3 records of your choice.

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

Prescribed Text/s (If any):
- Web Design The Complete Reference-Thomas Powell,Tata McGraw Hill
- PHP Project for Beginners-SharanamShah, Vaishali Shah,SPD,2015
- JavaScript 2.0: The Complete Reference-Thomas Powell and Fritz Schneider,TMH, 2nd Edition

Other Learning Resources recommended:
- https://www.w3schools.com/html/html_intro.asp
- https://www.w3schools.com/js/default.asp
- https://www.w3schools.com/php/default.asp

Teaching Plan:			
Unit No.	Unit Title	Teaching Methods	No. of Hours
1	Introduction to HTML5 syntax	Practical	2
2	Use of basic tags and attributes	Practical	2
3	Hyperlinks	Practical	2
4	Navbar	Practical	2
5	Tables	Practical	2+2
6	Use of table attribute	Practical	2
7	Forms-I	Practical	2
8	Forms-II	Practical	2
9	Lists	Practical	2
10	Layout and Media	Practical	2
11	Imagemaps	Practical	2
12	Use of CSS	Practical	2+2
13	CSS selectors	Practical	2
14	JavaScript basics and Functions	Practical	2
15	JavaScript Programs-I	Practical	2+2
16	JavaScript Programs-II	Practical	2+2
17	JavaScript Objects	Practical	2
18	JavaScript Events	Practical	2+2
19	Basic PHP-I	Practical	2+2
20	Basic PHP-II	Practical	2
21	Advanced PHP	Practical	2+2
22	PHP and MySQL-I	Practical	2+2

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Certified Journal (section I & II)	10
Attendance and active participation in both Laboratory	10

B) Semester End Examination: Maximum Marks: 30*
Duration: 3 hours

Question No	Unit	Marks
1	Program 1	20
2	Program 2	15
3	Program 3	15
4	Viva	10

(*Total marks obtained will be converted to marks out of 30)

Nomenclature of the Course	Technical Communication Skills I
Class	F.Y.B.Sc.I.T.
Semester	I
Course Code	USIT108
No. of Credits	2 (2 Hours Per Week)
Nature	Theory
Type	AEC

Course Outcomes:

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

CO1: Recognize the importance of various types of communication in technical set up.
CO2: Understand the dynamics in different forms of formal communication.
CO3: Learn about active listening and the art of giving presentations and interviews.
CO4: Learn the art of business writing and ethics in business communication across functional areas.
CO5: Evaluate, analyze and interpret technical data.

Syllabus:

Unit No.	Unit Title	Subtitles (Learning Points)
I	The Seven Cs of Effective Communication:	Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness
	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
	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
	Email communication	Introduction, Email étiquettes, Techniques of writing Effective Email
	Active Listening	Introduction, Type of listening, Barriers to effective listening

Prescribed Text/s (If any):
- Business Communication - Meenakshi Raman & Prakash Singh, Oxford-Higher Education, 2nd edition, 2006
- Professional Communication - Aruna Koneru, McGraw Hill, 2008

Other Learning Resources recommended:
- Professional Communication Skills - Laila Dias, Vipul Prakashan, 1st edition, 2010

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
I	The Seven Cs of Effective Communication:, Fundamentals of Communication, Barriers to communication	Chalk and board, Audio – Visual aids, Problem solving sessions	10
II	Non-verbal Communication, Conversations, Meeting and conferences	Chalk and board, Audio – Visual aids, Problem solving sessions	10
III	Group Discussion and team presentation, Email communication, Active Listening	Chalk and board, Audio – Visual aids, Problem solving sessions	10

Evaluation Pattern

A. Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline)	**10**
Assignments	**05**
Attendance and active participation in classroom	**05**

B. Semester End Examination: Maximum Marks: 30

Question No. and Sub questions (If any) (E.g. Q. 1 a) …	Unit and sub unit (with number and title)	Type of Question (Essay / short note / Objective / Diagram, etc.)	Marks
Q.1) A)	Unit 1(The Seven Cs of Effective Communication:, Fundamentals of Communication, Barriers to communication)	Short Note / Diagram	06
Q.1) B)	Unit 1(The Seven Cs of Effective Communication:, Fundamentals of Communication, Barriers to communication)	Short Note / Diagram	04
Q.2) A)	Unit 2(Non-verbal Communication, Conversations, Meeting and conferences)	Short Note / Diagram	06
Q.2) B)	Unit 2(Non-verbal Communication, Conversations, Meeting and conferences)	Short Note / Diagram	04
Q.3) A)	Unit 3(Group Discussion and team presentation, Email communication, Active Listening)	Short Note / Diagram	06
Q.3) B)	Unit 3(Group Discussion and team presentation, Email communication, Active Listening)	Short Note / Diagram	04

Nomenclature of the Course	Google Workspace and Multimedia Apps
Class	FYBSc/FYBCom/FYBA/FYBMS/FYBCom A/c&Fin
Semester	**I**
Course Code	USOEIT101
No. of Credits	2
Nature	Practical
Type	**Open Elective(Offered by Department)**

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

CO1: Simplify basic office tasks and improve work productivity.
CO2: To be able to create documents for printing and sharing
CO3: To be able to manage google forms.
CO4: To be able to manage and store data in a spreadsheet.
CO5: Develop a comprehensive understanding of multimedia, encompassing its core components, diverse applications across industries, and a critical analysis of its advantages and disadvantages.
CO6: Attain proficiency in utilizing essential multimedia tools like Canva for graphic design, Lexis Audio Editor for audio editing, and VN Mobile application for video editing. Gain practical experience in creating, editing, and sharing multimedia content across various platforms.

Syllabus:

Sr.No.	Title	Subtitles (Learning Points)
1	Gmail	1. Send and receive emails. 2. Organize your inbox with labels and filters.
2	Google Calendar	1. Schedule appointments and meetings. 2. Set up event reminders.
3	Google Drive	1. Store and organize files in the cloud. 2. Collaborate on documents, spreadsheets, and presentations in real-time.
4	Google Docs	1. Create and edit documents. 2. Collaborate with others in real-time.
5	Google Sheets	1. Create and manage spreadsheets. 2. Perform data analysis and calculations. 3. Share and collaborate on data sheets. 4. Create charts and graphs.
6	Google Slides	1. Create and design presentations
7	Google Forms	1. Design surveys and questionnaires. 2. Collect responses and analyze results. 3. Customize forms with various question types.

		4. Share forms via a link or embed them on websites
8	Lexis Audio Editor	1. Record an audio file and Save it. 2. Export Part of file. 3. Import and Mix: - Define a selection, Copy a part of a song from one to another file 4. Trim a sound file, Append or insert another audio file 5. Record direct into an open sound file
9	CANVA tool	1. Design a Flyer using Canva.
10	VN Mobile	1. Record video for Instagram reels/ YouTube shorts using VN Editor

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

Prescribed Text/s (If any):
- https://support.google.com/
  .

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
1	Gmail	Practical	2+2
2	Google Calendar	Practical	2
3	Google Drive	Practical	2
4	Google Docs	Practical	2+2
5	Google Sheets	Practical	2+2
6	Google Slides	Practical	2+2
7	Google Forms	Practical	2
8	Lexis Audio Editor	Practical	2+2
9	CANVA tool	Practical	2
10	VN Mobile	Practical	2

SEMESTER II

Nomenclature of the Course	Object Oriented Programming with C++
Class	F.Y.B.Sc.I.T.
Semester	II
Course Code	USIT201
No. of Credits	2 (2 Hours Per Week)
Nature	Theory
Type	Major (Mandatory)

Course Outcomes:

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

CO1 : Understand the concept of OOPs, features of C++ language.
CO2 : Understand and apply various types of Data Types , Operators,Conversions while designing the program.
CO3 : Understand and apply the concepts of Classes & Objects, friend function, constructors & destructors in program design.
CO4 : Design & implement various forms of inheritance, String class,calling base class constructors.
CO5 : Apply & Analyze operator overloading, runtime polymorphism,Generic Programming.
CO6 : Analyze and explore various Stream classes, I/O operations and exception handling.

Syllabus:

Unit No.	Unit Title	Subtitles (Learning Points)
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
	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
	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,Rules for 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
	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 ,

Prescribed Text/s (If any):
- Object Oriented Programming in C++ - E Balagurusamy, Tata McGraw-Hill, 5th Edition, 2011.
- Object-oriented Programming C++ Simplified - Hari Mohan Pandey, University Science Press,1st Edition, 2017.
- Object-Oriented Programming in C++ - Robert Lafore, Sams, 4th Edition, 2002.
- Programming with ANSI C++ - Bhushan Trivedi, Oxford University Press, 2nd Edition, 2012.
  .

Other Learning Resources recommended:
- Demystified Object-Oriented Programming with C++ - Dorothy R. Kirk, Packt Publishing Lt,1st Edition, 2012.
- C++ Programming:An Object-Oriented Approach - Behrouz A. Forouzan, Richard F.Gilberg, McGraw-Hill Education,1st Edition, 2020.
- C++ How to Program - Paul Deitel, Harvey Deitel, Pearson Education, 10th Edition, 2017

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
I	Starting With C++, Features Of C++, Operators And References In C++, Introduction to Object-Oriented Concepts	Chalk and board, Audio – Visual aids, Problem solving sessions	10
II	Function In C++, Class and	Chalk and board, Audio – Visual	10

	Objects In C++, Working With Constructor And Destructor, Working With Operator Overloading	aids, Problem solving sessions	
III	Working With Inheritance In C++, Pointers To Objects And Virtual,Template Programming Functions, File Handling In C++, Exception Handling In C++	Chalk and board, Audio – Visual aids, Problem solving sessions	10

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline)	**10**
Assignments	**05**
Attendance and active participation in classroom	**05**

B) Semester End Examination: Maximum Marks: 30

Question No. and Sub questions (If any)	Unit and sub unit (with number and title)	Type of Question (Essay / short note / Objective / Diagram, etc.)	Marks
Q.1) A)	Unit 1(Starting With C++, Features Of C++, Operators And References In C++, Introduction to Object-Oriented Concepts)	Short Note / Diagram / Program	06
Q.1) B)	Unit 1(Starting With C++, Features Of C++, Operators And References In C++, Introduction to Object-Oriented Concepts)	Short Note / Diagram / Program	04
Q.2) A)	Unit 2(Function In C++, Class and Objects In C++, Working With Constructor And Destructor, Working With Operator Overloading)	Short Note / Diagram / Program	06
Q.2) B)	Unit 2(Function In C++, Class and Objects In C++, Working With Constructor And	Short Note / Diagram / Program	04

		Destructor, Working With Operator Overloading)		
Q.3) A)		Unit 3(Working With Inheritance In C++, Pointers To Objects And Virtual,Template Programming Functions, File Handling In C++, Exception Handling In C++)	Short Note / Diagram / Program	06
Q.3) B)		Unit 3(Working With Inheritance In C++, Pointers To Objects And Virtual,Template Programming Functions, File Handling In C++, Exception Handling In C++)	Short Note / Diagram / Program	04

Nomenclature of the Course	Operating System
Class	F.Y.B.Sc.I.T.
Semester	II
Course Code	USIT202
No. of Credits	2 (2 Hours Per Week)
Nature	Theory
Type	Major (Mandatory)

Course Outcomes:	

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

CO1**:** Understand Functions, Services and structure of Operating Systems.
CO2: Understand processes, threads, schedulers and explanation of CPU scheduling.
CO3: Understand issues related to Process Synchronization and focus on principles of Deadlock and related problems.
CO4: Comprehend the mechanisms used in Memory Management and Virtual Memory
CO5: Understand the concepts of File System, secondary storage management and Disk Scheduling**.**

Syllabus:	

Unit No.	Unit Title	Subtitles (Learning Points)
I	**Introduction**	What Is An Operating System? History Of Operating System, Computer Hardware, Different Operating Systems, Operating System Concepts, System Calls, Operating System Structure.
	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.
	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.
	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

Prescribed Text/s (If any):
- Modern Operating Systems - Andrew S.Tanenbaum, Herbert Bos, Pearson, 4th Edition, 2014**.**
- Operating Systems:Internals and Design Principles - Willaim Stallings, Pearson, 8th Edition, 2009.
- Operating System Concepts - Abraham Silberschatz, Peter B.Galvineg Gagne, Wiley, 8th Edition.

Other Learning Resources recommended:
- Operating Systems - Godbole and Kahate, McGraw Hill, 3rd Edition

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
I	Introduction, Processes and Threads	Chalk and board, Audio – Visual aids, Problem solving sessions	10
II	Memory Management, File Systems	Chalk and board, Audio – Visual aids, Problem solving sessions	10
III	Deadlock, Study of LINUX and ANDROID, Study of Windows	Chalk and board, Audio – Visual aids, Problem solving sessions	10

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline)	**10**
Assignments	**05**
Attendance and active participation in classroom	**05**

B) Semester End Examination: Maximum Marks: 30

Question No. and Sub questions (If any)	Unit and sub unit (with number and title)	Type of Question (Essay / short note / Objective / Diagram, etc.)	Marks
Q.1) A)	Unit 1(Introduction, Processes and Threads)	Short Note / Diagram	06

Q.1) B)	Unit 1(Introduction, Processes and Threads)	Short Note / Diagram	04
Q.2) A)	Unit 2(Memory Management, File Systems)	Short Note / Diagram	06
Q.2) B)	Unit 2(Memory Management, File Systems)	Short Note / Diagram	04
Q.3) A)	Unit 3(Deadlock, Study of LINUX and ANDROID, Study of Windows)	Short Note / Diagram	06
Q.3) B)	Unit 3(Deadlock, Study of LINUX and ANDROID, Study of Windows)	Short Note / Diagram	04

Nomenclature of the Course	Programming Practical 2
Class	F.Y.B.Sc.I.T.
Semester	II
Course Code	USIT203
No. of Credits	2 (4 Hours Per Week)
Nature	Practical
Type	Major (Mandatory)

Course Outcomes:

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

CO1**:** Utilize C++ characteristics in software design and development.
CO2: Explain object-oriented techniques and explain how C++ supports them.
CO3: Employ C++ to demonstrate practical skill developing object-oriented solutions.
CO4: Examine a problem statement and design and develop object-oriented software using good Coding practices and procedures.
CO5: Use common software patterns and recognize their relevance in other software development contexts.

Section I: Object Oriented Programming with C++ Practical

Syllabus:

Sr. No.	Title	Subtitles (Learning Points)
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	**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.
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. 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.
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.
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.
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.
8	**File Handling**	a. Write a C++ program to copy the contents of one file to another.
9	**Exception Handling**	a. Write a C++ program to implement the exception handling with multiple catch statements.
10	**Template Programming**	a. Write a C++ Program to create Simple calculator using Class template. b. Write a C++ Program to get maximum of two number using Class template.

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

Prescribed Text/s (If any):
- Object Oriented Programming in C++ - E Balagurusamy, Tata McGraw-Hill, 5th Edition, 2011.

Other Learning Resources recommended:
- Object-oriented Programming C++ Simplified - Hari Mohan Pandey, University Science Press, 1st Edition, 2017.

Teaching Plan:

Sr.No.	Title	Teaching Methods	No. of Hours
1	C++ Basics Programs	Practical	2
2	Conditional Statement and Looping using C++	Practical	2+2
3	Classes and Methods	Practical	2+2
4	Constructor and Overloading	Practical	2+2
5	Inheritance I	Practical	2+2
6	Inheritance II	Practical	2+2
7	Use of this pointer	Practical	2
8	File Handling	Practical	2
9	Exception Handling	Practical	2
10	Template Programming	Practical	2

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)**

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

Prescribed Text/s (If any):
- Object Oriented Programming in C++ - E Balagurusamy, Tata McGraw-Hill, 5th Edition, 2011.
- Object-oriented Programming C++ Simplified - Hari Mohan Pandey, University Science Press, 1st Edition, 2017.

Teaching Plan:

Sr.No.	Title	Teaching Methods	No. of Hours
0	Feasibility Studies	Practical	4
1	Design Phase-I	Practical	4
2	Design Phase-II	Practical	4
3	Implementation Phase	Practical	8
4	Integration Phase	Practical	6
5	Documentation	Practical	4

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Certified Journal (section I)	**05**
Project Documentation	**05**
Attendance and active participation in both Laboratory	**10**

B) Semester End Examination: Maximum Marks: 30*
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

(*Addition of marks of both the sections will be converted to marks out of 30)

Nomenclature of the Course	Numerical Methods
Class	F.Y.B.Sc.I.T.
Semester	II
Course Code	USIT204
No. of Credits	2 (2 Hours Per Week)
Nature	Theory
Type	Minor

Course Outcomes:	

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

CO1**:** Calculate errors in numerical calculation.
CO2: Understand numerical techniques to find the roots of nonlinear equations and solution of systems of linear equations.
CO3: Use difference operators and techniques of interpolation.
CO4: Find numerical solutions to problems of differentiation, integration and ordinary differential equations.
CO5: Understand the linear optimization problems and find solutions to them.
CO6: Find linear and non linear relationships between variables.

Syllabus:

Unit No.	Unit Title	Subtitles (Learning Points)
I	Approximations and Round-Off Errors	Significant Figures, Accuracy and Precision, Error Definitions, Round-Off Errors, Truncation Errors, Blunders
	Solutions of Algebraic and Transcendental Equations	Bisection Method, Newton-Raphson Method, Regula-falsi method, Secant Method
	Interpolation	Forward Difference, Backward Difference, Newton's Forward Difference Interpolation, Newton's Backward Difference Interpolation, Lagrange's Interpolation
II	Solution of simultaneous algebraic equations using iterative methods	Gauss-Jordan Method, Gauss-Seidel Method
	Numerical differentiation and Integration	Numerical differentiation, Numerical integration using Trapezoidal Rule, Simpson's 1/3rd and 3/8th rules.
	Numerical solution of differential equations	Taylor series, Euler's Method, Modified Euler's Method, Runge-Kutta Methods
III	Least-Squares Regression	Linear Regression, Polynomial Regression, Multiple Linear Regression, Nonlinear Regression

	Linear Programming Problem	Linear optimization problem, Formulation and Graphical solution, Basic solution and Feasible solution.

Prescribed Text/s (If any):
- Introductory Methods of Numerical Methods - S.S.Sastry, PHI, 5th Edition, 2012.
- Numerical Methods for Engineers - Steven C.Chapra, Raymond P.Canale, Tata Mc Graw Hill, 6th Edition, 2010.

Other Learning Resources recommended:
- Numerical Methods - T Veerarajan,T Ramachandran,Tata McGraw Hill, 7th Edition, 2011

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
I	Approximations and Round-Off Errors, Solutions of Algebraic and Transcendental Equations, Interpolation	Chalk and board, Audio – Visual aids, Problem solving sessions	10
II	Solution of simultaneous algebraic equations using iterative methods, Numerical differentiation and Integration, Numerical solution of differential equations	Chalk and board, Audio – Visual aids, Problem solving sessions	10
III	Least-Squares Regression, Linear Programming Problem	Chalk and board, Audio – Visual aids, Problem solving sessions	10

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline)	**10**
Assignments	**05**
Attendance and active participation in classroom	**05**

B) Semester End Examination: Maximum Marks: 30

Question No. and Sub questions (If any)	Unit and sub unit (with number and title)	Type of Question (Essay / short note / Objective / Diagram, etc.)	Marks
Q.1) A)	Unit 1(Approximations and Round-Off Errors, Solutions of Algebraic and Transcendental Equations, Interpolation)	Short Note / Diagram / Problem Solving	06
Q.1) B)	Unit 1(Approximations and Round-Off Errors, Solutions of Algebraic and Transcendental Equations, Interpolation)	Short Note / Diagram / Problem Solving	04
Q.2) A)	Unit 2(Solution of simultaneous algebraic equations using iterative methods, Numerical differentiation and Integration, Numerical solution of differential equations)	Short Note / Diagram / Problem Solving	06
Q.2) B)	Unit 2(Solution of simultaneous algebraic equations using iterative methods, Numerical differentiation and Integration, Numerical solution of differential equations)	Short Note / Diagram / Problem Solving	04
Q.3) A)	Unit 3(Least-Squares Regression, Linear Programming Problem)	Short Note / Diagram / Problem Solving	06
Q.3) B)	Unit 3(Least-Squares Regression, Linear Programming Problem)	Short Note / Diagram / Problem Solving	04

Nomenclature of the Course	Data Communication and Networking
Class	F.Y.B.Sc.IT
Semester	II
Course Code	USIT205
No. of Credits	2 (2 Hours Per Week)
Nature	Theory
Type	Minor (Interdisciplinary)

Course Outcomes:	

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

CO1 : Identify various data communication standards,topologies, models and
     terminologies.
CO2 : Understand Layered task, Layers in OSI model and TCP/IP protocol suit
CO3 : Understanding basics of Physical Layer in Data communication.
CO4 : Understand the Physical Layer task.
CO4 : Understand protocols in Data Link Layer.
CO5 : Study of Wired and Wireless LAN.

Syllabus:

Unit No.	Unit Title	Subtitles (Learning Points)
I	**Introduction**	Data communications,Networks,The Internet, Protocols and Standards
	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
	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
	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

Prescribed Text/s (If any):
- Data Communication and Networking- Behrouz A.Forouzan,Tata McGraw Hill, 5th Edition
- Computer Networks - Andrew Tanenbaum, Pearson, Fifth Edition, 2013

Other Learning Resources recommended:
- TCP/IP Protocol Suite - Behrouz A.Forouzan, Tata McGraw Hill, Fourth Edition, 2010

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
I	Introduction, Network Models, Data and Signals	Chalk and board, Audio – Visual aids, Problem solving sessions	10
II	Digital and Analog Transmission,Bandwidth Utilization and Transmission Media,	Chalk and board, Audio – Visual aids, Problem solving sessions	10
III	Data Link Layer, Wired LANs, Wireless LANs and WANs	Chalk and board, Audio – Visual aids, Problem solving sessions	10

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline)	**10**
Assignments	**05**
Attendance and active participation in classroom	**05**

B) Semester End Examination: Maximum Marks: 30

Question No. and Sub questions (If any)	Unit and sub unit (with number and title)	Type of Question (Essay / short note / Objective / Diagram, etc.)	Marks
Q.1) A)	Unit 1(Introduction,Network Models,Data and Signals)	Short Note / Diagram	06

Q.1) B)	Unit 1(Introduction,Network Models,Data and Signals)	Short Note / Diagram	04
Q.2) A)	Unit 2(Digital and Analog Transmission,Bandwidth Utilization and Transmission Media)	Short Note / Diagram	06
Q.2) B)	Unit 2(Digital and Analog Transmission,Bandwidth Utilization and Transmission Media)	Short Note / Diagram	04
Q.3) A)	Unit 3(Data Link Layer,Wired LANs,Wireless LANs and WANs)	Short Note / Diagram	06
Q.3) B)	Unit 3(Data Link Layer,Wired LANs,Wireless LANs and WANs)	Short Note / Diagram	04

Nomenclature of the Course	Practical M2
Class	F.Y.B.Sc.I.T.
Semester	II
Course Code	USIT206
No. of Credits	2 (4 Hours Per Week)
Nature	Practical
Type	Minor

Course Outcomes:

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

CO1**:** Apply concepts of 8085 to single & Multiple Memory Locations.
CO2: Apply concepts of microprocessor register operations.
CO3: Implement assembly language programs
CO4: Find fast and accurate solution to simple and complex numerical problems using scilab programs.

Section I: Assembly Language Programming

Syllabus:

Sr.No.	Title	Subtitles (Learning Points)
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	**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 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.
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 the number of l's in the contents of D register and store the count in the B register.
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. Consider the sum to be an 8 bit number. So, ignore carries. Store the sum at memory location 4300H. 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.

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.
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 the starting address of the 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 the number of negative, zero and positive numbers from this list and store these results in memory locations 7000H, 7001H, and 7002H respectively.
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.
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.
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

Note : This is a sample Practical list. Course instructor may change the practical as

per the syllabus.

Prescribed Text/s (If any):
- Microprocessors Architecture, Programming and Applications with the 8085 - Ramesh Gaonkar, PENRAM, 5th Edition, 2012.

Other Learning Resources recommended:
- 8080A/8085 Assembly Language Programming - Lance A.Leventhel, Osborne, 1978.

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
1	Perform the following Operations related to memory locations	Practical	2+2
2	Simple assembly language programs	Practical	2+2
3	Packing and unpacking operations	Practical	2
4	Register Operations.	Practical	2+2
5	Multiple memory locations	Practical	2+2
6	Calculations with respect to memory locations	Practical	2+2
7	Assembly programs on memory locations.	Practical	2
8	String operations in assembly programs	Practical	2
9	Calculations on memory locations	Practical	2
10	Operations on BCD numbers.	Practical	2

Section II: Scilab Programming

Syllabus:

Sr.No.	Title	Subtitles (Learning Points)
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	**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.
3	**Interpolation**	a. Program for Newton's forward interpolation. b. Program for Newton's backward interpolation. c. Program for Lagrange's interpolation.
4	**Solving linear system of equations by iterative**	a. Program for solving linear systems of equations using Gauss Jordan method. b. Program for solving linear systems of equations using Gauss Seidel method.

	methods	
5	**Numerical Differentiation**	a. Program to obtain derivatives numerically.
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.
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.
8	**Solution of differential equations 2**	a. Program to solve differential equations using Runge-kutta 2nd order and 4th order methods.
9	**Regression 1**	a. Program for Linear regression. b. Program for Polynomial Regression.
10	**Regression 2**	a. Program for multiple linear regression. b. Program for non-linear regression.

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

Other Learning Resources recommended:
- https://www.scilab.org/about/community/books

Teaching Plan:

Sr No.	Title	Teaching Methods	No. of Hours
1	Error Calculation	Practical	2+2
2	Solution of algebraic and transcendental equations	Practical	2+2
3	Interpolation	Practical	2+2
4	Solving linear system of equations by iterative methods	Practical	2
5	Numerical Differentiation	Practical	2
6	Numerical Integration	Practical	2+2
7	Solution of differential equations 1	Practical	2
8	Solution of differential equations 2	Practical	2
9	Regression 1	Practical	2
10	Regression 2	Practical	2

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Certified Journal (section I & II)	10
Attendance and active participation in both Laboratory	10

B) Semester End Examination: Maximum Marks: 30*

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

(*Addition of marks of both the sections will be converted to marks out of 30)

Nomenclature of the Course	Computer Skills-2 Practical
Class	F.Y.B.Sc.I.T.
Semester	II
Course Code	USIT207
No. of Credits	2 (4 Hours Per Week)
Nature	Practical
Type	SEC

Course Outcomes:

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

CO1**:** Study different operating systems.
CO2: Analyze the working of an operating system, its programming interface and file system.
CO3: Develop algorithms for process scheduling, memory management, page replacement algorithms and disk scheduling.
CO4: Use Bootstrap to create websites quickly.
CO5: Access, setup and use Bootstrap in web projects.
CO6: Create websites from scratch using Bootstrap.
CO7: Create responsive websites rapidly.

Section I: Operating System Practical

Syllabus:

Sr.No.	Title	Sub titles (Learning Points)
1	**Installation 1**	a. Installation of virtual machine software.
2	**Installation 2**	a. Installation of Linux operating system (RedHat / Ubuntu) on virtual machine.
3	**Installation 3**	a. Installation of Windows operating system on virtual machine.
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
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.
6	**Windows (DOS) Commands 1**	a. Date, time, prompt, md, cd, rd, path. b. Chkdsk, copy, xcopy, format, fidsk, cls, defrag, del, move.
7	**Windows (DOS) Commands 2**	a. Diskcomp, diskcopy, diskpart, doskey, echo b. Edit, fc, find, rename, set, type, ver
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	
9	**Programming with Linux**	a. Installing utility software on Linux and Windows Running C/C++ Programs with command line argument in linux	
10	**Introduction to Shell Scripting**	a. Basic Operators b. Decision Making c. Looping	

Prescribed Text/s (If any):
- Modern Operating Systems - Andrew S.Tanenbaum, Herbert Bos, Pearson, 4th Edition, 2014**.**
- Operating Systems:Internals and Design Principles - Willaim Stallings, Pearson, 8th Edition, 2009.
- Operating System Concepts - Abraham Silberschatz, Peter B.Galvineg Gagne, Wiley, 8th Edition.

Teaching Plan:

Sr.No.	Title	Teaching Methods	No. of Hours
1	Installation 1	Practical	2
2	Installation 2	Practical	2
3	Installation 3	Practical	2
4	Linux commands: Working with Directories	Practical	2+2
5	Linux commands: Working with files	Practical	2+2
6	Windows (DOS) Commands 1	Practical	2+2
7	Windows (DOS) Commands 2	Practical	2
8	Working with Linux Desktop and utilities	Practical	2+2
9	Programming with Linux	Practical	2+2
10	Introduction to Shell Scripting	Practical	2

Section I: Responsive Web Designing Practical

Sr.No.	Title	Subtitles (Learning Points)
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	**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.

3	**Grid System**	a. Create a responsive web page of your class time table by using the bootstrap grid system.
4	**Table & Events**	a. Show at least 3 to 4 co-curricular,extra curricular activities of students that includes responsive tables with style such as overstate when Mouse over different colors of each row table with strip row.
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
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.
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.
8	**Different types of components**	a. Create responsive web pages of education websites using bootstrap breadcrumb, pagination, labels, JumboTron, page header, thumbnail component.
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
10	**Carousel bootstrap plugin**	a. Design animated photo gallery page Using Carousel bootstrap plugin with minimum 7 photos

Prescribed Text/s (If any):
- **https://www.w3schools.com/bootstrap5/index.php**

Teaching Plan:

Sr.No.	Title	Teaching Methods	No. of Hours
1	Setting Up Bootstrap	Practical	2
2	Container Class	Practical	2+2
3	Grid System	Practical	2
4	Table & Events	Practical	2
5	Text-Decoration & Form Layout	Practical	2+2
6	Glyphicons & Components	Practical	2+2

7	Bootstrap input groups components	Practical	2
8	Different types of components	Practical	2
9	Progress Bar & Components	Practical	2+2
10	Carousel bootstrap plugin	Practical	2+2

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Certified Journal (section I & II)	10
Attendance and active participation in both Laboratory	10

B) Semester End Examination: Maximum Marks: 30*
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

(*Addition of marks of both the sections will be converted to marks out of 30)

Nomenclature of the Course	Technical Communication Skills II
Class	F.Y.B.Sc.I.T.
Semester	II
Course Code	USIT208
No. of Credits	2 (2 Hours Per Week)
Nature	Theory
Type	AEC

Course Outcomes:	

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

CO1**:** Recognize the importance of various types of communication in technical set up.
CO2: Understand the dynamics in different forms of formal communication.
CO3: Learn about active listening and the art of giving presentations and interviews.
CO4: Learn the art of business writing and ethics in business communication across functional areas.
CO5: Evaluate, analyze and interpret technical data.

Syllabus:		
Unit No.	Unit Title	Subtitles (Learning Points)
I	**Effective presentation Strategies**	Introduction, Defining purpose, Analyzing audience and Locale, Organizing contents, preparing outline, Visual Aids, Understanding Nuances of delivery, Kinesics
	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
	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
	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

Prescribed Text/s (If any):
- Business Communication - Meenakshi Raman & Prakash Singh, Oxford-Higher Education, 2nd Edition, 2006.
- Professional Communication - Aruna Koneru, McGraw Hill, 2008.

Other Learning Resources recommended:
- Professional Communication Skills - Laila Dias, Vipul Prakashan, 1st Edition, 2010.

Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
I	Effective presentation Strategies, Interview, Business writing	Chalk and board, Audio – Visual aids, Problem solving sessions	10
II	Business correspondence, Business reports and proposal, Careers and Resume	Chalk and board, Audio – Visual aids, Problem solving sessions	10
III	Communication across Functional areas, Ethics in Business Communication, Creating and Using Visual Aids	Chalk and board, Audio – Visual aids, Problem solving sessions	10

Evaluation Pattern

   A) Continuous Internal Evaluation: Maximum Marks: 20

Method	Marks
Unit Test (MCQ / Descriptive – Based on Theory and/or Problems Online/Offline)	**10**
Assignments	**05**
Attendance and active participation in classroom	**05**

   B) Semester End Examination: Maximum Marks: 30

Question No. and Sub questions (If any)	Unit and sub unit (with number and title)	Type of Question (Essay / short note / Objective / Diagram, etc.)	Marks
Q.1) A)	Unit 1(Effective presentation Strategies, Interview, Business writing)	Short Note / Diagram	06

Q.1) B)	Unit 1(Effective presentation Strategies, Interview, Business writing)	Short Note / Diagram	04
Q.2) A)	Unit 2(Business correspondence, Business reports and proposal, Careers and Resume)	Short Note / Diagram	06
Q.2) B)	Unit 2(Business correspondence, Business reports and proposal, Careers and Resume)	Short Note / Diagram	04
Q.3) A)	Unit 3(Communication across Functional areas, Ethics in Business Communication, Creating and Using Visual Aids)	Short Note / Diagram	06
Q.3) B)	Unit 3(Communication across Functional areas, Ethics in Business Communication, Creating and Using Visual Aids)	Short Note / Diagram	04

Nomenclature of the Course	Social Media Awareness
Class	FYBSc/FYBCom/FYBA/FYBMS/FYBCom A/c&Fin
Semester	I
Course Code	USOEIT206
No. of Credits	2
Nature	Practical
Type	Open Elective(Offered by Department)

Course Outcomes:

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

CO1: Aware about Social media usage.
CO2: Take precautions while using social media.
CO3: Make email and social media accounts secure.
CO4: Make android phones secure.

Syllabus:

Sr.No.	Title	Subtitles (Learning Points)
1	Mail accounts Security 1	1. Change your password\ 2. Recover your account
2	Mail accounts Security 2	1. Update your account recovery details 2. Enable multi-factor authentication
3	Mail accounts Security 3	1. Check account mail settings 2. Check third party application access 3. Check login activity 4. Sign out of all other sessions
4	Facebook	1. Facebook password configuration 2. How to set contact information 3. Two factor authentication 4. Security and privacy features of facebook 5. How to be safe from scams and frauds
5	Instagram	1. Instagram password configuration 2. How to set personal details 3. Two factor authentication 4. Security and privacy features of instagram
6	WhatsApp	1. Two step Verification 2. Security and privacy features of WhatsApp 3. How to safe from frauds and unidentified numbers
7	Snapchat	1. Password Configuration 2. Contact Details 3. Two factor authentication

			4. Privacy features of snapchat.
8	Android Phone 1		1. Set a strong passcode (consider disabling fingerprint or face login) 2. Audit app permissions 3. Enable automatic updates 4. Enable find my Device 5. Keep Sensitive notifications of the lock screen
9	Android Phone 2		1. Disable personalized ads 2. Give your google account a privacy check-up 3. Quickly block access to the camera or mic 4. Keep an eye on your clipboard 5. Use end to end encryption in messages
10	Awareness		1. How to be safe from scams and frauds

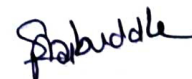**Note :** This is a sample Practical list. Course instructor may change the practical as per the syllabus.

Prescribed Text/s (If any):
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Teaching Plan:

Unit No.	Unit Title	Teaching Methods	No. of Hours
1	Mail accounts Security 1	Practical	2+2
2	Mail accounts Security 2	Practical	2
3	Mail accounts Security 3	Practical	2
4	Facebook	Practical	2+2
5	Instagram	Practical	2+2
6	WhatsApp	Practical	2+2
7	Snapchat	Practical	2
8	Android Phone 1	Practical	2+2
9	Android Phone 2	Practical	2
10	Awareness	Practical	2

Date: 30/04/2024
Place: Ratnagiri

Signature

Signature

Chairperson and HoD