JAI HIND COLLEGE AUTONOMOUS

Syllabus for F.Y.BSc

Course :Information Technology

Semester : I

Credit Based Semester & Grading System

With effect from Academic Year 2018-19

List of Courses

Course: Information Technology **Semester: I**

SR. NO.	COURSE CODE	COURSE TITLE	NO. OF LECTURES / WEEK	NO. OF CREDITS
		FYBSc IT		
1	SBIT101	Imperative Programming	5	2
2	SBIT102	Digital Electronics	5	2
3	SBIT103	Operating Systems	5	2
4	SBIT104	Discrete Mathematics	5	2
5	SBIT105	Communication Skills	5	2
6	SBIT101 PR	Imperative Programming Practical	3	2
7	SBIT102PR	Digital Electronics Practical	3	2
8	SBIT103 PR	Operating Systems Practical	3	2
9	SBIT104 PR	Discrete Mathematics Practical	3	2
10	SBIT105 PR	Communication Skills Practical	3	2

Semester I – Theory

Course: SBIT101	**Imperative Programming (Credits : 02 Lectures/Week: 05)**	
	Objectives: ➢ Improved programming skills ➢ Read, understand and trace the execution of programs written in C language ➢ Implementation of an algorithm into a programming language ➢ Ability to use different memory allocation methods ➢ Ability to handle possible errors during program execution. **Outcomes:** ➢ Designed to introduce the student to the various programming concepts of the C and python language. ➢ Students are introduced to these programming language elements including fundamental data types, flow control, and standard function libraries. ➢ Thorough treatment is given to the topics of dynamic memory allocation, standard I/O, macro definition, and the C runtime library. ➢ The course explains the use of structures, unions, and pointers early on so the students can practice extensively in the hands on labs.	
Unit I	**Introduction**:Types of Programming languages,History,features and application, Simple program logic, program development cycle, pseudocode statements and flowchart symbols, sentinel value to end a program, programming and user environments, evolution of programming models, desirable program characteristics. **Fundamentals:** Structure of a program, Compilation and Execution of a Program, Character Set, identifiers and keywords, data types, constants, variables and arrays, declarations, expressions, statements, Variable definition, symbolic constants **Operators and Expressions:** Arithmetic operators, unary operators, relational and logical operators, assignment operators, assignment operators, the conditional operator, library functions **Data Input and output:** Single character input and output, entering input data, scanf function, printf function, gets and puts functions, interactive programming	**15 L**
Unit II	**Conditional Statements and Loops:** Decision Making Within A Program, Conditions, Relational Operators, Logical Connectives, If Statement, If-Else Statement, While Loop, Do While, For Loop, Nested Loops, Infinite Loops, Switch Statement **Functions:** defining a function, accessing a function, passing arguments to a function, specifying argument data types, function prototypes recursion, modular programming and functions, standard library of c functions, prototype of a function, formal parameter list, return type, function call, block structure, passing arguments to a function **Program structure:** Storage classes, automatic variables, external variables, static variables, multifile programs, more library functions **Preprocessor:** Features, #define and #include, Directives and Macros	**15 L**

Unit III	**Arrays:** Definition, Processing, passing arrays to functions, multidimensional arrays, arrays and strings **Pointers:** Fundamentals, Declarations, Pointers Address Operators, Pointer Type Declaration, Pointer Assignment, Pointer Initialization, Pointer Arithmetic, Functions and Pointers, Arrays And Pointers, Pointer Arrays, passing functions to other functions **Structures and Unions:** Structure Variables, Initialization, Structure Assignment, Nested Structure, Structures and Functions, Arrays of Structures, Structures Containing Arrays, Unions, Structures and pointers	**15 L**
Unit IV	**Introduction to Python:** The Python Programming Language, History, Features, Installing Python, Running Python program, The Difference Between Brackets, Bracesand Parentheses **Variables and Expressions in Python:** Values and Types, Variables, Variable Names and Keywords, Type conversion, Operators and Operands, Expressions, Interactive Mode and Script Mode, Order of Operations, input and output function in python **Conditional Statements and loops in python:** if, if-else, nested if –else, For loop, while loop, nested loops **Control statements in python:** Terminating loops, skipping specific conditions	**15 L**

Textbook:

1. Programming with C, Tata McGRAW-Hill,Byron Gottfried,1996
2. Think Python O'Reilly, Allen Downey, 2012

Additional References:

1. "C" Programming", Brian W. Kernighan and Denis M. Ritchie,PHI
2. Let us C, Yashwant P. Kanetkar, BPB publication

Evaluation Scheme

[A] Evaluation scheme for Theory courses

I. Continuous Assessment (C.A.) - 40 Marks

(i) C.A.-I : Test – 20 Marks of 40 mins. duration

(ii) C.A.-II : Mini Project – 20 Marks

II. Semester End Examination (SEE)- 60 Marks

Q.1 Answer any two -10 Marks
Q.2 Answer any two -10 Marks
Q.3 Answer any two -10 Marks
Q.4 Answer any two -10 Marks
Q.5 Answer any four -20 Marks

[B] Evaluation scheme for Practical courses

(i) Internal Practical – 20 marks
(ii) External Practical – 30 marks

Course: SBIT102	**Digital Electronics (Credits : 02 Lectures/Week: 05)**	
	Objectives: ➢ Perform basic arithmetic calculations in different number System and codes ➢ To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits. ➢ To analyze and synthesize combinational and Sequential logic circuits ➢ To perform the analysis and design of various digital electronic circuits needed for computers by using Combinational and Sequential Circuit **Outcomes:** ➢ Covers the design and application of digital logic circuits, including combinational and sequential logic circuits.	
Unit I	**Number System:** Analog System, digital system, Binary number system, octal number system, hexadecimal number system, conversion from one number system to another, floating point numbers, weighted codes binary coded decimal, non-weighted ,codes Excess – 3 code, Gray code **Alphanumeric codes:** ASCII Code, ISCII Code, Hollerith , Code,Teletypewriter(TTY), Universal Product Code, Code conversion, Error detection and correction **Arithmetic:** Binary Arithmetic:Binary addition, Binary subtraction, Negative number representation, Subtraction using 1's complement and 2's complement, Binary multiplication and division, Arithmetic in octal number system, Arithmetic in hexadecimal number system, BCD and Excess – 3 arithmetic. **Logic Gates**: Logic (AND OR NOT), Boolean theorems, Boolean Laws, De Morgan's Theorem, Perfect Induction, Reduction of Logic expression using Boolean Algebra, Deriving Boolean expression from given circuit, exclusive OR and Exclusive NOR gates, Universal Logic gates, Implementation of other gates using universal gates, Input bubbled logic, Assertion level.	**15 L**
Unit II	**KarnaughMaps :** minterms and sum of minterm form, maxterm and Product of maxterm form, Reduction technique using Karnaugh maps – 2/3/4/5 variable K-maps, Grouping of variables in K-maps, K-maps for product of sum form, minimize Boolean expression using K-map and obtain K-map from Boolean expression, Quine Mc Cluskey Method. **Combinational Logic Circuits:** Multi-input, multi-output Combinational circuits(Multiplexer, Demultiplexer, Decoder, Encoders, Seven Segment displays, ALU), Code converters design and implementations	**15 L**
Unit III	**Arithmetic Circuits:** Adder, BCD Adder, Excess – 3 Adder, Binary Subtractors, BCD Subtractor, Multiplier, Comparator. **Sequential Circuits:**Terminologies used, S-R flip-flop, D flip-fop, JK flip-flop, Race-around condition, Master – slave JK flip-flop, T flip- flop, Conversion from one type of flip-flop to another, Application of flip-flops.	**15 L**
Unit IV	**Counters:** Asynchronous counter, Terms related to counters, IC 7493 (4-bit binary counter), Synchronous counter, Bushing, Type T Design, Type JK Design, Presettable counter, IC 7490, IC 7492, Synchronous counter ICs, Analysis of counter circuits. **Shift Register:** Parallel and shift registers, serial shifting, serial–in serial–	**15 L**

	out, serial–in parallel–out , parallel–in parallel–out, Ring counter, Johnson counter, Applications of shift registers, Pseudo-random binary sequence generator, IC7495, analysis of shift counters.	

Textbook:

1. Digital Electronics and Logic Design ,Palan,N.G., Technova
2. Make Electronics, Charles, P. O'Reilly , 2010

Additional References:

1. Modern Digital Electronics ,Jain, R.P. ,Tata McGraw Hill, 1970
2. Digital Principles and Applications, Malvino and Leach, Tata McGraw Hill
3. Digital Electronics: Principles, Devices and Applications Anil, K.M ,Wiley ,2007
4. S.S. Bhatti Rahul Malhotra,A Textbook of Digital Electronics, [Kindle Edition] Retrieved from http://www.amazon.com/

Evaluation Scheme

[A] Evaluation scheme for Theory courses

I. Continuous Assessment (C.A.) - 40 Marks

(iii)C.A.-I : Test – 20 Marks of 40 mins. duration

(iv)C.A.-II : Assignment – 20 Marks

II. Semester End Examination (SEE)- 60 Marks

Q.1	**Answer any two -10 Marks**
Q.2	**Answer any two -10 Marks**
Q.3	**Answer any two -10 Marks**
Q.4	**Answer any two -10 Marks**
Q.5	**Answer any four -20 Marks**

[B] Evaluation scheme for Practical courses

(i) Internal Practical – 20 marks
(ii) External Practical – 30 marks

Course: SBIT103	**Operating Systems (Credits : 02 Lectures/Week: 05)**	
	Objectives: ➢ Core understanding of fundamentals ➢ Descriptive objectives of each aspect ➢ Foundation of design, concepts and structure **Outcomes:** ➢ Understanding computing and resource management of the computer organization and operating systems	
Unit I	**Operating system:** What is an operating system?, History of operating system, Computer hardware, Different operating systems, Operating system concepts, System calls, Operating system structure. **Introduction to Compiler Design:** Overview, Architecture, Phases **Principles of Input-Output:** I/O hardware, I/O software, I/O software layers, Disks, Clocks, **User interfaces:** Keyboard, Mouse, Monitor, Thin clients, Power management **Processes and Threads:** Processes, Threads, Inter-process communication, Scheduling, IPC problems	**15 L**
Unit II	**Memory Management:** No memory abstraction, memory abstraction: address spaces, virtual memory, Paging: page replacement algorithms, design issues for paging systems, implementation issues, segmentation **File Systems:** Files, Directories, File system implementation, File-system management and optimization **Case Study:** MS-DOS file system, UNIX V7 file system, CD ROM file system.	**15 L**
Unit III	**Deadlocks:** Resources, Introduction to deadlocks, The ostrich algorithm, Deadlock, detection and recovery, Deadlock avoidance, Deadlock prevention, Issues. **Protection and Security:** Authentication, Program Threats, System threats	**15 L**
Unit IV	**Virtualization:** History, Requirements for virtualization, Type 1 and 2 hypervisors, Techniques for efficient virtualization, Hypervisor microkernels, Memory virtualization, I/O virtualization, Virtual , appliances, virtual machines on multicore CPUs **Cloud:** Overview, Architecture, Models-public, private, hybrid, SAAS Challenges. **Multiple Processor Systems:** Multiprocessors, Multi-computers, Distributed systems.	**15 L**

Textbook:

1. Operating System Concepts. New Jersey, NJ, John Wiley and Sons, Abraham Silberschatz, Peter B. Galvineg Gagne, A. (2013).

Additional References:

1. Operating Systems., Achyut Godbole and Atul Kahate, A. New Delhi, IND, TataMcGraw-Hill , (2017).

Evaluation Scheme

[A] Evaluation scheme for Theory courses

I. Continuous Assessment (C.A.) - 40 Marks

(v) C.A.-I : Test – 20 Marks of 40 mins. duration

(vi)C.A.-II : Presentation – 20 marks

II. Semester End Examination (SEE)- 60 Marks

Q.1	**Answer any two**	**-10 Marks**
Q.2	**Answer any two**	**-10 Marks**
Q.3	**Answer any two**	**-10 Marks**
Q.4	**Answer any two**	**-10 Marks**
Q.5	**Answer any four**	**-20 Marks**

[B] Evaluation scheme for Practical courses

(i) Internal Practical – 20 marks
(ii) External Practical – 30 marks

Course: SBIT104	**Discrete Mathematics (Credits : 02 Lectures/Week: 05)**	
	Objectives: ➢ Use mathematically correct terminology and notation. ➢ Construct correct direct and indirect proofs. ➢ Use division into cases in a proof. ➢ Use counterexamples. ➢ Apply logical reasoning to solve a variety of problems. **Outcomes:** ➢ To think analytically, creatively and critically in developing robust, extensible and highly maintainable technological solutions to simple and complex problems.	
Unit I	**The Logic of Compound Statements:** Logical Form and Logical Equivalence, Conditional Statements, Valid and Invalid Arguments **Quantified Statements:** Predicates and Quantified Statements, Statements with Multiple Quantifiers, Arguments with Quantified Statements **Set Theory:** Definitions and the Element Method of Proof, Properties of Sets, Disproofs, Algebraic Proofs, Boolean Algebras, Russell's Paradox and the Halting Problem. **Functions:** Functions Defined on General Sets, One-to-One and Onto, Inverse Functions, Composition of Functions, Cardinality with Applications to Computability	**15 L**
Unit II	**Relations:** Relations on Sets, Reflexivity, Symmetry, and Transitivity, Equivalence Relations, Partial Order Relations **Graphs and Trees:** Definitions and Basic Properties, Trails, Paths, and Circuits, Matrix Representations of Graphs, Isomorphism's of Graphs, Trees, Rooted Trees, Isomorphism's of Graphs,Spanning trees and shortest paths.	**15 L**
Unit III	**Elementary Number Theory and Methods of Proof:** Introduction to Direct Proofs, Rational Numbers, Divisibility, Division into Cases and the Quotient-Remainder Theorem, Floor and Ceiling, Indirect Argument: Contradiction and Contraposition, Two Classical Theorems, Applications in algorithms. **Sequences, Mathematical Induction, and Recursion:** Sequences, Mathematical Induction, Strong Mathematical Induction and the Well-Ordering Principle for the Integers, Correctness of algorithms, defining sequences recursively, solving recurrence relations by iteration, Second order linear homogenous recurrence relations with constant coefficients. General recursive definitions and structural induction.	**15 L**
Unit IV	**Counting and Probability:** Introduction, Possibility Trees and the Multiplication Rule, Counting Elements of Disjoint Sets: The Addition Rule, The Pigeonhole Principle, Counting Subsets of a Set: Combinations, r-Combinations with Repetition Allowed, Probability Axioms and Expected Value , Conditional Probability, Bayes' Formula and Independent Events.	**15 L**
Textbook: 1. Discrete Mathematics with Applications Cengage Learning , Sussana S. Epp .(2010). 2. Discrete Mathematics, Schaum's Outlines Series Seymour Lipschutz, Marc Lipson, Tata McGraw Hill 2007		

Evaluation Scheme

[A] Evaluation scheme for Theory courses

III. Continuous Assessment (C.A.) - 40 Marks

(vii) C.A.-I : Test – 20 Marks of 40 mins. duration

(viii) C.A.-II : Assignment – 20 Marks

IV. Semester End Examination (SEE)- 60 Marks

Q.1	**Answer any two -10 Marks**
Q.2	**Answer any two -10 Marks**
Q.3	**Answer any two -10 Marks**
Q.4	**Answer any two -10 Marks**
Q.5	**Answer any four -20 Marks**

[B] Evaluation scheme for Practical courses

(i) Internal Practical – 20 marks
(ii) External Practical – 30 marks

Course: SBIT105	**Communication Skills (Credits : 02 Lectures/Week: 05)**	
	Objectives: ➢ To Develop Communication Skills of Students ➢ To help in personality development ➢ To improve speaking, learning, and interview skills of students. **Outcomes:** ➢ Considering the significance of English language as a tool for global communication, the course aims to develop and enhance the linguistic and communicative competence of the students. ➢ The focus is on honing the skills of reading, writing, listening, and speaking. By providing suitable examples, the students will be exposed to various forms of personal and professional communication. ➢ The self-learning tasks designed will facilitate to enhance effective communication skills in a modern, globalised context.	
Unit I	**Introduction:** Need off Effective Communication, 7 c's of Communication **The Process of Communication:** Levels of Communication, Flow of Communication, Use of language in communication, Communication networks, Significance off technical communication **Barriers to Communication:** Types of Barriers, Miscommunication Noise, Overcoming measures	**15 L**
Unit II	**Listening Skills:** Listening as an active skill, Types of Listeners, Intensive Listening, Developing effective listening skills, Barriers to effective listening skills **Reading Skills:** Preview techniques, Skimming ,Scanning, Understanding the gist of an argument, Inferring lexical and contextual meaning, Recognizing coherence and sequencing of sentences; **Writing Skills:** Sentence formation, Use of appropriate diction, Paragraph and essay writing, Coherence and cohesion	**15 L**
Unit III	**Technical Writing:** Differences between technical and literary style, Elements of style, Common Errors **Letter Writing:** Formal, Informal, Business Letters **Non-verbal Communication and Body Language:** Forms of non-verbal communication, Interpreting body-language, Kinesics, Proxemics, Effective use of body language	**15 L**
Unit IV	**Interview Skills:** Type of Interviews, Success in job interviews, Appropriate use of non-verbal communication **Group Discussion** Difference between group, discussion and debate, Ensuring success in group discussions **Presentation Skills:** Oral presentation and public speaking skills, Business Presentations, **Technology based Communication:** Netiquettes, Effective e-mail messages, PowerPoint presentation	**15 L**

Textbook:

1. Business Communication Today Bovee, Courtland, L., John V. Thill and Barbara E. Schatzman, Seventh Edition. Delhi: Pearson Education 2004
2. Basic Business Communication: Skills for Empowering the Internet Generation, Lesikar, Raymond V and Marie E. Flatley, . Ninth Edition. New Delhi: Tata

McGraw-Hill Publishing Company Ltd., 2002

Additional References:

1. The Definitive Book of Body Language, Pease, Allan and Barbara Pease, New Delhi: Manjul Publishing House ,2005

Evaluation Scheme

[A] Evaluation scheme for Theory courses

I. Continuous Assessment (C.A.) - 40 Marks

(ix)C.A.-I : Test – 20 Marks of 40 mins. duration

(x) C.A.-II : Presentation – 20 Marks

II. Semester End Examination (SEE)- 60 Marks

Q.1	**Answer any two -10 Marks**
Q.2	**Answer any two -10 Marks**
Q.3	**Answer any two -10 Marks**
Q.4	**Answer any two -10 Marks**
Q.5	**Answer any four -20 Marks**

[B] Evaluation scheme for Practical courses

(i) Internal Practical – 20 marks
(ii) External Practical – 30 marks

Semester I – Practical

Course: SBIT101 PR	**Imperative Programming Practical (Credits :02 Practicals/Week:01)**

1. Basic Programs in C

a) Write a program to display the message HELLO WORLD.
b) Write a program to declare some variables of type int, float and double. Assign some values to these variables and display these values.
c) Write a program to find the addition, subtraction, multiplication and division of two numbers.

2. Programs on variables In C

a) Write a program to swap two numbers without using third variable.
b) Write a program to find the area of rectangle, square and circle.
c) Write a program to find the volume of a cube, sphere, and cylinder.

3. Conditional statements and loops(basic) In C

a) Write a program to enter a number from the user and display the month name. If number >13 then display invalid input using switch case.
b) Write a program to check whether the number is even or odd.
c) Write a program to check whether the number is positive, negative or zero.
d) Write a program to check whether the entered number is prime or not
e) Write a program to find the largest of three numbers.

4. Conditional statements and loops(advanced) In C

a) Write a program to find the sum of squares of digits of a number
b) Write a program to reverse the digits of an integer.
c) Write a program to find the sum of numbers from 1 to 100.
d) Write a programs to print the Fibonacci series.
e) Write a program to find the reverse of a number.
f) Write a program to find whether a given number is palindrome or not
g) Write a program to check whether the entered number is Armstrong or not.

5. Programs on patterns in C

Programs on different patterns.

6. Functions in C

Programs on Functions.

7. Recursive functions in C

a) Write a program to find the factorial of a number using recursive function.

b) Write a program to find the sum of natural number using recursive function.

8. Arrays in C

a) Write a program to find the largest value that is stored in the array
b) Write a program using pointers to compute the sum of all elements stored in an array.
c) Write a program to arrange the 'n' numbers stored in the array in ascending and descending order.
d) Write a program that performs addition and subtraction of matrices.
e) Write a program that performs multiplication of matrices.

9. Pointers in C

a) Write a program to demonstrate the use of pointers.
b) Write a program to perform addition and subtraction of two pointer variables.

10. Structures and Unions in C

a) Programs on structures.
b) Programs on unions.

11. Programs in python

a) Write a program to display the message HELLO WORLD.
b) Write a program to swap two numbers without using third variable.
c) Write a program to find the area of rectangle, square and circle.
d) Write a program to enter a number from the user and display the month name. If number >13 then display invalid input using switch case.
e) Write a program to check whether the number is even or odd.
f) Write a program to find the factorial of a number.
g) Write a program to check whether the entered number is prime or not.
h) Write a program to find the largest of three numbers.

Course: SBIT102 PR	Digital Electronics Practical (Credits :02 Practicals/Week:01)

1. Study of AND, OR, NOT, XOR, XNOR, NAND and NOR gates

a) IC 7400, 7402, 7404, 7408, 7432, 7486, 74266

b) Implement AND, OR, NOT, XOR, XNOR using NAND gates.

c) Implement AND, OR, NOT, XOR, XNOR using NOR gates.

2. Verifying De Morgan's laws.

a) Implement other given expressions using minimum number of gates.

b) Implement other given expressions using minimum number of ICs.

c) Design and implement combinational circuit based on the problem given and minimizing using K-maps.

3. Design and implement combinational circuit based on the problem given and minimizing using K-maps

4. Design Code converter

a) Design and implement Binary – to – Gray code converter.

b) Design and implement Gray – to – Binary code converter.

c) Design and implement Binary – to – BCD code converter

d) Design and implement Binary – to – XS-3 code converter

5. Design Encoder and Decoder.

a) Design and implement 8:3 encoder.

b) Design and implement 3:8 decoder.

c) Design and implement 4:1 multiplexer. Study of IC 74153, 74157

d) Design and implement 1:4 demultiplexer. Study of IC 74139

e) Implement the given expression using IC 74151 8:1 multiplexer.

f) Implement the given expression using IC 74138 3:8 decoder.

6. Design and implement adder

a) Design and implement Half adder and Full adder.

b) Design and implement BCD adder.

c) Design and implement XS – 3 adder.

d) Design and implement binary subtractor.

e) Design and implement BCD subtractor.

f) Design and implement XS – 3 subtractor.

7. Design multiplier

a) Design and implement a 2-bit by 2-bit multiplier.

b) Design and implement a 2-bit comparator.

8. Study of IC

a) Study of IC 7473.

b) Study of IC 7474.

c) Study of IC 7476.

d) Conversion of Flip-flops.

e) Design of 3-bit synchronous counter using 7473 and required gates

	f) Design of 3-bit ripple counter using IC 7473. **9. Study and design mod –n counter** a) Study of IC 7490, 7492, 7493 and designing mod-n counters using these. b) Designing mod-n counters using IC 7473 and 7400 (NAND gates) **10. Design registers** a) Design serial – in serial – out, serial – in parallel – out, parallel – in serial – out, parallel – in parallel – out and bidirectional shift registers using IC 7474. b) Study of ID 7495. c) Implementation of digits using seven segment displays.

Course: SBIT103 PR	Operating System Practical (Credits :02 Practicals/Week:01)

1. **Installation of virtual machine software.**

2. **Installation of Linux operating system (RedHat / Ubuntu) on virtual machine**

3. **Installation of Windows operating system on virtial 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) a.Diskcomp, diskcopy, diskpart, doskey, echo
b) 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. **Installing utility software on Linux and Windows**

10. **Shell programming**

a) Write Script to find out biggest number from given three nos. Nos are supplies as command line argument. Print error if sufficient arguments are not supplied.
b) Write script to print nos as 5,4,3,2,1 using while loop
c) Write Script, using case statement to perform basic math operation as addition, subtraction, multiplication, division
d) write script, that will print, Message "Hello World" , in Bold and Blink effect, and in different colors like red, brown etc using echo command.

Course: SBIT104 PR	Discrete Mathematics Practical (Credits : 2 Practicals/Week:01)

1. Sets Theory

a) Inclusion Exclusion principle.
b) Power Sets.
c) Mathematical Induction.

2. Functions and Algorithms

a) Recursively defined functions
b) Cardinality
c) Polynomial evaluation
d) Greatest Common Divisor

3. Boolean Algebra

a) Basic definitions in Boolean Algebra

4. Graph Theory

a) Paths and connectivity
b) Minimum spanning tree
c) Isomorphism

5. Directed Graphs

a) Adjacency matrix
b) Path matrix

6. Properties of integers

a) Division algorithm
b) Primes
c) Euclidean algorithm
d) Fundamental theorem of arithmetic
e) Congruence relation
f) Linear congruence equation

7. Algebraic Systems

a) Properties of operations
b) Roots of polynomials

8. Recurrence relations

a) Linear homogeneous recurrence relations with constant coefficients
b) Solving linear homogeneous recurrence relations with constant coefficients
c) Solving general homogeneous linear recurrence relations

9. Counting

a) Sum rule principle
b) Product rule principle
c) Factorial
d) Binomial coefficients

	e) Permutations f) Permutations with Repitition g) Ordered partitions h) Combinations i) Combinations with repetitions j) Unordered partitions **10. Probability Theory** a) Sample space and events b) Finite probability spaces c) Equiprobable spaces d) Addition Principle e) Conditional Probability f) Multiplication theorem for conditional probability g) Independent events h) Repeated trials with two outcomes

Course: SBIT105 PR	Communication Skills Practical (Credits: 02 Practicals/Week:01)
	1. Understanding the Basics a) Tutorial on Five Canons of Rhetoric's b) Assess the Feedback Skills c) Stop-keep doing- start4 **2. Planning your Communications** a) Understanding the Dos and Don'ts of persuading b) Minority Influence Strategy c) Establishing Credibility **3. Communicating Face to Face** a) Role Playing b) Crafting an Elevator Pitch c) Self-Questioning techniques **4. Communicating Powerfully in writing** a) Writing a Blog b) Writing Meeting Notes c) The Rhetorical Triangle **5. Non Verbal communication** a) Power of Body Language Exercise b) Guess the Emotion **6. Use of Word processing tools for communication** **7. Use of Spreadsheet tools for communication** **8. Use of Presentation tools for communication**