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Item No-



**Rayat Shikshan Sanstha's  
KARMAVEER BHAURAO PATIL COLLEGE, VASHI.  
NAVI MUMBAI  
(AUTONOMOUS COLLEGE)  
Sector-15- A, Vashi, Navi Mumbai - 400 703**

**Syllabus for F.Y.B.Sc. Information Technology**

**Program: B.Sc. Information Technology**

**Course: F.Y.B.Sc. Information Technology**

**(Choice Based Credit, Grading and Semester System with  
effect from the academic year 2021-2022)**

Rayat Shikshan Sanstha's

**Karmaveer Bhaurao Patil College Vashi, Navi Mumbai**

**Autonomous College**

[University of Mumbai]

Syllabus for Approval

<b>Sr. No.</b>	<b>Heading</b>	<b>Particulars</b>
<b>1</b>	<b>Title of Course</b>	<b>F.Y.B.Sc. Information Technology</b>
<b>2</b>	<b>Eligibility for Admission</b>	<b>12<sup>th</sup> Maths</b>
<b>3</b>	<b>Passing Marks</b>	<b>40%</b>
<b>4</b>	<b>Ordinances/Regulations (if any)</b>	
<b>5</b>	<b>No. of Years/Semesters</b>	<b>One year/Two semester</b>
<b>6</b>	<b>Level</b>	<b>U.G.</b>
<b>7</b>	<b>Pattern</b>	<b>Semester</b>
<b>8</b>	<b>Status</b>	<b>Revised</b>
<b>9</b>	<b>To be implemented from Academic year</b>	<b>2021-2022</b>

**Preamble of the Syllabus:**

The B.Sc. Information Technology programme was started in 2001 with an aim to make the students employable and impart industry oriented training. The main objectives of the course are:

- To think analytically, creatively and critically in developing robust, extensible and highly maintainable technological solutions to simple and complex problems.
- To apply their knowledge and skills to be employed and excel in IT professional careers and/or to continue their education in IT and/or related post graduate programmes.
- To be capable of managing complex IT projects with consideration of the human, financial and environmental factors.
- To work effectively as a part of a team to achieve a common stated goal.
- To adhere to the highest standards of ethics, including relevant industry and organizational codes of conduct.
- To communicate effectively with a range of audiences both technical and non-technical.
- To develop an aptitude to engage in continuing professional development. The new syllabus is aimed to achieve the objectives. The syllabus spanning three years 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
  - Embedded Systems Development & Programming
  - Software Testing
  - Networking
  - Database Administration
  - System Administration
  - Cyber Law Consultant
  - GIS (Geographic Information Systems)
  - IT Service Desk
  - Security

And many others

The students will also be trained in communication skills and green computing

## **Objectives of the Program:**

- To acquaint students with the fundamental of computer hardware and software in information technology
- To develop analytical skills and critical thinking through application of theory knowledge into practical course
- To construct and apply knowledge of programming, and appreciate the relationship between several programming languages and other disciplines
- To enable students to understand IT and its industrial and social context

## **Program Outcome:**

### **By the end of the course, a student should develop the ability:**

- Student will understand, coherently and effectively about various basic components of computers.
- Student can improve their computer literacy, their basic understanding of operative systems and a working knowledge of software commonly used in academic and professional environments.
- Student can able to develop basic skills in practical of Information Technology and its industrial applications.
- Student can do Academic and Professional Presentations - Designing and delivering an effective presentations and developing the various IT skills to the electronic databases.
- Student can develop ability to solve IT-oriented security issues and protocols
- Student can definitely design and implement a web page.
- Student can improve communication and business management skills, especially in providing technical support.

## Scheme of examination for Each Semester:

**Continuous Internal Evaluation: 40 Marks** (Common Test-20 Marks & 20 Marks for- Assignment, Projects, Group discussion, Open book test, online test etc.)

**Semester End Examination: 60 Marks** will be as follows -

<b>I.</b>	<b>Theory:</b> The Semester End Examination for theory course work will be conducted as per the following scheme.	
	Each theory paper shall be of two and half hour duration.	
	All questions are compulsory and will have internal options.	
	Q – I	From Unit – I (having internal options.) 10 M
	Q – II	From Unit – II (having internal options.) 10 M
	Q – III	From Unit – III (having internal options.) 10 M
	Q – IV	From Unit – IV (having internal options.) 10 M
	Q-V	From Unit – V (having internal options.) 10 M
Q-VI	From Unit – VI (having internal options.) 10 M	
<b>II.</b>	<b>Practical</b>	The Semester End Examination for practical course work will be conducted as per the following scheme.
<b>Sr. No.</b>	<b>Particulars of Semester End Practical Examination</b>	<b>Marks%</b>
1	Laboratory Work	40
2	Journal	05
3	Viva	05
	<b>TOTAL</b>	<b>50</b>

**Semester – I**

<b>Course Code</b>	<b>Course Type</b>	<b>Course Title</b>	<b>Credits</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>	<b>Total Credits</b>	<b>Total</b>
UGIT10 1	CORE COURSE	Discrete Mathematics	<b>03</b>	UGIT1P1	Discrete Mathematics Practical	<b>01</b>	<b>04</b>	<b>22</b>
UGIT10 2	CORE COURSE	Imperative Programming	<b>03</b>	UGIT1P2	Imperative Programming Practical	<b>01</b>	<b>04</b>	
UGIT10 3	CORE COURSE	Introduction to Digital Electronics	<b>03</b>	UGIT1P3	Digital Electronics Practical	<b>01</b>	<b>04</b>	
UGIT10 4	Ability Enhancement Compulsory Course (AECC)	Professional Communication Skill	<b>03</b>	UGIT1P4	Professional Communication Skill Practical	<b>01</b>	<b>04</b>	
UGIT10 5A	Elective: Generic (GE)	<b>Elective (Any one)</b> 1. Green Computing  2. Basic Computer Skills and Effective Internet Skills	<b>04</b>	UGIT1P5 A	<b>Elective (Any one)</b> 1. Green Computing Practical  2. Basic Computer Skills and Effective Internet Skills Practical	<b>02</b>	<b>06</b>	
UGIT10 5B	Elective: Generic (GE)		<b>04</b>	UGIT1P5B		<b>02</b>	<b>06</b>	

**Semester – II**

<b>Course Code</b>	<b>Course Type</b>	<b>Course Title</b>	<b>Credits</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>	<b>Total Credits</b>	<b>Total</b>
UGIT201	CORE COURSE	Numerical and Statistical Methods	<b>03</b>	UGIT2P1	Numerical and Statistical Methods Practical	<b>01</b>	<b>04</b>	<b>22</b>
UGIT202	CORE COURSE	Object Oriented Programming	<b>03</b>	UGIT2P2	Object Oriented Programming Practical	<b>01</b>	<b>04</b>	
UGIT203	CORE COURSE	Operating Systems	<b>03</b>	UGIT2P3	Operating Systems Practical	<b>01</b>	<b>04</b>	
UGIT204	Ability Enhancement Compulsory Course (AECC)	Life and Employability Skills	<b>03</b>	UGIT2P4	Life and Employability Skill Practical	<b>01</b>	<b>04</b>	
UGIT205A	Elective: Generic (GE)	<b>Elective (Any one)</b> 1. Web Programming and Designing  2. Management Information System	<b>04</b>	UGIT2P5 A	<b>Elective (Any one)</b> 1. Web Programming Practical  2. Management Information System Practical	<b>02</b>	<b>06</b>	
UGIT205B	Elective: Generic (GE)		<b>04</b>	UGIT2P5B		<b>02</b>	<b>06</b>	

# **Semester – I**



<b>B. Sc (Information Technology)</b>		<b>Semester – I</b>	
Course Name: <b>Discrete Mathematics</b>		Course Code: UGIT101	
Periods per week (1 Period is 50 minutes)		3	
Credits		3	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	2	60
	<b>Internal</b>	--	40

**Objectives:**

The purpose of the course is to familiarize the prospective learners with mathematical structures that are fundamentally discrete. This course introduces sets and functions, forming and solving recurrence relations and different counting principles. These concepts are useful to study or describe objects or problems in computer algorithms and programming languages.

**Expected Learning Outcomes:**

1. Student can understand overview of theory of discrete objects, starting with relations and partially ordered sets.
2. Student will able to recognized recurrence relations, generating function and operations on them.
3. Student will able to understand of graphs and trees, which are widely used in software.
4. Student will definitely get knowledge about models of automata theory and the corresponding formal languages.
5. Student can able to know importance of logic, set tree, graph, relation and function with respect to IT.

Student can definitely solve the problems and theorems based on discrete mathematics.

<b>Unit</b>	<b>Details</b>	<b>Lectures</b>
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I	<p><b>Set Theory:</b> Fundamentals - Sets and subsets, Venn Diagrams, Operations on sets, Laws of Set Theory, Power Sets, Partition of sets, The principle of Inclusion-Exclusion.</p> <p><b>Logic:</b> Propositions and Logical operations, Logical Form, Logical Equivalence, Implications, Laws of Logic, Conditional Statements, Valid and Invalid Arguments.</p>	8
II	<p><b>Quantified Statements :</b> Predicates and Quantified Statements, Statements with Multiple Quantifiers, Arguments with Quantified Statements</p> <p><b>Elementary Number Theory and Methods of Proof:</b></p> <p>Introduction to Direct Proofs, Rational Numbers, Divisibility. The Quotient-Remainder Theorem, Floor and Ceiling.</p>	8
III	<p><b>Sequences, Mathematical Induction, and Recursion</b> Sequences, Mathematical Induction, defining sequences recursively, solving recurrence relations by iteration, Second order linear homogeneous recurrence relations with constant coefficients.</p>	8
IV	<p><b>Functions:</b> Definitions and Types of functions, One-to-One and Onto, Identity and Inverse Functions, Composition of Functions.</p> <p><b>Relations:</b> Relations on Sets, Reflexivity, Symmetry, and Transitivity, Equivalence Relations, Partial Order Relations.</p>	8
V	<p><b>Graphs and Trees</b> Definitions and Basic Properties, Trails, Paths, and Circuits, Matrix Representations of Graphs, Isomorphism of Graphs, Trees, Rooted Trees, Isomorphism of Graphs, Spanning trees and shortest paths. Kruskal's Algorithm, Prim's Algorithm, Dijkstra's Shortest Path Algorithm</p>	8
VI	<p><b>Counting and Probability:</b> 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</p>	8

<b>References and Text Books:</b>					
<b>Sr. No.</b>	<b>Title</b>	<b>Author/s</b>	<b>Publisher</b>	<b>Edition</b>	<b>Year</b>
1.	Discrete Mathematics with Applications	Sussana S. Epp	Cengage Learning	4 <sup>th</sup>	2010
2.	Discrete Mathematics, Schaum's Outlines Series	Seymour Lipschutz, Marc Lipson	Tata MCGraw Hill		2007
3.	Discrete Mathematics and its Applications	Kenneth H. Rosen	Tata MCGraw Hill		
4.	Discrete mathematical structures	B Kolman RC Busby, S Ross	PHI		
5.	Discrete structures	Liu	Tata MCGraw Hill		

<b>B. Sc (Information Technology)</b>		<b>Semester – I</b>	
<b>Course Name: Discrete Mathematics Practical</b>		<b>Course Code: UGIT1P1</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>2</b>	
<b>Credits</b>		<b>1</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Practical Examination</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>--</b>	<b>--</b>

	<b>List of Practical: Write the programs for the following using SCILAB</b>
<b>1.</b>	<b>Set Theory</b>
a.	Inclusion Exclusion principle.
b.	Power Sets
<b>2.</b>	<b>Functions and Algorithms</b>
a.	Cardinality
b.	Polynomial evaluation
c.	Greatest Common Divisor
<b>3.</b>	<b>Counting</b>
a.	Sum rule principle
b.	Product rule principle
c.	Factorial
d.	Permutations
e.	Permutations with repetitions
f.	Combinations
g.	Combinations with repetitions

<b>4.</b>	<b>Probability Theory</b>
a.	Sample space and events
b.	Finite probability spaces
c.	Equiprobable spaces
d.	Addition Principle
e.	Conditional Probability
<b>5.</b>	<b>Graph Theory</b>
a.	Paths and connectivity
b.	Minimum spanning tree
<b>6.</b>	<b>Directed Graphs</b>
a.	Adjacency matrix
b.	Path matrix
<b>7.</b>	<b>Properties of integers</b>
a.	Division algorithm
b.	Primes
c.	Euclidean algorithm
d.	Fundamental theorem of arithmetic
<b>8.</b>	<b>Algebraic Systems</b>
a.	Properties of operations
b.	Roots of polynomials
<b>9.</b>	<b>Boolean Algebra</b>
a.	Basic definitions in Boolean Algebra
b.	Boolean algebra as lattices
<b>10.</b>	<b>Recurrence relations</b>

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

<b>B. Sc. (Information Technology)</b>		<b>Semester – I</b>	
<b>Course Name: Imperative Programming</b>		<b>Course Code: UGIT102</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>3</b>	
<b>Credits</b>		<b>3</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	<b>2</b>	<b>60</b>
	<b>Internal</b>	<b>--</b>	<b>40</b>

### Objectives:

The objective of this course is to provide a comprehensive study of the C programming language, stressing upon the strengths of C, which provide the students with the means of writing modular, efficient, maintainable, and portable code.

### Expected Learning Outcomes

1. Students should be able to write, compile and debug programs in C language.
2. Students should be able to use different data types in a computer program.
3. Students should be able to design programs involving decision structures, loops and functions.
4. Students should be able to explain the difference between call by value and call by reference
5. Students should be able to understand the dynamics of memory by the use of pointers.
6. Students should be able to use different data structures and create/update basic data files.

<b>Unit</b>	<b>Details</b>	<b>Lectures</b>
<b>I</b>	<p><b>Introduction:</b> Types of Programming languages, , features and Application. program development cycle, Programming model Algorithm and flowchart symbols, desirable program characteristics.</p> <p><b>Structure of C program:</b> Header and body, use of comments. Compilation and Execution of a Program.</p>	<b>8</b>

	<p><b>Fundamentals:</b></p> <p>Character Set, identifiers and keywords, data types, constants, declaring variables, scope of the variables according to block, expressions, statements, symbolic constant, #define and #include</p>	
<b>II</b>	<p><b>Operators and Expressions:</b></p> <p>Arithmetic operators, unary operators, relational and logical operators, Assignment operators, the conditional operator, comma operators, operator's precedence. Bitwise operator.</p> <p><b>Data Input and output:</b></p> <p>Single character input and output, entering input data, scanf function, Character I/O format: getch(), getchar(), gets(), putchar(), puts().</p>	<b>8</b>
<b>III</b>	<p><b>Conditional Statements and Loops:</b> Decision Making Within A Program: (i) Branching: If Statement, If-Else Statement, Switch Statement (ii) Looping: while loop, do. While, for loop (iii) Jump statements: break, continue and goto. Nested Loops, Infinite Loops,</p> <p><b>Program structure:</b></p> <p>Storage classes, automatic, register, external, static.</p>	<b>8</b>
<b>IV</b>	<p><b>Function:</b></p> <p>Overview, defining a function, accessing a function, function prototypes, specifying argument data types, passing arguments to a function: call by reference; call by value, block structure, recursive functions. Directives and Macros</p> <p><b>String:</b></p> <p>String ,declaring and initializing string, string functions, library functions</p>	<b>8</b>
<b>V</b>	<p><b>Array:</b></p> <p>Definition, processing, passing arrays to functions, 1D array, Multidimensional array, String</p>	<b>8</b>

<b>VI</b>	<p><b>Pointers:</b> Fundamentals, declarations, Pointers Address Operators, Pointer Type Declaration, Pointer Assignment, Pointer Initialization, Pointer Arithmetic, Functions and Pointers, Arrays And Pointers,</p> <p><b>Structure &amp; Unions:</b> Structure Variables, Initialization, Structure Assignment, Nested Structure, Structures and Functions, Structures and Arrays: Arrays of Structures, Structures Containing Arrays, Unions, Structures and pointers</p>	<b>8</b>

#### Books and References:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Programming with C	Byron Gottfried	Tata McGraw-Hill	2 <sup>nd</sup>	1996
2	Programming in ANSI C	BalagurUGamy	TMH	3 <sup>rd</sup>	
3.	“C” Programming”	Brian W. Kernighan & Denis M. Ritchie.	PHI	2 <sup>nd</sup>	
4.	Let UG C	Yashwant P. Kanetkar,	BPB publication		
5.	C for beginners	MadhUGudan Mothe	X-Team Series	1 <sup>st</sup>	2008
6.	21 <sup>st</sup> Century C	Ben Klemens	OReilly	1 <sup>st</sup>	2012



<b>B. Sc (Information Technology)</b>		<b>Semester – I</b>	
<b>Course Name: Imperative Programming Practical</b>		<b>Course Code: UGIT1P2</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>2</b>	
<b>Credits</b>		<b>1</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Practical Examination</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>--</b>	<b>--</b>

<b>List of Practical: (Can be done in any imperative language)</b>	
<b>1.</b>	<b>Basic Programs:</b>
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.
<b>2.</b>	<b>Programs on variables:</b>
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.
<b>3.</b>	<b>Conditional statements and loops(basic)</b>
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 find the factorial of a number.
e.	Write a program to check whether the entered number is prime or not.
f.	Write a program to find the largest of three numbers.
<b>4.</b>	<b>Conditional statements and loops(advanced)</b>
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 that solve the quadratic equation $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

h.	Write a program to check whether the entered number is Armstrong or not.
i.	Write a program to count the digit in a number
<b>5.</b>	<b>Programs on patterns:</b>
a.	Programs on different patterns.

<b>6.</b>	<b>Functions:</b>
a.	Programs on Functions.
<b>7.</b>	<b>Recursive functions</b>
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.
<b>8.</b>	<b>Arrays</b>
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.
<b>9.</b>	<b>Pointers</b>
a.	Write a program to demonstrate the use of pointers.
b.	Write a program to perform addition and subtraction of two pointer variables.
<b>10.</b>	<b>Structures and Unions</b>

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

<b>B. Sc (Information Technology)</b>		<b>Semester I</b>	
<b>Course Name: Digital Electronics</b>		<b>Course Code: UGIT103</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>3</b>	
<b>Credits</b>		<b>3</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	<b>2</b>	<b>60</b>
	<b>Internal</b>	<b>--</b>	<b>40</b>

**Objectives.**

To understand the structure and operation of modern processors and their instruction sets

**Expected Learning Outcomes:**

1. Student can understand about how computer systems work and underlying principles
2. Student will understand the basics of digital electronics needed for computers
3. Student can understand the basics of instruction set architecture for reduced and complex instruction sets
4. Student can understand the basics of processor structure and operation
5. Student can understand how data is transferred between the processor and I/O devices
6. Student will be able to understand importance of counters, circuits in computer system.

Unit	Details	Lectures
I	<p><b>Number System:</b> Analog System, digital system, numbering 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, EBCDIC, Hollerith Code, Error detection and correction, Code conversion.</p> <p><b>Binary Arithmetic:</b> 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</p>	8
II	<p><b>Boolean Algebra and Logic Gates:</b> IC Technology, Levels of IC Complexity, Introduction to Logic, 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.</p> <p><b>Minterm, Maxterm and Karnaugh Maps:</b> Introduction, minterms and sum of minterm form, maxterm and Product of maxterm form, Reduction technique using Karnaugh maps –2/3/4/5/6 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.</p>	8
III	<p><b>Combinational Logic Circuits:</b> Introduction, Multi-input, multi-output Combinational circuits, Code converters design and implementations</p> <p><b>Arithmetic Circuits:</b> Introduction, Adder, BCD Adder, Excess – 3 Adder, Binary Subtractor, BCD Subtractor, Multiplier, Comparator.</p>	8
IV	<p><b>Multiplexer, Demultiplexers, ALU, Encoder and Decoder:</b> Introduction, Multiplexer, Demultiplexers, Decoder, ALU, Encoders.</p>	8
V	<p><b>Sequential Circuits: Flip-Flop:</b> Introduction, Terminologies used, S-R flip-flop, D flip-flop, JK flip-flop, Race-around condition, Master – slave JK flip-flop, T flip-flop, conversion from one type of flip-flop to another.</p>	8
VI	<p><b>Counters:</b> Introduction, Asynchronous counter, Terms related to counters, IC</p>	8

	7493 (4-bit binary counter), Synchronous counter, Bushing, Type T Design, Type JK Design, Presettable counter, IC 7490, IC 7492, Synchronous counter ICs.	
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<b>References and Text Book:</b>					
<b>Sr. No</b>	<b>Title</b>	<b>Author/s</b>	<b>Publisher</b>	<b>Edition</b>	<b>Year</b>
1.	Digital Electronics	Dr. S. B. Kishor, S. Dasarwar, S. Kasarla	Published by DAS GANU Prakashan.	4 <sup>th</sup> Ed.,	2018
2.	Digital Electronics and Logic Design	N. G. Palan	Technova		
3.	Make Electronics	Charles Platt	O'Reilly	1st	2010
4.	Modern Digital Electronics	R. P. Jain	Tata McGraw Hill	3rd	
5.	Digital Principles and Applications	Malvino and Leech	Tata McGraw Hill		
6.	Digital Electronics: Principles, Devices and Applications,	Anil K. Maini	Wiley		2007
7.	Introduction to System Design Using Integrated Circuits	B. S. Sonde	New Age International (P) Limited, Publishers	2 <sup>nd</sup> Ed.	

<b>B. Sc (Information Technology)</b>		<b>Semester I</b>	
<b>Course Name: Digital Electronics Practical</b>		<b>Course Code: UGIT1P3</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>2</b>	
<b>Credits</b>		<b>1</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Practical Examination</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>--</b>	<b>--</b>

<b>List of Practicals</b>	
1.	Study of Logic gates and their ICs.
2.	Study of universal gates and their ICs.
3.	Implement the given Boolean expressions using a minimum number of gates.
4.	Implement combinational circuits.
5.	Implement code converters.
6.	Implement Adder and Subtractor Arithmetic circuits.
7.	Implement Arithmetic circuits.
8.	Implement Encode and Decoder and Multiplexer and Demultiplexers.
9.	Study of flip-flops and counters

<b>B. Sc (Information Technology)</b>		<b>Semester I</b>	
Course Name: <b>Professional Communication Skills</b>		Course Code: UGIT104	
Periods per week (1 Period is 50 minutes)		3	
Credits		3	
		<b>Hours</b>	<b>Marks</b>
Evaluation System	<b>Theory Examination</b>	<b>2</b>	<b>60</b>
	<b>Internal</b>	<b>--</b>	<b>40</b>

**Objectives.**

**Expected Learning Outcomes:**

1.

Unit	Details	Lectures
<b>I</b>	<b>The Seven Cs of Effective Communication:</b> Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness	<b>8</b>
<b>II</b>	<b>Understanding Business Communication:</b> Nature and Scope of Communication, Non-verbal Communication, Technology-enabled Business Communication	<b>8</b>



<b>III</b>	<p><b>Writing Business Messages and Documents:</b> Business writing, Instructions Business Reports and Proposals, Career building and Resume writing.</p> <p><b>Developing Oral Communication Skills for Business:</b> Effective Listening, Interviews</p>	<b>8</b>
<b>IV</b>	<p><b>Developing Oral Communication Skills for Business:</b> Meetings and Conferences, Group Discussions and Team Presentations, Team Briefing.</p>	<b>8</b>
<b>V</b>	<p><b>Understanding Specific Communication Needs:</b> Corporate Communication, Ethics in Business Communication, Business Communication Aids</p>	<b>8</b>
<b>VI</b>	<p><b>Presentation Process:</b> Planning the presentations, executing the presentations, Planning stage: Brainstorming, mind maps / concept maps, executing stage: chunking theory, creating outlines, Use of templates.</p>	<b>8</b>

<b>References and Text Book:</b>					
<b>Sr. No</b>	<b>Title</b>	<b>Author/s</b>	<b>Publisher</b>	<b>Edition</b>	<b>Year</b>
1.	Business Communication	Edited by Meenakshi Raman and Prakash Singh	Oxford University Press	Second	
2.	Professional Communication	Aruna Koneru	Tata McGraw Hill		
3.	Strategies for improving your business communication	Prof. M.S. Rao	Shroff Publishers and Distributors		2016
4.	Business Communication	Dr. Rishipal and Dr. Jyoti Sheoran	SPD		2014
5.	Graphics for learning proven Guidelines for planning, Designing, and evaluating Visuals in Training Materials	Ruth C. Clark. Chopeta Lyons	Pfeiffer, Wiley		2011
6.	Basic Business Communication: Skills for Empowering the Internet Generation	Lesikar Raymond V and Marie E. Flatley	Tata McGrawHill	10th	2005

7.	Nonverbal Communication: Notes on the Visual Perception of Human Relations	Ruesh, Jurgen and Weldon Kees	University of California Press		1966
8.	Business Communication Today	Bovee, Courtland L., Thill, John V.	Pearson Education Ltd.		2015
9.	Communication Skills	Dr. Nageshwar Rao, Dr. Rajendra P. Das	Himalaya Publishing House		

<b>B. Sc (Information Technology)</b>		<b>Semester I</b>	
<b>Course Name: Professional Communication Skills Practical</b>		<b>Course Code: UGIT1P4</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>2</b>	
<b>Credits</b>		<b>1</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Practical Examination</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>--</b>	<b>--</b>

<b>List of Practicals</b>	
<b>1.</b>	<b>Communication Origami, Guessing Game, Guessing the emotion</b>
<b>2.</b>	<b>Body Language, Follow All Instructions, Effective Feedback Skills</b>
<b>3.</b>	<b>The Name Game, Square Talk (Effective Communication), Room 101 (Influential and persuasive skills)</b>

4.	<b>Back to Back Communication, Paper Shapes (Importance of two-way communication), Memory Test(Presentation Skills)</b>
5.	<b>Exercises on Communication Principles</b>
6.	<b>Exercises on communication icebreakers</b>
7.	<b>Communication exercises</b>
a.	<b>For the following Practicals, Microsoft Office, Open Office, Libre Office or any other software suite can be used.</b>
8.	<b>Use of word processing tools for communication</b>
9.	<b>Use of spreadsheet tools for communication</b>
10.	<b>Use of presentation tools for communication</b>

<b>B. Sc. (Information Technology)</b>		<b>Semester I</b>	
Course Name: <b>Green Computing</b>		Course Code: UGIT105A	
Periods per week (1 Period is 50 minutes)		4	
Credits		4	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	2	60
	<b>Internal</b>	--	40

<b>Objectives.</b>		
<b>Expected Learning Outcomes:</b>		
1.		
<b>Unit</b>	<b>Details</b>	<b>Lectures</b>
<b>I</b>	<b>Overview and Issues:</b> Problems: Toxins, Power Consumption, Equipment Disposal,	<b>8</b>

	<p>Company's Carbon Footprint: Measuring, Details, reasons to bother, Cost Savings: Hardware, Power.</p> <p><b>Initiatives and Standards:</b> Global Initiatives: Basel Action Network, Basel Convention, WEEE Directive, RoHS, National Adoption, Asia:India</p>	
<b>II</b>	<p><b>Minimizing Power Usage:</b> Power Problems, Monitoring Power Usage, Servers, Low-Cost Options, Reducing Power Use, Low- Power Computers, PCs, Linux, Components, Servers, Computer Settings, Storage, Monitors, Power Supplies, Wireless Devices, Software.</p> <p><b>Cooling:</b> Cooling Costs, Causes of Cost, Calculating Cooling Needs, Reducing Cooling Costs, Economizers, On-Demand Cooling, Optimizing Airflow, Hot Aisle/Cold Aisle, Raised Floors, Supply Air Directly to Heat Sources, Fans, Humidity, Adding Cooling</p>	<b>8</b>
<b>III</b>	<p><b>Changing the Way of Work:</b> Old Behaviours, starting at the Top, Process Reengineering with Green in Mind, Analysing the Global Impact of Local Actions, Steps: Water, Recycling, Energy, Pollutants</p>	<b>8</b>
<b>IV</b>	<p><b>Going Paperless:</b> Paper Problems, The Environment, Costs: Paper and Office, Practicality, Storage, Destruction, Going Paperless, Changing Over, Paperless Billing</p>	<b>8</b>
<b>V</b>	<p><b>Recycling:</b> Problems, Materials, Means of Disposal, Recycling, Refurbishing, Life Cycle, Recycling Companies, Checklist, Hard Drive Recycling, cleaning a Hard Drive, Pros and cons of each method, CDs and DVDs, good and bad about CD and DVDs disposal</p>	<b>8</b>
<b>VI</b>	<p><b>Greening Your Information Systems:</b> Initial Improvement Calculations, Selecting Metrics, Tracking Progress, Change Business Processes, Customer Interaction, Green Supply Chain, Improve Technology Infrastructure</p> <p><b>Staying Green:</b> Organizational Check-ups, Chief Green Officer, Evolution, Sell the CEO, SMART Goals, Helpful Organizations.</p>	<b>8</b>

<b>Books and References:</b>					
<b>Sr. No.</b>	<b>Title</b>	<b>Author/s</b>	<b>Publisher</b>	<b>Edition</b>	<b>Year</b>
1.	Green IT	Toby Velte, Anthony Velte, Robert Elsenpeter	McGraw Hill		2008
2.	Green Data Center: Steps for the Journey	Alvin Galea, Michael Schaefer, Mike Ebbers	Shroff Publishers and Distributers		2011
3.	Green Computing and Green IT Best Practice	Jason Harris	Emereo		
4.	Green Computing Tools and Techniques for Saving Energy, Money and Resources	Bud E. Smith	CRC Press		2014

<b>B. Sc (Information Technology)</b>	<b>Semester I</b>
<b>Course Name: Green Computing Practical</b>	<b>Course Code: UGIT1P5A</b>
<b>Periods per week (1 Period is 50 minutes)</b>	<b>4</b>

<b>Credits</b>		<b>2</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Practical Examination</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>--</b>	<b>--</b>

<b>Project and Viva Voce</b>	
<b>1.</b>	<b>A project should be done based on the objectives of Green Computing. A report of minimum 50 pages should be prepared. The report should have a font size of 12, Times new roman and 1.5 line spacing. The headings should have font size 14. The report should be hard bound.</b>
<b>2.</b>	<b>The project can be done individually or a group of two students.</b>
<b>3.</b>	<b>The students will have to present the project during the examination.</b>
<b>4.</b>	<b>A certified copy of the project report is essential to appear for the examination.</b>

<b>B. Sc. (Information Technology)</b>	<b>Semester I</b>
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<b>Course Name: Basic Computer Skills and Effective Internet Skills</b>		<b>Course Code: UGIT105B</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>4</b>	
<b>Credits</b>		<b>4</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	<b>2</b>	<b>60</b>
	<b>Internal</b>	<b>--</b>	<b>40</b>

### Objectives.

The course is designed to aim at imparting a basic level appreciation programme for the common man. After completing the course the incumbent is able to the use the computer for basic purposes of preparing his personnel/business letters, viewing information on Internet (the web), sending mails, using internet etc. This allows a novice to be also a part of computer users list by making them digitally literate.

### Expected Learning Outcomes:

1.

<b>Unit</b>	<b>Details</b>	<b>Lectures</b>
<b>I</b>	<p><b>The Computer System:</b> Characteristics of computers, Basic Applications of computers, components of computer system, classification of computers, representations of data/information concepts of data processing</p> <p><b>Introduction to Windows:</b> What is operating system and basics of Windows, The user interface-using mouse and moving icons on the screen, The my computer icon, the recycle bin, Status bar, start menu and menu selection, running an application, windows explorer viewing of file, folders and directories, creating and renaming of files and folders, opening and closing of different windows. Windows Setting: Control Panels, Wall paper and screen savers, setting the date and sound, concept of menu using Help. Advanced Windows: Using right button of the mouse, creating shortcuts, basics of window setup, notepad, windows accessories.</p>	<b>8</b>
<b>II</b>	<p><b>Elements of Word Processing:</b> Word Processing Basics: Introduction to word processing, opening word processing package, the menu bar, using the Help, Using the Icons below menu bar. Operating documents and closing documents: opening documents, Save and Save As, page setup, printing of documents, display/hiding of paragraph marks and Inter word space. Moving around in document: scrolling in a document, scrolling by line/paragraph, fast scrolling and moving pages. Using a Document/Help Wizard. Text Creating and Manipulation: Paragraph and Tab Setting, Text Selection, Cut, copy and paste, Font and size selection, Bold, Italic and Underline, Alignment of Text. Formatting the Text: Changing font, Size and Color, Paragraph indenting, Bullets and Numbering, Use of Tab and Tab setting, Changing case, Handling Multiple Documents: . Opening and closing of Multiple documents,</p>	<b>8</b>

	Cut, Copy and Paste across the documents, Saving of Clip boards, Table Manipulation: Concept of table: Rows Columns and Cells, Draw Table, Changing cell Width and Height, Alignment of Text in Cell, Copying of cell, Delete/insertion of row and columns, Borders for Table Printing: Printing, Print Preview, Print a selected page	
<b>III</b>	<b>Spread sheets:</b> Elements of Electronic Spread sheets: Application/usage of Electronic Spread Sheet, Opening of Spread Sheet, The menu bar, Creation of cells and addressing of cells, Cell inputting Manipulation of Cells: Enter texts numbers and dates, Creation of tables, Cell Height and Widths, Copying of cells. Providing Formulas: Using basic functions / formalism a cell, Sum function, Average, Percentage, Other basic functions	<b>8</b>
<b>IV</b>	<b>Making Small Presentations:</b> Basics: Difference between presentation and document, Using Power Point, Opening a Power Point Presentation, Using Wizard for creating a presentation. Creation of Presentation: Title, Text Creation, Fonts and Sizes, Bullets and indenting, Moving to Next Slide. Preparation of Slides: Selection of type of Slides, Importing text from word documents, Moving to next Slide, The Slide manager. Providing aesthetics: Slide Designs, Background and Text colors, Making your own slide format, Footnotes and slide numbering. Slide Manipulation and Slide Show. Presentation of the Slides: Using the Slide Show, Printing the Slides and Handouts, Slide sorter, Title sorter	<b>8</b>
<b>V</b>	<b>Computer Communication and Internet:</b> Basic of Computer networks: LAN, WAN. Internet: Concept of Internet, Application of Internet. Service on Inter Net: WWW and web-sites, Electronic mails, Communication on Internet <b>WWW and Web Browsers:</b> Web Browsing software: Internet Explorer, Netscape Communicator. Surfing the Internet: Giving the URL address, Search, Moving Around in a web-site, Printing or saving portion of web pages, Down loading	<b>8</b>
<b>VI</b>	<b>Email:</b> Basic of electronic mail: What is an Electronic mail: Email addressing, Mailbox: Inbox and outbox. Using Emails: Viewing an email: Sending an Email, Saving mails, Sending same mail to various users. Document handling: Sending soft copy as attachment, Enclosures to email, Sending a Portion of document as email.	<b>8</b>



<b>References and Text Book:</b>					
<b>Sr. No</b>	<b>Title</b>	<b>Author/s</b>	<b>Publisher</b>	<b>Edition</b>	<b>Year</b>
1.	Data Processing and Information Technology	C.S. French	BPB Publications		1998
2.	Computer Fundamentals	P.K Sinha	BPB Publications		1992
3.	The ABCs of Microsoft Office 97 Professional edition	Guy Hart-Davis	BPB Publications		1998
4.	Microsoft Windows 98 Training Guide	Karl Schwartz			1998

<b>B. Sc. (Information Technology)</b>		<b>Semester I</b>	
<b>Course Name: Basic Computer Skills and Effective Internet Skills Practical</b>		<b>Course Code: UGIT1P5B</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>4</b>	
<b>Credits</b>		<b>2</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Practical Examination</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>--</b>	<b>--</b>

<b>List of Practicals</b>	
<b>1.</b>	<b>To study MS Word:</b> starting Ms Word, creating documents, opening a word document, cutting, copying and pasting text, modifying font, aligning text, indenting paragraphs and modifying line spacing, setting and modifying tabs, inserting numbers and bullets in the word document, inserting bullets, page breaks, auto correct, spelling check and grammar tool, changing default settings, finding text, finding and replacing text, split window option, working with columns, saving and protecting the document.
<b>2.</b>	<b>Creating and working with tables in MS Word:</b> Creating Table, Adding columns and Rows to the Table, Deleting columns or rows from the Table, Splitting and merging cells, Text alignment within tables, changing text orientation, Adding Calculations.
<b>3.</b>	To Study Mail Merge: Creating the Main Document, Creating the Data Source.
<b>4.</b>	<b>To study MS Excel:</b> Creating workbooks, Entering text and data in cells, formatting the Text, setting alignments of the Text, working with multiple cells, formatting features on numbers, changing the column width, changing the row height, Inserting and Deleting the Rows, Inserting and Deleting Columns, Moving and Copying the Cell Contents, Transferring the Data between Worksheets, Transferring the data between the Worksheets.
<b>5.</b>	<b>Using Formulae, referencing and creating range in MS Excel:</b> Writing a simple formula, Inserting a column, Writing a complex formula, Editing the formula, Relative references, Absolute references, Creating an Range, Creating names from a Row or a Column,

6.	Using Functions and Web Publishing in MS Excel: Using Excel Financial functions, Goal Seek, using common statistical functions, Creating Charts, Using Stock Charts, Preparing Excel Data for Web Publication, and Publishing Excel Data on the Web.
7.	<b>To study MS PowerPoint:</b> Starting MS PowerPoint, Creating a presentation using a blank presentation, Using Design Templates, Different views of Slides, Customizing the background of Slide Master, Modifying text, adding footer to the Slide.
8.	<b>Creating Handouts and Notes and Customizing the Presentation:</b> Making Handouts, Making Notes, Setting the slide timings, Drawing on the Slides, Customizing a presentation.
9.	<b>Working with Graphs and objects in MS PowerPoint:</b> Creating Graphs, Inserting Objects and graphics, Adding Transition to the Slide, Adding Slide Animation, Modify the Slide Background Color and Fill Pattern, Saving Presentation.
10.	To Study MS Outlook: setting up appointments, Scheduling a Meeting in Outlook, Scheduling Events in Outlook, Managing Task List in Outlook,

# **SEMESTER II**

<b>B. Sc. (Information Technology)</b>		<b>Semester – II</b>	
Course Name: <b>Numerical and Statistical Methods</b>		Course Code: UGIT201	
Periods per week (1 Period is 50 minutes)		3	
Credits		3	
		<b>Hou rs</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	2	60
	<b>Intern al</b>	--	40

**Objectives:**

1. To provide suitable and effective methods called Numerical Methods, for obtaining approximate representative numerical results of the problems.
2. To solve problems in the field of Applied Mathematics, Theoretical Physics and Engineering
3. which requires computing of numerical results using certain raw data.
4. To solve complex mathematical problems using only simple arithmetic operations. The approach involves formulation of mathematical models of physical situations that can be solved with arithmetic operations.
5. To deal with various topics like finding roots of equations, solving systems of linear algebraic
6. equations, interpolation and regression analysis, numerical integration & differentiation, solution of differential equation, boundary value problems, solution of matrix problems.
7. To facilitate numerical computing.

**Expected Learning Outcomes:**

1. Student can able to apply Numerical analysis which has enormous application in the field of Science and some fields of Engineering.
2. Student will become familiar with finite precision computation.
3. Student will become familiar with numerical solutions of nonlinear equations in a single variable.
4. Student will become familiar with numerical integration and differentiation, numerical solution of ordinary differential equations.
5. Student will become familiar with calculation and interpretation of errors in numerical method.
6. Student will become familiar with programming with numerical packages like SCILAB

<b>Unit</b>	<b>Details</b>	<b>Lectures</b>
I	<b>Mathematical Modeling and Engineering Problem Solving: A</b>	<b>8</b>

	Simple Mathematical Model, Conservation Laws and Engineering Problems <b>Approximations and Round-Off Errors:</b> Significant Figures, Accuracy and Precision, Error Definitions, Round-Off Errors <b>Truncation Errors and the Taylor Series:</b> The Taylor Series, Error Propagation, Total Numerical Errors, Formulation Errors and Data Uncertainty	
II	<b>Solutions of Algebraic and Transcendental Equations:</b> The Bisection Method, The Newton-Raphson Method, The Regula-falsi method, The Secant Method. <b>Interpolation:</b> Forward Difference, Backward Difference, Newton's Forward Difference Interpolation, Newton's Backward Difference Interpolation, Lagrange's Interpolation.	8
III	<b>Solution of simultaneous algebraic equations (linear) using iterative methods:</b> Gauss-Jordan Method, Gauss-Seidel Method. <b>Numerical differentiation and Integration:</b> Numerical differentiation, Numerical integration using Trapezoidal Rule, Simpson's 1/3rd and 3/8th rules.	8
IV	<b>Numerical solution of 1st and 2nd order differential equations:</b> Taylor series, Euler's Method, Modified Euler's Method, Runge-Kutta Method for 1st and 2nd Order Differential Equations.	8
V	<b>Least-Squares Regression:</b> Linear Regression, Polynomial Regression, Multiple Linear Regression, General Linear Least Squares, Nonlinear Regression <b>Linear Programming:</b> Linear optimization problem, Formulation and Graphical solution, Basic solution and Feasible solution.	8
VI	<b>Random variables:</b> Discrete and Continuous random variables, Probability density function, Probability distribution of random variables, Expected value, Variance. <b>Distributions:</b> Discrete distributions: Uniform, Binomial, Poisson, Bernoulli, Continuous distributions: uniform distributions, exponential, (derivation of mean and variance only and state other properties and discuss their applications) Normal distribution state all the properties and its applications.	8

<b>Books and References:</b>					
<b>Sr. No.</b>	<b>Title</b>	<b>Author/s</b>	<b>Publisher</b>	<b>Edition</b>	<b>Year</b>
1.	Introductory Methods of Numerical Methods	S. S. Shastri	PHI	Vol – 2	
2.	Numerical Methods for Engineers	Steven C. Chapra, Raymond P. Canale	Tata Mc Graw Hill	6 <sup>th</sup>	2010

3.	Numerical Analysis	Richard L. Burden, J. Douglas Faires	Cengage Learning	9th	2011
4.	Fundamentals of Mathematical Statistics	S. C. Gupta, V. K. Kapoor			
5.	Elements of Applied Mathematics	P.N.Wartikar and J.N.Wartikar	A. V. Griha, Pune	Volume 1 and 2	
6.	Numerical Methods	Dr. S. B. Kishor, B. Vaidya	DAS GANU Prakashan	2nd Ed.	2012

<b>B. Sc. (Information Technology)</b>		<b>Semester – II</b>	
<b>Course Name: Numerical and Statistical Methods</b>		<b>Course Code: UGIT2P1</b>	
<b>Practical</b>			
<b>Periods per week (1 Period is 50 minutes)</b>		<b>2</b>	
<b>Credits</b>		<b>1</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Practical Examination</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>--</b>	<b>--</b>

	<b>List of Practical</b>
<b>1.</b>	<b>Iterative Calculation</b>
a.	Program for iterative calculation.
b.	Program to calculate the roots of a quadratic equation using the formula.
c.	Program to evaluate $e^x$ using infinite series.
<b>2.</b>	<b>Solution of algebraic and transcendental equations:</b>
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
<b>3.</b>	<b>Interpolation</b>
a.	Program for Newton's forward interpolation.
b.	Program for Newton's backward interpolation.
c.	Program for Lagrange's interpolation.
<b>4.</b>	<b>Solving linear system of equations by iterative methods</b>
a.	Program for solving linear system of equations using Gauss Jordan method.
b.	Program for solving linear system of equations using Gauss Seidel method.
<b>5.</b>	<b>Numerical Differentiation</b>
a.	Programing to obtain derivatives numerically.
<b>6.</b>	<b>Numerical Integration</b>
a.	Program for numerical integration using Trapezoidal rule
b.	Program for numerical integration using Simpson's 1/3 <sup>rd</sup> rule.
c.	Program for numerical integration using Simpson's 3/8 <sup>th</sup> rule.
<b>7.</b>	<b>Solution of differential equations</b>
a.	Program to solve differential equation using Euler's method
b.	Program to solve differential equation using modified Euler's method.

c.	Program to solve differential equation using Runge-kutta 2 <sup>nd</sup> order and 4 <sup>th</sup> order methods.
<b>8.</b>	<b>Regression</b>
a.	Program for Linear regression.
b.	Program for Polynomial Regression.
c.	Program for multiple linear regression.
d.	Program for non-linear regression.
<b>9.</b>	<b>Random variables and distributions</b>
a.	Program to generate random variables.
b.	Program to fit binomial distribution.
c.	Program to fit Poisson distribution.
<b>10.</b>	<b>Distributions</b>
a.	Program for Uniform distribution.
b.	Program for Bernoulli distribution
c.	Program for Negative binomial distribution.



<b>B. Sc. (Information Technology)</b>		<b>Semester – II</b>	
Course Name: <b>Object Oriented Programming</b>		Course Code: USIT202	
Periods per week (1 Period is 50 minutes)		3	
Credits		3	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	2½	75
	<b>Internal</b>	--	25

<b>Unit</b>	<b>Details</b>	<b>Lectures</b>
I	<p><b>Object Oriented Methodology:</b> Introduction, Advantages and Disadvantages of Procedure Oriented Languages, what is Object Oriented? What is Object Oriented Development? Benefits and Application of OOPS.</p> <p><b>Principles of OOPS:</b> Basic Concepts of OOPS: Objects, Classes, Data Abstraction and Data Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing</p>	8
II	<p><b>Classes and Objects:</b> Simple classes (Class specification, class members accessing: public ,private ,protected), Defining member functions, Writing function definition outside the class ,Making outside function inline, Array of objects, passing object as an argument, Returning object from functions, friend classes, Pointer to object, Array of pointer to object , Static Functions, Static data member.</p> <p><b>Constructors and Destructors:</b> Introduction, Default Constructor, Parameterized Constructor and examples ,Multiple constructor in class, constructor with default arguments, copy constructor, Destructors</p>	8
III	<p><b>Polymorphism:</b> Concept of function overloading, overloaded operators, overloading unary and binary operators with member and friend function, overloading comparison operator, overloading arithmetic assignment operator, Data Conversion between objects and basic types</p>	8
IV	<p><b>Program development Using Inheritance:</b> Introduction, understanding inheritance, Advantages provided by inheritance, choosing the access specifier, Derived class declaration, derived class constructors, multiple inheritance, multilevel inheritance, hierarchical inheritance, virtual base classes, Abstract classes, containership, hybrid inheritance.</p>	8
V	<p><b>Virtual Functions:</b> Introduction and need, this pointer, Pointer to derived classes, Pure Virtual Functions, this Pointer, virtual destructors.</p> <p><b>Exception Handling:</b> Introduction, Exception Handling Mechanism, Concept of throw &amp; catch with example , Multiple Catch</p>	8

VI	<p><b>Templates:</b> Introduction, Function Template and examples, Class Template and examples.</p> <p><b>Working with Files:</b> Introduction, File Operations, Various File Modes, File Pointer and their Manipulation</p>	8
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<b>Books and References:</b>					
<b>Sr. No.</b>	<b>Title</b>	<b>Author/s</b>	<b>Publisher</b>	<b>Edition</b>	<b>Year</b>
1.	Object Oriented Analysis and Design	Timothy Budd	TMH	3 <sup>rd</sup>	2012
2.	Mastering C++	K R Venugopal, Rajkumar Buyya, T Ravishankar	Tata McGraw Hill	2 <sup>nd</sup> Edition	2011

3.	C++ for beginners	B. M. Hirwani	SPD		2013
4.	Effective Modern C++	Scott Meyers	SPD		
5.	Object Oriented Programming with C++	E. Balagurusamy	Tata McGraw Hill	4 <sup>th</sup>	
6.	Learning Python	Mark Lutz	O' Reilly	5 <sup>th</sup>	2013
7.	Mastering Object Oriented Python	Steven F. Lott	Pact Publishing		2014

<b>B. Sc. (Information Technology)</b>		<b>Semester – II</b>	
<b>Course Name: Object Oriented Programming Practical</b>		<b>Course Code: USIT2P2</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>2</b>	
<b>Credits</b>		<b>1</b>	
		<b>Hou rs</b>	<b>Mar ks</b>
<b>Evaluation System</b>	<b>Practical Examination</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>--</b>	<b>--</b>

<b>List of Practical: To be implemented using object oriented language</b>	
<b>1.</b>	<b>Classes and methods</b>
a.	Design an employee class for reading and displaying the employee information, the getInfo() and displayInfo() methods will be used repectively. Where getInfo() will be private method
b.	Design the class Demo which will contain the following methods: readNo(), factorial() for calculating the factorial of a number, reverseNo() will reverse the given number, isPalindrome() will check the given number is palindrome, isArmstrong() which will calculate the given number is armStrong or not. Where readNo() will be private method.
<b>2.</b>	<b>Using friend functions.</b>
a.	Write a friend function for adding the two complex numbers, using a single class
b.	Write a friend function for adding the two matrix from two different classes and display its sum.
<b>3.</b>	<b>Constructors and method overloading.</b>
a.	Design a class Complex for adding the two complex numbers and also show the use of constructor.
<b>4.</b>	<b>Operator Overloading</b>

a.	Overload the operator unary(-) for demonstrating operator overloading.
b.	Overload the operator + for adding the timings of two clocks, And also pass objects as an argument.
c.	Overload the + for concatenating the two strings. For e.g “Py” + “thon” = Python
<b>5.</b>	<b>Inheritance</b>
a.	Design a class for single level inheritance using public and private type derivation.
b.	Design a class for multiple inheritance.
c.	Implement the hierarchical inheritance.
<b>6.</b>	<b>Virtual functions and abstract classes</b>
a.	Implement the concept of method overriding.
b.	Show the use of virtual function
<b>7.</b>	<b>File handling</b>
a.	Design a class FileDemo open a file in read mode and display the total number of words and lines in the file.
b.	Design a class to handle multiple files and file operations
<b>8.</b>	<b>Templates</b>
a.	Show the implementation of template class library for swap function.
b.	Design the template class library for sorting ascending to descending and vice-versa

<b>B. Sc (Information Technology)</b>		<b>Semester – II</b>	
<b>Course Name: Operating Systems</b>		<b>Course Code: UGIT203</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>3</b>	
<b>Credits</b>		<b>3</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	<b>2</b>	<b>60</b>
	<b>Internal</b>	<b>--</b>	<b>40</b>

**Objectives:**

Learners must understand proper working of operating system. To provide a sound understanding of Computer operating system, its structures, functioning and algorithms.

**Expected Learning Outcomes:**

1. Student will able to understanding of operating system, its structures and functioning
2. Student can develop and master understanding of algorithms used by operating systems for various purposes.
3. Student can understand process, thread and relation between them.
4. Student can able to understand scheduling and solve problem based on it
5. Student can able to understand algorithms based on memory management
6. Student will able to know relation and importance of virtualization and cloud

<b>Unit</b>	<b>Details</b>	<b>Lectures</b>
<b>I</b>	<b>Introduction</b> :What is an operating system? History of operating system, OS and Computer System, System performance, Classes of OS, Batch processing, time-sharing, multiprocessing, real-time, distributed and modern operating systems, Desktop Systems, Handheld Systems, Clustered Systems, Assemblers, Compilers and Interpreters, Linkers.	<b>8</b>

<b>II</b>	<b>Operating-System Structures</b> :Operating-System Services, User Operating-System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating-System Structure, Virtual Machines, Operating-System Generation, System Boot.	<b>8</b>
<b>III</b>	<b>Processes and Process Synchronization</b> Process Concept, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, Operations on Processes, , Multithreading Models, Threading Issues, Thread Scheduling, Communication in Client–Server Systems, The Critical-Section Problem, Peterson’s Solution, Semaphores	<b>8</b>
<b>IV</b>	<b>Memory Management</b> :No memory abstraction, memory abstraction: address spaces, virtual memory, page replacement algorithms, design issues for paging systems, implementation issues and segmentation  <b>File Systems</b> :Files, directories, file system implementation, file-system management and optimization, MS-DOS file system, UNIX V7 file system, CD ROM file system. RAID Structure	<b>8</b>
<b>V</b>	<b>Input-Output</b> :Principles of I/O hardware, Principles of I/O software, I/O software layers, disks, clocks, user interfaces: keyboard, mouse, monitor, thinclients, power management,  <b>Deadlocks</b> : Resources, introduction to deadlocks, the ostrich algorithm, deadlock detection and recovery, deadlock avoidance, deadlock prevention, issues.	<b>8</b>
<b>VI</b>	<b>Virtualization and Cloud</b> :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, Clouds. <b>Multiple Processor Systems</b> :Multiprocessors, multicomputers, distributed systems	<b>8</b>

### Books and References:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Modern Operating Systems	Andrew S. Tanenbaum, Herbert Bos	Pearson	4 <sup>th</sup>	2014
2.	Operating Systems – Internals and Design	William Stallings	Pearson	8 <sup>th</sup>	2009

	Principles				
3.	Operating System Concepts	Abraham Silberschatz, Peter B. Galvineg Gagne	Wiley	8 <sup>th</sup>	
4.	Operating Systems	Godbole and Kahate	McGraw Hill	3 <sup>rd</sup>	
5	Operating System	Ashwini Somnathe Abhijit Somnathe	Sheth	1 <sup>st</sup>	

<b>B. Sc (Information Technology)</b>		<b>Semester – II</b>	
<b>Course Name: Operating Systems Practical</b>		<b>Course Code: UGIT2P3</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>2</b>	
<b>Credits</b>		<b>1</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Practical Examination</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>--</b>	<b>--</b>

### List of Practical

#### Part I: Windows Operating System

1. Introduction and Installation of the Windows Operating System.
2. Familiarization with some of the most frequently used MS-DOS commands.

#### Part II : Linux

3. Introduction and Installation of the Linux Operating System
4. Familiarization with some of the most frequently used Linux commands.
5. Studying the Linux commands related to files and directories.
6. Managing Processes in Linux
7. Fundamentals of Shell Programming.
8. Focusing on the usage of the test command and conditional statements.
9. Focusing on the usage of iteration statements and functions in shell programming.
10. Simulation of Round Robin Scheduling Algorithm Using C Language in Linux.
11. Simulation of Least Recently Used(LRU)Page Replacement Algorithm Using C Language in Linux.
12. Focusing on the installation, recompilation, and addition of new software to the Kernel.
13. Linking in new device drivers or special software to the kernel.

<b>B.Sc.(Information Technology)</b>		<b>Semester-II</b>	
<b>Course Name: Life And Employability Skills</b>		<b>Course Code: UGIT204</b>	
<b>Periods per week(1 periods is 50 minutes)</b>		<b>3</b>	
<b>Credits</b>		<b>3</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory</b>	<b>2</b>	<b>60</b>
	<b>Internal</b>	<b>---</b>	<b>40</b>

### Objectives:

To help learners develop their soft skills and develop their personality together with their technical skills. Developing professional, social and academic skills to harness hidden strengths, capabilities and knowledge equip them to excel in real work environment and corporate life. Understand various issues in personal and profession communication and learn to overcome them

To familiarize with the concept of Environment and its safety for making environment sustainable. To enhance awareness of Environment, its problem and solution on it.

### Expected Learning Outcomes:

1. Student can able to know about various aspects of soft skills and learn ways to develop personality
2. Student will able to understand the importance and type of communication in personal and professional environment.
3. Student will able to insight into much needed technical and non-technical qualities in career planning.
4. Student will definitely learn about Leadership, team building, decision making and stress management
5. Student can learn about Safety and Hazard can be achieved in and by hardware, software, network communication and data center operations.
6. Student can able to understand the strategies, frameworks, processes and



management of safe Environment

UNIT	DETAILS	Lectures
I	<p><b>Motivational Training:</b> Characteristics Essential to Achieving Success, The Power of Positive Attitude, Self awareness, Importance of Commitment Ethics and Values, Ways to Motivate Oneself Personal Goal setting and Employability Planning.</p> <p><b>Facing Interviews:</b> Manners, Etiquettes, Dress code for an interview, Do's &amp; Don'ts for an interview</p> <p><b>Behavioral Skills:</b> Problem Solving, Confidence Building, Attitude</p>	8
II	<p><b>Entrepreneurship Skills:</b> Concept of Entrepreneurship, Performance &amp; Record, Role &amp; Function of entrepreneurs in relation to the enterprise &amp; relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business, Qualities of a good Entrepreneur, SWOT and Risk Analysis.</p> <p><b>Project Preparation &amp; Marketing analysis:</b> Concept &amp; application of PLC, Sales &amp; distribution Management. Different Between Small Scale &amp; Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.</p>	8
III	<p><b>Institutions Support:</b> Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes &amp; procedure &amp; the available scheme.</p> <p><b>Investment Procurement:</b> Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation &amp; Costing, Investment procedure – Loan procurement – Banking Processes</p>	8
IV	<p><b>Productivity:</b> Definition, Necessity, Meaning of GDP Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages</p> <p><b>Quality Tools:</b> Quality Consciousness- Meaning of quality, Quality characteristic. Quality Circles- Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, House Keeping- Purpose of Housekeeping, Practice of good Housekeeping.</p>	8

V	<p><b>Occupational Safety and Hazard:</b>  Safety &amp; Health- Introduction to Occupational Safety and Health importance of safety and health at workplace. Occupational Hazards- Basic Hazards, Chemical Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders &amp; its prevention. Accident &amp; safety- Basic principles for protective equipment. Accident Prevention techniques – control of accidents and safety measures. First Aid- Care of injured &amp; Sick at the workplaces, First-Aid &amp; Transportation of sick person</p> <p><b>Labour Welfare Legislation:</b>  Welfare Acts- Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen’s compensation Act.</p>	8
VI	<p><b>Environment:</b>  Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance. Right attitude towards environment, Maintenance of in – house environment</p> <p><b>Global warming:</b>  Global warming, climate change and Ozone layer depletion</p> <p><b>Pollution:</b>  Pollution and pollutants including liquid, gaseous, solid and hazardous waste.</p>	8

**Books and References:**

1. Production and Operations Management by S.N. Chary, TMH
2. Essentials of Management by Koontz & Weihrich, TMH
3. Modern Production / Operations Management by E.S. Buffa and R.K. Sarin, John Wiley & Sons
4. Production Systems: Planning, Analysis and Control by J.L.Riggs, 3rd ed., Wiley.
5. Productions and Operations Management by A.Muhlemann, J.Oakland and K.Lockyer, Macmillan
6. Operations Research - An Introduction by H.A.Taha, Prentice Hall of India
7. Operations Research by J.K.Sharma, Macmillan
8. Business Correspondence & Report Writing by R.C. Sharma and K.Mohan, TMH
9. How to prepare for Group Discussion & Interview (With Audio Cassette) by Prasad, TMH
10. Spoken English – A self-learning guide to conversation practice (with Cassette)
11. Introduction to Environmental Engineering by Mackenzie, L. Davis and A. David, Cornwell, Mcgraw Hill, 3rd Ed.
12. Environmental Engineering by Peary, Rowe and Tchobanoglous, McgrawHill
13. Total Quality Management – An Introductory Text by Paul James, Prentice Hall
14. Quality Control and Applications by Housen&Ghose
15. Industrial Engineering Management by O.P. Khanna

<b>B.Sc.(Information Technology)</b>		<b>Semester-II</b>	
<b>Course Name: Life And Employability Skills Practical</b>		<b>Course Code: UGIT2P4</b>	
<b>Periods per week(1 periods is 50 minutes)</b>		<b>2</b>	
<b>Credits</b>		<b>1</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>---</b>	<b>--</b>

<b>List of Practical</b>
<p><b>a) Listening</b></p> <ol style="list-style-type: none"> <li>1. Deductive Reasoning Skills (taking down notes/hints)</li> <li>2. Cognitive Skills (answering questions)</li> <li>3. Retention Skills (filling in blanks with exact words heard)</li> </ol> <p><b>b) Speaking Extempore/ Prepared</b></p> <ol style="list-style-type: none"> <li>1. Personality/Psychological Skills (instant sentence making)</li> <li>2. Pleasing &amp; Amiable Skills (say in phrases/expressions)</li> <li>3. Assertive Skills (introducing oneself/others)</li> <li>4. Expressive Skills (describe/explain things)</li> <li>5. Fluency/Compatibility Skills (dialogue)</li> <li>6. Leadership/Team Spirit Skills (group discussion)</li> </ol> <p><b>c) Writing &amp; Reading</b></p> <ol style="list-style-type: none"> <li>1. Creative &amp; Reasoning Skills (frame questions on patterns)</li> <li>2. Creative &amp; Composing Skills (make sentences on patterns)</li> <li>3. Attitude &amp; Aim Skills (prepare resume)</li> <li>4. Entrepreneurship Skills (prepare outline of a project)</li> </ol> <p><b>d) Industrial Visit</b></p>

<b>B. Sc (Information Technology)</b>		<b>Semester – II</b>	
<b>Course Name: Web Programming and Web Designing</b>		<b>Course Code: UGIT205A</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		4	
<b>Credits</b>		4	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Exam</b>		<b>60</b>
	<b>I</b>		<b>40</b>

**Objectives:**

To provide insight into emerging technologies to design and develop state of - the art web applications using client-side scripting, server-side scripting, and database connectivity.

Expected Learning Outcomes:

1. Student will able to design valid, well-formed, scalable, and meaningful pages using emerging technologies.
2. Student can understand the various platforms, devices, display resolutions, viewports, and browsers that render websites
3. Student will able to develop and implement client-side scripting language programs.
4. Student can able to use different multimedia option to enhance look and feel of website
5. Student will able to apply style to enhance the overall impact of website
6. Student can understand the different events.

Unit	Details	Lectures
I	<p><b>Fundamentals Web:</b> Internet, Internet Services WWW, Web Browsers, Web Servers, URL, HTTP.</p> <p><b>HTML5:</b> Introduction, Why HTML5? Formatting text by using tags, using lists and backgrounds, Creating hyperlinks and anchors.</p> <p><b>Tables :</b> Creating simple table, specifying the size of the table, specifying the width of the column, merging table cells, using tables for page layout, formatting tables: applying table borders, applying background and foreground fills, changing cell padding, spacing and alignment.</p>	8
II	<p>HTML5 Page layout and navigation:            Creating navigational aids: planning site organization, creating navigation bar, creating image map, redirecting to another URL.            Creating image map, HTML5 semantic tags, creating divisions, creating HTML5 semantic layout, Media: Audio and video in HTML5, HTML multimedia basics, embedding video clips, incorporating audio on web page</p>	8
III	<p>Forms: creating basic form, using check boxes and option buttons, creating lists, additional input types in HTML5.</p> <p>Style Sheets: What are style sheets?, Why are style sheets valuable?, Different approaches to style sheets, Linking to style information in separate file, Setting up style information, Using the &lt;LINK&gt; tag, Embedded style information, Using &lt;STYLE&gt; tag, Inline style information. CSS formatting text using style sheets, formatting paragraphs using style sheets.</p>	8

<b>IV</b>	<p>Java Script: Introduction, Client-Side JavaScript, Server-Side JavaScript, JavaScript Objects, JavaScript Security.</p> <p>Operators: Assignment Operators, Comparison Operators, Arithmetic Operators, , Logical Operators, Short-Circuit Evaluation, String Operators, Conditional operator, delete, new, this, void  Statements: Break, comment, continue, delete, do...while, export, for, for...in, function, if...else, import, labelled, return, switch, var, while, with.</p>	<b>8</b>
<b>V</b>	<p>Core JavaScript (Properties and Methods of Each) : Array, Boolean, Date, Function, Math, Number, Object, String, regExp.</p> <p>Document and its associated objects: document Object Model(DOM) Hierarchy, Link, Area, Anchor, Image, Applet, History, Location</p>	<b>8</b>
<b>VI</b>	<p>Layer Events and Event Handlers : General Information about Events, Defining Event Handlers, event, onAbort, onBlur, onChange, onClick, onDbClick, onDragDrop, onError, onFocus, onKeyDown, onKeyPress, onKeyUp, onLoad, onMouseDown, onMouseMove, onMouseOut, onMouseOver, onMouseUp, onMove, onReset, onResize, onSelect, onSubmit, onUnload.</p>	<b>8</b>

### Books and References:

Sr. No	Title	Author/s	Publisher	Edition	Year
1.	Web Design The Complete Reference	Thomas Powell	Tata McGrawHill		-
2.	HTML5 Step by Step	Faithe Wempen	Microsoft Press		2011
3.	Head First HTML 5 program	Eric Freeman	O'Reilly		2013
4.	JavaScript 2.0: The Complete Reference	Thomas Powell and Fritz Schneider	Tata McGraw Hill	2 <sup>nd</sup>	

<b>B.Sc.(Information Technology)</b>		<b>Semester-II</b>	
<b>Course Name: Web Programming Practical</b>		<b>Course Code: UGIT2P5A</b>	
<b>Periods per week(1 periods is 50 minutes)</b>		<b>4</b>	
<b>Credits</b>		<b>2</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>---</b>	<b>--</b>
<b>List of Practical</b>			
<ol style="list-style-type: none"> <li>1. Design a web page to provide Myself using any 15 tags and provide appropriate title and heading to the page</li> <li>2. Design a web page to display a Calendar.</li> <li>3. Design a Registration Form</li> <li>4. Design a web page with Image maps.</li> <li>5. Design a web page using CSS.</li> <li>6. Design a web page embedding with multimedia features.</li> <li>7. Design a web page demonstrating different semantics.</li> <li>8. Write a program to find out the factorial of a number using Function.</li> <li>9. Write a program to demonstrate functions and properties of String Object.</li> <li>10. Write a program to change font name using external JavaScript.</li> <li>11. Write a program to explain the working of different events.</li> <li>12. Write a program for Form Validation</li> </ol>			

<b>Course Name: E-Commerce</b>		<b>Course Code: UGIT205B</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>4</b>	
<b>Credits</b>		<b>4</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	<b>2</b>	<b>60</b>
	<b>Internal</b>	<b>--</b>	<b>40</b>

**Objectives:**

1. To study the fundamental e-commerce concepts
2. To know the process of online transaction in real life.
3. To give the practical knowledge of online marketing, advertisement.

**Expected Learning Outcomes:**

1. Enter basic online transaction.
2. Use simple digital payments.
3. Obtain basic knowledge of cashless transaction

<b>Unit</b>	<b>Details</b>	<b>Lectures</b>
<b>I</b>	<b>Fundamentals of e-Commerce:</b> e-Commerce: Meaning & Nature , Introduction to e-Commerce - Origin, Definitions & Meaning, Scope & Goals, Feature, Needs & Functions, Significance, Advantages & Disadvantages of e-commerce, Essentials of e-Commerce, e-Commerce v/s Traditional Commerce , Technology Infrastructure for e-Commerce -The Internet and WWW, e- Commerce Infrastructure	<b>8</b>
<b>II</b>	<b>Business Models and E-Commerce:</b> e-Business: Meaning, Definitions, Importance Requirements of E-Business , e-Business Models based on the relationships of transaction parties , e-Business Models based on the relationships of transaction types ,Manufacture Model, Advertising Model, Value Chain Model, Brokerage Model	<b>8</b>
<b>III</b>	<b>E-Enterprise:</b> Managing the e-Enterprise, Introduction e-Enterprise, Auctions in E-commerce, Comparison between Conventional Design and E-organization, Organization of Business in an e-Enterprise. Government's support for cashless payments- Lucky Grahak Yojna for customers and Digi Dhan Vyapar Yojna.	<b>8</b>
<b>IV</b>	<b>Classification of E-Commerce:</b> B2C, B2B, C2C, C2G, G2G, B2G	<b>8</b>
<b>V</b>	<b>E-Payments Systems:</b> Models of Payments: Credit Cards, Debit Cards, Internet Banking , eCredit Accounts & e-Money/Cash, e-wallets , Data Protections, risk from mistakes and disputes, Consumer protection ,Management Information Privacy , Managing Credit Risk	<b>8</b>
<b>VI</b>	<b>Mobile Commerce:</b> Introduction of M-Commerce, Types of Mobile Commerce Services, Technologies Of Wireless Business – Benefits and Limitations, Mobile Marketing & Advertisement, Non- Internet Applications In M-Commerce – Wireless/Wired Commerce Comparisons.	<b>8</b>

**Books and References:**

1. e-Commerce - Concepts, Models, Strategies, by C S V Murthy Himalaya Publishing House
2. Basics of e-Commerce- Legal and Security Issues ISBN 81-203-2432-3 E-Commerce, EBusiness Dr C S Rayudu : Himalaya Publishing



3. e-Commerce: An Indian Perspective 2nd Edition P T Josheph SJ.
4. Electronic Commerce: Elias M Awad, Pearson Education
5. E-Logistics and E-Supply Chain Management - by Dimitris Folinas, Ioannis Manikas, Deryn Graham  
Publisher: IGI Global
6. e-Commerce- Prashant Publications.
7. e-Commerce - Concepts, Models, Strategies, by C S V Murthy Himalaya Publishing House
8. Basics of e-Commerce- Legal and Security Issues ISBN 81-203-2432-3 E-Commerce, EBusiness Dr C S Rayudu : Himalaya Publishing
9. e-Commerce: An Indian Perspective 2nd Edition P T Josheph SJ.
10. Electronic Commerce: Elias M Awad, Pearson Education
11. E-Logistics and E-Supply Chain Management - by Dimitris Folinas, Ioannis Manikas, Deryn Graham  
Publisher: IGI Global
12. e-Commerce- Prashant Publications.

<b>B. Sc (Information Technology)</b>		<b>Semester – II</b>	
<b>Course Name: E-Commerce Practical</b>		<b>Course Code: UGIT2P5B</b>	
<b>Periods per week (1 Period is 50 minutes)</b>		<b>4</b>	
<b>Credits</b>		<b>2</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Practical Examination</b>	<b>2½</b>	<b>50</b>
	<b>Internal</b>	<b>--</b>	<b>--</b>

<b>List of Practical</b>
1. Search and Demonstrate any 5 commercial Websites (e-commerce) for purchasing various products.
2. Study of shipping strategies in e-commerce and list various sellers in Ecommerce.
3. Demonstrate possible Payment Methods while purchasing through a website.
4. Perform a Marketing Transaction on a commercial Website.
5. Demonstrate B2B, C2C and B2C Relationship using websites.
6. Create an UPI account.
7. Demonstrate how to perform M-commerce Transactions Study various M-Commerce Websites(Nordstorm, Zillow, Mizpee, Target)
8. Perform a Banking Transaction using various Apps.
9. Demonstrate Billing Transactions using various Apps
10. Live demo for billing transaction

#### **Books and References:**

1. e-Commerce - Concepts, Models, Strategies, by C S V Murthy Himalaya Publishing House
2. Basics of e-Commerce- Legal and Security Issues ISBN 81-203-2432-3 E-Commerce, EBusiness
3. Dr C S Rayudu : Himalaya Publishing
4. e-Commerce: An Indian Perspective 2nd Edition P T Josheph SJ.
5. Electronic Commerce: Elias M Awad, Pearson Education
6. E-Logistics and E-Supply Chain Management - by Dimitris Folinas, Ioannis Manikas, Deryn
7. GrahamPublisher: IGI Global
8. e-Commerce- Prashant Publications