SHIVAJI UNIVERSITY, KOLHAPUR

Accredited By NAAC "A++" Grade

Multiple Entry and Multiple Exit Option (NEP-2020)

Syllabus for

B. Sc. Information Technology (Entire) - I

(Under Faculty of Science and Technology)

PART- I SEMESTER- I & II

(Syllabus to be implemented from Academic Year 2024-25)

Shivaji University, Kolhapur

B.Sc. Information Technology (Entire)

(Under Faculty of Science and Technology)

Program Outcomes (PO):

Upon successful completion of the B.Sc. Information Technology (Entire), the student should have met the following Outcomes:

Understand the basic concepts of programming, databases, and networking.

PO1 Acquire problem solving skills and design, and analyze algorithms.

PO2 Ability to work in teams as well as individual to build software systems and to use a range of programming languages and tools to develop computer programs to solve problems effectively.

PO3 Ability to communicate effectively in both verbal and written form in industry.

PO4 Ability to select appropriate techniques to tackle and solve problems in the discipline of information security management.

Program Specific Outcomes (PSO):

PSO1 To groom the graduates towards excellence through building communication skills, handling leadership challenges and negotiating career path ways.

PSO-2 To heighten the conscious of the graduates on socio-economic concern and to inculcate moral and ethical values to chisel them as better human being.

PSO-3 To train the student on the state-of-the-art tools and techniques and facilitate them to comprehend, analyze, design and create feasible solutions/innovative products for real life problems.

PSO4 To pursue higher studies with good knowledge in core areas of Information Technology.

1. **Introduction**

a) The name of the program shall be B.Sc. Information Technology (Entire).

b) After completion students will be able to apply standard software engineering practices and strategies in software project development using an open-source programming environment to deliver a quality product for business success.

c) Job Opportunities: The program addresses the job requirements in many domains such as web development, mobile development, Testing and one involving an assortment of hardware and software.

d) Many graduates begin their careers as junior programmers and, after some experience, are promoted as system analysts. Others seek a n entrepreneurial role in the Information Technology world as independent

business owners, software authors, consultants, or suppliers of systems and equipment.

e) Career opportunities exist in such areas as software development and hardware integration, technical writing, training others on a computer, software design, software testing and technical support.

f) The present curricula focus on the learning aspect from three dimensions viz. Conceptual Learning, Skills Learning and Practical / Hands-on.

2. Medium of Instruction:

The medium of instruction will be English only

3. Admission Procedure

To be eligible for admission to the B. Sc. Information Technology [Entire] a candidate must have passed

- HSC (10+2) from science stream

OR

- Three Year Diploma Course (after SSC i.e. 10th Standard), of Board of Technical Education conducted by Government of Maharashtra or its equivalent

4. Course Structure:

Lectures and Practical should be conducted as per the scheme of lectures and practical's indicated in the course structure.

5. Teaching and Practical Scheme

a) Contact session for teaching 60 minutes each.

b) One Practical Batch should be of 20 students.

c) Practical evaluation should be conducted after the commencement of university examination.

6. Assessment

1. The final practical examination will be conducted by the university appointed examiners internal as well as external at the end of semester for each lab course and marks will be submitted to the university by the panel.
2. The practical examination will be conducted semester wise in order to maintain the relevance of the respective theory course with laboratory course.
3. The final examinations shall be conducted at the end of the semester.
4. Nature of question paper: Nature of question paper is as follows for University end semester examination.

❖ Theory Examination:

Que. No.	**Question**	**Marks**
Q.1.	08 Multiple Choice Questions (One Mark each)	**08 Marks**
Q.2.	Attempt any TWO out of THREE (08 marks each)	**16 Marks**
	a)	
	b)	
	c)	
Q.3.	Attempt any FOUR (4 marks each)	**16 Marks**
	a)	
	b)	
	c)	
	d)	
	e)	

	f)	
	Total Marks	**40 Marks**

- **Internal Evaluation examination of 10 marks should be in the form of assignments**.

❖ Practical Examination:

1. Each paper carries 50 Marks.
2. Duration of Practical Examination: 3 Hrs.
3. Nature of Question paper: There will be four questions of 20 marks each. Students will be attempted any two out of four questions.
4. Certified Journal carries 5 Marks and Viva voce carries 5 Marks
5. ***No paper work is required for the Practical exam of DSC***

7. Standard of Passing:

1. Minimum 16 marks in each subject. There shall be separate passing for theory (semester end exam and Internal) and practical also.
2. Admission to B.Sc. Information Technology (Entire) Part II is allowed even if the student fails in all the subjects of part I
3. Admission to B.Sc. Information Technology (Entire) Part III is allowed only if student is passed on all the subjects of B.Sc. Information Technology(Entire) Part I

8. Board of Paper Setters /Examiners:

For each Semester end examination there will be a board of Paper setters and examiners for everycourse. While appointing paper setter /examiners, care should be taken to see that there is at least one person specialized in each unit of the course.

9. Credit system implementation:

As per the University norms

10. Clarification of Syllabus:

The syllabus committee should meet at least once in a year to study and clarify any difficulties from the Institutes.

11. Eligibility of Faculty:

MCA (from any faculty) or M.Sc. (Computer Science) or M.Sc. (Information Technology) with at least B+ or equivalent

12. Revision of Syllabus:

As the computer technology experience rapid rate of obsolescence of knowledge, revision of thesyllabus should be considered every two/three year.

13. Fees Structure: As approved by the Shivaji University fee fixation committee.

14. Intake Capacity: 80

15. Award of Class:

Grading: Shivaji University has introduced a Seven-point grading system as follows:

B.Sc. Information Technology (Entire) Part I Semester I & II

Multiple Entry and Multiple Exit Option

(NEP-2020)

Syllabus to be implemented from Academic Year 2024-25

Sr. No.	Marks Obtained out of 100	Marks Obtained out of 50	Grade Point	CGPA	Letter grade
1.	91 – 100	46 – 50	10	9.0 to 10.0	O: Outstanding
2.	81 – 90	41 – 45	9	8.0 to 8.99	A+
3.	71 – 80	36 – 40	8	7.0 to 7.99	A
4.	61 – 70	31 – 35	7	6.0 to 6.99	B+
5.	51 – 60	26 - 30	6	5.0 to 5.99	B
6.	40 – 50	20 – 25	5	4.0 to 4.99	C:
7.	< 40	< 20	0 to 4	0.0 to 3.99	Fail
8.	Absent	Absent	0		-

1. Title: B.Sc. Information Technology (Entire) Part I
2. Year of implementation: Syllabus will be implemented from June 2024 onwards
3. Duration: B.Sc. Information Technology (Entire) Part I. The duration of course shall be one year (Two semesters).
4. Pattern: Pattern of examination will be semester
5. Medium of Instruction: English
6. Structure Of Course:

Multiple Entry and Multiple Exit Option (NEP-2020)

B.Sc. Information Technology (Entire) Program Structure

B.Sc. Information Technology (Entire) Part - I (Level-4.5)

Semester	Subject Type	Course Code	Course Title
SEM – I	Course-I	Subject I DSC I:	Basics of C Programming
		Subject I DSC II:	Web Development Using HTML
		Subject I Practical I:	Practical-I Based on Subject I DSC I and Subject I DSC II
	Course-II	Subject II DSC I:	Foundation of Mathematics
		Subject II DSC II:	Basic Algebra
		Subject II Practical I:	Practical-I Based on Subject II DSC I and Subject II DSC II
	Course-III	Subject III DSC I:	Basic Electronics
		Subject III DSC II:	Fundamentals of Digital Computing
		Subject III Practical I:	Practical Based on Subject III DSC-I and Subject III DSC-II
	OE-I		Basics of Management
	IKS -I		Vedic Mathematics
SEM – II	Course I	Subject I DSC III:	Advanced C Programming
		Subject I DSC IV:	Web Development Using Cascaded Style Sheets
		Subject I Practical II:	Practical-I Based on Subject I DSC III and Subject I DSC IV
	Course II	Subject II DSC III:	Numerical Methods
		Subject II DSC IV:	Graph Theory
		Subject II Practical II:	Practical-II Based on Subject II DSC III and Subject II DSC IV
	Course III	Subject III DSC III:	Microprocessor Architecture
		Subject III DSC IV:	Fundamentals of Digital Design
		Subject III Practical II:	Practical Based on Subject III DSC-III and Subject III DSC-IV
	OE-II		Improving Reading Comprehension
	VEC-II		Democracy, Election and Constitution

Multiple Entry and Multiple Exit Option (NEP-2020)

B.Sc. Information Technology (Entire) Program Structure

B.Sc. Information Technology (Entire) Part - I (Level-4.5)

SEMESTER-I (Duration- Six Month)											
Sr. No.	Course Code	Teaching Scheme			Examination Scheme						
		Theory and Practical			University Assessment (UA)			Internal Assessment (IA)			
		Lectures (Per week)	Hours (Per week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours	
1	DSC I	2	2	2	40	16	2	10	04	2	
2	DSC II	2	2	2	40	16	2	10	04	2	
3	Practical I	4*	4*	2	50	20	3	-	-	-	
4	DSC I	2	2	2	40	16	2	10	04	2	
5	DSC II	2	2	2	40	16	2	10	04	2	
6	Practical I	4*	4*	2	50	20	3	-	-	-	
7	DSC I	2	2	2	40	16	2	10	04	2	
8	DSC II	2	2	2	40	16	2	10	04	2	
9	Practical I	4*	4*	2	20	20	3	-	-	-	
10	OE	2	2	2	40	16	2	10	04	2	
11	IKS-1	2	2	2	40	16	2	10	04	2	
	Total (A)	28	28	**22**	**480**			**70**	**480 + 70 = 550**		
*** Lectures per week per batch**											

SEMESTER-II (Duration- Six Month)										
Sr. No.	Course Code	Teaching Scheme			Examination Scheme					
		Theory and Practical			University Assessment (UA)			Internal Assessment (IA)		
		Lectures (Per week)	Hours (Per week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours
1	DS III	2	2	2	40	16	2	10	04	2
2	DSC IV	2	2	2	40	16	2	10	04	2
3	Practical II	4*	4*	2	50	20	3	-	-	-
4	DSC III	2	2	2	40	16	2	10	04	2
5	DSC IV	2	2	2	40	16	2	10	04	2
6	Practical II	4*	4*	2	50	20	3	-	-	-
7	DSC III	2	2	2	40	16	2	10	04	2
8	DSCIV	2	2	2	40	16	2	10	04	2
9	Practical II	4*	4*	2	50	20	3	-	-	-
10	OE	2	2	2	40	16	2	10	04	2
11	VEC-1: Democracy	2	2	2	40	16	2	10	04	2
	Total (B)	28	28	**22**	**480**			**70**	**480 + 70 = 550**	

* Lectures per week per batch								
	Total (A+B)		**22+22 = 44**	**960**			**140**	**960 + 140 = 1100**

• Student contact hours per week: 25 Hours (Min.)	• Total Marks for B.Sc. Information Technology (Entire)-I: **1100**
• Theory and Practical Lectures: **60** Minutes Each	• Total Credits for B.Sc. Information Technology (Entire)-I (Semester I & II): **44**
• **Requirement for Entry at Level 4.5: Completed all requirements of the 10+2**	
• DSC: Department Specific Core • OE: Open Elective	• IKS: Indian Knowledge System • VEC: Value Education Course
• **Exit Option at Level 4.5:** Students can exit after Level 4.5 with under **certificate course in Computer Programming** if he/she completes the courses equivalent to minimum of **44** credits and an **additional 4 credits** core NSQF course/Internship.	

B.Sc. Part -I Information Technology (Entire) (Semester-I)

Course Code:-Subject I DSC I

Title of Course: Basics of C Programming

Theory:-**30hrs**

Credits: 02

Total Marks: 50

Course Outcomes:

1. Illustrate the flowchart and design an algorithm for given problem
2. Acquire the information about data types.
3. Students will be able to develop logics which will help to createprograms and applications.
4. Will help to switch for any programming language fordevelopment.

Sr.No	Description	Hours
Uint I	**Basics of Programming and Introduction to 'C'** Intorduction about problem. Steps in problem solving- Problem definition, Problem Analysis, Algorithm, Flowchart, Coding, Testing. Types of errors: Logical, Syntatical, Runtime. Character set, Keywords ,Constants, Variables , Datatypes in C. Formattedand unformatted Input-output functions in C. Structure of C Program. Operators: Arithmatic, Logical, Relational,Bitwise,increment, decrement, conditional operator.	**15**
Unit II	**Control statements and Array. Branching** Statements: Introduction, if statement, if-else statement, Nested if-else statement, else if ladder, switch case statement. Looping statements: Introduction to loop, while loop, do- while loop, for loop, nested for loop,difference between while and do- while loop.Jumping statements: break, continue, goto. Array: Defintition, declaration,initialization, Memory representation of array. Types ofarray: One ,Two, Multidimensional. String: Stringhandling functions: strcpy(), strcat(),strlen(), strcmp(),strrev(),strupr(),strlwr()	**15**

Reference Books:

1. Programming in C - Schuam Outline Series
2. Let Us C- Yashwant Kanetkar
3. Programmig in ANSI C- E.

Balagurusamy.

4. The completereference ‘C’ - Herbert

Schildt

5. C Programming - Venugopal

6. The C Programming Language- Ritchie and Kernighan.

B.Sc. Part -I Information Technology (Entire) (Semester-I)

Course Code:-Subject I DSC II

Title of Course: Web Development Using HTML

Theory:-**30hrs**

Credits: 02

Total Marks: 50

Course Outcome-

Students who complete this course should be able to:

1. Understand basic concept of HTML.
2. Learn how to use HTML tags.
3. Understand how to design Webpages using HTML .
4. Understand use of frames to design.

Sr.No	Description	Hours
Uint I	**Web Design Principles:** Basic principles involved in developing a web site , Planning process, Five Golden rules of web designing , Brief History of Internet ,What is World Wide Web, Why create a web site , Web Standards, What is HTML , HTML Documents , Basic structure of an HTML document , Creating an HTML document	**15**
Unit II	**Introduction to elements of HTML:** Mark up Tags , Heading-Paragraphs , Line Breaks , HTML Tags. Working with Text , Working with Lists, Tables and Frames Working with Hyperlinks, Images and Multimedia Working with Forms and controls.	**15**

Reference Books:

Complete HTML- Thomas Powel HTML Black Book- Steven Holzner

Teach Yourself Web Technologies – Ivan Bayross

HTML and CSS 3- Seventh edition – Castro Elizabeth and Bruce Hyslop.

B.Sc. Part -I Information Technology (Entire)

(Semester- I)

Course Code:-Subject I Practical I

Title of Course: Practical-I Based on Subject I DSC I and Subject I DSC II

Practical :-**30hrs**

Credits: 02

Total Marks: 50

Course Outcomes:

Learners will be able to,

1. Develop applications.
2. Debug the program
3. Design static web pages using Hyper Text Markup Language (HTML).
4. Enhance the look of web pages by implementing CSS.
5. Collect information from the user with HTML Forms.
6. Design website using HTML & FRAME .

1. Program to display "Welcome to FY B.Sc. IT" message.
2. Program to enter a number and display it.
3. Program to enter a character and display it.
4. Program to perform bitwise operations on given input.
5. Program to check given number is even or odd.
6. Program to check given number is positive or negative.
7. Program to display grade wise result of student.
8. Program to perform arithmetic operations on choice.
9. Program to display numbers in given range using while loop.
10. Program to reverse a number using while loop.
11. Program to display sum of first 10 numbers using do-while loop.
12. Program to display the multiplication table using for loop.
13. Program to display various pyramid formats E.g.

```
        1
      2   2
    3   3   3
  4   4   4   4
```

14. Program to check given number is Armstrong or not.
15. Program to read and display array.
16. Program to search number in array.
17. Program to display transpose of matrix.
18. Program to perform addition of matrices.

19. Program to perform various operation on string.
20. Program to check given string is palindrome or not.
21. Design simple webpage using basic tags in HTML
22. Design simple webpage using text formatting tags
23. Design simple webpage using list tags
24. Design simple webpage using table tag
25. Design simple webpage using image tag
26. Design simple webpage using anchor tag
27. Design simple webpage using frame tag and its attributes
28. Design a web page to list a table content and navigate within the pagesusing hyperlink
29. Design simple webpage to display time tableDesign simple webpage to display Mark sheet
30. Design simple webpage using frame tag

B.Sc. Information Technology (Entire) Part-I

(Semester I)

Course Code:-Subject II DSC I:

Title of Course:-Foundation of Mathematics

Theory :**-30hrs**

Credits: 02

Total Marks: 50

After completion this course students will be enable to:

1. Basic knowledge of set theory, functions and relations concepts, matrix needed for designing and solving problems.
2. Construct simple mathematical proofs and possess the ability to verify them.
3. Basic knowledge of application of matrices.
4. Basic knowledge of Mean value theorems.

Sr. No	Description	Hours
Unit I	Ad joint of matrix, Inverse of Matrix, Application of matrices to a systemof liner homogeneous and Nonhomogeneous equations. Eigen values and Eigen vectors. n^{th} order derivative of some standard functions : (i) $(ax + b)^n$, (ii) $\frac{1}{ax + b}$ (iii) $\log(ax = b)$, (iv) e^{ax}, (v) a^{mx}, (vi) $\sin(ax + b)$, (vii) $\cos(ax + b)$, (viii) $e^{ax}\sin(bx + c)$, (ix) $e^{ax}\cos(bx+c)$ leibnitz's theorem andit's applications	**15**
Unit II	**Mean Value Theorems** Introduction, Rolle's theorem, Geometrical Interpretation of Rolle's theorem,Lagrange's mean value theorem., Geometrical Interpretation of Lagrange's mean value theorem, Cauchy's mean value theorem, Geometrical Interpretation of Cauchy's mean value theorem. Introduction, Partial derivative of first order, Partial derivative of Higher orders, Homogeneous functions, Euler's on homogeneous functions.	**15**

Reference Books:

1. Shanti Narayan : Differential Calculus.
2. S.B. Nimse : Calculus
3. H.T.Dinde, A.D. Lokhande, P.D.Sutar, U.H.Nai: AText Book of Calculus And Differential Equa-tions, Published by SUMS, 2003.
4. R.B.Kul-karni,J.D.Yadhav,N.I.Dhanshetti:AtextBookOfAlgebra And

Geometry.

B.Sc. Information Technology (Entire) Part-I
(Semester I)

Course Code:-Subject II DSC II:

Title of Course:-Basic Algebra

Theory :-30hrs

Credits: 02

Total Marks: 50

After completion this course students will be enable to:

Course Learning Outcomes: Upon successful completion of the course students will able to:

CO 1. apply fundamental concepts in Number theory to solve problems on congruence.
CO 2. solve problems based on Fermat's theorem and residue classes.
CO 3. use fundamental concepts in Mathematics like sets, relations and functions.
CO 4. learn basic concepts like poset, lattice, Boolean algebra and apply them to find CNF and DNF.

Sr. No	Description	Hours
Unit I	**Divisibility of integers** 1.1. Introduction 1.2. Divisibility: Division algorithm (Statement only). 1.3. Greatest Common Divisor (GCD), Least Common Multiple (LCM), examples. 1.4. Euclidean algorithm, examples. 1.5. Prime numbers, Euclides Lemma, Fundamental theorem of Arithmetic (without proof), examples. 1.6. Congruence relation and its properties 1.7. Fermat's Theorem (Statement only), examples. 1.8. Residue Classes: Definition, addition modulo n, multiplication modulo n, Examples.	**15**
Unit II	**Relations & Boolean Algebra** **15 hrs.** 1. 2. **2.1. Relations** 2.1.1. Ordered pairs, Cartesian product. 2.1.2. Relations, Types of relations, Equivalence relation, Partial ordering relation, Examples.	**15**

	2.1.3. Digraphs of relations, matrix representation and composition of Relations, Examples. 2.1.4. Transitive closure, Warshall's algorithm, Examples. 2.1.5. Equivalence class, Partition of a set. **2.2. Boolean algebra** 2.2.1. Hasse diagram. 2.2.2. Lattice: Definition, principle of duality. 2.2.3. Basic properties of algebraic systems defined by Lattices. 2.2.4. Distributive and complemented lattices. 2.2.5. Boolean lattices and Boolean algebras. 2.2.6. Boolean expressions and Boolean functions. 2.2.7. Disjunctive and conjunctive normal forms and examples.	

Reference Books:

1. Algebra by S. R. Patil and Others Nirali Prakashan.
2. Algebra by Bhopatkar, Nimbkar, Joglekar, VISION Publication.
3. Algebra by Naik and Patil, PHADAKE Prakashan.
4. A Foundation Course in Mathematics, Ajit Kumar, S. Kumeresan and Bhaba Kumar Sarma, Narosa Publication House.
5. Elementary Number Theory, Seventh edition: David M. Burton, McGraw-Hill.
6. Lattices & Boolean Algebras: First Concepts by V. K. Khanna, Vikas Publishing House, Second Edition, 2008

B.Sc. Information Technology (Entire) Part-I
(Semester I)

Course Code:-Subject II Practical I:

Title of Course:-Practical-I Based on Subject II DSC I and Subject II DSC II

Practical :-**30hrs**

Credits: 02

Total Marks: 50

Pr. No	Title of the Practical	No. of Practical
1.	Combinatorial arguments	1
2.	Recurrence relation	1
3.	Proofs of valid arguments using truth table	1
4.	Proofs of valid arguments using laws of inferences	1
5.	Euclidean algorithm	1
6.	Examples using Fermat's theorem	1
7.	Warshall's algorithm	1
8.	Disjunctive and Conjunctive normal forms (DNF & CNF)	1
9.	C – Programs: finding g. c. d and l. c. m., determination of primes	1
10.	C – program for Euclidean algorithm	1
11.	C – program for Warshall's algorithm	1
12.	C – program to determine the value of φ (*n*) (Euler φ function).	1

B.Sc. Part -I Information Technology (Entire)

(Semester-I)

Course Code:-Subject III DSC I:

Title of Course: Basic Electronics

Theory:**-30hrs**

Credits: 02

Total Marks: 50

Course Outcomes (COs)
On completion of the course, the students will be able to

CO1: To understand and distinguish the electronics devices.
CO2: To understand the semiconductor applications and solve the circuits.
CO3: To understand the logic family.
CO4: To understand the TTL and CMOS concept.

Units	Contents	Hours
1.	**Unit 1: Semiconductors and Network theorems** AC fundamentals, types of alternating current and voltage sinusoidal and non-sinusoidal, Definition: Cycle, time period, frequency, amplitude Active and Passive devices: Resistors, Capacitors, Inductors and Transformer, semiconductors, types of semiconductors, PN junction diode construction, forward and reverse biasing of diode, Zener diode, LED, 7 segment display, their applications Network Theorems: voltage and current source, Kirchhoff's Current Law, Kirchhoff's Voltage Law, Superposition theorem, Thevenin's theorem, Nortons theorem, Maximum Power transfer theorem	**15**
2.	**Unit 2: Logic Family** Logic family classification: Unipolar and Bipolar logic families, characteristics of digital ICs: speed, power dissipation, figure of merits, fan out, current and voltage parameters, noise immunity, operating temperature range, Transistor- Transistor Logic: operation of TTL, TTL with open collector output, Schottkey TTL, TTL characteristics, CMOS: CMOS Inverter, CMOS characteristics, CMOS configurations, Tristate logic and tristate TTL inverter, TTL to CMOS and CMOS to TTL	**15**

Reference Books:

1. Digital Logic application and design, John Yarbrough
2. Principles of Electronics: by A.P.Malvino, Tata Mc-Graw Hill Publication,
3. A text Book of Applied Electronics: by R. S. Shed, S. chand Publication.
4. Principles of Electronics: by V. K. Meheta, S. Chand & Company Ltd.
5. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt.

B.Sc. Part -I Information Technology (Entire)

(Semester-I)

Course Code:-Subject III DSC II:

Title of Course: Fundamentals of Digital Computing

Theory:**-30hrs**

Credits: 02

Total Marks: 50

Course Outcomes (COs)

On completion of the course, the students will be able to:

CO1 To understand the concept of Number Systems and codes
CO2 To simplify Boolean algebraic assignments.
CO3 To understand and compare the functionalities, properties and applicability of Logic Gates
CO4 To understand and design the arithmetic circuits

Unit	Contents	Hours
1	**Unit 1: Number System and Digital Signals:** **Number System and Codes:** Decimal, Binary, Octal and Hexadecimal number systems, base conversions. Representation of signed and unsigned numbers, BCD, ASCII codes, Grey Code, EBCDIC code, Binary and Hexadecimal arithmetic; Addition, subtraction by 2's complement method. **Logic Gates and Boolean algebra:** Truth Tables of OR, AND, NOT, NOR, NAND, XOR, XNOR, Universal Gates, Active high and active low signals, Basic postulates and fundamental theorems of Boolean algebra. De-Morgan's Theorems	15

2	**Unit 2: Logic Gates and Digital Circuits:** **Combinational Logic Analysis and Design:** Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh map minimization up to 4 variables for SOP). **Arithmetic Circuits:** Binary Addition. Half and Full Adder. Half and Full Subtractor, 4-bit binary Adder/Subtractor ALU. Data processing circuits: Multiplexers, De-multiplexers, Decoders, Encoders.	15

Reference Books

1) Digital principals and applications; Malvino Leach, Tata McGraw Hill, 4th Edition
2) Fundamentals of Digital Electronics: A. Anand Kumar PHI Publication 2001
3) Digital principals: T. L. Floyd 3rd edition
4) Digital Electronics: C. F. Strangio

B.Sc. Part -I Information Technology (Entire) (Semester-I)

Course Code:-Subject III Practical I:

Title of Course: Practical Based on Subject III DSC-I and Subject III DSC-II

Practical:**-30hrs**

Credits: 02

Total Marks: 50

Semester-I	
Sr. No.	**Name of the Practical**
1	Study of various electronic components, equipment& measuring devices,
2	Measurement of Amplitude, Frequency & Phase of waveforms by using CRO.
3	Study of Logic gates
4	Study of Universal building block (NAND & NOR)
5	Study of De-Morgan's Theorems
6	Study of Half Adder
7	Study of Full Adder
8	Study of Multiplexer using IC
9	Study of Demultiplexer using IC
10	Study of EX-OR gate

11	Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode
12	Study of KCL and KVL

B.Sc. Part -I Information Technology (Entire)

(Semester- I)

Course Code:- OE -I

Title: Basics of Management

Total Contact Hours: 30 Hrs. (30 lectures of 60 min)

B.Sc. Part -I Information Technology (Entire)

(Semester- I)

Course Code:- IKS-I

Title: Vedic Mathematics

Total Contact Hours: 30 Hrs. (30 lectures of 60 min)

B.Sc. Part -I Information Technology (Entire)

(Semester- II)

Course Code:-Subject I DSC III:

Title of Course: Advanced C Programming

Theory:-**30hrs**

Credits: 02

Total Marks: 50

Course Outcomes:

1. Understand a functional hierarchical code organization.
2. Ability to work with different storage class.
3. To impart knowledge in creating and using pointer
4. Understand to work with file handling concept.

Sr.No	Description	Hours
Unit I	**Functions and Pointer** ▪ Definition, Types of function, function proto-type Local and global variables. ▪ Recursive functions ▪ Storage classes- auto, external, static and register. ▪ Pointer: Defintion, declaration, initialization,pointer arithmatic,pointer of pointer, Arrayof pointers. ▪ Funcion call by value and call by reference. Dynamic memmory allocation and dealloca-tion.	**15**
Unit II	**Structure, Union and File handling** ▪ Structure: Defintion, declaration of structure, Nested structure,Array ofstructures,Structure pointer, Passing structure to function. ▪ Union:Definition, declaration of Union,Difference between structure and union. File Handling: Concept of file, Text and Binary File. ▪ File opening and closing files- fopen(), fclose()File opening modes- read, write,ap-pend. ▪ ▪ Reading and writing functions- gets(), puts()Formatted input- scanf(), sscanf(), fscanf(), fread()Formatted output- printf(), fprintf(),fwrite() Functions: fseek, ftell, re- wind()	**15**

Reference Book :

1. Programming in C - Schuam Outline Series
2. Let Us C- Yashwant Kanetkar
3. Programmig in ANSI C- E. Balagurusamy.
4. The complete reference ‘C’ - Herbert Schildt
5. C Programming – Venugopal The C Programming Language- Ritchie and Kernighan.

B.Sc. Part -I Information Technology (Entire)

(Semester- II)

Course Code:-Subject I DSC IV:

Title of Course: Web Development Using Cascaded Style Sheets

Theory:**-30hrs**

Credits: 02

Total Marks: 50

After completion this course students will be enable to:

1. Understand basic concept of HTML.
2. Learn how to use HTML tags.
3. Understand how to design Webpages using HTML and CSS.
4. Understand use of frames to design.

Sr. No	Description	Hours
Unit I	**Introduction to CSS:** Introduction Understanding the concepts of CSS, Advantages and disadvantages CSS syntax Grouping selectors and rulers Using the class selectors Using the ID selectors Comparing ID and classes selectors, Using CSS comments, Types of Style sheets- External Internal, Inline. Formatting text and fonts, CSS Selectors- id, group, class. CSS properties- Border, background, list, image, margin. List properties: list-style-images, list-style-position, list- style-type, list-style. CSS positioning(relative, absolute, fixed and Z-index) CSS properties and table attributes	15
Unit II	**Introduction to XML : XML** Introduction, XML versus HTML, XML terminologies, XML standards(XML,XML namespace,DTD,CSS,XSL,XML schema, Xquery, Xlink, Xpointer,Xpath), Creating XML Document XML syntax checking, The idea of markup ,XML structure, Organizing information in XML, Creating well formed XML documents, XML namespaces(overview) XML Documentation Introduction to DTD, Document type declaration Element type declaration, Attribute declaration, Conditional sections, limitations of DTD	15

Reference Books: Step By Step XML(First Edition-2000)Publisher: PHI Practice-Hall India.By Michael J.Young

B.Sc. Part -I Information Technology (Entire)

(Semester- II)

Course Code:-Subject I Practical II:

Title of Course: Practical-I Based on Subject I DSC III and Subject I DSC IV

Practical:**-30hrs**

Credits: 02

Total Marks: 50

Course Outcomes:

Learners will be able to,

1. Develop applications with nested structure .
2. Understand concept of passing arguments .
3. Develop applications with file handling
4. Understand pointer arithmetic operations.

1. Write a function to sort given array elements in ascending and descending order.
2. Write a function to check given number is prime or not.
3. Write a function using call by reference to swap two numbers.
4. Write a function to create copy string using pointer.
5. Write a function to reverse a string.
6. Write a function to find the length of given string.
7. Write a function to concat 2 strings.
8. Write a function to count spaces in given sentence.
9. Write a function to count number of characters and words in given sentence.
10. Write a program to perform pointer arithmetic operations.
11. Write a program to create a structure for date and display it.
12. Write a program to create nested structure read the values and display it.
13. Write a program to display create structure Student
    - (rollno,name,m1,m2,m3) accept values for n students and display the same.
14. Write a program to create union read the values and display it.
15. Write a Program to create text file and read and write characters from/in the file.
16. Write a Program to create text file and read and write string from/in the file.
17. Write a program to create text file and read and write student data(Rollno, Name, Class) from/in the file using fscanf,fprintf().
18. Write a program to demostrate the use of fseek(),ftell() and rewind() functions.
19. Create a web page with all types of Cascading style sheets.
20. Design a web page using CSS (cascading Style sheets) which includes the following:
21. Use different font , styles: In the style definition you define how each selector should work (font , color etc.). Then in the body of your pages,

you refer to these selectors to activate the styles.

22. Write a Program in to Create your own style sheets and use them in your web page .
23. Design simple webpage using Inline CSS.
24. Design simple webpage using Internal CSS
25. Design simple webpage using External CSS

B.Sc. Part -I Information Technology (Entire)

(Semester- II)

Course Code:-Subject II DSC III:

Title of Course: Numerical Methods

Theory:-**30hrs**

Credits: 02

Total Marks: 50

B.Sc. Part -I Information Technology (Entire)

(Semester- II)

Course Code:-Subject II DSC IV:

Title of Course: Graph Theory

Theory:-**30hrs**

Credits: 02

Total Marks: 50

Course Learning Outcomes: Upon successful completion of the course students will able to:

CO 1. achieve command of the fundamental definitions and concepts of graph theory.
CO 2. model problems using graphs and solve these problems algorithmically.
CO 3. illustrate fundamentals of spanning tree, circuits and cut-sets.
CO 4. apply this knowledge in (especially) computer science applications.

Unit 1: Graphs and operations on graphs **15 hrs.**

1.1. Definition and elementary results
1.2. Types of graphs
1.3. Isomorphism
1.4. Matrix representation of graphs: Adjacency matrix and incidence matrix

1.5. Subgraphs and induced graphs
1.6. Complement of a graph, Self complementary graphs
1.7. Union, intersection of graphs, Ring sum of two graphs
1.8. Definitions: walk, trail, tour, path and circuit,
1.9. Definitions of connected, disconnected graphs
1.10. Dijkstra's shortest path algorithm
1.11. Connectivity: Isthumus, cut-vertex, Edge connectivity & vertex connectivity.

Unit 2: Tree Graphs **15 hrs.**

1.1. Tree: Definition
1.2. Properties of Trees:
  1.2.1. Theorem: A tree with n vertices has n -1 edges.
  1.2.2. Theorem: A connected graph G with n vertices and n - 1 edges is a tree
  1.2.3. Theorem: A graph with n vertices is a tree if and only if it is circuit free and has n - 1 edges.
  1.2.4. Theorem: A graph G is a tree if and only if it is minimally connected.
1.3. Centre of a tree
1.4. Spanning tree: Definition and examples
1.5. Fundamental circuit and cut-set: Definition, examples.
1.6. Binary trees and elementary results, examples.
1.7. Kruskal's algorithm, examples.

Reference Books:

1. Discrete Mathematics by Kenneth Rosen, Tata McGraw Hill
2. Graph Theory with Applications to Computer Sc. & Engg. by Narsing Deo, PHI, 2009
3. A First Step in Graph Theory by Raghunathan, Nimkar and Solapurrkar
4. Discrete mathematics by S.R.Patil and others, NIRALI Prakashan.
5. Discrete mathematics by Bhopatkar, Nimbkar, Joglekar, VISION Publication.
6. Introduction to Graph theory by S. Arumugham and S. Ramachandran, published by Scitech Publications, Chennai-17
7. Introduction to Graph Theory, Mamta Chaudhary, Vani Sharma and Pooja Yadav, Sultan Chand & Sons, Educational Publishers, New Delhi.

B.Sc. Part -I Information Technology (Entire) (Semester- II)

Course Code:-Subject II Practical II:

Title of Course: Practical-II Based on Subject II DSC III and Subject II DSC IV

Practical:-**30hrs**

Credits: 02

Total Marks: 50

B.Sc. Part -I Information Technology (Entire)

(Semester- II)

Course Code:-Subject III DSC III:

Title of Course: Microprocessor Architecture

Theory:-**30hrs**

Credits: 02

Total Marks: 50

Course Outcomes (COs):

On completion of the course, the students will be able to:

CO1 To study microprocessor assembly language

CO2 Write assembly language program for microprocessors
CO3 Draw and describe architecture of 8085 microcontroller
CO4 To study memory management in microprocessors.

Unit	Contents	Hours
1	**Unit 1 Microcomputer Organization and 8085 Architecture:** Basic components of microcomputer (CPU, Program memory, Data memory, input and output ports, idea of RAM (SDRAM, DRAM) Types of ROM Memory organization & addressing. Memory Interfacing. Memory Map, multitasking. Main features of 8085. Block diagram and Pin-out diagram of 8085. Data and address buses. Registers, ALU, Stack memory, Program counter, Flag register, concept of pipelining architecture.	15
2	**Unit 2: Interfacing and programming of 8085** Basic Interfacing concepts, Interfacing Output Displays, Interfacing Input Devices, Memory Mapped I/O. Introduction to 8085 Instructions: Data Transfer Operations, Arithmetic Operations, Logic Operation, Branch Operation, Writing Assembly Languages Programs, Debugging a Program Instruction classification, addressing modes of Instructions, Instruction set (Data transfer including stacks. Arithmetic, logical, branch, and control instructions). Subroutines, delay loops Programs for: Addition, Subtraction, Multiplication, Division, Block transfer. Introduction to 8085 Assembly Language Programming: writing assembling and Execution of a simple program, Overview of 8085 Instruction Set	15

Reference Books

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Gaonkar,
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. Microprocessor and Microcontrollers, N. Senthil Kumar, 2010, Oxford University Press

COURSE OUTCOME

After Completing this course student will be able to:

CO 1 To study segmented, pipelined architecture in microprocessors.

CO 2 To study memory management in microprocessors.

CO 3 To study microprocessor assembly language.

CO 4 Draw and describe architecture of 8085 microcontroller.

Sr. No.	Description	Hours
Unit I	**Microcomputer Organization** Basic components of microcomputer (CPU, Program memory, Data memory, input and output ports, idea of RAM (SDRAM, DRAM) Types of ROM Memory organization & addressing. MemoryInterfacing. Memory Map. **8085 Microprocessor Architecture** Main features of 8085. Block diagram and Pin-out diagram of 8085. Data and address buses. Registers,ALU, Stack memory, Program counter, Flag register	**15**
Unit II	**Interfacing of I/O Devices** Basic Interfacing concepts, Interfacing Output Displays, Interfacing Input Devices, Memory Mapped I/O. Introduction to 8085 Instructions: Data Transfer Operations, Arithmetic Operations, Logic Operation, Branch Operation, Writing Assembly Languages Programs, Debugging a Program. Instruction classification, addressing modes of Instructions, Instruction set (Data transfer including stacks. Arithmetic, logical, branch, and control instructions). Subroutines, delay loops Programs for: Addition, Subtraction, Multiplication, Division, Block transfer	**15**

Reference Books:

• Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Gaonkar, Prentice Hall.
• Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
• The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi,
J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
• Microprocessor and Microcontrollers, N. Senthil Kumar, 2010, Oxford University Press

B.Sc. Part -I Information Technology (Entire) (Semester- II)

Course Code:-Subject III DSC IV:

Title of Course: Fundamentals of Digital Design

Theory:**-30hrs**

Credits: 02

Total Marks: 50

Course Outcomes (COs):

On completion of the course, the students will be able to

CO1: To analyse different types of digital electronic circuit using various logical tools.

CO2: To understand the working principle, selection criteria and applications of sequential and combinational circuits.

CO3: To design and implement digital circuits

CO4: To understand the concept of memory and memory devices.

Units	Contents	Hours
1	**Unit 1: Sequential and Combinational Circuits** **Sequential Circuits:** SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race around conditions in JK Flip-Flop. Master-slave JK Flip-Flop. **Shift registers:** Serial-in-Serial-out, Serial-in-Parallel-out, Parallel in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits). **Counters (4 bits):** Ring Counter, Asynchronous counters, Synchronous Counter, Jhonson counter	15
2	**Unit 2: Memory Devices and Memory Organization** Decoder design using universal gates: BCD to binary, BCD to 7 segments, 3:8 decoder, Clock and Timer (IC 555): Introduction, Block diagram of IC 555, Astable and monostable multivibrator **Memory Devices and memory organization:** Types of memory – volatile and non-volatile, SRAM and DRAM, classification and working principle of memory devices; RAM, ROM, EPROM, EEPROM, UVEPROM, Flash RAM, Concept of Diode Matrix ROM, speed and cost range of memory devices, memory organization – building the required memory size by using available memory chips, memory address map	15

Reference Books:

- Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha, 7th Ed., 2011, Tata McGraw
- Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
- Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
- Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI
- Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia (1994)
- R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)

B.Sc. Part -I Information Technology (Entire) (Semester- II)

Course Code:-Subject III Practical II:

Title of Course: Practical Based on Subject III DSC-III and Subject III DSC-IV Practical:**-30hrs**

Credits: 02

Total Marks: 50

Practical

Semester-II	
Sr. No.	**Name of The Practical**
1	Monostable multivibrator by using Timer IC-555.
2	Astable multivibrator by using Timer IC-555.
3	To build and test Flip-Flop (RS, Clocked RS, D).
4	To make a Shift Register (serial-in and serial-out) using D-type/JK Flip-Flop ICs
5	Study of Encoder & seven segment Decoder.
6	Study of counter.
7	Addition and subtraction of numbers using direct addressing mode
8	Addition and subtraction of numbers using indirect addressing mode
9	Multiplication by repeated addition.
10	Division by repeated subtraction
11	Handling of 16-bit Numbers.
12	Use of CALL and RETURN Instruction.
13	Block data handling.

B.Sc. Part -I Information Technology (Entire) (Semester- II)

Course Code:-OE-II

Title of Course: Improving Reading Comprehension
Theory:**-30hrs**

Credits: 02

Total Marks: 50

B.Sc. Part -I Information Technology (Entire) (Semester- II)

Course Code:-VEC-I

Title of Course: Democracy, Election and Constitution
Theory:**-30hrs**

Credits: 02

Total Marks: 50