STATE BOARD OF TECHNICAL EDUCATION, BIHAR

Scheme of Teaching and Examination for
IIIrd Semester Diploma in Computer Science & Engineering
(Effective from Session 2020-2021 Batch)

THEORY

Sl. No	SUBJECTS	SUBJECT CODE	Periods per Week	Hours of Exam	Teacher's Assessment (TA) Marks (A)	Class Test (CT) Marks (B)	End Semester Exam. (ESE) Marks (C)	Total Marks (A+B+C)	Pass Marks ESE	Pass Marks in the Subject	Credits
1.	Discrete Mathematics	2018301	03	03	10	20	70	100	28	40	02
2.	Computer programming through C	2000302	03	03	10	20	70	100	28	40	03
3.	Computer Organization & Architecture	2018303	03	03	10	20	70	100	28	40	03
4.	Digital Electronic & Microprocessor	2018304	03	03	10	20	70	100	28	40	02
5.	Web Technology	2018305	03	03	10	20	70	100	28	40	03
	Total		**15**				**350**	**500**			**13**

PRACTICAL

Sl. No	SUBJECTS	SUBJECT CODE	Periods per Week	Hours of Exam	Practical (ESE) Internal (A)	Practical (ESE) External (B)	Total Marks (A+B)	Pass Marks in the Subject	Credits
6.	Computer programming through C (LAB)	2000306	06 50% Physical 50% Virtual	03	15	35	50	20	03
7.	Digital Electronic & Microprocessor (LAB)	2018307	04 50% Physical 50% Virtual	03	15	35	50	20	02
8.	Web Technology (LAB)	2018308	02 50% Physical 50% Virtual	03	07	18	25	10	01
	Total		**12**				**125**		**06**

TERM WORK

Sl. No	SUBJECTS	SUBJECT CODE	Periods per Week	Marks of Internal Examiner (X)	Marks of External Examiner (Y)	Total Marks (X+Y)	Pass Marks in the Subject	Credits
9.	Computer Organization & Architecture (T.W)	2018309	04	15	35	50	20	02
10.	Summer Internship I (4 weeks) after II Semester	2018310	-	15	35	50	20	02
11.	Python	2018311	02	07	18	25	10	01
	Total		**06**			**125**		**05**
	Total Periods per week of each of duration One Hour 33					**Total Marks 750**		**24**

DISCRETE MATHEMATHICS

SUBJECT CODE: 2018301	Theory			No. of period in one session: 50			Credits
	No. of Periods per Week			Full Marks:	:	100	02
	L	T	P/S	ESE	:	70	
	03	-	-	T. A	:	10	
				C.T	:	20	

Course Learning Objective:

The main objectives of the course are to:

- Introduce concepts of mathematical logic for analysing propositions and proving theorems.
- Use sets for solving applied problems, and use the properties of set operations algebraically.
- Work with relations and investigate their properties.
- Investigate functions as relations and their properties.
- Introduce basic concepts of graphs, digraphs and trees.

Learning Outcomes:

After completion of the course students are expected to be able to:

- Analyse logical propositions via truth tables.
- Prove mathematical theorems using mathematical induction.
- Understand sets and perform operations and algebra on sets.
- Determine properties of relations, identify equivalence and partial order relations, sketch relations.
- Identify functions and determine their properties.
- Define graphs, digraphs and trees, and identify their main properties.
- Evaluate combinations and permutations on sets.

Contents: Theory		Hrs.	Marks
Unit – 1	**The Foundations- Logic and Proofs:** Propositional logic, propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Interference, Introduction to proofs, Normal forms, proof methods and strategy.	[9]	
Unit – 2	**Introduction to SET THEORY:** Concept of sets: Notation – subset, superset, Empty set, Universal set. Examples – Operation on sets: Union – Intersection – Complementation – Difference – Symmetric difference – problems relating simple set identities, Definition of power set, Cartesian product of finite number of sets, simple problems – cardinality of a set, Finite and Infinite sets.	[8]	
Unit – 3	**Relation Between two sets:** Binary relation as a subset of Cartesian product, Reflexive, Symmetric & transitive relations – Examples, Equivalence relation – Examples.	[6]	
Unit – 4	**Functions:** Definition of function – Domain, Co-domain & Range of a function – Related problems.	[6]	

Unit – 5	**Recurrence Relation:** Definition – Examples (Fibonacci, Factorial etc.), Linear recurrence relations with constants coefficients – Homogenous solutions – Particular solutions – Total solutions – Problems.	[6]	
Unit – 6	**Graph Theory:** Introduction – Definition of a graph – sub graph – Isomorphism-walk, Paths and circuits – connectedness and components – Euler graphs.	[5]	
Unit – 7	**Counting:** Introduction – Basic counting principles, Factorial Notation, Binomial coefficients, Permutations, Combinations, The pigeonhole principle, Generation of Permutation and Combinations.	[5]	
Unit – 8	**Probability Theory:** Introduction, Sample space and Events, Finite probability spaces, Conditional probability, Independent Events, Independent Repeated Trials, Binomial Distribution, Random variables.	[5]	

Text/Reference Books-

1. Foundation of Discrete Mathematics – K.D. Joshi

2. Discrete Mathematics with Algorithms – Albertson & Hutchinson / John Wiley

3. Discrete Mathematics / Iyengar, Venkatesh, Chandrasekaran & Arunachalam / Vikash Publishing House

4. Discrete Structure and Graph Theory / S.K.S. Rathore and H. Chaudhuri / Everest Publishing House

5. Discrete Mathematics & Its Applications with combinatorics and Graph Theory, Seventh Edition – Kenneth H Rosen / Tata McGraw-Hill Education Pvt. Ltd New Delhi

6. Discrete Mathematics, Third Edition – Seymour Lipschutz, Marc Lars Lipson, Varsha H Patil / Tata McGraw-Hill Education Pvt. Ltd New Delhi

COMPUTER PROGRAMMING THROUGH C

SUBJECT CODE: 2000302	Theory			No. of period in one session: 50			Credits
	No. of Periods per Week			Full Marks:	:	100	03
	L	T	P/S	ESE	:	70	
	03	-	-	T. A	:	10	
				C.T	:	20	

Course Learning Objective:

Computers play a vital role in present day life, more so, in the professional life of technician engineers. In order to enable the students, use the computers effectively in problem solving, this course offers the modern programming language C along with exposition to various engineering applications of computers.

Objective:

The objectives of this course are to make the students able to:

- Develop efficient algorithms for solving a problem.
- Use the various constructs of a programming language viz. conditional, iteration and recursion.
- Implement the algorithms in "C" language.
- Use simple data structures like array, stacks and linked list solving problems.
- Handling File in "C".

Contents: Theory		Hrs.	Marks
Unit -1	**Introduction to computer software:**	[05]	
	➢ Classification of computer software.		
	• System software.		
	• Application software.		
	➢ Programming languages.		
	• Machine languages.		
	• Assembly languages.		
	• High level programming languages.		
	➢ Algorithms and flowchart.		
Unit -2	**Fundamental of C languages.**	[08]	
	➢ Introduction.		
	• Background.		
	• Characteristics of C.		
	• Uses of C.		
	➢ Structure of a C program.		
	➢ Writing the first C program.		
	➢ Files used in a C program.		
	• Source code files.		
	• Header files.		

	• Object files.		
	• Binary executable files.		
	➢ Compiling and Executing C programs.		
	➢ Using comments.		
	➢ Characters used in C.		
	➢ Identifier.		
	➢ Keyword or Reserved words.		
	➢ Tokens.		
	➢ Constants.		
	• Numeric constant.		
	• String Character constant.		
	➢ Variables.		
	➢ Variable Declaration.		
	➢ Basic Data Types.		
	➢ Additional Data types.		
	➢ Operators and Expressions.		
	➢ Operator Precedence and Associativity.		
	➢ Type conversion and Type casting.		
	➢ Input/ Output statements in C.		
Unit -3	**Decision Control and Looping Statements:** ➢ Introduction to Decision control statements. ➢ Conditional Branching statements. • If statement. • If-else statement. • If-else-if statement. • Switch case. ➢ Iterative statements. • While loop. • Do-while loop. • For loop. ➢ Nested loops. ➢ Break and continue statements. • Break statement. • Continue statement. ➢ Goto statement.	[8]	

Unit -4	**Functions in 'C'.** ➢ Uses of functions. ➢ User defined functions. ➢ Function Declaration. ➢ Calling a function. ➢ Actual and formal Arguments. ➢ Rules to call a function. ➢ Function propotype. ➢ Recursion. • Use of Recursive function. ➢ Local or Internal variables. ➢ Global or External variables. ➢ Void function. ➢ Storage classes in C. • Auto or Automatic Storage class. • Static Storage class. • Extern Storage class. • Register Storage class.	[8]	
Unit -5	**Arrays.** ➢ Introduction. ➢ Declaration of Arrays. ➢ Accessing the Elements of an Array. • Calculating the address of Array elements. • Calculating the length of an Array. ➢ Storing values in Arrays. • Initializing Arrays during Declaration. • Inputting values from the keyboard. • Assigning values to Individual Elements. ➢ Operations on Arrays. • Traversing an Array. • Inserting an Element in an Array. • Deleting an Element from an Array. • Merging Two Arrays. • Searching for a value in an Array. ➢ Passing Arrays to functions. ➢ Two dimensional Arrays. • Declaring Two-dimensional Arrays.	[10]	

	• Initializing Two-dimensional Arrays. • Accessing the Elements of two-dimensional Arrays. ➤ Operations on Two-dimensional Arrays.		
Unit -6	**Pointers.** ➤ Understanding the Computer's Memory. ➤ Introduction to pointers. ➤ Declaring pointer variables. ➤ Pointer Expressions and pointer Arithmetic. ➤ Null pointers. ➤ Passing Arguments to function using pointer. ➤ Pointers and Arrays. ➤ Passing an Array to a Function. ➤ Dynamic Memory Allocation. • Malloc ( ) function. • Calloc ( ) function. • Realloc ( ) function. • Free ( ) function.	[6]	
Unit -7	**Structures and Unions.** ➤ Structures. ➤ Structure variables and Arrays. • Initialization of structure variable and Array. • Dot (•) Operator. • Assigning value of a structure to Another structure. ➤ Structure within structures. ➤ Site of ( ) of a structure. ➤ Unions. ➤ Site of ( ) unions. ➤ Difference between a structure and a union. ➤ Enum Data Type. ➤ Typedef Declaration.	[5]	

Text / Reference Books -

1. Programming with C. Second Edition. Tata McGraw-Hill, 2000   -   Byron Gottfried

2. How to solve by Computer, Seventh Edition, 2001, Prentice hall   R.G. Dromey of India.

3. Programming with ANSI-C, First Edition, 1996, Tata McGraw   E. Balaguruswami hill.

4. Programming with ANSI & Turbo C. First Edition, Pearson   A. Kamthane

    Education.

5.   Programming with C. First Edition, 1997, Tara McGraw hill.   Venugopla and Prasad

6.   The C Programming Language, Second Edition, 2001, Prentice   -   B. W. Kernighan & D.M.

                                                                          Ritchie Hall of India.

7.   Programming in C, Vikash Publishing House Pvt. Ltd., Jungpura,   R. Subburaj New Delhi.

8.   Programming with C Language, Tara McGraw Hill, New Delhi.   -   C. Balagurswami

9.   Programming in C, Galgotia Publications Pvt. Ltd. Dariyaganj,   -   Kris A. Jamsa New Delhi.

10.   The Art of C Programming, Narosa Publishing House, New   -Jones, Robin & Stewart Delhi.

11.   Problem Solving and Programming. Prentice Hall International.   -   A.C. Kenneth

12.   C made easy, McGraw Hill Book Company, 1987.   -   H. Schildt

13.   Software Engineering, McGraw Hill, 1992.   -   R.S. Pressman

14.   Pointers in C, BPB publication, New Delhi.   - Yashwant Kanetka

COMPUTER ORGANISATION & ARCHITECTURE

SUBJECT CODE: 2018303	Theory			No. of period in one session: 50			Credits
	No. of Periods per Week			Full Marks:	:	100	03
	L	T	P/S	ESE	:	70	
	03	-	-	T. A	:	10	
				C.T	:	20	

Course Learning Objective:

This course will enable the students to grasp the working of basic components of computer system. Further the course will help them to learn as to how the basic components interact with each other to form a working system.

Objective:

Objective of the course is to familiarize students about hardware and software design including logic design, and basic structure and behavior of the various functional modules of the computers and how they interact to provide the processing needs of the user.

This subject mainly focuses on the hardware and system software. It aims to describe the following aspects:

1. Building blocks of the computer.

2. Computer Design.

3. Assembly Language Programming.

	Contents: Theory	Hrs.	Marks
Unit – 1	**Basic structure of computers:** Structure of a computer system, Arithmetic Logic Unit, Control Unit, Bus Structure, Von Neumann Architecture.	[8]	

Unit – 2	**Computer Arithmetic Operations:**
	Introduction to logic gates, Boolean algebra, Data Representation-Number system, Fixed and floating-point numbers, (IEEE standard) Floating point representation, signed numbers, 1's and 2's Complements Arithmetic, 2's complement method for multiplication.
	➤ Adders:
	   • Half Adder
	   • Full Adder
	➤ Sub tractors:
	   • Half sub tractor
	   • Full sub tractor
	➤ Addition and Subtraction Algorithm:
	   • Addition and Subtraction with Signed Magnitude Data.
		[12]	

	➢ Multiplication Algorithms: • Hardware Implementation for multiplication. • Flowchart for Multiplying Binary Numbers. • Booth's Multiplication Algorithm.			
Unit – 3	**Central Processing Unit and Instruction:** ➢ Micro operations: • Arithmetic micro-operations • Logic micro-operations • Shift micro-operations ➢ Control Unit: • Performing an Arithmetic or Logic operation. • Fetching a word from memory, storing a word in a memory, Execution of a complete Instruction. • Hardwired Control Unit. • Micro programmed Control Unit. ➢ Components of CPU: • Buses • Registers • Flags • Stacks • I/O Ports ➢ General Register Organization, Types of Instructions, Instruction formats, Addressing modes, Data transfer and manipulation, Program control, Instruction cycle.	[12]	
Unit – 4	**Memory Organization:** Characteristics of Memory system, Types of memories, Main memory, Static & Dynamic memories, Secondary memory, Performance considerations, Cache memory with mapping, Virtual memory, Address memory used pages, Page replacement, Introduction to RAID.	[10]	
Unit – 5	**I/O Organization:** Peripheral Devices, Input-output Interface, Asynchronous Data Transfer Modes, Modes of Data Transfer from I/O to memory, Interrupt Handling, Types of Interrupts, Priority Interrupt, Direct Memory Access, Input-output Processor (IOP), Synchronous and Asynchronous Data Transfer.	[8]	

Text/Reference Books:

1   Computer System Architecture, Third Edition, 2000, Pearson Education   M.M. Mano

2   Computer System and Architecture, Prentice Hall of India Pvt. Ltd., New M. Mano Delhi

3   Computer Architecture and Organization, McGraw Hill Company, New Delhi   J.P. Hayes

4   Computer Organization and Architecture, Prentice Hall of India Ltd., NewW. Stallings Delhi

5   Computer System Architecture, Third Edition, 1998, Prentice Hall of India   M. Morris Mano

6   Microprocessor Architecture, Programming and Application, Wiley Eastern   Gaonkar Limited

Reference Books:

1   Computer Architecture & Organization, Third Edition, 1988, McGraw-Hill.   - J.P. Hayes New York

2   Computer Design and Architecture, Second Edition, 1991, Harper Collins S.G. Siva Publishers

3   Computer Organization and Design, Prentice Hill of India Ltd., 1994   P. Pal Choudhary

DIGITAL ELECTRONICS & MICROPROCESSOR

SUBJECT CODE: 2018304	Theory			No. of period in one session: 50			Credits
	No. of Periods per Week			Full Marks:	:	100	**02**
	L	T	P/S	ESE	:	70	
	03	-	-	T. A	:	10	
				C.T	:	20	

Course Learning Objective:

The subject will help the students to learn facts, concepts, principle and procedure of digital electronics. These techniques can be used for designing sequential and combinational circuits which forms the basis of any electronic device. Also, this subject is designed to give clear idea about working principles of 8085 microprocessor.

Objective:

The objective of this subject is to enable the students to know basic concepts of digital electronics and familiarity with available chips. After undergoing this course, the students will have the awareness of various arithmetic circuits, counter design, registers, A/D and D/A converters, semi-conductor memories, multiplexers and de-multiplexers etc.

Contents: Theory		Hrs.	Marks
Unit – 1	**NUMBER SYSTEM:** Decimal, binary, octal and hexadecimal, hexa-decimal number systems, Conversion from one system to another,1's,2's and 9's,10's complements signed numbers Codes: BCD, Excess-3, Gray codes weighted and non-weighted codes, binary arithmetic,	[6]	
Unit – 2	**LOGIC GATES AND FLIP FLOPS:** Definitions, symbols and truth table of NOT, OR, AND, NAND, NOR, XOR, XNOR gates, basic gates, universal gates, De Morgan's Theorems; Karnaugh-Map ,Sum of Product, Product of Sum, Min term , Max term, Logical diagram, truth table, Flip -Flops- RS, T, D, JK, Master/ Slave JK and timing diagram.	[8]	
Unit – 3	**REGISTERS:** Shift Registers Serial in Serial out Serial in Parallel out Parallel in Parallel out Parallel in Serial out Bidirectional Shift Register	[5]	
Unit – 4	**COUNTERS:** Asynchronous counters Synchronous Counter Decade counter and its application Cascade Counter, Encoder & Decoder	[6]	

Unit – 5	**LOGIC FAMILY & CIRCUITS:** Digital integrated circuits Half adder and full adder circuit, Half Subtractor and full subtractor circuit, design and implementation, Multiplexer, Demultiplexer.	[6]	
Unit – 6	**A/D AND D/A CONVERTERS:** Analog to digital convertor, Digital to Analog Convertor, ADC comparator, Dual Slope ADC, Successive ADC.	[8]	
Unit – 7	**MEMORIES AND DISPLAY DEVICES:** Memory Unit Concept of memories using registers Primary Memory Secondary Memory Static and Dynamic Memory LCD, LED, Seven Segment Display Basic operation and Applications, Dot Matrix display.	[6]	
Unit – 8	**MICROPROCESSORS:** Evaluation of microprocessors, microcomputer organization,8085 architecture,8085 pin diagram 8085 flag register & timing diagram, instruction sets, addressing modes, 8086 architectures, 8086 pin diagram, 8086 Flag register instruction sets and addressing modes	[5]	

Text Books: -

1. Digital Electronics and Applications, McGraw Hills Publishers. - Malvino Leach

2. Digital Logic and Computer Design, Prentice Hall of India Ltd., New Delhi. - Morries Marrow

3. Digital Integrated Electronics, Prentice Hall of India Ltd., New Delhi - Herbert Raub and Donal Sachilling

4. Digital Electronics, Prentice Hall of India Ltd., New Delhi – Rajaraman

5. Microelectronics, McGraw Hill, 1987 - J. Millman and A. Grabel

6. Linear Integrated Circuits, Wiley Eastern, 1991 - D. Roychaudhuri and S.B. Jani

Reference Books:

1. Digital Principles, Latest Edition, 2000, Tata McGraw Hill Publishing Company Ltd., New Delhi - Malvin& Leach

2. Modern Digital Electronics, Second Edition, 2000, Tata McGraw Hill Publishing Company Ltd., New Delhi - R.P. Jain

3. Digital Electronics, First Edition, 2000, Tata McGraw Hill Publishing Company Ltd., New Delhi - V.K. Puri

4. Electronics Circuits and Systems, 1992, Tata McGraw Hill Publishing Company - Y.N. Bapat

5. Modern Digital Electronics, 1983, Tata McGraw Hill Publishing Company - R.P. Jain

6. Digital Computer Fundamentals, T.M.H. - Malvino

7. Digital Computer, Dhanpat Roy & Sons. - B. Ram

8. Introduction to Microprocessors, Dhanpat Roy & Sons. - Dr. B. Ram

WEB TECHNOLOGY

SUBJECT CODE: 2018305	Theory			No. of period in one session: 50			Credits
	No. of Periods per Week			Full Marks:	:	100	**03**
	L	T	P/S	ESE	:	70	
	03	-	-	T. A	:	10	
				C.T	:	20	

Course Learning Objective

Internet is the easiest and fastest way of communication. The use of Internet can be easily seen in our day-to-day life, be it sending a mail or looking for same information, its importance can't be overruled. This subject exposes the diploma students to basic networking technology and the Internet technology. IT will teach the students, the Internet technology and different features available on the Internet.

Contents: Theory		Hrs.	Marks
Unit – 1	**Introduction to Web Design** Introduction to internet, www, website, working of website, webpages, front end, back end, client & server scripting language, responsive web designing, type of websites (static & dynamic websites)	[6]	
Unit – 2	**Editors** Downloading free editors like notepad++, subline text editor, making use of editors, file creation & editing, saving.	[6]	
Unit – 3	**HTML Basics** HTML: Introduction, Basic structure of HTML, Head section and element of head section, Formatting tags: Bold, Italic, underline, strike through, Div, pre tag anchor links & named anchors image tags, paragraphs, comments, tables: attributes – (Border, cell padding, cell spacing, height, width), TR, TH, Row span. Col span list: ordered list, unordered list, definition list, forms, form elements, Input types, Input attributes, Text Input Area, Dropdown, Radio buttons, Check-boxes, submit and Reset Buttons Frames: Frameset, nested frames. HTML5 Introduction, HTML5 New Elements: Section, Nav, Article, Aside, Audio Tag, Video Tag, HTML5 form validations. Require attribute, Pattern Attribute, Autofocus Attribute, Email, number type, datatype, Range type, HTML embed multimedia, HTML Layout, HTML Iframe.	[12]	
Unit – 4	**Introduction to cascading style sheets (CSS):** Concept of CSS, creating style sheet, CSS properties, CSS styling. Working with block elements and objects. Working with Lists and Tables. **CSS ID and class Box Model:** Border properties, padding properties, Merging properties. **CSS Advanced:** Grouping, Dimension, Display, Positioning, Align, Navigation Bar, Attribute Sectors, CSS Color	[10]	

Unit			
Unit – 5	**Introduction to XML** Introduction to XML. Use of XML, Simple XML, XML key components, DID and Schemes. Using XML with application, Transforming XML using XSL and X SLT.	[8]	
Unit – 6	**Java Script and Angular JS** Introduction to Client-side scripting language, variables in Java script, operations in JS, Conditions statements, JS Popup Boxes, JS Events, Basic Form validation in Java script. Introduction to Angular. JS: Expressions, Modules and Directives.	[8]	

Text/Reference Books-

1. HTML-4 for world wide web, Wesley (Singapore) Pvt., New Delhi. - Castro Addison

2. HTML 4.0 Unlashed, Tech Media Publication - Rick Dranell

3. Teach yourself HTML 4.0 with XML, DHTML and Java Script, IDG Books India Pvt. Ltd.,

4. New Delhi - Stephanie, Cottrell, Bryant

COMPUTER PROGRAMMING THROUGH 'C' LAB

SUBJECT CODE: 2000306	Lab			No. of period in one session: 50			Credits
	No. of Periods per Week			Full Marks	:	50	**03**
	L	T	P/S	ESE	:	50	
	-	-	06	Internal	:	15	
				External	:	35	

Course Learning Objectives:

This Lab course is intended to practice what is taught in theory class of 'Computer Programming' and become proficient in computer programming. Computer programming is all about regular practice. Students should work on solved and unsolved problems listed in the text books, and the problems given by the teacher. Some of the topics that should necessary be covered in lab are listed below.

Course outcomes:

Student should be able to write code snippets, and then compile, debug and execute them.

	Content: Practical	**Hrs.**	**Marks**
Unit – 1	Familiarization with programming environment (Editor, Compiler, etc.)	04	
Unit – 2	Programs using, I/O statements and various operators	04	
Unit – 3	Programs using expression evaluation and precedence	04	
Unit – 4	Programs using decision making statements and branching statements	04	
Unit – 5	Programs using loop statements	04	
Unit – 6	Programs to demonstrate applications of n dimensional arrays	04	
Unit – 7	Programs to demonstrate use of string manipulation functions	04	
Unit – 8	Programs to demonstrate parameter passing mechanism	04	
Unit – 9	Programs to demonstrate recursion	04	
Unit – 10	Programs to demonstrate use of pointers	04	
Unit – 11	Programs to demonstrate command line arguments	03	
Unit – 12	Programs to demonstrate dynamic memory allocation	03	
Unit – 13	Programs to demonstrate file operations	04	

The language of choice will be C. This is a skill course. More you practice, better it will be.

Reference Books:

1. Let Us C, Yashavant Kanetkar

2. Problem Solving and Programming in C, R.S. Salaria, Khanna Publishing House

3. C Programming Absolute Beginner's Guide, Dean Miller and Greg Perry

4. The C Programming Language, Kernighan and Ritchie, Prentice Hall of India

5. Programming in ANSI C, E. Balagurusamy, Tata McGraw-Hill

6. C Programming & Data Structures, B. A. Fouruzan and R. F. Gilberg, CENGAGE Learning.

DIGITAL ELECTRONICS & MICROPROCESSOR LAB

SUBJECT CODE: 2018307	Theory			No. of period in one session: 40			Credits
	No. of Periods per Week			Full Marks:	:	50	02
	L	T	P/S	ESE	:	50	
	-	-	04	Internal	:	15	
				External	:	35	

Course Learning Objective:

The subject will help the students to learn facts, concepts, principle and procedure of digital electronics. These techniques can be used for designing sequential and combinational circuits which forms the basis of any electronic device. Also, this subject is designed to give clear idea about working principles of 8085 microprocessor.

Objective:

The objective of this subject is to enable the students to know basic concepts of digital electronics and familiarity with available chips. After undergoing this course, the students will have the awareness of various arithmetic circuits, counter design, registers, A/D and D/A converters, semi-conductor memories, multiplexers and de-multiplexers etc.

	Content - Practical	Hrs.	Marks
Unit – 1	Study of logic Gates and verify Truth Table.	03	
Unit – 2	Study of S-R, J-K, T and D Flip Flop.	03	
Unit – 3	Study of Serial and Parallel Registers.	03	
Unit – 4	Study of 4-bit UP/DOWN asynchronous Counter.	03	
Unit – 5	Study of 4-bit UP/DOWN synchronous Counter.	03	
Unit – 6	Study of Encoder & Decoder.	04	
Unit – 7	Study of Half Adder and Full Adder	04	
Unit – 8	Study of Full Adder and Subtractor.	04	
Unit – 9	Study of Multiplexer & Demultiplexer.	04	
Unit – 10	Study A/D AND D/A Convertor	03	
Unit – 11	Study of Seven Segment Display	03	
Unit – 12	Study of 8080 Microprocessor programming, Addition, Subtraction etc..	03	

Text Books: -

1. Digital Electronics and Applications, McGraw Hills Publishers. - Malvino Leach

2. Digital Logic and Computer Design, Prentice Hall of India Ltd., New Delhi. - Morries Marrow

3. Digital Integreted Electronics, Prentice Hall of India Ltd., New Delhi - Herbert Raub and Donal Sachilling

4. Digital Electronics, Prentice Hall of India Ltd., New Delhi – Rajaraman

5. Microelectronics, McGraw Hill, 1987 - J. Millman and A. Grabel

6. Linear Integrated Circuits, Wiley Eastern, 1991 - D. Roychaudhuri and S.B. Jani

WEB TECHNOLOGY LAB

SUBJECT CODE: 2018308	Term Work			No. of period in one session: 40			Credits
	No. of Periods per Week			Full Marks:	:	25	
	L	T	P/S	ESE	:	25	01
		-	02	Internal	:	07	
				External	:	18	

Course Learning Objectives:

This Lab course is intended to practice whatever is taught in theory class of 'Web Technologies'. Some of the things that should necessary be covered in lab.

Course outcomes:

Student will be able to program web applications using and will be able to do the following:

- Use LAMP Stack for web applications
- Write simple applications with Technologies like HTML, Java script, AJAX, PHP
- Connect to Database and get results
- Parse XML files Student will be able to develop/build a functional website with full features.

	Content - Practical	Hrs.	Marks
Unit – 1	Home page Development static pages (using Only HTML) of an online Book store.	04	
Unit – 2	Write a JavaScript to design a simple calculator to perform the following operations: sum, product, difference and quotient.	06	
Unit – 3	Write a PHP program to display a digital clock which displays the current time of the server.	06	
Unit – 4	Write an HTML code to display your CV on a web page.	04	
Unit – 5	Write an XML program to display products.	05	
Unit – 6	Create a web page with all types of Cascading style sheets.	06	
Unit – 7	Write a PHP program to display a digital clock which displays the current time of the server.	05	
Unit – 8	Write a JavaScript that calculates the squares and cubes of the numbers from 0 to 10 and outputs HTML text that displays the resulting values in an HTML table format.	04	

This is a skill course. More student practice and try to find solution on their own, better it will be.

Reference Books:

1. "Web Technologies--A Computer Science Perspective", Jeffrey C.Jackson

2. "Internet & World Wide Web How to Program", Deitel, Deitel, Goldberg, Pearson Education

3. "Web programming- Building Internet Application", Chris Bales

4. Web Applications: Concepts and Real-World Design, Knuckles

COMPUTER ORGANISATION & ARCHITECTURE (T.W)

SUBJECT CODE: 2018309	Term Work			No. of period in one session: 50			Credits
	No. of Periods per Week			Full Marks:	:	50	**02**
	L	T	P/S				
	-	04		Internal	:	15	
				External	:	35	

Course Objective:

1. Understanding the behaviour of Logic Gates, Adders, Decoders, Multiplexers and Flip-Flops.
2. Understanding the behaviour of ALU, RAM, STACK and PROCESSOR from working modules and the modules designed by the student as part of the experiment.

Practical Outcomes: After completing the course, the students will understand

(1) Analyse the behaviour of logic gates

(2) Design combinational circuits for basic components of computer system and applications.

(3) Analyse the operational behaviour and applications of various flip-flop.

(4) Design Arithmetic logic units and different types of memory blocks.

	Contents: Term Work	Hrs.	Marks
Unit -1	Introduction to Verilog HDL/VHDL	[3]	
Unit -2	Verify the behaviour of logic gates using truth tables (AND, OR, NOT, XOR, NAND, NOR)	[5]	
Unit -3	Implementing HALF ADDER, FULL ADDER using basic logic gates	[6]	
Unit -4	Implementing Binary -to -Gray, Gray -to -Binary code conversions	[5]	
Unit -5	Implementing 3-8line DECODER	[5]	
Unit -6	Implementing 4x1 and 8x1 MULTIPLEXERS.	[6]	
Unit -7	Verify the excitation tables of various FLIP-FLOPS	[8]	
Unit -8	Design of an 8-bit Input/Output system with four 8-bit Internal Registers.	[6]	
Unit -9	Design of an 8-bit ARITHMETIC LOGIC UNIT. Design of 24x8 (16 byte) RAM. Design of 24x8 (16 byte) STACK. Implementation of a 4-bit PROCESSOR.	[6]	

Reference Book:

1. A Verilog HDL Primer by J. Bhasker Bk & Hardcover; Published by Star Galaxy Press. ISBN: 0-9656277-4-8
2. Verilog HDL: A Guide to Digital Design and Synthesis by Samir Palikir Published by Prentice Hall Publication date: March 1996

3. Patterson, D.A., and Hennessy, J.L., "Computer Organization and Design: The Hardware/Software Interface" Morgan Kaufmann Publishers, 4th Edition, Inc.2005

SUMMER INTERNSHIP I (4 WEEKS) AFTER II SEMESTER (T.W)

SUBJECT CODE: 2018310	Term Work			No. of period in one session: 50			Credits
	No. of Periods per Week			Full Marks:		50	
	L	T	P/S				02
		-	-	Internal	:	15	
				External	:	35	

PYTHON

SUBJECT CODE 2018311	Practical						Credits
	No. of Periods per Week			Full Marks:	:	25	**01**
	L	T	P/S				
	-	-	02	Internal	:	07	
				External	:	18	

	CONTENTS	Hrs.	Marks
UNIT – 01	Write a program to demonstrate basic data type in python.		
UNIT – 02	Write a program to compute distance between two points taking input from the user (Pythagorean Theorem)		
UNIT – 03	Write a python program Using for loop, write a program that prints out the decimal equivalent of $1+\frac{1}{2}+1/3\ldots 1/n$		
UNIT – 04	Write a Python program to find first n prime numbers. Write a program to demonstrate list and tuple in python.		
UNIT – 05	Write a program using a for loop that loops over a sequence. Write a program using a while loop that asks the user for a number and prints a countdown from that number to zero.		
UNIT – 06	Write a Python Program to add matrices. Write a Python program to multiply matrices.		
UNIT – 07	Write a Python program to check if a string is palindrome or not.		
UNIT – 08	Write a Python program to Extract Unique values dictionary values		
UNIT – 09	Write a Python program to read file word by word Write a Python program to Get number of characters, words.		
UNIT – 10	Write a Python program for Linear Search		

References Books:

1. Taming Python by Programming, Jeeva Jose, Khanna Publishing House

2. Starting Out with Python, Tony Gaddis, Pearson

3. Core Python Programming, Wesley J. Chun, Prentice Hall

4. Python Programming: Using Problem Solving Approach, Reema Thareja, Oxford University

5. Introduction to Computation and Programming Using Python. John V. Guttag, MIT Press.