

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

1052 : DIPLOMA IN COMPUTER ENGINEERING SYLLABUS

N-SCHEME

(To be implemented from the year 2020-21 onwards)

CURRICULUM OUTLINE

III SEMESTER

Col No	SUBJECT CODE	SUBJECT	HOURS PER WEEK		
			THEORY	PRACTICAL	TOTAL
1	4052310	Basics of Electrical and Electronics Engineering	5		5
2	4052320	Operating System	5		5
3	4052330	C Programming and Data structures	6		6
4	4052340	Electrical and Electronics Engineering Practical		4	4
5	4052350	Linux Practical		4	4
6	4052360	C Programming and Data Structures Practical		4	4
7	4052370	E Publishing Practical		4	4
			16	16	32
		Physical Education			2
		Library			1
	Total				35

Col No	SUBJECT CODE	SUBJECT	HOURS PER WEEK		
			THEORY	PRACTICAL	TOTAL
1	4052410	Computer Architecture	5		5
2	4052420	Web design and Programming	5		5
3	4052430	Object Oriented Programming with Java	5		5
4	4052440	RDBMS	5		5
5	4052450	Web design and Programming Practical		4	4
6	4052460	Java Programming Practical		4	4
7	4052470	RDBMS Practical		4	4
			20	12	32
		Physical Education			2
		Library			1
	Total				35

ANNEXURE – II

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

1052 : DIPLOMA IN COMPUTER ENGINEERING SYLLABUS

N-SCHEME

(To be implemented from the year 2020-21 onwards)

SCHEME OF EXAMINATION

III SEMESTER

Col No	CODE	SUBJECT	Examination Marks			Minimum for Pass	Duration
			Internal	External *	Total		
1	4052310	Basics of Electrical and Electronics Engineering	25	100	100	40	3
2	4052320	Operating System	25	100	100	40	3
3	4052330	C Programming and Data structures	25	100	100	40	3
4	4052340	Electrical and Electronics Engineering Practical	25	100	100	50	3
5	4052350	Linux Practical	25	100	100	50	3
6	4052360	C Programming and Data Structures Practical	25	100	100	50	3
7	4052370	E Publishing Practical	25	100	100	50	3

IV SEMESTER

Col No	CODE	SUBJECT	Examination Marks			Minimum for Pass	Duration
			Internal	External *	Total		
1	4052410	Computer Architecture	25	100	100	40	3
2	4052420	Web design and Programming	25	100	100	40	3
3	4052430	Object Oriented Programming with Java	25	100	100	40	3
4	4052440	RDBMS	25	100	100	40	3
5	4052450	Web design and Programming Practical	25	100	100	50	3
6	4052460	Java Programming Practical	25	100	100	50	3
7	4052470	RDBMS Practical	25	100	100	50	3

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(To be implemented for the students admitted from the year 2021 - 2022 onwards)

Course Name : 1052: Diploma in Computer
Engineering Subject Code : 4052310
Semester : III
Subject Title : Basics of Electrical and Electronics Engineering

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 Weeks

Subject	Instructions		Examination			Duration
	Hours /Week	Hours/ Semester	Marks			
			Internal Assessment	Board Examinations	Total	
Basics of Electrical and Electronics Engineering	5	80	25	100*	100	3Hrs

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit	Topic	Hours
I	AC FUNDAMENTALS, BATTERIES AND UPS	13
II	TRANSFORMER AND SPECIAL MOTORS	12
III	SEMICONDUCTOR DEVICES	16
IV	BOOLEAN ALGEBRA, LOGIC GATES AND COMBINATIONAL SYSTEMS	16
V	SEQUENTIAL LOGIC SYSTEM	16
Test and Model Exam		7
TOTAL		80

RATIONALE:

Diploma Engineers from all branches of engineering are expected to have some basic knowledge of electrical and electronics engineering. Also the technicians working in different engineering fields have to deal with various types of electrical equipments. Various types of electronic circuits are used in different electrical equipments. Hence it is necessary to study electric circuits, different types of electrical machines and electronic devices their principles and working characteristics. The basic concepts studied in this subject will be very useful for understanding of higher level subjects in further study.

OBJECTIVES:

On completion of the following units of syllabus contents, the students must be able to

- Understand the AC fundamentals
- Understand the working principle of UPS
- Know about servomotors
- Familiarize with semiconductor devices, rectifier circuits, transistors and its applications
- Use Binary ,Octal and Hexadecimal numbers
- Define logic gates
- Significance of Boolean algebra in digital circuits
- Understand the working principles of sequential and combinational logic circuits
- Define Flip-flops and describe behavior of various flip-flops
- Know about Synchronous and Asynchronous counters
- Know about the function of shift registers

Unit	Name of the topics	Hours
I	AC FUNDAMENTALS, BATTERIES AND UPS	
	1.1 AC Fundamental Difference between AC and DC - Advantages of AC over DC Wave form of sinusoidal A.C. Cycle—Generation of single phase A.C. by elementary alternator - Definition of cycle, frequency, time period, amplitude, peak value, average value and rms value – Define peak factor and form factor - Concept of phase, phase difference and phase angle. Single phase and 3 phase (Definition) - Meaning of lagging and leading sine wave- Advantages of three phase over single phase	4
	1.2 Batteries Classification of cells- Construction of Lead acid cell— Methods of charging –Care and Maintenance of Lead acid battery– Indications of a fully charge battery—Maintenance free batteries.	3
	1.3 UPS Need for UPS - Online and Offline UPS – Definition – Block Diagram –Explanation of each block– Merits and demerits of online and offline UPS–Need of heat sink-Specification and ratings– Maintenance of UPS including batteries.	3
	1.4 Switches Basics of switches used - Ratings of switches used for a system Installation – Ratings and types of wires used – necessity of MCB, ELCB.	3
II	TRANSFORMER AND SPECIAL MOTORS	
	2.1 Single Phase transformer Working Principle and Construction of transformer – Brief description of each part – Function and materials used – emf equation of transformer (No derivation) — Voltage and current ratio of a transformer – Efficiency - Losses in a transformer - Auto transformer - Applications — Step up and Step down transformer (Definition only)	5

	<p>2.2. Special Motors</p> <p>Stepper Motor: Definition - Working principle - Types and applications – Servo motors: Definition - Working principle - Types and applications – Factors to be considered for selecting a motor for a particular application.</p> <p>2.3. Electrical Safety:</p> <p>Electric shock – need for earthing - types of earthing, fuses- need – types of fuses</p>	5
III	<p>SEMICONDUCTOR DEVICES</p> <p>3.1 Diodes</p> <p>PN Junction diode– Barrier Voltage, Depletion Region — Forward biased and Reverse biased Junction — Working principle – forward /Reverse characteristics of PN Junction diode - Applications of diode — Zener Diode: Construction-Characteristics (Forward and Reverse)– Avalanche and Zener break down - Applications of Zener diode. Light Emitting Diodes-operation, construction and characteristics. LDR: Principle of operation and Characteristics. Photo Diode–Principle of operation (concept only)</p>	8
	<p>3.2 Rectifiers</p> <p>Definition – Need of Rectification – Circuit diagram, Operation, i/p and o/p Waveforms of Half wave - Full wave- Bridge rectifiers (without filters) - Uses of filters in rectifier circuit — Ripple factor, Efficiency and PIV (No derivation) – Comparison</p>	4
	<p>3.3 Bipolar Junction Transistor</p> <p>Definition- Principle of NPN and PNP transistor- Symbol - Transistor terminals - Operating principle (NPN transistor only) -Configurations of transistor.</p>	4
IV	<p>BOOLEAN ALGEBRA, LOGIC GATES COMBINATIONAL SYSTEM</p> <p>4.1 Number representation</p> <p>Decimal, Binary, Octal and Hexadecimal number Systems-Conversion of number from one number system to another (without decimal point) -</p>	4

	BCD CODE — ASCII Codes - Parity bit — Use of a parity bit —Odd parity and Even parity	
	4.2 Logic gates Positive and Negative logic System- Definition, Truth table, Symbol and Logical equations of AND–OR–NOT–EXOR–EXNOR (Only 2-inputs) gates– Universal gates–NAND–NOR–Symbol and truth table.	4
	4.3 Boolean Algebra Basic laws of Boolean algebra – Demorgan’s Theorem and proofs –Duality theorem - Simplification of logical equations using Boolean laws -De-Morgan’s theorem–Two and three variable Karnaugh map	3
	4.4 Arithmetic Circuits Half Adder and full adder-Truth table, Circuit diagram–Half subtractor and Full subtractor- Truth table, Circuit diagram.	3
	4.5 Combinational logic circuits Parity generator and checker -Multiplexer – De multiplexer – Encoder - Decoder (Definition and Basic Circuits only)	2
V	SEQUENTIAL LOGIC SYSTEM 5.1 Flip flops Basic principle of operation - S-R, D flip-flop – Operation and truth table- Race Condition – JK flip flop–T flip flop– Toggling- Edge Triggered Flip-flop – Level Triggered flip flop - JK Master Slave flip flop.	6
	5.2 Counters Need-Types of counters - 4bit Asynchronous counter- Mod N counter- Decade Counter -4bit Synchronous counter-Distinguish between Synchronous and Asynchronous counter-Application of counters	5
	5.3 Registers Shift register-Block diagram representation and wave form of serial in, Serial Out, Serial in Parallel out, Parallel in-parallel out Applications of Shift Registers.	5

TEXTBOOKS

S.No	Title	Author	Publisher	Year of Publishing / Edition
1	Electrical Technology Vol I and II	.B.L.Theraja	S.Chand &Co, NewDelhi	Multiple Colour Revised FirstEdition,2012
2	Modern Digital Electronics	R.P.Jain	Tata Mc- Graw Hill, NewDelhi	Third Reprint2010
3	Principles of Digital Electronics	K.Meena	PHI learning Private Ltd	2009

REFERENCE BOOKS

S.No	Title	Author	Publisher	Year of Publishing/ Edition
1.	Digital Electronics and Logic Design	Jaydeep Chakravarthy	University Press, Hyderabad	First Edition 2012
2.	Basic Electrical Engineering	V.N.Mittle	Tata Mc-GrawHill, NewDelhi	First Edition
3.	Basic Electrical and Electronics Engineering	R.Muthu subramanian R.Salivajanan	Tata Mc-GrawHill, NewDelhi	Seventh Reprint2011
4.	Principles of Electronics	V.K.Mehta	S.Chand &Co, NewDelhi	Second Edition
5.	Digital Electronics	G.K.Kharate	Oxford University Press	2010

DIPLOMA IN COMPUTER ENGINEERING

SEMESTER PATTERN

II YEAR

N – SCHEME

III SEMESTER

4052320 – Operating System

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STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(To be Implemented for the students admitted from the year 2021 - 2022 onwards)

Course Name : 1052:Diploma in Computer Engineering

Subject Code : 4052320

Semester : III

Subject Title : Operating System

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester:16 weeks

Subject	Instructions		Examination			Duration
	Hours /Week	Hours/ Semester	Marks			
			Internal Assessment	Board Examinations	Total	
Operating System	5	80	25	100*	100	3Hrs

* Examinations will be conducted for 100marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit	Topic	Hrs.
I	Introduction to Operating System	16
II	Process Management	17
III	Memory Management	13
IV	I/O and File Management, Security and Protection	13
V	Linux–Case study	14
Test and Model Exam		7
Total		80

RATIONALE:

Students have to be conversant with computer, its terminology and functioning. The heart of a computer is based around its Operating System. The processor deals with request coming from all directions asynchronously. The operating system has to deal with the problems of contention, resource management and both program and user data management, and provide a useful no-wait user interface. The course provides clear vision, understanding and working of Operating Systems.

OBJECTIVES:

On completion of the following units of syllabus contents, the students must be able to

- Understand the purpose, goals, functions and evolution of Operating Systems.
- Understand the concept of process, process states and their scheduling.
- Classify different types of schedulers and scheduling algorithms.
- Identify the significance of inter-process communication and synchronization.
- Know about the usage of semaphore in inter-process communication.
- Understand the condition for a dead lock, ways to prevent or recover from the deadlock.
- Know about memory protection against unauthorized access and sharing.
- Compare and contrast paging and segmentation techniques.
- Define virtual memory and its underlying concepts.
- Describe page replacement policies and disk scheduling techniques.
- Describe the features and brief history of Linux
- Compare Unix and Linux
- Explain Linux architecture
- Describe the process management, memory management handled by LINUX
- Describe file management, device drivers handled by Linux
- Learn to manage accounts in Linux OS.
- Learn to write shell script.

DETAILED SYLLABUS

Contents:Theory

Unit	Name of the Topics	Hours
I	<p>INTRODUCTION TO OPERATING SYSTEMS</p> <p>Basics of Operating Systems Definition–Types of Operating Systems: Mainframe, Desktop, Multiprocessor, Distributed, Clustered, Multiprogramming, Real time, Embedded and Timesharing, Mobile OS (Android, iOS).</p> <p>Operating System Components Process Management component– Memory Management component - I/O Management component — File Management component-Protection System– Networking Management component– Command interpreter.</p> <p>Operating System Services Process Execution — I/O operations– File manipulations — Communications–Error detection and recovery–Resource allocation–Accounting–System Protection-System Calls–System call Execution.</p> <p>Operating System Structures Simple structure, Layered, Monolithic, Microkernel Operating Systems – Hybrid Operating System – Views – User, System view –Concept of Virtual Machine–Bootting.</p> <p>User Interface Command Line Interface(CLI)based OS–DOS, Unix–Graphic User Interface (GUI) based OS–Windows, Linux–Difference between CLI and GUI.</p>	<p>4</p> <p>4</p> <p>3</p> <p>3</p> <p>2</p>
II	<p>PROCESS MANAGEMENT</p> <p>2.1 Processes Definition–Process Relationship-Process states–Process State transitions Process Control Block–Context switching–Threads – Concept of multithreads –Benefits of threads–Types of threads.</p>	<p>4</p>

	<p>2.2.Process Scheduling Definition–Scheduling objectives–Types of Schedulers–Scheduling criteria – CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time (Definition only)–Scheduling algorithms – Preemptive and Non – pre emptive - FCFS – SJF –SRT–PS–RR–MQ– Multiprocessor scheduling– Types–Performance evaluation of the scheduling.</p> <p>2.3.Inter-process Communication and Synchronization Definition – Shared Memory System – Message passing–Critical section –Mutual Exclusion–Semaphores.</p> <p>2.4Deadlocks Definition –Deadlock characteristics–Deadlock Prevention–Deadlock Avoidance –Deadlock detection and Recovery.</p>	<p>6</p> <p>4</p> <p>3</p>
<p>III</p>	<p>MEMORYMANAGEMENT</p> <p>Basic Memory Management Definition – Logical and Physical address map – Memory allocation – Contiguous Memory allocation – Partition allocation -Single, Fixed and Variable partition–Internal and External fragmentation and Compaction –Swapping - Paging – Principle of operation – Page allocation – Hardware support for paging – Protection and sharing – Disadvantages of paging.</p> <p>Virtual Memory Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault , Working Set , Dirty page/Dirty bit – Demand paging, Segmentation</p> <p>Page Replacement Algorithms Optimal (OPT), First In First Out (FIFO), Second Chance (SC), Not Recently Used (NRU) and Least Recently Used (LRU), Advantages and Disadvantages of Virtual Machine.</p>	<p>6</p> <p>4</p> <p>3</p>

IV	<p>I/O AND FILEMANAGEMENT</p> <p>Disk Management</p> <p>Disk Structure – Physical structure, Logical structure, Disk formatting, Disk Scheduling and its algorithms, RAID structure of disk, RAID levels0-6.</p> <p>File Management</p> <p>File concept – File attributes – Name, Identifier, Type, Location, Size, Time, Date, user identification–File Operations-File system structure–Byte sequence, Record sequence and Tree-based Directory Structure–Single level, Two levels, Tree structured Directory.</p> <p>Access Methods</p> <p>Sequential, Random access – File allocation methods – Contiguous, Linked, Indexed.</p> <p>Security and Protection</p> <p>Security threats–Security Policies and mechanisms–Authentications</p>	<p>4</p> <p>4</p> <p>2</p> <p>3</p>
V	<p>Linux–Case study</p> <p>5.1.Introduction</p> <p>History of Linux – Features of Linux – Components of Linux system – Userspace – Kernel space - Linux Architecture - Popular Flavors of Linux- FSF/GNU-Linux Desktop: GNOME- KDE.</p> <p>File System</p> <p>Second extended file system – ext2 – Virtual File System – Different typesof files - File Management — File Security — 3 levels — Mounting file system– Unmounting</p> <p>Managing Accounts</p> <p>Types of accounts–Root, System, User–Manage Users and Groups – Create, Modify, Delete a Group – Create, Modify, Delete an account.</p>	<p>6</p> <p>4</p> <p>2</p>

5.4Shell Programming Linux shell — Types — Graphical, Command Line — Characteristics of Various shells — Bash, Csh / Tcsh, Zsh, Fish — Shell Prompt — Shell scripting—Need for Shell script– Shell script advantages and disadvantages–Script example.	2
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REFERENCE BOOKS

- “Operating System Internal and Design Principles”, William Stallings, Pearson Education, 7th Edition
- “Operating System, Principles & Design”, Pal Chaudhury, PHI Learning, First Edition
- “Operating System”, Rohit Khurana IT LESE, Vikas Publishing Ltd, First Edition 2011
- “Operating System concepts”, Abraham Siberschatz Galvin, Gagne, Wiley Publishers, 9th Edition
- “Operating Systems”, Harvey M. Deitel and Paul J. Deitel, David R. Choffnes, Pearson Education, New Delhi, Third Edition, 2007

Learning Websites

https://en.wikipedia.org/wiki/Operating_system

<https://computer.howstuffworks.com/operating-system.htm>

https://www.tutorialspoint.com/operating_system/index.htm

<https://www.geeksforgeeks.org/operating-systems/>

<https://codescracker.com/operating-system/>

<https://www.computerhope.com/os.htm>

Shell Script Programs Website links

<http://www.codepoc.io/blog/unix>

<https://books.google.co.in>

DIPLOMA IN COMPUTER ENGINEERING

SEMESTER PATTERN

II YEAR

N – SCHEME

III SEMESTER

4052330 – C Programming and Data Structures

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STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(To be Implemented for the students admitted from the year 2021 - 2022 onwards)

Course Name : 1052:Diploma in Computer Engineering

Subject Code : 452330

Semester : III

Subject title : C Programming and Data Structures

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per Semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours /Week	Hours/ Semester	Marks			
			Internal Assessment	Board Examinations	Total	
C Programming and Data Structures	6	96	25	100*	100	3Hrs

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit	Topics	Hours
I	PROGRAM DEVELOPMENT & INTRODUCTION TO C	18
II	DECISION MAKING, ARRAYS , STRINGS, FUNCTIONS	18
III	STRUCTURES, UNIONS AND POINTERS	17
IV	INTRODUCTION TO DATA STRUCTURES, STACK, QUEUES	17
V	LINKED LIST, TREES, SORTING, SEARCHING	19
	Test and Model Exam	7
	TOTAL	96

RATIONALE:

C' is the most widely used computer language, which is being taught as a core course. C is general purpose structural language that is powerful, efficient and compact, which combines features of high level language and low-level language. It is closer to both

Man and Machine. Due to this inherent flexibility and tolerance it is suitable for different development environments. Due to these powerful features, C has not lost its importance and popularity in recently developed and advanced software industry. C can also be used for system level programming and it is still considered as first priority programming language. This course covers the basic concepts of C. This course will act as “Programming concept developer” for students. It will also act as “Backbone” for subjects like OOPS, Visual Basic, Windows Programming, JAVA etc.

Data structures are the techniques of designing the basic algorithms for real-life projects. In the present era, it is very essential to develop programs and organize data in such a way that it solves a complex problem efficiently. Understanding of data structures is essential and this facilitates to acquire sound knowledge of the insight of hardware requirement to any problem base. The practice and assimilation of data structure techniques is essential for programming.

OBJECTIVES:

At the end of the Course, the Students will able to

- Define Program, Algorithm and flow chart
- List down and Explain various program development steps
- Write down algorithm and flow chart for simple problems.
- Describe the concepts of Constants, Variables, Data types and operators.
- Develop programs using input and output operations.
- Use of command line arguments.
- Explain compiler controlled directives.
- Understand the structure and usage of different looping and branching statements.
- Define arrays and string handling functions.
- Explain user-defined functions, structures and union.
- Define pointers and using the concept of Pointers.
- Define Linear and non-linear data structures.
- List and discuss the different types of linear data structures.
- Define a tree and the different terms related with trees.
- Write the algorithm for different types of sorting and searching.

Contents: Theory

Unit	Name of the Topics	Hours
I	PROGRAM DEVELOPMENT & INTRODUCTION TO C 1.1 Program Program Definition - Program development cycle – Algorithm –flowchart – symbols, importance & advantage of flow chart.	3
	1.2 Introduction to C History of C - Features of C Language - Structure of a C program – Execution of C Program : Compiling, Link and Run a program — Diagrammatic representation of program execution process.	3
	1.3 Variables, Constants & Data types C character set – Tokens – Constants - Keywords – identifiers and Variables - Data types and storage – Data type Qualifiers – Declaration of variables – Assigning values to variables – Escape sequences - Defining symbolic constants	5
	1.4 C operators Arithmetic, Logical, Assignment, Relational, Increment and Decrement, Conditional, Bitwise, Special Operator precedence and Associativity. C expressions – Arithmetic expressions, Evaluation of expressions- Type cast operator.	5
	1.5 I/O statements Formatted input, formatted output, Unformatted I/O statements	2
II	DECISION MAKING, ARRAYS , STRINGS, FUNCTIONS 2.1 Control Statements Simple if statement – if-else, else-if-ladder statements, switch statement, Looping Statements — while, do _ while and for loop, go to, continue and break statements.	5
	2.2 Arrays Definition – Array element and subscript - Declaration – Initialization of one dimension array elements - Two dimensional arrays – initialization of elements.	4

	<p>2.3 Strings</p> <p>Introduction – Declaring and Initializing string variables, Reading strings , Writing strings, String handling functions — strlen() , strcpy(), strcmp(), strcat() and strrev() functions.</p>	3
	<p>2.4.Built in Functions</p> <p>Declaration and definition of function. Math functions – Console I/O functions – Standard I/O functions – Character Oriented functions .</p>	3
	<p>2.5.User defined functions</p> <p>Defining functions & Needs, Scope and Life time of Variables, Function call, return values, Recursion.</p>	3
III	<p>STRUCTURES, UNIONS AND POINTERS</p> <p>3.1 Structures and Unions</p> <p>Structure Definition – Variable declaration – initialization – Accessing and giving values to structures, Structures within structures, Arrays within structures. Unions: Declaration – initialization. Difference between Union and Structure.</p>	7
	<p>3.2 Pointers</p> <p>Introduction – Advantages of pointers – Accessing the address of a variable – Declaring and Initializing pointers – Accessing a variable through its pointer –Pointer Expressions.</p>	4
	<p>3.3 Dynamic memory allocation</p> <p>Advantages – malloc(), calloc(), realloc() and free() functions.</p>	2
	<p>3.4 Command line arguments :</p> <p>Introduction – argv and argc arguments .</p>	4
IV	<p>INTRODUCTION TO DATA STRUCTURES, STACK, QUEUES</p> <p>4.1 Introduction to Data Structures</p> <p>Introduction - Data and Information - Elementary data structure organization - Types of data structures - Primitive and Non Primitive data structures, Operations on data structures: Traversing, Inserting, Deleting, Searching, Sorting, Merging, Different Approaches to designing an algorithm: Top-Down</p>	8

	approach, Bottom-up approach (Definition and examples only)	
	<p>4.2 Definition of a Stack</p> <p>Operations on Stack (PUSH & POP) - Implementation of stack through arrays - Polish notations — Conversion of infix to postfix expression,</p>	5
	<p>4.3 Queues</p> <p>Definition – Representation of Queue using arrays – Circular Queue, Dequeue (Definition and Examples only)</p>	4
V	<p>LINKED LIST, TREES, SORTING, SEARCHING</p> <p>5.1 Terminologies</p> <p>Node, Address, Pointer, Information, Null Pointer, Empty list -. Type of lists : Singly linked list , Doubly linked list, Circular list - Representation of singly linked lists in Memory-Difference between Linked & sequential List — Advantages and Disadvantages of Linked list. (Concepts only, no implementations)</p>	6
	<p>5.2. Trees</p> <p>Terminologies: Degree of a node, degree of a tree, level of a node, leaf node, Depth / Height of a tree, In-degree & out-Degree, siblings. In order traversal, Preorder traversal, Post order traversal. (Concepts only, no implementations)</p>	6
	<p>5.3. Sorting</p> <p>Introduction, Types of sorting - Bubble sort , Quick Sort - Examples.</p>	3
	<p>5.4 Searching</p> <p>Definition – Algorithms and “C” programs for Linear search and Binary search.</p>	3

TEXT BOOKS:

Sl.No	TITLE	AUTHOR	PUBLISHER
1.	Programming in ANSI C	Prof. E. Balagurusamy	Tata Mc-Graw Hill, New Delhi, 4 th Edition

REFERENCE BOOKS:

S.No	TITLE	AUTHOR	PUBLISHER
1.	A Text Book on C	E. Karthikeyan	PHI Private Limited, New Delhi
2.	Programming with C	Byron Gottfried.	Schaum Series -TMGH
3.	Programming and Problem solving using C	ISRD Group, Lucknow	Tata Mc-GrawHill, NewDelhi
4.	Let us C	Yashavent Kanethar	BPB Publication, 2005, New Delhi
5.	Introduction to Data structures with applications.	Trembley and Sorenson	Tata Mc-GrawHill, NewDelhi
6.	Fundamentals of Data structures in C	Horowitz , sahni Anderson- freed	University Press, Hyderabad
7.	Introduction to Data structures	Bhagat Singh	TMGH, New Delhi
8.	Data Structures and Algorithms	G.A. Vijayalakshmi Pai	TMGH, New Delhi

DIPLOMA IN COMPUTER ENGINEERING

SEMESTER PATTERN

II YEAR

N – SCHEME

III SEMESTER

4052340 – Electrical and Electronics Engineering
Practical
www.binils.com

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(To be Implemented for the students admitted from the year 2021 - 2022 onwards)

Course Name : 1052:Diploma in Computer Engineering
Subject Code : 4052340
Semester : III
Subject title : Electrical and Electronics Engineering Practical

TEACHING & SCHEME OF EXAMINATION

No. of weeks per Semester: 16 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours/ Semester	Marks			
			Internal Assessment	Board Examinations	Total	
Electrical and Electronics Engineering Practical	4	64	25	100*	100	3Hrs

* Examinations will be conducted for 100 Marks and it will be reduced to 75 marks.

RATIONALE:

Diploma Engineers from all branches of engineering are expected to have some practical knowledge of electrical and electronics engineering. Also the technicians working in different engineering fields have to deal with various types of electrical equipments. Various types of electronic circuits are used in different electrical equipments. Hence it is necessary to have practice with electric circuits, different types of electronic devices to know the principles and working characteristics.

OBJECTIVES

On completion of the following practical contents the students must be able to

- Verify Power supply of SMPS
- Find the efficiency and voltage regulation of a single phase transformer
- Study the characteristics of PN junction diode and Zener Diode
- Function of Rectifier circuit
- Test the performance of Light devices
- Know about the function of a Transistor
- How to construct different logic functions using universal gates
- Realize the combinational circuits and sequential circuits

DETAILED SYLLABUS

Contents:Practical

LAB EXERCISES

1	A	Checking of power supply in SMPS
	B	Construct the circuit and draw the graph for different stages of Bridge rectifier with filter using CRO.
2		Construct the circuit and draw the forward characteristics of PN junction Diode and find input resistance.
3		Construct the circuit and draw the reverse characteristics of Zener Diode and find breakdown voltage.
4		Construct the circuit and draw the VI characteristics of LED
5		Construct the circuit and draw the characteristics of LDR
6		Construct CE configuration circuit and draw the input characteristics and also find input resistance.
7		Construct CE configuration circuit and draw the output characteristics and also find output resistance.

8	A	Verify the truth tables of NAND,AND,NOR,OR,NOT,XOR using IC's
	B	Realization of basic gates using either NAND or NOR gate.
9		Construct and verify Half adder and Half Subtractor
10		Construct and verify the truth table of Full adder
11		Construct and verify the truth table of Full subtractor
12		Verify the truth tables of RS,D,T and JKFF
13		Construct and test the parity generator and checker function using IC74180
14		Construct and test the 4bit Ripple counter(IC7493)
15		Construct and test decade counter(IC7490)

BOARDEXAMINATION

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION	
Writing any one Experiment (CIRCUIT DIAGRAM, TABULAR COLUMN, TRUTH TABLE / EQUATION / FORMULA)	45 Marks
Construction	40 Marks
Result	10 Marks
VIVA-VOCE	05 Marks
Total	100 Marks

LIST OF EQUIPMENTS / COMPONENTS REQUIRED
 (for a batch of 30 students)

S.No	Name of the Equipments	Range	Required Nos
1	Ammeter	(0-50)ma	6
2	Voltmeter	(0-20)V,(0-1v)	6
3	Power supply	0-30V	6
4	Digital Trainer Kit		6
5	Bread Board		6
6	Fixed dual power supply	0-15V	2
7	Signal generator	1MHz	2
8	CRO Dual Trace	30MHz	6

COMPONENTS

S.No	Name of the components	
1	Resistors	1150Ω,1KΩ,2.2KΩ,10KΩ,220Ω
2	Capacitor	10μF, 4.7μF
3	PN Diode	IN4007
4	Zener Diode	Z11.1
5	Transistor	SL100,CL100
6	IC7400, IC7402, IC7404, IC7408,IC7432,IC7486	
7	Ic74180,IC74153,IC7476,IC7474	
8	IC7490,IC7493,IC7495	

DIPLOMA IN COMPUTER ENGINEERING

SEMESTER PATTERN

II YEAR

N – SCHEME

III SEMESTER

4052350 – Linux Practical

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STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(To be Implemented for the students admitted from the year 2021 - 2022 onwards)

Course Name : 1052:Diploma in Computer Engineering

Subject Code : 4052350

Semester : III

Subject title : Linux Practical

TEACHING & SCHEME OF EXAMINATION

No. of weeks per Semester : 16 Weeks

Subject	Instructions		Examination			Duration
	Hours /Week	Hours/ Semester	Marks			
			Internal Assessment	Board Examinations	Total	
Linux Practical	4	64	25	100*	100	3Hrs.

* Examinations will be conducted for 100 Marks and it will be reduced to 75marks.

RATIONALE:

- Linux is an open-source Operating System which offer a variety of functions, programs or applications and Linux software to choose from, to the users, most of them are free. It has a good graphical user interface (GUI) and almost all the functionality that other proprietary OS offer.
- This practical enables to learn the commands used to perform various operations in a Linux system and write shell scripts for various functions. One of the top practical uses for Linux is web application development.

OBJECTIVES:

On completion of the following exercises ,the students must be able to

- Login and logoff Procedures
- Use of General purpose commands
- Explain the use of simple filters and advanced filters.

- Know the details of process status
- Use Various communication Commands
- Search patterns
- Use of shell scripts and define the elements of the shell script
- Write shell script for various problems.

DETAILED SYLLABUS

Contents: Practical

Units	Topics	Hours
I	Basics of Linux OS: Entering and Exiting from a Linux system –User Accounts- General understanding of various application programs–Different shells	2
II	Linux Commands: Learn the syntax and usage of : Directory Management Commands-File Management Commands- General Purpose Commands-Simple Filters–Advanced Filters- Communication Commands-Check the Process Status-Process Management Commands-Search Patterns- Exercises.	28
III	Text Editor: File operations(New, Open, Close, Save, Save and Exit, Print) –Text Editing operations (Inserting, deleting, finding, replacing, copying and moving).	2
IV	ShellScripts: Use of shellscripts –Numerical operations-Looping–Swapping Technique-String operations–Using Command line arguments – Filters – Date Functions – Relational operations-Logical operations-Boolean operations-Basic arithmetic operations – Case statement – Search Directory or File -Exercises.	32

LAB EXERCISES

Contents:Practical

PART–A LINUX COMMANDS	
Write down the syntax and usage of the following exercise with all options.	
Check the commands with the system	
1	Usage of Directory Management commands: ls, cd, pwd, mkdir, rmdir
2	Usage of File Management commands :cat, chmod, cp, mv, rm, more
3	Use the General Purpose commands: wc, cal, date, who, tty, ln
4	Using the Simple filters: pr, head, tail, cut, paste, nl ,sort
5	Advanced filters: Search for a pattern using grep, egrep, fgrep, uniq Communication Commands: write, wall
6	Check the details of process name, PID, status using ps command. Process Management commands:&,nohup, kill, nice
7	Device pattern using meta character to match each of the following situation: All three character filenames. All filenames that contains the characters 'a' or 'b' or 'c.' All filenames beginning with a particular string. All filenames beginning with 'ca' and ending with two digits. All filenames beginning with 's 'and having 'a' at somewhere.
PART– BSHELL SCRIPTS	
1	Write a shell script that accepts a numerical value N. Then display the Decrementing value of N till it reaches 0.
2	Write a shell script to search a string and display it.
3	Write a shell script that takes three command line arguments. The first argument is the name of the destination file and the other two arguments are Names of files to be placed in the destination file.

4	Write a shell script to print contents of file from given line number to next given Number of lines.
5	Write a shell script that print out date information in this order: time, day of The week, day number, year– that is like this.21:18:00 IST Mon16 Aug2021
6	Develop a Basic math Calculator using case statement
7	Write a shell script that represents a multiple choice question, gets the user's Answer and report back whether the answer is right, wrong or not one of the choices.
8	Write a shell script that takes a command line argument and reports on Whether it is a directory, a file or something else.

BOARD EXAMINATION

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DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION	
Correctness of Commands in Part-A	20 Marks
Execution of Commands in Part-A	20 Marks
Writing program in Part-B	20 Marks
Execution of program in Part-B	25 Marks
Printed Output (Part–A)	5 Marks
Printed Output (Part–B)	5 Marks
VIVA– VOCE	5 Marks
TOTAL	100 Marks

HARDWARE AND SOFTWARE REQUIREMENTS

Minimum Hardware Requirements:

Desktop Computers:30 Nos

Laser Printer:1No.

Minimum Software Requirements:

Operating System :Any Linux Based GUI Operating System

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DIPLOMA IN COMPUTER ENGINEERING

SEMESTER PATTERN

II YEAR

N – SCHEME

III SEMESTER

4052360 – C Programming and Data Structures

Practical
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STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(To be Implemented for the students admitted from the year 2021 - 2022 onwards)

Course Name : 1052:Diploma in Computer Engineering
Subject Code : 4052360
Semester : III
Subject title : C Programming and Data Structures Practical

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per Semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examinations	Total	
C Programming and Data Structures Practical	4	64	25	100*	100	3Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

As 'C' is the most widely used computer language in software industry to provide the hands on experience on writing C programs and on implementation of linear and non-linear data structure, this course is introduced. The knowledge of 'C' language and data structures will be reinforced by practical exercises during the course of study. This course will help students to develop the capability of selecting a particular data structure.

OBJECTIVES:

At the end of the Course, the Students will able to

- Analyze the given problem.
- Think the logic to solve the given problem.
- Describe the concepts of constants, variables, data types and operators.
- Develop programs using input and output operations.
- Write programs using command line arguments.
- Write programs using compiler control directives.
- Write programs using different looping and branching statements.
- Write programs based on arrays.
- Write Programs using string handling functions.
- Write programs using user-defined functions, Structures and Union.
- Write programs using the concept of Pointers.
- Understand the use of arrays
- Implement linear data structure algorithms using C language.
- Implement non - linear data structure algorithms using C language.
- Write programs for traversing a binary tree.
- Write programs for searching and sorting.

DETAILED SYLLABUS

Contents:Practical

PART – A

1. Write a simple C Program
 - a. Print your Name and Address
 - b. Find Simple interest and Compound interest.
2. Write a C program to swap two variable's using
 - (i) third variable and (ii) without using a third variable.
3. Write a program to find the largest number between given three numbers.
4. Write a program to print all prime numbers from 1 to N.
5. Write a program to prepare the total marks for N students by reading the Reg.No,Name, Mark1 to Mark6 by using array of structures.
6. Write a program using the function power (a,b) to calculate the value of a raised to b.
7. Write a program to find the length of the given string using pointers.
8. Write a program to find factorial of a number using recursion.

PART – B

9. Write a program in 'C' to create a singly linked list containing at least five elements.Make necessary assumptions.
10. Write a "C" program to perform operations in stack using array.
11. Write a "C" program to convert an infix expression into post fix expression.
12. Write a "C" program to perform operations in queue using array.
13. Write a "C" program to add two 3 x 3 matrices and display the result in Matrix form.
14. Write a "C" program to read 10 elements and sort the above numbers using bubble sort.
15. Write a "C" Program for binary searching.

BOARD EXAMINATION

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION	
Writing any one program from PART – A	20 Marks
Writing any one program from PART – B	25 Marks
Executing program (PART – A)	20 Marks
Executing program (PART – B)	20 Marks
Result with printout (PART – A)	05 Marks
Result with printout (PART – B)	05 Marks
VIVA – VOCE	05 Marks
Total	100 Marks

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HARDWARE REQUIREMENT

Desktop Computers - 30 No's
Laser Printer - 1 No

SOFTWARE REQUIREMENT

C – Compiler with Editor.

DIPLOMA IN COMPUTER ENGINEERING

SEMESTER PATTERN

II YEAR

N- SCHEME

III SEMESTER

4052370 – E Publishing Practical

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STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS
N-SCHEME

(To be Implemented for the students admitted from the year 2021 - 2022 onwards)

Course Name : 1052:Diploma in Computer Engineering
Subject Code : 4052370
Semester : III
Subject title : E PUBLISHING PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per Semester: 16 Weeks

Subject	Instructions		Examination			Duration
	Hours /Week	Hours/ Semester	Marks			
			Internal Assessment	Board Examinations	Total	
E PUBLISHING PRACTICAL	4	64	25	100*	100	3Hrs.

*Board Examination Conducted for 100 Marks and Converted To 75 Marks

RATIONALE:

This course will enable the students to familiarize with the features and use of application packages such as CorelDraw, Photoshop and Adobe indesign. This subject will develop skills in handling the above packages to develop software for-publishing. It makes the students exactly suitable for DTP industry.

OBJECTIVES:

On completion of the following exercises the students must be able to

- Learn all tools and options in CorelDraw.
- Create designs like Bit Notice, Notebook Wrapper, Invitation and Calendar in CorelDraw or any open source software.
- Learn all tools and options in Photo Shop.
- Create designs using layers, tools, text effects and filters in Photoshop or any equivalent open source software.
- Learn to use character styles, paragraph styles, text effects and text frame in Adobe In design or any equivalent open source software
- Create master page, multipage document and monthly calendar in Adobe Indesign.

DETAILED SYLLABUS

Contents: Practical

LAB EXERCISES

PART-A

1. Create a Bit Notice with specified height and width with various text styles.
2. Create a design using all basic tools and make changes using shape tool.
3. Create a notebook wrapper design using fountain filling and pattern filling tools.
4. Create an invitation using arrange menu commands like transformations, align and distribute and order.
5. Create a calendar with the help of Grid Tool, Power clip and import commands.
6. Create a simple logo using text tool, rectangle tool and ellipse tool.
7. Transform one object into another object using blend tool.

PART-B

1. Create a design by using the various Selection Tools, cutting and pasting the images.
2. Using multiple layers, create a design with the use of masking various images.
3. Create a design by the use of text tools and apply text effects.
4. Change the color of an image by the use of selective coloring method.
5. Create a design by applying the various filtering effects.
6. Create a simple layout and master page by using master page palette and Character Styles.
7. Create a multipage document by using character, paragraph, auto flow and text commands.
8. Create a stylish monthly calendar sheet by using table and its formatting commands.

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DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION	
Procedure Writing - One Question from PART - A	20 Marks
Procedure Writing - One Question from PART - B	25 Marks
Executing Exercise (PART - A)	20 Marks
Executing Exercise (PART - B)	20 Marks
Result(Part - A)	5 Marks
Result(Part - B)	5 Marks
VIVA - VOCE	5 Marks
TOTAL	100 Marks

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HARDWARE REQUIREMENTS

Desktop Computers	30 Nos
Laser printer	1 No
Scanner	1 No

SOFTWARE REQUIREMENTS

Any Open Source Software

- GIMP
- Scribus
- Inkscape
- Krita
- Pinta
- Shotwell or any equivalent open source software.[or]
- Corel draw, Photoshop, Adobe indesign.(optional)

[Open source software usage is recommended than proprietary for doing lab exercises]

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