



SYLLABUS

DIPLOMA IN COMPUTER ENGINEERING

Course Code: 1052

2015-2016

M- SCHEME

**DIRECTORATE OF TECHNICAL EDUCATION
GOVERNMENT OF TAMILNADU**

ANNEXURE - I
CURRICULUM OUTLINE

THIRD SEMESTER

Subject Code	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial / Drawing	Practical hours	Total Hours
35231	Basics of Electrical & Electronics Engineering	5	-	-	5
35232	Operating Systems	5	-	-	5
35233	C Programming	6	-	-	6
35234	Electrical & Electronics Practical	-	-	4	4
35235	Linux Practical	-	-	4	4
35236	C Programming Practical	-	-	6	6
30001	Computer Applications Practical**	-	-	4	4
	Seminar	1	-	-	1
TOTAL		17	-	18	35

FOURTH SEMESTER

Subject Code	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial / Drawing	Practical hours	Total Hours
35241	Computer Architecture	4	-	-	4
35242	Computer Networks and Security	4	-	-	4
35243	Object Oriented Programming with Java	6	-	-	6
35244	Data Structures using C	6	-	-	6
35245	Java Programming Practical	-	-	4	4
35246	Data Structures using C Practical	-	-	6	6
30002	Life and Employability Skill Practical**	-	-	4	4
	Seminar	1	-	-	1
TOTAL		21	-	14	35

** Common with all Branches of Engineering / Technology

1052 – COMPUTER ENGINEERING**SCHEME OF THE EXAMINATION III SEMESTER**

Subject Code	SUBJECT	Examination Marks			Minimum for pass	Duration of Exam Hours
		Internal Assessment Marks	Board Exam. Marks	Total Mark		
35231	Basics of Electrical & Electronics Engineering	25	75	100	40	3
35232	Operating Systems	25	75	100	40	3
35233	C Programming	25	75	100	40	3
35234	Electrical & Electronics Practical	25	75	100	50	3
35235	Linux Practical	25	75	100	50	3
35236	C Programming Practical	25	75	100	50	3
30001	Computer Applications Practical	25	75	100	50	3
		175	525	700		

FOURTH SEMESTER

Subject Code	SUBJECT	Examination Marks			Minimum for pass	Duration of Exam Hours
		Internal Assessment Marks	Board Exam Marks	Total Mark		
35241	Computer Architecture	25	75	100	40	3
35242	Computer Networks and Security	25	75	100	40	3
35243	Object Oriented Programming with	25	75	100	40	3
35244	Data Structures using C	25	75	100	40	3
35245	Java Programming Practical	25	75	100	50	3
35246	Data Structures using C Practical	25	75	100	50	3
30002	Life and Employability Skill Practical	25	75	100	50	3
TOTAL		175	525	700		

EQUIVALENT PAPERS FOR COMPUTER ENGINEERING			
L SCHEME SUBJECTS		MSCHEME SUBJECTS	
III SEMESTER W.E.F OCT 16			
25231	BASICS OF ELECTRICAL AND ELECTRONIC ENGG	35231	BASICS OF ELECTRICAL AND ELECTRONIC ENGG
25232	OPERATING SYSTEM	35232	OPERATING SYSTEM
25233	C PROGRAMMING	35233	C PROGRAMMING
25234	ELECTRICAL AND ELECTRONICS PRACTICAL	35234	ELECTRICAL AND ELECTRONICS PRACTICAL
25235	LINUX PRACTICAL	35235	LINUX PRACTICAL
25236	C PROGRAMMING PRACTICAL	35236	C PROGRAMMING PRACTICAL
20001	COMPUTER APPLICATIONS PRACTICAL	30001	COMPUTER APPLICATIONS PRACTICAL
IV SEMESTER W.E.F APR 17			
25241	COMPUTER ARCHITECTURE	35241	COMPUTER ARCHITECTURE
25242	COMPUTER NETWORK AND SECURITY	35242	COMPUTER NETWORK AND SECURITY
25243	OOPS WITH JAVA	35243	OOPS WITH JAVA
25244	DATA STRUCTURES USING C	35244	DATA STRUCTURES USING C
25245	JAVA PROGRAMMING PRACTICAL	35245	JAVA PROGRAMMING PRACTICAL
25246	DATA STRUCTURES USING C PRACTICAL	35246	DATA STRUCTURES USING C PRACTICAL
25245	COMMUNICATION AND LIFE SKILL PRACTICAL	35245	Life and Employability Skill Practical
V SEMESTER W.E.F OCT 17			
52551	WEB PROGRAMMING	35251	WEB PROGRAMMING
25252	RELATIONAL DATABASE MANAGEMENT SYSTEMS	35252	RELATIONAL DATABASE MANAGEMENT SYSTEMS
25253	.NET PROGRAMMING	35253	COMPONENT BASED PROGRAMMING
	ELECTIVE –I -THEORY		ELECTIVE –I -THEORY
25272	SOFTWARE ENGINEERING	352572	SOFTWARE ENGINEERING
25271	CONCEPTS OF ADVANCED COMPUTING	352571	CLOUD COMPUTING
25255	WEB PROGRAMMING PRACTICAL	35255	WEB PROGRAMMING PRACTICAL
25256	RELATIONAL DATABASE MANAGEMENT SYSTEMS PRACTICAL	35256	RELATIONAL DATABASE MANAGEMENT SYSTEMS PRACTICAL
25257	.NET PROGRAMMING PRACTICAL	35257	COMPONENT BASED PROGRAMMING PRACTICAL
VI SEMESTER W.E.F APR 18			
25261	COMPUTER HARDWARE AND SERVICING	35261	COMPUTER HARDWARE AND SERVICING
25262	MOBILE COMPUTING	35262	MOBILE COMPUTING
	ELECTIVE –II THEORY		ELECTIVE –II THEORY
25281	a. MULTIMEDIA SYSTEMS	35281	a. MULTIMEDIA SYSTEMS
25282	b. OPEN SOURCE SOFTWARE	35282	B. OPEN SOURCE SOFTWARE
25264	COMPUTER SERVICING AND NETWORK PRACTICAL	35264	COMPUTER SERVICEING AND NETWORK PRACTICAL
25265	SYSTEM ADMIN PRACTICAL		NO EQUIVALENT
	ELECTIVE-II PRACTICAL		ELECTIVE-II PRACTICAL
25283	a.MULTIMEDIA SYSTEMS PRACTICAL	35283	a. MULTIMEDIA SYSTEMS PRACTICAL
25284	b.OPEN SOURCE SOFTWARE PRACTICAL	35284	b.OPEN SOURCE SOFTWARE PRACTICAL
25267	PROJECT WORK AND ENTREPRENEURSHIP	35267	PROJECT WORK

Board Examination - Question paper pattern

Common for all theory subjects

Time: 3 Hrs

Max. Marks: 75

PART A - (1 to 8) 5 Questions are to be answered out of 8 questions for 2 marks each. (Question No. 8 will be the compulsory question and can be asked from any one of the units) (From each unit maximum of two 2 marks questions alone can be asked)

PART B - (9 to 16) 5 Questions are to be answered out of 8 questions for 3 marks each. (Question No. 16 will be the compulsory question and can be asked from any one of the units) (From each unit maximum of two 3 marks questions alone can be asked)

PART C - (17 to 21) Five Questions will be in the Either OR Pattern. Students have to answer these five questions. Each question carries 10 marks. (Based on the discretion of the question setter, he/she can ask two five mark questions (with sub division A & sub division B) instead of one ten marks question if required)

SEMESTER - III



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M- SCHEME

III SEMESTER

2015 –2016 onwards

**35231 - BASICS OF ELECTRICAL AND
ELECTRONICS ENGINEERING**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

Course Name : Diploma in Computer Engineering.

Subject Code : 35231

Semester : III

Subject title : BASICSOF ELECTRICAL AND ELECTRONICS ENGINEERING

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester 15 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
Basics of Electrical and Electronics Engineering	5Hrs	75Hrs	Internal Assessment	Board Examination	Total	3 Hrs
			25	75	100	

TOPICS AND ALLOCATION OF HOURS

Unit No.	Topic	No of Hours
I	AC FUNDAMENTALS , BATTERIES AND UPS	12
II	TRANSFORMER AND SPECIALMOTORS	12
III	SEMICONDUCTOR DEVICES	14
IV	BOOLEAN ALGEBRA , LOGIC GATES AND COMBINATIONAL SYSTEMS	14
V	SEQUENTIAL LOGICSYSTEM	13
TEST AND REVISION		10
TOTAL		75

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 stepper motors and servo motors
- 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

DETAILED SYLLABUS

UNIT I. AC FUNDAMENTALS ,BATTERIES AND UPS		12Hrs
1.1	AC Fundamentals: Difference between AC and DC - Advantages of AC over DC – Waveform 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	6 Hrs
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 Hrs
1.3	UPS : Need for UPS - Online and Offline UPS – Definition – Block Diagram – Explanation of each block – Merits and demerits of on line and off line UPS – Need of heat sink- Specification and ratings –Maintenance of UPS including batteries	3 Hrs

UNIT II.TRANSFORMER AND SPECIAL MOTORS		12 Hrs
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 - Comparison with two winding transformer – Applications – Step up and Step down transformer (Definition only)	5Hrs
2.2	Special Motors: 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.	5Hrs
2.3	Electrical Safety: Electric shock-need for earthing-types of earthing, fuses-need-types of fuses	2Hrs
UNIT III.SEMICONDUCTOR DEVICES		14 Hrs
3.1	Diodes: PN Junction diode – Barrier Voltage, Depletion Region – Forward biased and Reverse biased Junction – Working principle - forward /Reverse characteristics of P-N 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)	6Hrs
3.2	Rectifiers: 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	4Hrs
3.3	Bipolar Junction Transistor: Definition - Principle of NPN and PNP transistor - Symbol - Transistor terminals - Operating principle (NPN transistor only) - Configurations of transistor – Comparison between CB, CE and CC - Input and Output characteristics of CE configuration – Transistor application as switch.	4Hrs
UNIT IV.BOOLEAN ALGEBRA ,LOGIC GATES COMBINATIONAL SYSTEM		14 Hrs
4.1	Number representation: Decimal, Binary, Octal and Hexa decimal number systems- Conversion of number from one number system to another (without decimal point) - BCD CODE – ASCII Codes - Parity bit – Use of a parity bit – Odd parity and Even parity	3Hrs

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 .	3Hrs
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	3Hrs
4.4	Arithmetic Circuits: Half Adder and full adder- Truth table, Circuit diagram – Half subtractor and Full subtractor - Truth table, Circuit diagram.	3Hrs
4.5	Combinational logic circuits: Parity generator and checker - Multiplexer - De multiplexer – Encoder - Decoder (Definition and Basic Circuits only) – Comparator Circuit for two bit words.	2Hrs
UNIT V .SEQUENTIAL LOGIC SYSTEM		–13 Hrs
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 - Need for a Master-slave flip flop - J-K Master Slave flip flop.	5Hrs
5.2	Counters: Need- Types of counters- 4 bit Asynchronous counter-Mod N counter-Decade Counter- 4 bit Synchronous counter-Distinguish between Synchronous and Asynchronous counter-Application of counters	4Hrs
5.3	Registers: Shift register - Block diagram representation and waveform of serial –in Serial out, Serial – in Parallel – out, Parallel in -parallel out Applications of Shift Registers.	4Hrs

TEXT BOOKS

S.No	Title	Author	Publisher	Year of Publishing / Edition
1	Electrical Technology Vol I and II	B.L.Theraja	S.Chand& Co , New Delhi	Mutiple Colour Revised First Edition,2012
2	Modern Digital Electronics	R.P. Jain	TataMc-GrawHill, New Delhi	Third Reprint 2010
3	Principles of Digital electronics	K.Meena	PHI learning Private Ltd	2009

REFERENCES

S.No	Title	Author	Publisher	Year of Publishing/ Edition
1.	Digital Electronics and Logic Design	Jaydeep Chakravarthy	University Press, Hyderabad	First Edition2012
2.	Basic Electricall Engineering	V.N.Mittle	Tata Mc-Graw Hill, NewDelhi	First Edition
3.	Basic Electrical and Electronics Engineering	R,Muthusubramanian R.Salivajanan	Tata Mc-Graw Hill, NewDelhi	Seventh Reprint 2011
4..	Principles of Electronics	V.K.Mehta	S.Chand & Co, NewDelhi	Second Edition
5.	Digital Electronics	G.K.Kharate	Oxford University Press	2010



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M- SCHEME

III SEMESTER

2015 –2016 onwards

35232 – OPEARTING SYSTEMS

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

Course Name : Diploma in Computer Engineering.

Subject Code : 35232

Semester : III

Subject title : OPEARTING SYSTEMS

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester: 15 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
OPEARTING SYSTEMS	5 Hrs	75 Hrs	Internal Assessment	Board Examination	Total	3 Hrs
			25	75	100	

TOPICS AND ALLOCATION OF HOURS

Unit	Topic	No of
1	Introduction to Operating System	14
2	Process management	16
3	Memory Management	12
4	I/O and File Management, Security and Protection	13
5	Linux – Case study	10
TEST AND REVISION		10
TOTAL		75

Rationale :

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 concept of Operating System is discussed through case studies of LINUX. The course provides clear vision, understanding and working of Operating Systems.

Objectives:

- Understand the purpose, goals, functions and evolution of Operating Systems.
- Understand the concept of process, various states in the process and their scheduling.
- Classify different types of schedulers and scheduling algorithms.
- Identify the significance of inter-process communication and synchronization.
- Discuss the usage of semaphore in inter-process communication.
- Understand the conditions for a deadlock.
- Describe the ways to 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 the page replacement policies like Optimal, FIFO and LRU.
- Discuss the disk scheduling techniques.
- Mention the role of security policies
- Discuss about significance of authentication
- 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

DETAILED SYLLABUS

UNIT I INTRODUCTION TO OPERATING SYSTEMS		14 Hrs
1.1	Basics of Operating Systems: Definition – Generations of Operating systems – Types of Operating Systems: Mainframe, Desktop, Multiprocessor, Distributed, Clustered, Multiprogramming, Real time, Embedded and Time sharing.	4 Hrs
1.2	Operating System Components: Process Management component – Memory Management component - I/O Management component – File Management component - Protection System – Networking management component – Command interpreter	4 Hrs
1.3	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	4 Hrs
1.4	Operating System Structures: Simple structure, Layered, Monolithic, Microkernel Operating Systems – Concept of Virtual Machine – Booting	2 Hrs

UNIT – II PROCESS MANAGEMENT		16 Hrs
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	4 Hrs
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 – Pre emptive and Non – pre emptive - FCFS – SJF – RR - Multiprocessor scheduling – Types - Performance evaluation of the scheduling.	5 Hrs
2.3	Inter-process Communication and Synchronization: Definition – Shared Memory System – Message passing – Critical section – Mutual Exclusion - Semaphores.	4 Hrs
2.4	Deadlocks: Definition – Deadlock characteristics – Deadlock Prevention – Deadlock Avoidance – Deadlock detection and Recovery.	3 Hrs
UNIT – III MEMORY MANAGEMENT		12 Hrs
3.1	Basic Memory Management : Definition – Logical and Physical address map – Memory allocation – Contiguous Memory allocation – Fixed and variable partition – Internal and External fragmentation and Compaction – Paging – Principle of operation – Page allocation – Hardware support for paging – Protection and sharing – Disadvantages of paging.	5 Hrs
3.2	Virtual Memory : Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault , Working Set , Dirty page/Dirty bit – Demand paging (Concepts only) – Page Replacement policies – Optimal (OPT) , First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recently used (LRU)	7 Hrs
UNIT – IV I/O AND FILE MANAGEMENT , SECURITY & PROTECTION		13Hrs
4.1	Disk Management: Disk Structure, Disk Scheduling and its algorithms, RAID TECHNOLOGY.	4 Hrs
4.2	File Management: File concept – File attributes – Name, Identifier, Type, Location, Size, Time, Date, user identification – File Operations - Directory Structure – Single level, Two level, Tree Structure – Disk space allocation methods– Contiguous, Linked, Indexed. Access Methods – Sequential, Random access – File system structure – Byte sequence, Record sequence and Tree-based – Disk formatting	6 Hrs
4.3	Security and Protection: Security threats – Security Policies and mechanisms – Authentications	3 Hrs
UNIT – V LINUX – A CASE STUDY		10 Hrs
5.1	Introduction – History of Linux – Features of Linux- Linux Architecture - Popular Flavors of Linux - FSF/GNU - Linux Desktop: GNOME-KDE.	6 Hrs
5.2	File System – ext2 – Virtual File System - Different types of files - File Management – File Security – 3 levels – Mounting file system – Unmounting	4 Hrs

TEXT BOOKS

Sl.No.	TITLE	AUTHOR	PUBLISHER	Edition
1	Operating System concepts	Abraham Siberschatz Galvin, Gagne	Wiley	9th Edition
2	Operating System Internal and Design Principles	William Stallings	Pearson Education	7 th Edition

REFERENCES

Sl.No	TITLE	AUTHOR	PUBLISHER	Year of Publishing/Edition
1	Operating system, Principals & Design	Pal Chaudhury	PHI Learning	First Edition
2	Operating System	William stalling	Pearson Education, New Delhi.	2003
3	Operating Systems	Deitel and Deitel	Pearson Education, New Delhi.	Third Edition, 2007
4	Operating System	Rohit Khurana ITLESE	Vikas Publishing Ltd	First Edition 2011



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M- SCHEME

III SEMESTER

2015 –2016 onwards

35233– C PROGRAMMING

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(Implemented from the academic year 2016-2017 onwards)

Course Name : Diploma in Computer Engineering.

Subject Code : 35233

Semester : III

Subject title : C PROGRAMMING

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester 15 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
C Programming	6 Hrs	90 Hrs	Internal Assessment	Board Examination	Total	3 Hrs
			25	75	100	

TOPICS & ALLOCATION OF HOURS

Unit No.	Topics	No. of Hours
I	PROGRAM DEVELOPMENT AND INTRODUCTION TO C	15
II	DECISION MAKING, ARRAYS AND STRINGS	16
III	FUNCTIONS, STRUCTURES AND UNIONS	16
IV	POINTERS	17
V	FILE MANAGEMENT & PREPROCESSORS	16
TEST AND REVISION		10
TOTAL		90

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 "Programmingconcept developer" for students. It will also act as "Backbone" for subjects like OOPS, Visual Basic, Windows Programming, JAVA etc.

OBJECTIVES

At the end of the Course, the students will be 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.
- To understand the dynamic data structure and memory management.

DETAILED SYLLABUS

UNIT - I Program Development & Introduction to C		15Hrs
1.1	Program Algorithm & flow chart:- Program development cycle- Programming language levels & features. Algorithm – Properties & classification of Algorithm, flow chart – symbols, importance & advantage of flow chart.	3Hrs
1.2	Introduction C: - History of C – features of C structure of C program – Compiling, link & run a program. Diagrammatic representation of program execution process.	2Hrs

1.3	Variables, Constants & Data types: C character set-Tokens-Constants- Key words – identifiers and Variables – Data types and storage – Data type Qualifiers – Declaration of Variables – Assigning values to variables- Declaring variables as constants-Declaration – Variables as volatile- Overflow & under flow of data	4Hrs
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	4Hrs
1.5	.I/O statements: Formatted input, formatted output, Unformatted I/O statements	2Hrs
UNIT – II DECISION MAKING,ARRAYS and STRINGS		16 Hrs
2.1	Branching:- Introduction – Simple if statement – if –else – else-if ladder , nested if-else-Switch statement – go statement – Simple programs.	4Hrs
2.2	Looping statements:- While, do-while statements, for loop, break & continue statement – Simple programs	4Hrs
2.3	Arrays:- Declaration and initialization of One dimensional, Two dimensional and Character arrays – Accessing array elements – Programs using arrays	4Hrs
2.4	Strings :- Declaration and initialization of string variables, Reading String, Writing Strings – String handling functions (strlen(),strcat(),strcmp()) – String manipulation programs	4Hrs
UNIT – III FUNCTIONS, STRUCTURES AND UNIONS		16 Hrs
3.1	Built –in functions: -Math functions – Console I/O functions – Standard I/O functions – Character Oriented functions – Simple programs.	4Hrs
3.2	User defined functions:- Defining functions & Needs-, Scope and Life time of Variables, , Function call, return values, Storage classes, Category of function – Recursion – Simple programs	6Hrs
3.3	Structures and Unions:- Structure – Definition, initialization, arrays of structures, Arrays with in structures, structures within structures, Structures and functions – Unions – Structure of Union – Difference between Union and structure – Simple programs.	6Hrs
UNIT - IV POINTERS		17 Hrs

4.1	Pointers:- Definition – advantages of pointers – accessing the address of a variable through pointers - declaring and initializing pointers- pointers expressions, increment and scale factor- array of pointers- pointers and array - pointer and character strings –function arguments – pointers to functions – pointers and structures – programs using pointer.	12Hrs
4.2	Dynamic Memory Management:- introduction – dynamic memory allocation – allocating a block memory (MALLOC) – allocating multiple blocks of memory (CALLOC) –releasing the used space: free – altering the size of a block (REALLOC) – simple programs	5Hrs
UNIT –V FILE MANAGEMENT AND PREPROCESSORS		16 Hrs
5.1	File Management: Introduction-Defining and opening a file-closing a file-Input/ Output operations on files—Error handling during I/O operations –Random Access to files—Programs using files	9Hrs
5.2	Command line arguments: Introduction – argv and argc arguments – Programs using command Line Arguments –Programs	3Hrs
5.3	The preprocessor: Introduction – Macro Substitution, File inclusion, Compiler control directives.	4Hrs

Text book:

1. Programming in ANSI C 4E by Prof. E. BALAGURUSAMY, the TATA McGRAW – HILL publications.

REFERNCES

S.No	Title	Author	Publisher	Year of Publishing/ Edition
1.	Programming and Problem solving using C	ISR D Group, Lucknow	Tata Mc-GrawHill, NewDelhi	Sixth Reprint 2010
2.	Let us C	Yeswanth Kanetkar	BPB Publications	Fourth Revised
3.	A TextBook on C	E.Karthikeyan	PHI Private Limited, New Delhi	2008

4.	Programming in C	D.Ravichandran	New Age International Publishers,Chennai	FirstEdition1996 Reprint2011
5.	Computer Concepts and	Dr.S.S.Khandare	S.Chand & Company Ltd. New Delhi	FirstEdition2010
6.	Complete Knowledge in C	Sukhendu Dey, Debobrata Dutta	Narosa Publishing House, New Delhi	Reprint2010
7.	Programming in C	Reema Theraja	Oxford University Press	FirstEdition2011
8.	Practical C Programming	Steve Oualline	O'Reilly, Shroff	Eleventh Indian ReprintOct2010



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M- SCHEME

III SEMESTER

2015 –2016 onwards

**35234 – ELECTRICAL AND ELECTRONICS
ENGINEERING PRACTICAL**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

Course Name : Diploma in Computer Engineering.

Subject Code : 35234

Semester : III

Subject title : Electrical and Electronics Engineering Practical

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester 15 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
Electrical and Electronics Engineering Practical	4 Hrs	60 Hrs	Internal Assessment	Board Examination	Total	3 Hrs
			25	75	100	

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

LAB EXERCISES

1	A	Checking of power supply in SMPS
	B	To determine Efficiency and Voltage Regulation of single phase transformer using direct loading method
2	A	Construct the circuit and draw the forward characteristics of PN junction Diode and find input resistance.
	B	Construct the circuit and draw the reverse characteristics of Zener Diode and find breakdown voltage.
3		Construct the circuit and draw the graph for different stages of Bridge rectifier with filter using CRO
4	A	Construct the circuit and draw the characteristics of LDR
	B	Construct the circuit and draw the VI characteristics of LED
5	A	Construct CE configuration circuit and draw the input characteristics and also find input resistance
	B	Construct CE configuration circuit and draw the output characteristics and also find output resistance .
6	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.
7		Construct and verify Half adder and Half Subtractor
8		Construct and verify the truth table of Full adder
9		Construct and verify the truth table of Full subtractor
10		Verify the truth tables of RS, D, T and JKFF
11		Construct and test the parity generator and checker function using IC 74180
12		Construct and test encoder and decoder circuit(IC 74138)
13		Construct and test the function of Multiplexer and De-ultiplexer(IC 74151)
14		Construct and test the 4 bit Ripple counter (IC7493)
15		Construct and test decade counter (IC 7490)

SCHEME OF VALUATION	
Writing any one Experiment (CIRCUIT DAIGRAM, TABULAR COLUMN, TRUTH TABLE/EQUATION/FORMULA)	30 Marks
Construction	30 Marks
Result	10 Marks
VIVA – VOCE	05 Marks
Total	75 Marks

EQUIPMENTS/COMPONENTS REQUIRED

EQUIPMENTS

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	0-15 V	2
7	Signal generator	1 MHz	2
8	CRO Dual Trace	30 MHz	6
9	Single Phase Transformer		

COMPONENTS

S.No	Name of the components	
1	Resistors	1150Ω, 1KΩ, 2.2KΩ, 10KΩ, 2 20Ω
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	Ic 74180, IC 74153, IC 7476, IC 7474	
8	IC 7490, IC 7493, IC 7495	



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M- SCHEME

III SEMESTER

2015 –2016 onwards

35235 –LINUX PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

Course Name : Diploma in Computer Engineering.

Subject Code : 35235

Semester : III

Subject title : Linux Practical

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester 15 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
Linux Practical	4Hrs	60Hrs	Internal Assessment	Board Examination	Total	3 Hrs
			25	75	100	

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
- Define the elements of the shell script
- Write shell script for various problems.

LAB EXERCISES

PART – A LINUX COMMANDS	
Write down the syntax and usage of the following exercise with all options. Check the commands with the system	
1	(a) Logon to LINUX and logoff. (b) Usage of directory management commands: ls, cd, pwd, mkdir, rmdir (c) Usage of File Management commands: cat, chmod, cp, mv, rm, more, file commands
2	Use the general purpose commnds: wc, od, lp, cal , date, who , tty ,ln
3	Using the simple filters: pr, head, tail, cut, paste, nl, sort
4	Advanced filters : Search for a pattern using grep, egrep & fgrep
5	To know the details of process status- pscommand , Process management commands: &,nohup, kill, nice
6	Communication Commands: news, write, mail, wall, calendar
7	Device pattern using meta character to match each of the following situation:- a. All two character filenames. b. All filenames consisting of two lowercase letters. c. All filenames ending with c. d. All filenames beginning with a c and ending with a digit. e. All filenames beginning with p and having at somewhere.
PART – B SHELL 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 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.
3	Write a Shell script to print contents of file from given line number to next given number of lines
4	a)Shell script to say Good morning/Afternoon/Evening as you log in to system b)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 Thu 4 Feb 2016
5	Write a shell-script that tells you its name and PID
6	Develop a Basic math Calculator using case statement
7	Write a shell-script that presents 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	<p>a) Write script to determine whether given file exist or not, file name is supplied as command line argument, also check for sufficient number of command line argument</p> <p>b) Write a shell-script that takes a command line argument and reports on whether it is a directory, a file or something else.</p>
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SCHEME OF VALUATION	
Commands in Part-A	10 Marks
Execution of Commands in Part-A	15 Marks
Program in Part-B	15 Marks
Execution of program in Part-B	20 Marks
Printed Output (Part –A)	5 Marks
Printed Output (Part –B)	5 Marks
VIVA – VOCE	5 Marks
TOTAL	75 Marks



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M- SCHEME

III SEMESTER

2015 –2016 onwards

35236 – C PROGRAMMING PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

Course Name : Diploma in Computer Engineering.

Subject Code : 35236

Semester : III

Subject title : C Programming Practical

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester 15 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
C Programming Practical	6Hrs	90 Hrs	Internal	Board	Total	3 Hrs
			Assessment	Examination		
			25	75	100	

OBJECTIVES

At the end of the Course, the students will be 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.

LAB EXERCISES

Part – A

1. Write a simple C program.
 - a. Print your name and address.
 - b. Find simple 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 convert a given number of days into months and days using integer arithmetic operators.
4. Write a program the use of variables in expression and their evaluation.
5. Write a program converts the given temperature in Fahrenheit to Celsius using preprocessor.
6. Write a program to find the largest number between given three numbers.
7. Write a program to perform following tasks
 - a. Find factorial of a number
 - b. Print prime numbers up N times.
8. 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.
9. Write a program using the function power (a,b) to calculate the value of a raised to b.
10. Write a program to find the length of the given string using pointers.

Part – B

1. Read an integer number, find the number of digit and sum of all individual digits and also print the above number in reverse order.
2. Write a program to perform following tasks
 - a. Print Fibonacci series up to N terms and its sum.
 - b. Print whether a given year is leap or not.
3. Read a sentence through command line argument. Write a program to write out the string arguments to main in reverse order.
4. Write a program to arrange the given N names in alphabetical order.
5. Write a program to count the numbers and chars in the string.
6. Write a program that uses a function to sort an array of integers.
7. Write a program to calculate the subject wise and student wise totals and store them as a part of the structure.

8. Write a program to read 10 values to an array variable. Use pointers to locate and display each value.
9. Write a program that uses a table of integers whose size will be specified interactively at run time.
10. Write a program to store a character string in a block of memory space created by MALLOC and then modify the same to store a larger string.

SCHEME OF VALUATION	
Writing any one program from PART – A	10 Marks
Writing any one program from PART – B	15 Marks
Executing program (PART – A)	15 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	75 Marks

Note: student: computer ratio in lab should be strictly 1:1

HARDWARE REQUIREMENT

- Desktop Computers – 36 Nos
- Laser Printer – 4 Nos

SOFTWARE REQUIREMENT

- C – Compiler with Editor



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M- SCHEME

III SEMESTER

2015 –2016 onwards

30001- COMPUTER APPLICATIONS PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

M- SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

Course Name : For All Branches
Subject Code : 30001
Semester : III
Subject title : COMPUTER APPLICATIONS PRACTICAL

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester: 15 Weeks

Course	Instruction		Examination			Duration
			Max.			
	Hours/ week	Hours/ Semester	Continuous Assessment	Semester- End Examinations	Total	
COMPUTER APPLICATION S PRACTICAL	4 Hrs	60 Hrs	25	75	100	3 Hrs

RATIONALE:

The application of Computer knowledge is essential the students of all disciplines of Engineering in addition to their respective branch of study. The Computer Application Practical course facilitates the necessary knowledge and skills regarding creating, working and maintaining the documents and presentation of documents with audio visual effects in a computer and produces necessary skills in E- Learning and Chatting tools..

OBJECTIVES:

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

- Use the GUI operating systems
- Familiarize and customize the desktop
- Use the different facilities available in the word processor
- Prepare Power Point presentation with different formats
- Expose E-learning tools and chatting tools
- Analyze the datasheet
- Create and manipulate the database
- Create different types of charts
- Prepare PowerPoint presentation
- Understand Internet concepts and usage of e-mail

GUIDELINES:

- All the experiments given in the list of experiments should be completed and all the experiments should include for the end semester practical examination.
- The computer systems should be 1:1 ratio for practical classes

SYLLABUS LAB EXERCISES SECTION – A

GRAPHICAL OPERATING SYSTEM

Introduction to GUI OS; Features and various versions of GUI OS & its use; Working with GUI OS; My Computer & Recycle bin ; Desktop, Icons and Explorer; Screen description & working styles of GUI OS; Dialog Boxes & Toolbars; Working with Files & Folders; simple operations like copy, delete, moving of files and folders from one drive to another, Shortcuts & Autostart; Accessories and Windows Settings using Control Panel- setting common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & Program lists; Installing and Uninstalling new Hard ware & Software program on your computer - Copying in CD/DVD settings – Recording Audio files.

Exercises

1. a. Installing screen saver and change the monitor resolution by 1280X960
b. Setting wall papers
c. Creating, moving, deleting and renaming a folder
d. Copy, paste and cut a folder/file
e. Displaying the properties for a file or folder
2. a. Restoring files and folders from Recycle bin
b. Creating short cuts for folder/file
c. Finding a file or folder by name
d. Selecting and moving two or more files/folders using mouse
e. Sorting folders/files.

WORD PROCESSING

Introduction to Word Processing – Examples- Creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header footer deleting, moving, replace, editing text in document. Saving a document, spell checker.

Printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height width of row or column. Editing, deleting Rows, columns in table. Borders, shading, Templates, wizards, drawing objects, mail merge.

Exercises

3. Create the following table and perform the operations given below

DAYS	1	2	3	4	5	6	7	8
MON	←TEST→		A: JPP			CA	RDBMS	TUT
	B:RDBMS							
TUE	CA	OOP	CN	RDBMS	A: RDBMS			
					B: JPP			
WED	CN	RDBMS	OOP	RDBMS	COMMUNICATION		CN	CA
THU	OOP	A: JPP			CA	RDBMS	CN	OOP
		B: RDBMS						
FRI	COMMUNICATION		A: RDBMS		OOP	CN	RDBMS	CA
			B: JPP					
SAT	OOPS	RDBMS	CN	CA	-----			

4. Create a standard covering letter and use mail merge to generate the customized letters for applying to a job in various organizations. Also, create a database and generate labels for the applying organizations.
5. Create a news letter of three pages with two columns text. The first page contains some formatting bullets and numbers. Set the document background colour and add 'confidential' as the watermark. Give the document a title which should be displayed in the header. The header/ footer of the first page should be different from other two pages. Also, add author name and date/ time in the header. The footer should have the page number.

SPREADSHEET

Introduction to Analysis Package – Examples - Concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options.

Exercises

6. Create a result sheet containing Candidate's Register No., Name, Marks for six subjects. Calculate the total and result. The result must be calculated as below and failed candidates should be turned to red.

Result is Distinction if Total $\geq 70\%$ First
 Class if Total $\geq 60\%$ and $< 70\%$ Second
 Class if Total $\geq 50\%$ and $< 60\%$ Pass if
 Total $\geq 35\%$ and $< 50\%$
 Fail otherwise

Create a separate table based on class by using auto filter feature.

7. Create a table of records with columns as Name and Donation Amount. Donation amount should be formatted with two decimal places. There should be at least twenty records in the table. Create a conditional format to highlight the highest donation with blue color and lowest donation with red colour. The table should have a heading.

8. Create line and bar chart to highlight the sales of the company for three different periods for the following data.

SALES BAR CHART

Period	Product1	Product2	Product3	Total
JAN	35	40	50	125
FEB	46	56	40	142
MAR	70	50	40	160

SECTION – B

DATABASE

Introduction – Menus – Tool bar – Create – Edit – Save – Data types – Insert – Delete – Update – View – Sorting and filtering – Queries – Report – Page setup – Print.

Exercises

9. Create Database to maintain at least 10 addresses of your class mates with the following constraints

- Roll no. should be the primary key.
- Name should be not null

10. create a students table with the following fields: Sr.No, Reg. No, Name, Marks in 5 subjects. Calculate total and percentage of 10 students. Perform the following queries.

- To find the details of distinction student
- To find the details of first class students
- To find the details of second class students

11. Design a report for the above exercise to print the consolidated result sheet and mark card for the student.

PRESENTATION

Introduction - Opening new presentation, Parts of PowerPoint window – Opening -Saving and closing presentations - Features of PowerPoint, Background design, Word art, Clip art, Drawings, 3D settings - Animations, Sound, Views, types of views - Inserting and deleting slides, arranging slides, slides show, rehearsal, setup show, custom show - Creating custom presentations, action setting, auto content wizard, working with auto content wizard

Exercises

12. Make a marketing presentation of any consumer product with at least 10 slides. Use different customized animation effects on pictures and clip art on any four of the ten slides.
13. Create a Presentation about our institution or any subject with different slide transition with sound effect.

INTERNET

Introduction – Getting acquainted with Internet Connection - Browsers – Website URL - Open a website – Net Browsing - Email: Creating E-mail id – Sending , receiving and deleting E-mail - Email with Attachments – CC and BCC - Chatting – Creating Group mail - Google docs – Search Engines – Searching topics .

Most Popular Social Networking Sites : History – Features – Services – Usage of Face book , Twitter and LinkedIn.

Transferring data through wifi / bluetooth among different devices.

Introduction to cybercrime – Software Piracy – Viruses – Antivirus Software

Exercises

14. Create an e-mail id and perform the following
- Write an e-mail inviting your friends to your Birthday Party.
 - Make your own signature and add it to the e-mail message.
 - Add a word attachment of the venue route
 - Send the e-mail to at least 5 of your friends.
15. Create a presentation on Google docs. Ask your friend to review it and comment on it. Use “Discussion” option for your discussions on the presentation.

Hardware and Software Requirements

Hardware Requirements:

- Computers – 36Nos
 - Intel Core i3 Processor
 - 500 GB Hard Disk, 2 MB RAM
 - 14" Monitor
- Projector – 1 Nos
- Laser Printer – 1 No
- Internet Connection – Minimum of 512 KB

Software Requirement

- Any GUI Operating System
- Open Source Software / MS- Office

1. SemesterEndExamination–75 Marks

Content	Max.Marks
Writing Procedure – One Question from Section A	15
Demonstration	15
Results with Printout	5
Writing Procedure – One Question from Section B	15
Demonstration	15
Results with Printout	5
Viva voce	5
Total	75MARK

SEMESTER - IV



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M – SCHEME

IV SEMESTER

2015 – 2016 onwards

35241 – COMPUTER ARCHITECTURE

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

Course Name : Diploma in Computer Engineering.

Subject Code : 35241

Semester : IV

Subject title : COMPUTER ARCHITECTURE

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester 15 Weeks

Subject	Instructions		Examination			
	<i>Hours / Week</i>	<i>Hours / Semester</i>	<i>Marks</i>			<i>Duration</i>
Computer Architecture	4 Hrs	60 Hrs	Internal Assessment	Board Examination	Total	3 Hrs
			25	75	100	

UNIT	TOPIC	HOURS
I	REGISTER TRANSFER LOGIC AND CPU	12
II	INPUT – OUTPUT MODULE	10
III	MEMORY MODULE	8
IV	MICROPROCESSORS AND PARALLEL PROCESS	10
V	ARCHITECTURE AND CONCEPTS OF ADVANCED PROCESSORS	10
	REVISION	10
	TOTAL	60

RATIONALE

Diploma in Computer Engineering have to be conversant with computer, its terminology and functioning. Computer Architecture is concerned with the structure and behavior of the various functional modules of the computer and their interaction, the course provides the necessary understanding of the hardware operation of digital computers.

OBJECTIVES

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

- Know the fundamental blocks of computer
- Realize the function of I/O in different operation modes
- Use of I/O processor
- Know about different memory types and their operations
- Study about the fundamental blocks of CPU
- Know about the computer arithmetic
- Study the different processors

UNIT I REGISTER TRANSFER LOGIC AND CPU		-----12 HOURS
1.1	Register transfer: Register Transfer Language – Inter Register transfer – control function-Bus transfer-memory transfer	3 Hrs
1.2	Micro operations and ALU: Arithmetic micro operations-Binary adder-subtractor, incremter, 4 bit arithmetic circuit, Logic micro operations- one stage of logic circuit-applications, shift micro operations- 4 bit combinational circuit shifter-one stage of ALU	4Hrs
1.3	Central processing unit: components of CPU- General register organization, bus system-register set with common ALU-memory stack - stack limits, Instruction format(3,2,1,0 address instructions)	3 Hs
1.4	Control unit: structure of control unit-fetch cycle, indirect cycle, Execute cycle, interrupt cycle, instruction cycle.	2 Hrs
UNIT II INPUT – OUTPUT MODULE		----- 10 HOURS
2.1	Input output Interface : Need for I/O interface, I/O bus and interface, I/O commands, Example of I/O interface	2 Hrs
2.2	Asynchronous data transfer- strobe control, handshaking, Asynchronous serial transfer, Asynchronous communication interface	3 Hrs
2.3	Modes of transfer- Programmed I/O,Interrupt initiated I/O-vectored interrupt, non-vectored interrupt, Priority interrupt, Interrupt controller ,DMA –DMA controller, DMA transfer	3 Hrs

2.4	I/O Processor: CPU-IOP communication. Serial communication	1 Hr
UNIT III MEMORY MODULE		----- 8 HOURS
3.1.	Memory types: CPU registers, Main memory, Secondary memory, Cache	1Hr
3.2	Main Memory: ROM, RAM, Memory address map, memory connection to CPU	2 Hrs
3.3	Secondary Memory: Magnetic tape , Magnetic Disk	1 Hr
3.4	Cache: Need for cache memory, operational principle, Cache initialization, Different mapping techniques, Writing into cache	2 Hrs
3.5	Memory Management : Virtual memory concept-virtual address, physical address, memory table for mapping a virtual address, address mapping using pages, Associative memory page table, Page replacement technique	2Hrs
UNIT IV MICROPROCESSORS AND PARALLEL PROCESS		-----10HOURS
4.1	Microprocessor: Block diagram of 8086-registers: segment registers, address: effective address, flag registers and application of microprocessor	3 Hrs
4.2	Parallel processing: types of parallel processing systems. parallel organizations	4 Hrs
4.3	Pipe Lining: instruction pipeline, arithmetic pipeline, pipelining in super scalar processors	3 Hrs
UNIT V . ARCHITECTURE AND CONCEPTS OF ADVANCED PROCESSORS		10 HOURS
5.1	Symmetric Multiprocessors: Organizations, a mainframe	2 Hrs
5.2	Multithreading and clusters: Implicit and explicit multi threading, cluster configuration	2 Hrs
5.3	NUMA and vector:: NUMA organizations and approaches to vector computation	3 Hrs
5.4	Multi Core : Multicore organization	3 Hrs

Text Book

SI.No.	TITLE	AUTHOR	PUBLISHER	Edition
1.	COMPUTER SYSTEM ARCHITECTURE	M.MORRIS MANO	Prentice –Hall of India Pvt Limited	THIRD EDITION
2.	COMPUTER ORGANIZATION AND ARCHITECTURE designing for performance	William Stallings	Pearson Publications.	Eighth Edition

REFERENCE BOOKS:

Sl.No.	TITLE	AUTHOR	PUBLISHER	Edition
1.	Computer Organization	V.carl Hamacher, Zvonko G.Vransic, Safgat G.Zaky	McGraw-Hill International Editions-Computer science series	Fifth Edition
2.	Computer Organization and Design	David A. Patterson and John L. Hennessey	Morgan Kauffman / Elsevier	Fifth edition
3.	Computer Architecture and Organization	John P. Hayes	Tata Mc Graw Hill	Third Edition



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M – SCHEME

IV SEMESTER

2015 – 2016 onwards

35242 – COMPUTER NETWORKS AND SECURITY

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

Course Name : Diploma in Computer Engineering.

Subject Code : 35242

Semester : IV

Subject title : COMPUTER NETWORKS AND SECURITY

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester 15 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
Computer Networks and Security	4 Hrs	60 Hrs	Internal Assessment	Board Examination	Total	3 Hrs
			25	75	100	

TOPICS AND ALLOCATION OF HOURS

UNIT	TOPIC	HOURS
I	DATA COMMUNICATIONS	10
II	OSI MODEL AND LAN PROTOCOLS	10
III	TCP/IP SUIT	10
IV	NETWORK SECURITY	10
V	APPLICATIONS OF NETWORK SECURITY	10
	TEST & REVISION	10
	TOTAL	60

RATIONALE

The exponential growth of Engineering and Technology particularly information and communications engineering has benefited the day-to-day life of entire mankind in all respects. The research and developments are continually happening in this field to fine tune and improve the field particularly also in Computer Networks and Security which directly or indirectly has impact on every man's daily life. As such the introduction of current and future trends and technology of computer networks and security would strengthen the knowledge and skills of engineering community in taking one-step further the prosperity of mankind.

OBJECTIVES

- Understand the concept of data communication.
- Discuss the advantages and disadvantages of different network topologies.
- Know different network classification based on different category.
- Study about different networking devices and their practical usages.
- Understand the different layers of OSI and their functions.
- Compare different LAN protocols.
- Study about ISDN and FDDI concepts and its applications.
- Identify the protocols used in TCP /IP and compare with OSI model.
- Know the IP addressing and TCP/ IP protocols briefly.
- Understand the basic concepts of network security.
- Identify the attacks and threats.
- Understand the basic concepts of RAID and digital Signatures.
- Study about Cryptography and different Cryptography Algorithms.
- Discuss about Network Security Applications.
- Know the applications of Network Security.
- Discuss about VPN and Firewalls.
- Identify the Wireless Security Issues.

DETAILED SYLLABUS

UNIT I DATA COMMUNICATIONS	 10 HOURS
1.1	Data Communication: Components of a data communication – Data flow: Simplex - Halfduplex – Full duplex; Networks – Network criteria – Types of Connections: Point topoint – multipoint; Topologies: Star, Bus, Ring, Mesh, Hybrid – Advantages andDisadvantages of each topology.	2 Hrs
1.2.	Types of Networks: Need for computer Networks - LAN – MAN – WAN – CAN – HAN –Internet – Intranet – Extranet , Client-Server, Peer to Peer	2 Hrs

	Networks.	
1.3	Transmission Media : Characteristics of Transmission Media - Classification of transmission media - Guided – Twisted pair – Coaxial – Fiber optics – Unguided – Radiowaves – Infrared – Low Orbit satellite (LOS) – VSAT – Cabling and Standards	3 Hrs
1.4.	Network devices: Features and Concepts of Switches – Routers (Wired and Wireless) –Gateways.	3 Hrs
UNIT II OSI MODEL AND LAN PROTOCOLS	 10 HOURS
2.1.	Network Models: Protocol definition - Standards - OSI Model – Layered architecture–Functions of all layers.	2 Hrs
2.2.	802.X Protocols : Concepts and PDU format of CSMA/CD (802.3) – Token bus (802.4) –Token ring (802.5) – Ethernet – Types of Ethernet (Fast Ethernet, gigabit Ethernet) –Comparison between 802.3, 802.4 and 802.5	3 Hrs
2.3.	FDDI: Frame format – Advantages and disadvantages of FDDI.	2 Hrs
2.4	Switching: Definition – Circuit switching – Packet switching – Message switching.	2 Hrs
2.5	ISDN : Concepts – Services – Broad Band ISDN	1Hrs
UNIT III TCP/IP SUIT	 10 HOURS
3.1.	Overview of TCP / IP: OSI & TCP/IP – Transport Layer Protocol– Connection Oriented and Connectionless Services – Sockets - TCP & UDP.	3Hrs
3.2.	Network Layers Protocol: IP – Interior Gateway Protocols (IGMP, ICMP, ARP, RARP Concept only).	2 Hrs
3.3.	IP Addressing : Dotted Decimal Notation –Subnetting & Supernetting – VLSM Technique-IPv6 (concepts only)	3 Hrs
3.4	Application Layer Protocols: FTP– Telnet – SMTP– HTTP – DNS – POP.	2 Hrs
UNIT IV NETWORK SECURITY	 10 HOURS
4.1.	Introduction to Network security: Definition – Need for security – Principles of Security – Attacks – Types of Attacks – Criminal attacks – Legal Attacks – Passive and Active attacks – Security Services – Security Mechanisms .	2 Hrs
4.2.	Cryptography: Definition – Symmetric Encryption principles – Symmetric Block Encryption Algorithms – DES, AES – Stream ciphers – RC4 – Digest function – Public key Cryptography Principles–RSA-Diffe-Hellman algorithm– Digital Signature(Definition only)	3Hrs
4.3.	Network Security Application: Authentication applications – Kerberos (concepts only) - Overview- Motivation –Encryption Techniques;	2Hrs
4.4.	Internet Security: Email security – PGP - S/MIME - IP security – Overview –	3Hrs

	IP Security Architecture - Web security - SSL, TLS ,SET (Concepts only)	
UNIT – V APPLICATIONS OF NETWORK SECURITY	 10 HOURS
5.1	Introduction to network security : Definition and Basic concepts-Basic concepts ofRAID levels(0,1,2,3,4,5).	2 Hrs
5.2	Hackers Techniques: Historical hacking techniques & open sharing-Bad Passwords- Advanced Techniques- Viruses-worms-Trojan horses-SPAM	2 Hrs
5.3	Security Mechanism : Introduction – Types of Firewalls – Packet filters – Application gate ways – Limitations of firewalls.	2 Hrs
5.4	Intrusion: Intruders– Intruder detection – Classification of Intruder Detection systems –Honey pots.	2Hrs
5.5	Wireless Security Issues: Definition and Types -Transmission Security, Authentication ,WLAN Detection, Eaves Dropping, Active Attacks, WEP Definition and Features.	2Hrs

Text Book:

SI.No.	TITLE	AUTHOR	PUBLISHER	Edition
1.	Data Communication and networking	Behrouz A.Forouzen	TataMcGraw-Hill,New Delhi	Fifth Edition
2.	Network Security Essentials	William Stallings	Pearson Publications.	Fifth Edition
3.	CRYPTOGRAPHY AND NETWORK SECURITY	William Stallings	Pearson Publications.	Sixth Edition

Reference Books:

Sl.No.	TITLE	AUTHOR	PUBLISHER	Edition
1.	Computer Communication Networks	AchyutS.Godbole	TataMcGraw-Hill,New Delhi	
2.	Computer Networks	Andrew S.Tanenbaum	Pearson Publications.	Fifth edition
3.	CRYPTOGRAPHY AND NETWORK SECURITY	BehrouzA.Forouzen	TataMcGraw-Hill,New Delhi.	ThirdEdition



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M – SCHEME

IV SEMESTER

2015 – 2016 onwards

**35243 – OBJECT ORIENTED PROGRAMMING WITH
JAVA**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

Course Name : Diploma in Computer Engineering.

Subject Code : 35243

Semester :IV

Subject title : Object Oriented Programming with Java

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester 15 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Internal Assessment	Board Examination	Total	
Object Oriented Programming with Java	6	90	25	75	100	3 Hrs

UNITS AND ALLOCATION OF HOURS

UNIT No.	TOPIC	No. of Hours
I	INTRODUCTION TO OOPS AND JAVA	15
II	CONTROL STRUCTURES, ARRAYS, AND VECTORS	13
III	STRINGS, CLASSES AND INTERFACES	18
IV	PACKAGES, APPLETS AND AWT CONTROLS	16
V	EXCEPTION HANDLING, MULTITHREADS AND I/O STREAMS	18
	TEST AND REVISION	10
	TOTAL	90

Rationale:

Today almost every branch of computer science is feeling presence of object - orientation. Object oriented technology is successfully incorporated in various fields of computer science. Since its arrival on the scene in 1995, the Java has been accepted as one of the primary programming language. This subject is designed to give you exposure to basic concepts of object - oriented technology. This subject will help in learning to write programs in Java using object - oriented paradigm. Approach in this subject is to take Java as a language that is used as a primary tool in many different areas of programming work.

Objectives:

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

- Know the paradigms of programming languages.
- Understand the concepts of Object Oriented Programming.
- State the benefits and applications of Object Oriented Programming.
- Know the history of development of Java.
- Comprehend the features and tokens of Java.
- Explain about the control structures used in Java.
- Use of Arrays and Vectors in Java Program.
- Demonstrate the use of string and String Buffers.
- Define Class with the attributes and methods.
- Understand the need for interfaces.
- Implement Interfaces in classes.
- Create packages.
- Write simple Applets.
- List the types of AWT Components and types of exceptions.
- Handle the errors using exceptions.
- Understand the concepts of multithreading.
- Develop multithreaded programs in Java.
- Define stream and list the types of streams.

DETAILED SYLLABUS

UNIT I INTRODUCTION TO OOPS AND JAVA		15 HOURS
1.1	Introduction to OOPS: Paradigms of Programming Languages - Basic concepts of Object Oriented Programming – Differences between Procedure Oriented Programming and Object Oriented programming - Objects and Classes – Data abstraction and Encapsulation, Inheritance, Polymorphism, Dynamic binding, Message communication – Benefits of OOP – Application of OOPs.	8 Hrs

1.2	Java : History – Java features – Java Environment – JDK – API.	2 Hrs
1.3	Introduction to Java : Types of java program – Creating and Executing a Java program – Java Tokens: Keywords, Character set, Identifiers, Literals, Separator – Java Virtual Machine (JVM) – Command Line Arguments – Comments in Java program	5 Hrs
UNIT II CONTROL STRUCTURES, ARRAYS, AND VECTORS		13 HOURS
2.1	Elements: Constants – Variables – Data types - Scope of variables – Type casting – Operators: Special operators – Expressions – Evaluation of Expressions	5 Hrs
2.2	Decision making and Branching: Simple if statement – if – else statement – Nesting if – else – else if Ladder – switch statement – Decision making and Looping: While loop – do – While loop - for loop – break – labeled loop – continue Statement.	5 Hrs
2.3	Arrays: One Dimensional Array – Creating an array – Array processing – Multidimensional Array – Vectors – ArrayList – Advantages of Array List over Array Wrapper classes	4 Hrs
UNIT III STRINGS, CLASSES AND INTERFACES		18 HOURS
3.1	Strings: String Array – String Methods – String Buffer Class	3 Hrs
3.2	Class and objects: Defining a class – Methods – Creating objects – Accessing class members – Constructors – Method overloading – Static members – Nesting of Methods - – this keyword – Command line input	7 Hrs
3.3	Inheritance: Defining a subclass – Deriving a sub class – Single Inheritance – Multilevel Inheritance – Hierarchical Inheritance – Overriding methods – Final variables and methods – Final classes – Final methods - Abstract methods and classes – Visibility Control: Public access, Private access, friend, protected. Interfaces: Multiple Inheritance - - Defining interface – Extending interface - Implementing Interface - Accessing interface variables	8 Hrs
UNIT IV PACKAGES, APPLETS AND AWT CONTROLS		16 HOURS
4.1	Packages: Java API Packages – System Packages – Naming Conventions – Creating & Accessing a Package – Adding Class to a Package – Hiding Classes	4 Hrs
4.2	Applets: Introduction – Applet Life cycle – Creating & Executing an Applet – Applet tags in HTML – Parameter tag – Aligning the display - Graphics Class: Drawing and filling lines – Rectangles – Polygon – Circles – Arcs – Line Graphs – Drawing Bar charts	8 Hrs
4.3	AWT Components and Even Handlers: Abstract window tool kit – Event Handlers – Event Listeners – AWT Controls and Event Handling: Labels – TextComponent – ActionEvent – Buttons – CheckBoxes – ItemEvent - Choice – Scrollbars – Layout Managers- Input Events – Menus	4 Hrs

UNIT-V EXCEPTION HANDLING, MULTITHREADS AND I/O STREAMS		18 HOURS
5.1	Exception Handling: Limitations of Error handling – Advantages of Exception Handling - Types of Errors – Basics of Exception Handling – try blocks – throwing an exception – catching an exception – finally statement	6 Hrs
5.2	Multithreading: Creating Threads – Life of a Thread – Defining & Running Thread – Thread Methods – Thread Priority – Synchronization – Implementing Runnable interface – Thread Scheduling.	7 Hrs
5.3	I/O Streams: File – Streams – Advantages - The stream classes – Byte streams –Character streams	5 Hrs

TEXT BOOKS

SI.No.	TITLE	AUTHOR	PUBLISHER	Edition
1	Programming with Java	E. Balagurusamy	TataMc-Graw Hill, New Delhi	5 th Edition
2	Java, A Beginner's Guide	Herbert Schildt	Oracle Press	6 th Edition



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M – SCHEME

IV SEMESTER

2015 – 2016 onwards

35244 – DATA STRUCTURES USING C

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

Course Name : Diploma in Computer Engineering.

Subject Code : 35244

Semester : IV

Subject title : DATA STRUCTURES USING C

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester 15 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Internal Assessment	Board Examination	Total	
DATA STRUCTURES USING C	6	90	25	75	100	3 Hrs

TOPICS AND ALLOCATION OF HOURS

Unit No	Topic	No of Hours
I	INTRODUCTION TO DATA STRUCTURES , ARRAYS AND STRINGS AND ARRAYS	16
II	STACKS , RECURSION AND QUEUES	16
III	LINKED LISTS	16
IV	TREES AND GRAPHS	17
V	SEARCHING , SORTING AND HASHING	15
TEST AND REVISION		10
TOTAL		90

RATIONALE

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

- Define Linear and non-linear data structures.
- List and discuss the different types of linear data structures.
- Differentiate Stack and Queue
- Understand the Operations of Stack
- Explain the applications of stack
- Explain Linked lists and its implementation
- Define a tree and the different terms related with trees.
- Describe the different ways of traversing a binary tree.
- Discuss the various operations on Binary Search tree.
- Define graph terminologies and describe the different ways of traversing a graph.
- Write the algorithm for different types of sorting.
- Write the algorithm for different types of searching.
- Describe hash table and hash function.

DETAILED SYLLABUS

UNIT – I. INTRODUCTION TO DATA STRUCTURES , ARRAYS AND STRINGS 16 Hours		
1.1.	Introduction to Data Structures : 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 approach , Bottom-up approach - Complexity : Time complexity , Space complexity - Big 'O' Notation.	6 Hrs
1.2	ARRAYS: Introduction - Characteristics of Array - One Dimensional Array - Two Dimensional Arrays - Multi Dimensional Arrays – Advantages and Disadvantages of linear arrays - Row Major order - Column Major order - Operations on arrays with Algorithms (searching, traversing, inserting, deleting - Pointer and Arrays – Pointers and Two Dimensional Arrays - Array of Pointers - Pointers and Strings – Implementation of arrays -	7 Hrs
1.3	Strings : Strings and their representations - String Conversion- String manipulation, String arrays	3 Hrs
UNIT – II STACKS , RECURSION AND QUEUES ... 16 Hours		
2.1	Definition of a Stack - Operations on Stack (PUSH & POP)- Implementing Push and Pop Operations - Implementation of stack through arrays – Applications of Stack : Reversing a list - Polish notations - Conversion of infix to postfix expression	6 Hrs

	- Evaluation of postfix expression - Algorithm for evaluating Infix to prefix expression.	
2.2	Recursion - Recursive definition – Algorithm and C function for : Multiplication of Natural numbers - Factorial Function - GCD function - Properties of Recursive algorithms/functions – Advantages and Disadvantages of Recursion	4 Hrs
2.3	Queues: The queue and its sequential representation - implementation of Queues and their operations - implementation of Circular queues and their operations - Dequeue and Priority queues(Concepts only)	6 Hrs
UNIT – III LINKED LISTS	 16 Hours
3.1	Terminologies: 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- Operations on a singly linked list (only algorithm) : Traversing a singly linked list , Searching a singly linked list , Inserting a new node in a singly linked list (front, middle, end), Deleting a node from a singly linked list (front, middle, rear) - Doubly linked list, Circular linked lists (Concepts only, no implementations)	16 Hrs
UNIT – IV TREES AND GRAPHS	 17 Hours
4.1	Trees: Terminologies: Degree of a node, degree of a tree, level of a node, leaf node, Depth / Height of a tree, In-degree & out-Degree, Path, Ancestor & descendant nodes-, siblings - Type of Trees : Binary tree - List representation of Tree - Binary tree traversal (only algorithm) : In order traversal , Preorder traversal , Post order traversal - Expression tree – Binary Search Tree – Creation of a Binary Search tree without duplicate node.	10 Hrs
4.2	Graphs : Introduction - Terminologies: graph, node (Vertices), arcs (edge), directed graph, in-degree, out-degree, adjacent, successor, predecessor, relation, weight, path, length - Representations of a graph - Adjacency Matrix Representation - Adjacency List Representation - Traversal of graphs : Depth-first search (DFS) , Breadth-first search (BFS) - Applications of Graph	7 Hrs
UNIT – V SORTING ,SEARCHING AND HASHING	 15 Hours
5.1	Sorting Techniques : Introduction – Algorithms and “ C” programs for : Selection sort , Insertion sort , Bubble sort – Algorithms only : Merge Sort ,Radix sort, Shell sort , Quick sort	6 Hrs
5.2	Searching : Introduction - Algorithms and “ C” programs for Linear search and Binary search	4 Hrs
5.3	Hashing : Hash tables – methods- Hash function - Collision resolution techniques	5 Hrs

TEXT BOOKS

Sl.No	TITLE	AUTHOR	PUBLISHER	Year of Publishing/Edition
1.	Data Structures	SeyMour Lipschutz	Schaum;s outlines, TMH Private Limited,New Delhi	Indian Adapted Edition 2006. 20 th Reprint 2011
2.	Data Structures with C	SeyMour Lipschutz	Schaum;s outlines, TMH Private	First Reprint 2011
3.	Data Structures A Programming approach with C	Dharmender Singh Kushwaha and Arun Kumar Misra	Prentice Hall of India, New Delhi	2012

REFERENCES

Sl.No	TITLE	AUTHOR	PUBLISHER	Year of Publishing/Edition
1.	Data Structures and Algorithms	G.A.Vijayalakshmi Pai	TMGH, New Delhi	6 th Reprint 2011
2.	Data Structures Using C - -1000 Problems and Solutions	Sudipta Mukherjee	TMGH, New Delhi	Second Reprint 2010
3.	Introduction to Data structures Using C	Venkatesh N.Baitipuli	University Science Press, Chennai	First Edition, 2009
4.	Classic Data Structures	Debasis Samanta	Prentice Hall of India, New Delhi	2009 / Second Edition
5.	Principles of Data structures using C and C++	Vinu V.Das	New Age International Publishers, New	Reprint 2008
6.	Data structures Using C	ISR D Group	TMGH, New Delhi	Ninth Reprint 2011
7.	Fundamentals of Data structures in C	Horowitz , sahni Anderson- freed	University Press, Hyderabad	Second Edition
8.	Data and file structures	Rohit Khurana	Vikas Publishing Ltd	First Edition 2010



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M- SCHEME

IV SEMESTER

2015 –2016 onwards

35245 –JAVA PROGRAMMING PRACTICAL

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

DIPLOMA IN COMPUTER ENGINEERING

M – SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

Course Name : Diploma in Computer Engineering.
Subject Code : 35245
Semester : IV Semester
Subject : JAVA PROGRAMMING PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 week

Subject	Instructions		Examination			Duration
	Hours/Week	Hours/ Semester	Internal Assessment	Board Examination	Total	
JAVA PROGRAMMING PRACTICAL	4	60	25	75	100	3Hrs

Objectives:

- Analyze the given problem
- Develop the logic to solve the given problem
- Develop Java application
- Develop programs using different operators and expressions.
- Develop programs using sequential, conditional and Iterative statements.
- Handle arrays of fixed and variable size.
- Develop applications using Vectors.
- Create classes and objects
- Implement constructors and constructor overloading.
- Solve problems using inheritance and Polymorphism.
- Create own package and interface.
- Create Applet programs.
- Handle exception arising in programs.
- Use GUI components to develop GUI applications
- Use multithreading in programs.

PART-A CONSOLE APPLICATIONS	
1	Write a Java program to display the count of all commands line arguments and list each in a line
2	Write a program to find out sum of digits of given number
3	Write a program to display multiplication table in row , column format
4	Write a program to a) To find whether the given number is prime or not b) To display all prime numbers in a given range of numbers
5	Write a program to create an array of integers and accept a number. Check whether it exists in the array. Create your own exception with appropriate error message and raise the exception when the element is not found in the array.
6	Write a program to implement stack using Vector class or ArrayList
7	Write a program to execute any given windows application and report the exit status of the application
8	Write a program to get a file name at run time and check for its existence check whether it is a directory or normal file. If it is a normal file display its size and other attributes of the file.
9	Write a program to copy a file to another file using java.io package Classes.
10	Write a program to get a file at runtime and display the number of lines, words and characters in that file.
PART-B GUI APPLICATIONS	
11	Create a Frame with two labels. At runtime display x and y co-ordinates of mouse pointer in the Labels.
12	Create a Frame and Checkbox group with five Checkboxes with labels as Red, Green, Blue, Yellow and White. At run time change the background color of Frame using Checkboxes.
13	Create a Frame with 3 Scrollbars representing the three basic colors RED, GREEN and BLUE. Change the background color of the Frame using the values of Scrollbars.
APPLETS	
14	Create an Applet to calculate Simple and Compound interest by passing parameters through <PARAM> tags of HTML file.
15	Draw a bar chart for the MARKS scored in 5 subjects by a student using Graphics object

SCHEME OF VALUATION		
1.	Any one program from PART- A	20
2.	Execution and Result	10
3.	Print out	5
4.	Any one program from PART - B	20
5.	Execution and Result	10
6.	Print out	5
7.	Viva voce	5
TOTAL		75

HARDWARE REQUIREMENT	SOFTWARE REQUIREMNT
Desktop Computers – 36 Nos Printer – 1 No Student : Computer = 1 : 1	<ol style="list-style-type: none"> 1. Any Text Editor (OR) Net beans 2. JDK 1.7 or above 3. Java enabled Browser



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M – SCHEME

IV SEMESTER

2015 – 2016 onwards

**35246 – DATA STRUCTURES USING C
PRACTICAL**

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(to be implemented to the student Admitted from the Year 2015-2016 on wards)

(Implemented from the academic year 2016-2017 onwards)

Course Name : Diploma in Computer Engineering.

Subject Code : 35246

Semester : IV

Subject title : DATA STRUCTURES USING C PRACTICAL

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester 15 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Internal Assessment	Board Examination	Total	
DATA STRUCTURE USING C PRACTICAL	6	90	25	75	100	3 Hrs

RATIONALE

To provide the hands on experience on implementation of linear and non-linear data structure , this course will be introduced . The knowledge of 'C' language and data structures will be reinforced by practical exercises during the course of study. The course will help students to develop the capability of selecting a particular data structure.

OBJECTIVES

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

- Understand the use of arrays
- Use of arrays and pointers.
- 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.

LAB EXERCISES

1. Write a program in 'C' to insert, delete an element from an array of elements. Also print the position of a particular element
2. Implement array using row major order and column major order.
3. Write a program in 'C' to create a two dimensional array with at least ten elements. Search for a particular element and print its position and address of the element.
4. Write a program in 'C' to perform PUSH and POP operations in stack by using array.
5. Write a program in 'C' to display the reverse of a string using a stack.
6. Write a program in 'C' to evaluate a postfix expression.
7. Write a program in 'C' to create a queue containing ten elements and perform delete and insert operations using array.
8. Write a program in 'C' to implement recursive function.
9. Write a program in 'C' to create a singly linked list containing at least five elements. Make necessary assumptions.
10. Write a program in 'C' to delete the first node that contains an integer data item of a single linked list.
11. Write a program in 'C' to create a binary tree.
12. Write a program in 'C' for pre-order traversal of a binary tree.
13. Write a program in 'C' for binary searching
14. Write a program in 'C' to sort 'N' Numbers using Insertion sort.
15. Write a program in 'C' to sort 'N' Numbers using bubble sort.
16. Write a program in 'C' to sort 'N' Numbers using selection sort.

SCHEME OF VALUATION

Write any Two programs (20+20)	40 Marks
Execute any One program	20 Marks
Result with printout	10 Marks
VIVA - VOCE	5 Marks
TOTAL	75 Marks

HARDWARE REQUIREMENT : • Desktop Computers – 36 Nos • Laser Printer – 4 Nos

SOFTWARE REQUIREMNT : • C – Compiler with Editor



DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN COMPUTER ENGINEERING

II YEAR

M – SCHEME

IV SEMESTER

2015 – 2016 onwards

**30002 – LIFE AND EMPLOYABILITY SKILL
PRACTICAL**

[COMMON TO ALL BRANCHES]

CURRICULUM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

DIPLOMA IN ENGINEERING – SYLLABUS – M Scheme

(Being implemented from the Academic Year 2016-2017 onwards)

Course Name : **All Branches of Diploma in Engineering and Technology and Special Programmes**

Subject Code : **30002**

Semester : **IV**

Subject Title : **LIFE AND EMPLOYABILITY SKILLS PRACTICAL**

Teaching and Scheme of Examination: No. of Weeks per Semester: 15 Weeks

Subject	Instruction		Examination			
	Hours/Week	Hours/Semester	Marks			Duration
			Internal assessment	Board Examination	Total	
Life and Employability Skills	4 Hours	60 Hours	25	75	100	3 Hours

Topics and Allocation of Hours:

Sl. No.	Section	No. of Hours
1	Part – A Communication	30
2	Part – B Entrepreneurship, Project Preparation, Productivity, Occupational Safety, Health, Hazard, Quality Tools & Labour Welfare	20
3	Part – C Environment, Global Warming, Pollution	10
TOTAL		60

RATIONALE

Against the backdrop of the needs of the Industries, as well as based on fulfilling the expectations of the Industries, the Diploma Level students have to be trained directly and indirectly in toning up their competency levels. Proficiency in Communication only, equips them with confidence and capacity to cope with the employment. Hence, there is a necessity to focus on these in the curriculum. At the end of the Course, the student is better equipped to express himself in oral and written communication effectively.

SPECIFIC INSTRUCTIONAL OBJECTIVES

- 1. Emphasize and Enhance Speaking Skills**

- 2. Increase Ability to Express Views & Opinions**

- 3. Develop and Enhance Employability Skills**

- 4. Induce Entrepreneurship and Plan for the Future**

- 5. Expose & Induce Life Skills for Effective Managerial Ability**

LIFE AND EMPLOYABILITY SKILLS PRACTICAL

SYLLABUS

Unit	Topics	Activity	Hours
I	Communication, Listening, Training, Facing Interviews, Behavioural Skills	<ul style="list-style-type: none"> -- instant sentence making – say expressions/phrases-- self- introduction/another higher official in company – describe/explain product – frame questions based on patterns – make sentences based on patterns 	30
II	Entrepreneurship, Project Preparation, Marketing Analysis, Support & Procurement	<ul style="list-style-type: none"> -- prepare an outline of a project to obtain loan from bank in becoming an entrepreneur – prepare a resume 	10
III	Productivity – comparison with developed countries, Quality Tools, Circles, Consciousness, Management, House Keeping	<ul style="list-style-type: none"> -- search in the website -- prepare a presentation – discuss & interact 	05
IV	Occupational Safety, Health Hazard, Accident & Safety, First-Aid, Labour Welfare Legislation, Welfare Acts	<ul style="list-style-type: none"> -- search in the website -- prepare a presentation – discuss & interact 	05
V	Environment, Global Warming, Pollution	<ul style="list-style-type: none"> -- taking down notes / hints – answering questions -- fill in blanks the exact words heard 	10

LEARNING STRUCTURE

100 Marks

- Focus more on Speaking & Listening Skills
- Attention less on Reading & Writing Skills
- Apply the skills in fulfilling the Objectives on Focused Topics

a) Listening	25 Marks
1. Deductive Reasoning Skills (taking down notes/hints)	10
2. Cognitive Skills (answering questions)	10
3. Retention Skills (filling in blanks with exact words heard)	05
b) Speaking Extempore/ Prepared	30 Marks
1. Personality/Psychological Skills (instant sentence making)	05
2. Pleasing & Amiable Skills (say in phrases/expressions)	05
3. Assertive Skills (introducing oneself/others)	05
4. Expressive Skills (describe/explain things)	05
5. Fluency/Compatibility Skills (dialogue)	05
6. Leadership/Team Spirit Skills (group discussion)	05
c) Writing & Reading	20 Marks
1. Creative & Reasoning Skills (frame questions on patterns)	05
2. Creative & Composing Skills (make sentences on patterns)	05
3. Attitude & Aim Skills (prepare resume)	05
4. Entrepreneurship Skills (prepare outline of a project)	05
d) Continuous Assessment (Internal Marks)	25 Marks
(search,read, write down, speak, listen, interact & discuss)	
1. Cognitive Skills (Google search on focused topics)	
2. Presentation Skills& Interactive Skills (after listening, discuss)	
Note down and present in the Record Note on any 5 topics	10 Marks
Other activities recorded in the Record note	10 Marks
Attendance	05 Marks
INTERNAL MARKS	25 MARKS
EXTERNAL MARKS AT END EXAMINATION	75 MARKS

MODEL QUESTION

Time: 3 Hours

Maximum Marks: 75

A. LISTENING

25 Marks

1. Listen to the content and take down notes/hints 10
2. Listen to the content and answer the following questions. 10
3. Listen to the content and fill in the blanks the exact words heard. 05

B. SPEAKING

30 Marks

1. Say in a sentence instantly on hearing the word(5 words, one after another). 05
2. Say any five expressions commonly used in communication. 05
3. Imagine, a consultant has come to your department.
Introduce him to your subordinates. 05
4. Explain/describe the product you are about to launch in the market. 05
5. Speak with your immediate boss about the progress you have made. 05
6. Discuss within the group on the topic of focus in the syllabus. 05

C. WRITING & READING

20 Marks

1. Frame new questions from the pattern given by changing sets of words with your own. 05

a.	When	do	you	return?	
b.	How	is	his performance?		
c.	Where	has	the manager	gone?	
d.	What	is	the progress	today?	
e.	Why	are	the machines	not functioning?	

2. Make sentences from the pattern given by changing sets of words with your own. 05

3.	a.	The workers	are	on strike		
	b.	The labourers	are paid	well	in this factory	
	c.	There	is	a rest room	for the workers	
	d.	These	are	the new products	launched	by our company
	e.	Almost everyone	come	to the company	on motorbikes	

- Prepare a resume for the post of Department Manager. 05

4. Prepare an outline of a project to obtain a loan. (Provide headings and subheadings) 05

I. Guidelines for setting the question paper:

A. LISTENING :

ONLY TOPICS related to
POLLUTION /
ENVIRONMENT /
GLOBAL WARMING are to be taken.

These topics are common for all the three types of evaluation.

B. SPEAKING :

1. WORDS of common usage
2. Fragments – expression of politeness, courtesy, cordiality
3. Introduce yourself as an engineer with designation or
Introduce the official visiting your company/department

4. Describe/Explain the product/machine/department
5. Dialogue must be with someone in the place of work.
6. Group of six/eight
Discuss the focused topic prescribed in syllabus

C. WRITING & READING:

1. Provide five different structures.
Students are to substitute at least one with some other
word/words
2. Provide five different structures.
Students are to substitute at least one with some other
word/words
3. Provide some post related to industries.
4. Outline of the project (skeleton/structure)
Only the various headings and subheadings
Content is not needed

II. Guidelines for recording the material on the Focused Topics in the Record note.

Write in the record note, **on any five topics**, from the list of topics given below. **10 Marks**
(5 topics x 10 marks = 50 marks. Thus, the **Average of 5 topics is 10 Marks**)

1. Productivity in Industries – Comparison with developed countries
2. Quality Tools, Quality Circles and Quality Consciousness

3. Effective Management
4. House Keeping in Industries
5. Occupational Safety and Hazard
6. Occupational Accident and First Aid
7. Labour Welfare Legislations
8. Labour Welfare Acts and Rights
9. Entrepreneurship
10. Marketing Analysis, Support and Procurement

LABORATORY REQUIREMENT:

1. An echo-free room
2. Necessary furniture and comfortable chairs
3. A minimum of two Computers with internet access
4. A minimum of two different English dailies
5. A minimum of Three Mikes with and without cords
6. Colour Television (minimum size – 29”)
7. DVD/VCD Player with Home Theatre speakers
8. Smart board
9. Projector

Suggested Reading:

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