PROPOSED CURRICULAR STRUCTURE FOR PART – 2 (2ND YEAR) OF THE FULL- TIME DIPLOMA COURSE IN ENGINEERING AND TECHNOLOGY

WEST BENGAL STATE COUNCIL OF TECHNICAL EDUCATION

TEACHING AND EXAMINATION SCHEME FOR DIPLOMA IN ENGINEERING COURSES

COURSE NAME: COMPUTER SOFTWARE TECHNOLOGY

SEMESTER: THIRD

BRANCH CODE: CSWT

SR. NO.	SUBJECT	CREDITS	PERIODS			EVALUATION SCHEME					
			L	TU	PR	INTERNAL SCHEME			ESE	PR	TOTAL MARK
						TA	CT	Total			
1	Discrete Mathematics	3	3			10	20	30	70		100
2	C Programming	3+2	3	1	3	10	20	30	70	100	200
3	Digital Techniques	3+2	3		3	10	20	30	70	100	200
4	System Programming	3	3			10	20	30	70		100
5	Electronics Device & Circuits	3+1	3		2	10	20	30	70	50	150
6	Management Information System& ERP	3	3			10	20	30	70		100
7	Professional Practice-I (*PC Maintenance)	2			3					50	50
Total		25	18	1	11	60	120	180	420	300	900

STUDENT CONTACT HOURS PER WEEK: 30 HRS.

Theory and Practical Periods of 60 minutes each.

L-Lecture, TU-Tutorials, PR-Practical, TA-Teachers Assessment, CT-Class Test, ESE-End Semester Examination.

*LAN configuration will be included in PC Maintenance

DISCRETE MATHEMATICS

| Subject Code CSWT / 3 / T1 / DMTH | Course offered in Part – II First Semester | Course Duration 17 weeks | 3 lecture contact periods per week | Full Marks 70 |

OBJECTIVE

With this subject students would be familiar with the matrix algebra, set theory and counting theory, which will help to develop the analytical and logical sense. This subject also includes graph theory, which has vast application in computer science.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	SET THEORY	13
	2	MATRIX THEORY	13
B	3	COUNTING TECHNIQUES	12
	4	GRAPH THEORY	13

TOTAL PERIODS: 51

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2	12	ANY 20	ONE	1 x 20 = 20	FOUR	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10 X 5 = 50
B	3, 4	12				FOUR			

DETAIL COURSE CONTENT

Name of Course: DISCRETE MATHEMATICS	
Subject Code : CSWT / 3 / T1 / DMTH	Semester: Third
Duration : 17 weeks	**Maximum Marks : 100**
Teaching Scheme :	**Examination Scheme :**
Theory: 3 contact hours/week.	Internal Examination : 20 Marks
Tutorial :-NA	Class Attendance : 5 Marks
Practical : NA	End Semester Examination : 70 Marks
Credit : 3	Teacher's Assessment : 5 Marks

Content (Name of Topic)	Hrs/ Credit	MARKS
Group A		
Unit 1 SET THEORY		
1.1 CONCEPT OF SETS: Notation – Subset – Superset – Empty set – Universal set – Examples — OPERATION ON SETS: Union – Intersection – Complementation – Difference – Symmetric difference – Problems relating simple set identities – Definition of power set – Cartesian product of finite number of sets – Simple problems – Cardinality of a set – Finite and infinite sets	13	
1.2 RELATION BETWEEN TWO SETS: Binary relation as a subset of Cartesian product – Reflexive, symmetric & transitive relations – Examples — Equivalence relation – Examples – Partition – problems		
1.3 FUNCTIONS: Definition of function – Domain, Co-domain & Range of a function – Injective, Subjective and Bijective functions – Related problems		
Unit 2 MATRIX THEORY		
2.1 ELEMENTARY TRANSFORMATION ON A MATRIX: Equivalent matrices – Definition of sub-matrix of a matrix – Rank of a matrix (definition) – Echelon form of a matrix – Theorems on rank (statement only) – Evaluation of rank of a matrix – Problems	13	
2.2 ADJOINT of a square matrix – Definition of INVERSE of a matrix – Uniqueness of the inverse – Theorems on inverse of matrices – Problems		
2.3 System of SIMULTANEOUS LINEAR EQUATIONS – Test of consistency – Solution of system of simultaneous linear equations by matrix method – Problems		
2.4 Definition of EIGEN – Values and eigenvectors – Characteristic equation – Theorems on eigenvalues and eigenvectors – Related problems		
Group B		
Unit 3 COUNTING TECHNIQUES		
3.1 PRINCIPLE OF INCLUSION AND EXCLUSION: Statement of the principle – Set theoretic problems relating to principles of inclusion and exclusion	12	
3.2 MATHEMATICAL INDUCTION: Concept of Induction – Statement of the principle of Mathematical Induction – Application of the principle of Induction in various problems		
3.3 RECURRENCE RELATION: Definition – Examples (Fibonacci series etc.) – Linear recurrence relations with constants coefficients – Homogeneous solutions – Particular solutions – Total solutions – Problems		

Unit 4		**GRAPH THEORY**		
	4.1	Introduction – Definition of a graph – Subgraph – Isomorphism – Walk, Paths and Circuits – Connectedness and components – Euler graphs – Hamiltonian paths and Circuits – Problems	13	
	4.2	TREE**:** Definition & properties of trees – Distance & centre in a tree – Rooted & binary trees – Spanning tree – Spanning tree in a weighted graph – Problems		
	4.3	Graph theoretic algorithms – Minimal Spanning tree algorithm – Shorted path algorithm.		

REFERENCE BOOKS

1. Foundation of Discrete Mathematics / K. D. Joshi
2. Discrete Mathematics with Algorithms / Albertson & Hutchinson / John Wiley
3. Discrete Mathematics / Iyenger, Venkatesh, Chandrasekaran & Arunachalam / Vikash Publishing House
4. Discrete Structure and Graph Theory / S.K.S. Rathore and H. Chaudhuri / Everest Publishing House
5. Graph Theory with Application to Engineering and Computer Science / Narsingh Deo / Prentice Hall of India, N. Delhi.

C PROGRAMMING

Subject Code CSWT / 3 / T/CP	Course offered in Part – II First Semester	Course Duration 17 weeks	3 lecture contact periods & 1 Tutorial per week	Full Marks 70

OBJECTIVE

This course is designed to have the students become competent in writing C program. Upon successful completion of this course the students will be able to: .
(i) use data types, operators and expressions in writing C program;
(ii) use function, external variables, multiple source files and also pre-processing;
(iii) employ the standard library in developing C program;
(iv) use arrays, structure, unions and pointers and organize data;
(v) use file accessing functions comfortably.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	INTRODUCTION TO PROGRAMMING	3
	2	OVERVIEW OF C PROGRAMMING	3
	3	TYPES, OPERATORS & EXPRESSIONS	6
	4	MANAGING INPUT & OUTPUT OPERATIONS	6
	5	CONTROL FLOW (DECISION MAKING)	8
B	6	ARRAY & STRING	6
	7	FUNCTIONS	8
	8	STRUCTURE & UNION	6
	9	POINTERS	8
	10	FILE HANDLING IN C	6

TOTAL PERIODS: 68

CONTACT PERIODS: 60   **INTERNAL ASSESSMENT:8**

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2,3,4,5	10	ANY 20	ONE	1 x 20 = 20	FOUR	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10 X 5 = 50
B	6,7,8,9,10	15				FIVE			

DETAIL COURSE CONTENT

Name of Course: DISCRETE MATHEMATICS	
Subject Code : CSWT / 3 / T / C	Semester: Third
Duration : 17 weeks	**Maximum Marks : 100**
Teaching Scheme :	**Examination Scheme :**
Theory: 3 contact hours/week.	Internal Examination : 20 Marks
Tutorial :-1 contact hour/week	Class Attendance : 5 Marks
Practical : 3 contact hours/week.	Teacher's Assessment : 5 Marks
Credit : 3	End Semester Examination : 70 Marks

	Content (Name of Topic)	Hrs/ Credit	MARKS
	Group A		
Module 1	**INTRODUCTION TO PROGRAMMING**		
	Concept of program . Different programming languages & programming logic . Algorithms & Flow-charts	**3**	
Module 2	**OVERVIEW OF C PROGRAMMING**		
	Introduction of C language . History of C . Importance of C . Demerits of C . Basic structure of C .Working steps of C Compiler . Source Code . Object code . Executable code	**3**	
Module 3	**TYPES, OPERATORS & EXPRESSIONS**		
	Introduction (Grammars/Syntax Rules) . Character sets . Key words and Identifiers . Constants . Variables . Data types and Sizes . Declaration of variables. Different operators and expressions. Type conversions	**6**	
Module 4	**MANAGING INPUT & OUTPUT OPERATIONS**		
	Analysis of some Input as well as Output functions: scanf ( ) . printf ( ) . getchar ( ) . putchar ( ) . Formatted Input and Output statements	**6**	
Module 5	**CONTROL FLOW (DECISION MAKING)**		
	Decision making and branching . Simple and nested IF statements . IF-ELSE statements . SWITCH CASE statements . Looping concept . GOTO statement . Looping: FOR, WHILE and DO-WHILE statements . Comparative study among them . BREAK and CONTINUE statements	**8**	
	Group B		
Module 6	**ARRAY & STRING**		
	One and two dimensional array . Array initialization . Handling of character strings by using Array . Concatenation and comparisons of strings . String handling functions	**6**	

Module 7	**FUNCTIONS**		
	Concept of user defined function . Difference between library function and user defined Function . Parameter passing technique . Calling a function . Category of function and their study .Nesting of functions and Recursions . Scope and lifetime of variables in functions	8	
Module 8	**STRUCTURE & UNION**		
	Structure : Declaration and initialization , Defining and processing, Passing to a function, Array of structure, Union	6	
Module 9	**POINTERS**		
	Pointer declaration and accessing variables through pointers . Pointers and Arrays . Strings	8	
Module 10	**FILE HANDLING IN C**		
	Different types of files. File operation: creation, copy, delete, update, text file, binary file. Command line arguments	6	

REFERENCE BOOKS

1. PROGRAMMING IN ANSI C / E. Balagurusamy / Tata McGraw-Hill
2. LET US C / Y. Kanetkar / BPB
3. THINKING IN C / P.B. Mahapatra / Wheelers
4. THE C LANGUAGE TRAINER WITH C GRAPHICS AND C++ / J. Jayasri / New Age International
5. A FIRST COURSE IN PROGRAMMING WITH C / T. Jeyapoovan / Vikash Publishing House
6. PROGRAMMING WITH C / Byron Gottfried / Tata McGraw-Hill

C PROGRAMMING LAB

Subject Code CSWT / 3 / PR/CPL	Course offered in Part – II First Semester	Course Duration 17 weeks	3 sessional contact periods per week	Full Marks 100

OBJECTIVE

On satisfactory completion of the course, the students should be in a position to develop the skills complementary to the knowledge acquired in the theoretical subject PROGRAMMING IN C.

MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	CONTACT PERIODS
1	BASIC OF PROGRAMMING	3
2	OPERATORS AND EXPRESSIONS	6
3	DECISION MAKING	7
4	ARRAY & STRING	7
5	USER DEFINED FUNCTIONS	7
6	POINTERS	6
7	STRUCTURE & UNION	4
8	FILE HANDLING	5

E X A M I N A T I O N   S C H E M E

1. **Continuous Internal Assessment of 50 marks** is to be carried out by the teachers throughout Part
. II First Semester. **Distribution of marks:** Performance of Job . 35, Notebook . 15.
2. **External Assessment of 50 marks** shall be held at the end of Part . II First Semester on the entire
syllabus. One job per student from any one of the jobs done is to be performed. Job is to be set by
lottery system. **Distribution of marks:** On spot job . 25, Viva-voce . 25.

D E T A I L   C O U R S E   C O N T E N T

	Content (Name of Topic)	Hrs/ Credit	MARKS
	Group A		
Module 1	**BASIC OF C PROGRAMMING**		
	1.1 To execute a sample C program to study the basic structure of C program. 1.2 To be familiar with keywords and identifiers through some program. 1.3 To apply constant, variables and different types of data types.	**3**	
Module 2	**OPERATORS & EXPRESSIONS**		
	2.1 To write program using Arithmetic, Relational, Logical and Assignment operators. 2.2 To write program to implement increment & decrement operators and to find the greatest between two numbers using conditional operator. 2.3 To evaluate an expression to study operator precedence and associativity and to write a program using casting a value.	**6**	
Module 3	**DECISION MAKING**		
	3.1 To use formatted scanf( ) and printf( ) functions for di fferent types of data. 3.2 To find the roots of a quadratic equation. Find the greatest of three numbers using IF .ELSE and IF - ELSE IF statements. 3.3 To test whether the given character is vowel or not, using nested i f .else statement and Switch-case statement. 3.4 To find the sum of all Fibonacci numbers in between 1 to n using ‘for’ loop. 3.5 To find G.C. D and L.C.M of two numbers using ‘WHILE’ loop. 3.6 To find the sum of the digits of an integer using DO .WHILE loop structure. 3.7 To solve other problems for the implementation of different loop structure.	**7**	
Module 4	**ARRAY & STRING**		
	4.1 To write a program to accept 10 numbers, store them in a single dimensional array and to make the average of the numbers. 4.2 To make an array of n elements and sort them and to write a program to check whether an input number is palindrome or not. 4.3 To write a program to accept a string and to count the no of vowels present in this string. 4.4 To write programs on matrix operation (addition, subtraction & multiplication). 4.5 To write some programs to utilize different string handling functions and to create an array to store the names of 10 students arranging them alphabetically.	**7**	

Module 5	**USER DEFINED FUNCTIONS**		
	5.1 To write a program to find the sum of the digits of a given number using function. 5.2 To write program using functions**: —** (a) with no argument and no return value; (b) with argument and no return value; (c) with argument and return value. 5.3 To find out the factorial of a given number using recursive function. 5.4 To write a program that uses a function to sort an array of integers. 5.5 To write programs to illustrate auto variable, external variable, static variable and register variable.	**7**	
Group B			
Module 6	**POINTERS**		
	6.1 To write a program to access variables using pointer. 6.2 To write a program to assign the address of an integer array to a pointer vari able 'p' and add all the array elements through 'p'. 6.3 To write programs to explain parameter passing ' by reference ' and 'by value'.	**6**	
Module 7	**STRUCTURE & UNION**		
	7.1 To write a program to define and assign values to structure members 7.2 To write program to explain structure with arrays. 7.3 To define and assign values to 'Union' members.	**4**	
Module 8	**FILE HANDLING**		
	8.1 To write to and read from a sequential access file (use character type data). 8.2 To create an integer data file, to read this file and to write all odd numbers to a new file. 8.3 To write program to use different functions used in file handling. 8.4 To make a random access to a file..	**5**	

D I G I T A L TECHNIQUES

Subject Code	Course offered in	Course Duration	3 lecture contact periods	Full Marks
CSWT / 3 / T / DT	Part – II Semester	17 weeks	per week	70

O B J E C T I V E

This subject is basically designed to introduce the students with various components of digital circuits. It also develops the skill of designing the circuits.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	NUMBER SYSTEM & CODE	08
	2	BOOLEAN ALGEBRA & LOGIC GATES	06
B	3	SIMPLIFICATION OF LOGIC EXPRESSIONS	06
	4	COMBINATIONAL LOGIC CIRCUITS	11
C	5	SEQUENTIAL CIRCUITS	12
	6	DATA CONVERTER	06

CONTACT PERIODS: 49   INTERNAL ASSESSMENT: 2   TOTAL PERIODS:51

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2	9	ANY 25	ONE	1 x 25 = 25	THREE	FIVE, TAKING AT LEAST ONE FROM EACH GROUP	TEN	10 X 5 = 50
B	3, 4	13				THREE			
C	5, 6	11				THREE			

DETAIL COURSE CONTENT

Name of Course: Digital Technique	
Subject Code : CSWT / 3 / T / DT	Semester: Fourth
Duration : 17 weeks	**Maximum Marks : 100**
Teaching Scheme : 20 +10	**Examination Scheme : 70**
Theory: 3 contact hours/week.	Internal Examination : 20 Marks
Tutorial :-1 contact hour/week	Class Attendance : 5 Marks
Practical : 3 contact hours/week.	End Semester Examination : 70 Marks
Credit : 3	Teacher's Assessment : 5 Marks

	Content (Name of Topic)	Hrs/ Credit	MARKS
Group A			
Module 1	NUMBER SYSTEMS & CODE	8	
	Simple arithmetic using positive and negative binary numbers: Addition, Subtraction, Division — Different Weighted & Non-weighted codes — Error correcting codes		
Module 2	BOOLEAN ALGEBRA & LOGIC GATES	6	
	Definition of Boolean Algebra — Boolean Theorems (with their proofs) — Standard forms of expression & their conversion from one to another — LOGIC GATES: AND, OR, NOT, NAND, NOR, XOR, XNOR (truth table, logic expression, symbol) — Simple logic circuits using these gates.		
Group B			
Module 3	SIMPLIFICATION OF LOGIC EXPRESSIONS	6	
	Simplification of Boolean expression or logic expression using — (i) Boolean Algebra; (ii) Karnaugh Maps & (iii) Quine Maclusky Method		
Module 4	COMBINATIONAL LOGIC CIRCUITS	11	
	Arithmetic Circuits: Half adder – Full adder – Half subtractor – Full subtractor (truth table, logic expression, equivalent circuit diagram – brief description) — Comparator – Multiplexer – Demultiplexer / Decoder – Code Converter – Encoder – Parity Generator & Checker.		
Group C			
Module 5	SEQUENTIAL CIRCUITS	12	
	Introduction to sequential circuits — Model of sequential circuits: latch & flip flops – timing parameters of latch & flip flops – conversion of one flip flop to another — COUNTER: Introduction to counter – Binary ripple counter (UP/DOWN) – Module-n-counter – Synchronous & Asynchronous counter — REGISTERS: Shift registers – Serial data – Parallel data – Design of registers & their functional detail.		
Module 6	DATA CONVERTER	6	
	DIGITAL TO ANALOG CONVERTER (DAC): Weighted register ladder, Commercially Available DAC — ANALOG TO DIGITAL CONVERTER (ADC): Different types – Successive approximation – Dual – Slope type – ADC performance – Commercially available ADC		

REFERENCE BOOKS

1. Digital Logic & Computer Design / M. Morris Mano / Prentice Hall of India, N. Delhi
2. Digital Principles & Applications / Malvino & Leach / Tata McGraw-Hill
3. Modern Digital Electronics / R.P. Jain / Tata McGraw-Hill
4. Digital Logic Applications & Design / M. Yarbrough / Vikash Publishing House
5. Digital Computer Electronics / Malvino & Brown / Tata McGraw-Hill
6. Digital Systems / Ronald J. Tocsin / Prentice Hall of India, N. Delhi
7. Digital Electronics & Microcomputers / R. K. Gaur / Dhanpat Rai Publications
8. Fundamental of Digital Circuits / A. Anand Kumar / Prentice Hall of India, N. Delhi
9. Digital Circuits and Design/S. Salivahanan, S.Arivazhagan/Vikas Publishing house pvt. Ltd.

DIGITAL TECHNIQUE LAB

Subject Code	Course offered in	Course Duration	Full Marks
CSWT / 3 / PR / DTL	Part – II Second Semester	17 weeks	100

CONTACT PERIODS	TOTAL
3 sessional contact periods per week for 17 weeks	51 periods

OBJECTIVE

On satisfactory completion of the course, the students should be in a position to develop the skills corresponding to the knowledge acquired in the theoretical subject DIGITAL TECHNIQUE.

EXAMINATION SCHEME

1. **Continuous Internal Assessment of 50 marks** is to be carried out by the teachers throughout Part – II First Semester. **Distribution of marks:** Performance of Job – 35, Notebook – 15.
2. **External Assessment of 50 marks** shall be held at the end of Part – II First Semester on the entire syllabus. One job per student from any one of the jobs done is to be performed. Job is to be set by lottery system. **Distribution of marks:** On spot job – 25, Viva-voce – 25.

DETAIL COURSE CONTENT
(At least any ten experiments from the following)

1. To verify the truth tables for AND, OR, NOT, XOR, XNOR, NAND AND NOR gates.
2. To design Half adder and Full adder using all NAND gates or with all NOR gates.
3. To realize a truth table or a logic expression using the minimum number of logic gates.
4. To study 4-bit full adder IC chip (7483); Cascading of 7483.
5. To design 1's, 2's, 9's and 10's complement circuit using full adder.
6. To design BCD adder.
7. To design a simple multiplexer using discrete logic gates.
8. To use commercial multiplexer using IC chips for the design of combinational circuits.
9. To design simple decoder using discrete logic gates.
10. To use commercial multiplexer IC chips for the design of multi-output combinational circuit.
11. To design Gray-to-Binary and Binary-to-Gray code converter using discrete logic gates, multiplexers & decoders.
12. To design RS and D latch using all NAND gates or NOR gates.
13. To debounce mechanical switch using latch.
14. To design Master Slave JK flip-flop.
15. To design ripple counter.
16. To design synchronous counter.
17. To study some commercially available counter chips.
18. To design shift registers using flips-flops and to study its behaviour.
19. To study commercially available shift register IC chips.
20. To design astable and monostable multivibrator using 555 timer chip.
21. To study commercially available ADC and DAC chips.
22. To design ramp generator using DAC and counter.

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SYSTEM PROGRAMMING

Subject Code	Course offered in	Course Duration	3 lecture contact periods	Full Marks
CSWT / 3 / T4/SP	Part – II First Semester	17 weeks	per week	70

OBJECTIVE

System Programs, viz. compilers, loaders, macro processors, operating systems, were developed to make computers better adapted to the need of their users. Further, people want more assistance in mechanics of preparing their programs. System Programming teaches the procedures for the design of software systems and provides a basis for judgment in the design of software.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	LANGUAGE PROCESSORS	5
	2	MACHINE STRUCTURE, MACHINE LANGUAGE & ASSEMBLY LANGUAGE	5
	3	ASSEMBLERS	8
	4	MACRO LANGUAGE & MACRO PROCESSOR	7
B	5	LOADERS & LINKERS	10
	6	COMPILERS & INTERPRETERS	14

CONTACT PERIODS: 49   **INTERNAL ASSESSMENT: 2**   **TOTAL PERIODS: 51**

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2,3,4	12	ANY 20	ONE	1 x 20 = 20	FOUR	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10 X 5 = 50
B	5,6	12				FOUR			

DETAIL COURSE CONTENT

Name of Course: DISCRETE MATHEMATICS	
Subject Code : CSWT / 3 / T4 / SP	Semester: Third
Duration : 17 weeks	**Maximum Marks : 100**
Teaching Scheme :	**Examination Scheme :**
Theory: 3 contact hours/week.	Internal Examination : 20 Marks
Tutorial :-	Class Attendance : 5 Marks
Practical : -	End Semester Examination : 70 Marks
Credit : 3	Teacher's Assessment : 5 Marks

	Content (Name of Topic)	Hrs/ Credit	MARKS
	Group A		
Module 1	**LANGUAGE PROCESSORS**		
	Introduction . EVOLUTION OF THE COMPONENTS OF A PROGRAMMING SYSTEM**:** Assemblers, loaders, macros, compilers, formal systems . Language processing activities . Fundamentals of language processing & specification.	**5**	
Module 2	**MACHINE STRUCTURE, MACHINE LANGUAGE & ASSEMBLY LANGUAGE**		
	General MACHINE STRUCTURE . MACHINE LANGUAGE**:** Long way, no looping, address modification using instructions as data, address modification using index registers . ASSEMBLY LANGUAGE Programs (using Literals also).	**5**	
Module 3	**ASSEMBLERS**		
	Elements of Assembly Language Programming . General Design Procedure of System Software . DESIGN SPECIFICATION of an Assembler**:** Synthesis & Analysis phase . PASS STRUCTURE of an Assembler**:** Twopass translation . DESIGN of a Two-pass assembler: data structures & algorithms.	**8**	
Module 4	**MACRO LANGUAGE & MACRO PROCESSOR**		
	MACRO INSTRUCTIONS . FEATURES OF A MACRO FACILITY**:** Macro definition & call . Macro expansion . Nested macro calls . Advanced macro facilities**:** conditional macro expansion, time loops expansion, semantic expansion . DESIGN of a Two-pass Macro Processor: data structures & algorithms.	**7**	

Group B			
Module 5	**LOADERS & LINKERS**		
	BASIC LOADER FUNCTIONS . ABSOLUTE LOADER: Design . BOOTSTRAP LOADER: Overview . MACHINEDEPENDENT LOADER FEATURES: Relocation, program linking, tables and logic for a linking loader . MACHINEINDEPENDENT LOADER FEATURES: Automatic library search, loader options, overlay programs . DIRECTLINKING LOADER: Concepts & Algorithm . RELOCATION & LINKING Concepts . Concepts of OVERLAYS.	10	
Module 7	**COMPILERS & INTERPRETERS**		
	ASPECTS OF COMPILATION . MEMORY ALLOCATION . BASIC COMPILER FUNCTIONS: Grammars, Lexical analysis, Syntactic analysis, Code generation . COMPILER CONSTRUCTION: seven phases. COMPILATION OF EXPRESSIONS. COMPILATION OF CONTROL STRUCTURE . CODE OPTIMIZATION: Machine-independent and Machine-dependent . INTERPRETERS: Use of interpreters, Overview of interpretation.	14	

REFERENCE BOOKS

1. Systems Programming / John J. Donovan / Tata McGraw Hill
2. Systems Programming and Operating Systems / D.M. Dhamdhere / Tata McGraw Hill
3. L.L. Beck – "System Software " (3rd Ed.)- Pearson Education

ELECTRONICS DEVICE & CIRCUIT

Subject Code	Course offered in	Course Duration	3 lecture contact periods	Full Marks
CSWT / 3 / T / EDC	Part – II First Semester	17 weeks	per week	70

OBJECTIVE

This subject will enable the students to comprehend the concepts and working principle of electronics devices and circuits and their application in electronic system. The knowledge acquired by student will help them to troubleshoot and repair electronic circuits and devices.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	PERIODS
A	1	**Fundamentals of Semiconductors Electronics**	6
	2	**Zener Diode**	4
	3	**RECTIFIER & Power Supply**	6
B	4	**BIPOLAR TRANSISTOR**	5
	5	**TRANSISTOR BIASING**	6
	6	**FIELD EFFECT TRANSISTOR**	5

C	7	**SPECIAL SEMICONDUCTOR DEVICES**	6
	8	**OPERATIONAL AMPLIFIER**	7
	9	**TIMER CIRCUITS**	6

CONTACT PERIODS: 45　　　　　**INTERNAL ASSESSMENT: 6**　　　　　**TOTAL PERIODS: 51**

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2, 3	30	ANY 20	ONE	20	3	FIVE, TAKING AT LEAST ONE FROM EACH GROUP	TEN	10 X 5 = 50
B	4,5,6					3			
C	7,8,9					3			

	Content (Name of Topic)	Hrs/ Credit	MARKS
	Group A		
Module 1	**Fundamentals of Semiconductors Electronics**		
	Semiconductor diodes – symbol and basic construction, Formation of depletion layer and barrier potential, Forward-bias and reverse-bias condition, Explanation of V-I characteristics of ordinary diodes, Applications of ordinary diodes.	**6**	
Module 2	**Zener Diode**		
	BREAKDOWN: Zener and avalanche – Construction of Zener diode and operation of Zener diode in reverse biased condition – Characteristics and equivalent circuits, specifications – Simple voltage regulator circuit.	**4**	
Module 3	**RECTIFIER & Power Supply**		
	Half-wave and full-wave rectifier, average voltage, r.m.s voltage, efficiency and ripple factor, percentage voltage regulation	**6**	
	Function of filter circuits**:** Capacitor input filter, inductive filter, Π type filter – Calculation of ripple factor and average output voltage – Function of bleeder resistor		
	Series and shunt regulator using transistor		
	Concept of switch mode power supply		
	Block schematic description of uninterrupted power supply.		
	GROUP-B		
Module 4	**BIPOLAR TRANSISTOR**		

	Construction and operation of NPN and PNP transistors-V-I characteristics, transistor in active, saturation and cut-off-CE, CB, CC configuration and their differences, definitions of current gains and their relationship. Transistor as simple amplifier & oscillator and their simple application	**5**	
Module 5	**TRANSISTOR BIASING**		
	Concept of Q-point – AC and DC load line – Stabilization and stability factor TYPES OF BIASING**:** (a) Base Bias, (b) Collector Feedback Bias, (c) Emitter Feedback Bias, (d) Potential Divider Bias. Bias compensation circuits using diode and thermistors – FET biasing	**6**	
Module 6	**FIELD EFFECT TRANSISTOR**		
	Construction, operation and VI characteristics of JFET, pinch-off voltage, drain résistance, transconductance, amplification factor and their relationship Enhancement and depletion type MOSFET- concepts of CMOS Differences between BJT and JFET.	**5**	
GROUP-C			
Module 7	**SPECIAL SEMICONDUCTOR DEVICES**		
	Construction, operation and characteristics of UJT – Equivalent circuit – UJT as relaxation oscillator – Field of applications Construction, operation and characteristics of SCR – Turn on and turn off mechanism – SCS, DIAC, TRIAC and their uses Elementary ideas of LED, LCD, photodiode, phototransistor and solar cell and their applications.	**6**	
Module 8	**OPERATIONAL AMPLIFIER**		
	Circuit operation of differential amplifier, single ended and double ended	**7**	
	Introduction to operational amplifier – Inverting and non inverting mode and their gain calculation – Common mode rejection ratio – Bias current – Offset voltage and current – Slew rate, open loop and closed loop gain – Input and output impedance – Frequency response and virtual ground		
	Applications of OPAMP as**:** Adder, Subtractor, Voltage Follower, Integrator, Differentiator, Comparator, Schmitt Trigger		
Module 9	**TIMER CIRCUITS**		
	Principle of operation of electronic timer	**6**	
	Functional description of internal blocks of timer IC555		
	Use of 555 timers in monostable and astable mode		
	Principle of operation of digital timer		

REFERENCE BOOKS

1. Electronic Principles / Malvino / Tata McGraw-Hill
2. Electronic Devices and Circuits / Boylestad & Nashalsky / Prentice Hall of India, N. Delhi
3. Electronic Devices and Circuits / S. Salivanan / Tata McGraw-Hill
4. Electronic Devices and Circuits / Mottershed / Prentice Hall of India, N. Delhi
5. Electronic Devices and Circuits / Millman & Halkias / Tata McGraw-Hill
6. Electronic Fundamentals and Applications / Chattopadhyay & Rakhshit / New Age International
7. Basic Electronic & Linear Circuits / Bhargava / Tata McGraw-Hill
8. Electronic Principle / Sahadeb / Dhanpat Rai & Sons

ELECTRONICS DEVICES AND CIRCUITS LAB

Subject Code CSWT / 3 / PR / EDCL	**Course offered in** Part – II Second Semester	**Course Duration** 17 weeks	**Full Marks** 50

CONTACT PERIODS

2 sessional contact periods per week for 17 weeks

O B J E C T I V E

On satisfactory completion of the course, the students should be in a position to develop the skills corresponding to the knowledge acquired in the theoretical subject ELECTRONICS DEVICES AND CIRCUITS.

E X A M I N A T I O N   S C H E M E

1. **Continuous Internal Assessment of 25 marks** is to be carried out by the teachers throughout Part – II Second Semester. **Distribution of marks:** Performance of Job – 15, Notebook – 10.
2. **External Assessment of 25 marks** shall be held at the end of Part – II Second Semester on the entire syllabus. One job per student from any one of the jobs done is to be performed. Job is to be set by lottery system. **Distribution of marks:** On spot job – 15, Viva-voce – 10.

D E T A I L   C O U R S E   C O N T E N T

Job 1 To be familiar with the common assembly tools.

Job 2 To be able to identify the following passive and active circuit elements**:** —
Resistor, capacitor, inductor, transformer, relay, switches, batteries/cells, diode, transistors, SCR, DIAC, TRIAC, LED, LCD, photodiode, phototransistors, ICs etc.

Job 3 To be familiar with the following basic instruments**:** —
Multimeter, oscilloscope, power supply and function generator.

Job 4 To study the VI characteristics of a reverse biased Zener diode.

Job 5 To study the input and output characteristics and to find the h-parameters of a BJT for**:**
(a) C – E configuration; (b) C – C configuration; (c) C – B configuration.

Job 6 To study the FET characteristics.

Job 7 To study the rectifier with and without capacitor filter for**:**
(a)   half-wave rectifier ;(b) full-wave rectifier; (c) bridge rectifier.

Job 8 To study the following applications of op-amp using IC741**:**
(a)   adder; (b) subtractor; (c) differentiator (d) integrator; and, (e) voltage follower.

Job 9 To study the characteristics of IC555 timer connected as**:**
(a)   astable multi-vibrator; (b) monostable multi-vibrator.

MANAGEMENT INFORMATION SYSTEM AND ERP

Subject Code CSWT / 3 / T/ MIS&ERP	Course offered in Part – II First Semester	Course Duration 17 weeks	3 lecture contact periods per week	Full Marks 70

OBJECTIVE

To develop the basic understanding of the management information system as applicable in business organizations and to **know the strategic importance of Enterprise Resource Planning.**.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	Basic Concept and role , Uses of EDI,SDLC,DSS,DBMS,DDL,DML,DLL,RDBMS,DFD,ERD,	15
	2	MS-ACCESS, E-COMMERCE & E-BUSINESS	10
B	3	MS-ACCESS,SDLC,DSS,E-COMMERCE & E-BUSINESS BASIC CONCEPT,ITS IMPLEMENTATION	12
	4	BUSINESS MODULES AND ITS MARKET	12

CONTACT PERIODS: 49   **INTERNAL ASSESSMENT: 2**   **TOTAL PERIODS: 51**

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2	12	ANY 20	ONE	1 x 20 = 20	FOUR	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10 X 5 = 50
B	3, 4	12				FOUR			

DETAIL COURSE CONTENT

Name of Course: DISCRETE MATHEMATICS	
Subject Code : CSWT / 3 / T / MIS&ERP	Semester: Third
Duration : 17 weeks	**Maximum Marks : 100**
Teaching Scheme :	**Examination Scheme :**
Theory: 3 contact hours/week.	Internal Examination : 20 Marks

Tutorial :-NA	Class Attendance : 5 Marks
Practical : NA	End Semester Examination : 70 Marks
Credit : 3	Teacher's Assessment : 5 Marks

		Content (Name of Topic)	Hrs/ Credit	MARKS
Group A				
Unit 1		Basic Concept and role , Uses of EDI,SDLC,DSS,DBMS,DDL,DML,DLL,RDBMS,DFD,ERD,		
		MANAGEMENT INFORMATION SYSTEM: DEFINITION, BASIC CONCEPTS, FRAMEWORK, ROLE & NEED OF MIS		
		HARDWARE, SOFTWARE AND ADVANTAGES OF COMPUTERS IN INFORMATION SYSTEMS		
		COMPUTER NETWORKS, TYPES OF NETWORK DATA COMMUNICATION AND WIRELESS COMMUNICATION TECHNOLOGY,	15	
		ELECTRONIC DATA INTERCHANGE (EDI)		
Unit 2		MS-ACCESS, MANAGEMENT CONCEPT		
		DATA PROCESSING SYSTEMS, RETRIEVAL OF DATA, STORAGE OF DATA, CONCEPTS OF INFORMATION, ORGANIZATIONAL		
		STRUCTURE AND MANAGEMENT CONCEPTS, THE DECISION MAKING PROCESS BY INFORMATION, CONCEPTS OF PLANNING AND	10	
		CONTROL, EIS, DSS, TPS.		
Group B				
Unit 3		SDLC,DSS,E-COMMERCE & E-BUSINESS		
		System Concept, System Development Life Cycle (SDLC), Decision Support System (DSS),		
		characteristics & capabilities of DSS		
		Data sources and data management, Files: Definitions, types of files, concepts of DBMS, data warehouse		
		, DDL, DML, DLL, concepts of RDBMS, Data Flow Diagram (DFD), E-R Diagram and mapping Cardinalities	12	
		Concepts of E-Commerce & E-Business: B2B, B2C, C2C concepts etc.		
Unit 4		BASIC CONCEPT, BUSINESS MODULES AND ITS MARKET		

	ERP: An Overview, Enterprise – An Overview, Benefits of ERP, ERP and Related Technologies, Business Process Reengineering (BPR), Data Warehousing, Data Mining, OLAP, SCM ERP IMPLEMENTATION ERP Implementation Lifecycle, Implementation Methodology, Hidden Costs, Organizing the Implementation, Vendors, Consultants and Users, Contracts with Vendors, Consultants and Employees, Project Management and Monitoring	12	

R E F E R E N C E   B O O K S

1. Kenneth C Laudon-Jane P. Laudon, Management Information System, Pearson Education, New Delhi.
2. Gordon B. Davis, Margrethe H Olson,MIS –conceptual Foundations, structure and Development, Tata McGraw-Hill , New Delhi
3. Banerjee, U. K, Practical Management Information System, Indian experiences and Case Studies, , Macmillan Publication, New Delhi
4. Kumar,M, Business Information Systems, Vikash Publishing House, New Delhi
5. Gupta, A.K, Sharma, J.K., MIS, Macmillan Publication, New Delhi
6. Alexis Leon, "ERP Demystified", Tata McGraw Hill, New Delhi, 2000
7. Joseph A Brady, Ellen F Monk, Bret Wagner, "Concepts in Enterprise Resource Planning", ThompsonCourse Technology, USA, 2001.
8. Vinod Kumar Garg and Venkitakrishnan N K, "Enterprise Resource Planning – Concepts and Practice", PHI, New Delhi, 2003

P C   MAINTENANCE & Libre Office

Subject Code CSWT / 3 / PR/PCM	Course offered in Part – II First Semester	Course Duration 17 weeks	2 sessional contact periods per week	Full Marks 50

E X A M I N A T I O N   S C H E M E

Continues internal assessment of 50 marks is to be carried out by teachers throughout Part – III Second Semester.
Distribution of marks: Performance of Job – 35, Notebook – 15.

D E T A I L   C O U R S E   C O N T E N T

Group-A

Job 1 To locate and identify the most common components (parts) in a modern PC (PC, PC-AT to Pentium).

Job 2 To install and configure HDD.

Job 3 To be familiar with Pen drive, CD-RW, DVD-RW, Blu-ray Disc

Job 4 To be familiar with and to be able to troubleshoot motherboard.

Job 5 To be familiar with SMPS.

Job 6 To disassemble and reassemble a total PC system.

Job 7 To install video card, sound card, etc.

Job 8 To install and configure Printer and Scanner; to undertake preventive maintenance and to troubleshoot Printer/Scanner.

Job 9 To install and configure Web cam.

Job 10 To practice anti-virus software installation and virus removal.

Job 11 To install Windows server 2008/XP/Win7/Win8, UNIX/Linux.

Job 12 To be familiar with different network cables (UTP, STP, Coaxial), Connectors (BNC, BNC-T, RJ-11 (4 wire) RJ-45 (8 wire), DB9, DB15) and Terminator.

Job 13 To study the different expansion slots of a motherboard, set the NIC to expansion slot and to install the driver.

Job 14 To study crimping: RJ-45, RJ-11, Crossover and Straight Cable.

Job 15 To connect HUB with other nodes and HUB-to-HUB.

Job 16 To make a LAN with point-to-point connection of PCs/Laptops and LAN with switch.

Job 17 To make wireless LAN.

Group-B

Job 18 Installation Of LibreOffice and Introduction to LibreOffice Writer

Job 19 Introduction to LibreOfficeCalc

Job 20 Introduction to LibreOffice Impress

Job 21 Introduction to LibreOffice Base

Job 22 Introduction to LibreOffice Math

Job 23 Introduction to LibreOffice Draw

REFERENCE BOOKS

1. Hands on networking essentials with projects / M.J. Palmer
2. Internet working with TCP-IP / D.E. Comer and D. Stevens / Prentice Hall of India
3. CISCO Internet working / Charles Riley / SPD Pvt. Ltd.
4. Networking Cabling handbook / Chris Clark / Tata McGraw Hill
5. Designing and implementing local and WANs / M.J. Palmer and R.B. Sinclair / Vikas Publishing House.

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