ANNEXURE I

STATE BOARD OF TECHNICAL EDUCATION &TRAINING, TAMILNADU

DIPLOMA IN ELECTRONICS AND COMMUNICATION ENGINEERING SYLLABUS

N SCHEME

(Implemented from the Academic year 2020- 2021 onwards)

CURRICULUM OUTLINE

FULL TIME(1040)

THIRD SEMESTER

SUBJECT CODE	SUBJECT	HOURS PER WEEK			
		THEORY HOURS	TUTORIAL HOURS	PRACTICAL HOURS	TOTAL HOURS
4040310	Electronic Devices and Circuits	5	-	-	5
4040320	Electrical Circuits and Instrumentation	6	-	-	6
4040330	Programming in 'C'	5	-	-	5
4040340	Electronic Devices and Circuits Practical	-	-	4	4
4040350	Electrical Circuits and Instrumentation Practical	-	-	4	4
4040360	Programming in 'C' Practical	-	-	4	4
4040370	Simulation Practical			4	4
	Physical Education	-	2	-	2
	Library	-	1	-	1
Total		16	3	16	35

ANNEXURE II

STATE BOARD OF TECHNICAL EDUCATION &TRAINING, TAMILNADU

DIPLOMA IN ELECTRONICS AND COMMUNICATIONENGINEERING SYLLABUS

N SCHEME

(Implemented from the Academic year 2020- 2021 onwards)

SCHEME OF EXAMINATION

(FULL TIME)(1040)

THIRD SEMESTER

Subject Code	Subject	Examination			
		Marks			Duration
		Internal Assessment	Board Examinations	Total	
4040310	Electronic Devices and Circuits	25	100*	100	3 Hrs.
4040320	Electrical Circuits and Instrumentation	25	100*	100	3 Hrs.
4040330	Programming in 'C'	25	100*	100	3 Hrs.
4040340	Electronic Devices and Circuits Practical	25	100*	100	3 Hrs.
4040350	Electrical Circuits and Instrumentation Practical	25	100*	100	3 Hrs.
4040360	Programming in 'C' Practical	25	100*	100	3 Hrs.
4040370	Simulation Practical	25	100*	100	3 Hrs.
	Physical Education				
	Library				

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

STATE BOARD OF TECHNICAL EDUCATION &TRAINING, TAMILNADU

DIPLOMA IN ENGINEERING/TECHNOLOGY SYLLABUS

N SCHEME

(To be Implemented for the students admitted from the year 2020 - 2021 onwards)

Course Name   : 1040:Electronics and Communication Engineering

Subject Code   : 4040310

Semester   :IIISemester

Subject title   : ELECTRONIC DEVICESANDCIRCUITS

TEACHINGAND SCHEME OF EXAMINATION

No ofweeks/ semester: 16weeks

Subject	Instruction		Examination			
	Hours /Week	Hours /Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
Electronic Devices and Circuits	5	80	25	100*	100	3 Hrs

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

Topics and allocation of hours

UNIT	TOPIC	Hrs
I	Filters, Zener diode and Opto-electronic devices	14
II	Bipolar Junction Transistor, Field Effect Transistor and UJT	16
III	Feedback, Amplifiers and Oscillators	16
IV	Special Semiconducting Devices(SCR, DIAC AND TRIAC)	14
V	Wave shaping Circuits	13
	Tests and Model Exam	7
	Total	80

RATIONALE:

EveryElectronicsEngineershouldhavesoundknowledgeaboutthecomponentsused in Electronics Industry.This is vitalin R&DDepartment for chip level troubleshooting. To meet theindustrialneeds,diplomaholders mustbetaughtaboutthemostfundamentalsubject, ElectronicdevicesandCircuits.Bystudyingthissubject,theywillbeskilledinhandlingall types ofelectronic devices and ableto applythe skill in electronics system.

OBJECTIVES:

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

➢ Know the importance of Filters
➢ Know the construction,working principle and applications ofZener diode
➢ Know the construction,working principle and applications ofOptoelectronic devices
➢ Know the biasing methods of Transistors and their applications
➢ Study the performance of special devices like UJT,FET
➢ Studythe Concept of Feedback, different types of Negative feedback connections
➢ Know the Types of Transistor amplifiers ,Transistor oscillators and their applications
➢ Study the performance of Special semiconducting devices like SCR, DIAC, andTRIAC
➢ Explain the concept ofwave shaping circuits, Bistable Multivibrator and Schmitt trigger
➢ Studytheworking principle ofclippers , clampers , Voltage Multipliers and their applications

4040310 ELECTRONIC DEVICES AND CIRCUITS

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the topics	Hours
I	**FILTERS, ZENER DIODES AND OPTO-ELECTRONIC DEVICES**	
	1.1: FILTERS	5
	Definition - Types - Capacitor filter - Inductor filter - L section filter - Pi section and RC filter - Comparison and Applications of Filters	
	1.2: ZENER DIODE	5
	Construction, Working principle and Characteristics of Zener Diodes- Zenerbreakdown-Avalanchebreakdown- Zenerdiode asa Voltageregulator.	
	1.3: OPTO-ELECTRONIC DEVICES	4
	Definition - Types - Symbol, Working , Characteristics and Applications of LED, 7 Segment LED - Photo diode, Photo transistor and Opto- coupler	
II	**BIPOLAR JUNCTION TRANSISTOR (BJT), FIELD EFFECT TRANSISTOR (FET) AND UNI JUNCTION TRANSISTOR (UJT)**	
	2.1: BIPOLAR JUNCTION TRANSISTOR	7
	Transistorbiasing: Need for biasing - Types- Fixedbias,Collector tobase bias andSelfbias (Operation only ,No derivation of circuit elements and parameters)– Define: Stability factor - Operation of Common Emitter TransistorasanAmplifier andasa switch.	
	2.2: FIELD EFFECT TRANSISTOR (FET)	5
	Construction– Workingprinciple–Classification - Drain and Transfer Characteristics -Applications–Comparison betweenFETandBJT- FET amplifier (common source amplifier).	
	2.3: UNIJUNCTION TRANSISTOR (UJT)	4
	Construction- Equivalentcircuit-Operation-Characteristics- UJTasa relaxation oscillator	

III	**FEEDBACK , AMPLIFIERS AND OSCILLATORS**	
	3.1: FEEDBACK	6
	Concept - effects of negativefeedback-Types of negativefeedback connections - Applications	
	3.2: AMPLIFIERS	6
	Transistor amplifiers - Types - RC coupled amplifier - Working and Frequency responsecharacteristics –Working of Common Collector Amplifier(Emitter follower)	
	3.3 : OSCILLATORS	4
	Transistoroscillators–Conditionsforoscillation(Barkhausencriterion)- Classifications– HartleyOscillator– Colpitts Oscillator – RC Phaseshift oscillator	
IV	**SPECIAL SEMICONDUCTING DEVICES (SCR, DIAC AND TRIAC)**	
	4.1:SCR (SILICON CONTROLLED RECTIFIER)	5
	Symbol – Layered Structure – Transistor analogy - Working–VIcharacteristics– Applications - ComparisonbetweenSCRand Transistor	
	4.2: DIAC (Diode for Alternating Current)	5
	Symbol – Layered structure - Working – VIcharacteristics- Applications	
	4.3: TRIAC (Triode for Alternating Current)	4
	Symbol – Layered structure - Working – VIcharacteristics- Applications	
V	**WAVE SHAPING CIRCUITS**	
	5.1: CLIPPERSAND CLAMPERS	5
	Construction and working of Positive, Negative and biased Clippers - Construction and working of Positive and Negative Clamper	
	5.2: Voltage Multipliers	3
	Construction and working of Voltage Doubler and Tripler.	
	5.3 :Multivibrator and SchmittTrigger	
	Construction – Working – Waveform of Astable and Monostable Multivibratorusing Transistorsand SchmittTrigger usingTransistors	5

Reference Books:

1. Electronics Devices & Circuits bySalivahananS,N.Suresh Kumar, A.Vallavaraj
   Tata McGrawPublication 3rdEdition 2016

2. Electronics Devices and circuit theorybyBoyestad&Nashelsky, PHI , NewDelhi 2009

3. Electronic Principles byMalvino,-Tata McGrawHill Publication 2010.

4. ElectronicsDevices&CircuitsbyJacobMillmanandHalkias3rdEdition
   2010, Tata McGraw– Hill publication

5. Optical Fiber Communication byGerdKeiser 5thEdition, Tata McGraw– Hill .

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STATE BOARD OF TECHNICAL EDUCATION ANDTRAINING, TAMILNADU

DIPLOMAINENGINEERING / TECHNOLOGY SYLLABUS

N SCHEME

(To be Implemented for the students admitted from the year 2020 - 2021 onwards)

Course Name   : 1040:Electronics and Communication Engineering

SubjectCode.   : 4040320

Semester   :III

SubjectTitle   :ELECTRICALCIRCUITSANDINSTRUMENTATION

TEACHINGANDSCHEMEOFEXAMINATION

NumberofWeeks/Semester:16weeks

Subject	Instructions		Examination			
			Marks			
	Hours/ Week	Hours/ Semester	Internal Assessment	Board Examination	Total	Duration
ElectricalCircuits andInstrumentation	6	96	25	100*	100	3Hrs

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

Topics and Allocation of Hours

UNIT	Topic	Hrs
I	DCCircuitsandTheorems	18
II	ACCircuits	17
III	ElectricalMachines	18
IV	Transducers andCRO	18
V	Measurement and Instruments	18
Revision ,Test& Model Exam		7
TOTAL		96

RATIONALE:

This subject enables the students with concepts of DC circuits & network theorems, AC circuits. The subject also deals with principles and working of different Measuringinstruments and Electrical Machines.Theintroductionofthissubjectimpart the knowledge forstudents to analyze the electrical circuits.

OBJECTIVES:

Onsuccessfulcompletionofthecourse,thestudentsmustbeable to

➢ State ohm'slawandKirchoff'slaws.

➢ Understand the DC circuit and network theorems.

➢ Understandseriesandparallelcircuits.

➢ Define varioustermsrelatedtoACcircuits.

➢ Get knowledge on ACcircuits.

➢ Understand aboutresonance in seriesandparallelcircuits.

➢ Know theoperationof different Electrical machines.

➢ Know theoperationof measuringinstruments.

➢ Have basic knowledge on circuit analysis.

4040320 ELECTRICAL CIRCUITS AND INSTRUMENTATION DETAILEDSYLLABUS

Contents: Theory

UNIT	NAMEOF THE TOPIC	HOURS
1	**D.C.CIRCUITSAND THEOREMS** 1.1 Definition and Unit: Voltage, current, power, resistance andconductance . 1.2 Electrical laws: Ohm's law – Simple problems in ohm'slaw – Kirchoff's current law and Kirchoff's voltage law. 1.3 Basic DC circuits: Series and Parallel connections of resistors – Voltage and Current division in series and parallel circuits – Mesh analysis for DC circuits (simpleproblems). 1.4 Network theorems: Thevenin's theorem –Superpositiontheorem – Maximumpower transfer theorem (Statement, Explanation, Simpleproblems).	3 4 5 6
2	**A.C.CIRCUITS** 2.1 Basic AC circuits: Definition for impedance, reactance, admittance andpower factor Sinusoidal and Non sinusoidal waveforms – Average and RMS value – Current and Voltage relationship in R, L and C circuits – Analysis of RL, RC and RLC series circuits – Analysis of RL, RC and RLC parallel circuits (simple problems). 2.2 Resonance: Series resonance – Parallel resonance – Conditionfor resonance – frequency response – Resonant frequency, Q factor and bandwidth.	9 8
3	**ELECTRICAL MACHINES** 3.1 Transformer : Construction – workingprinciple – EMF equation – Losses in transformer – efficiency of a transformer – OC, SC test ontransformer– Applications of transformer. 3.2 Single phase and three phase supply : Introduction to single phase and three phase supply – Star Deltatransformation – Differencebetweensinglephaseandthreephasesupply. 3.3 DC Generator: Construction, working principle, EMF equation. 3.4 Electric Motors: DC motor –Single phase induction motor –Three phase	5 5 3 5

	induction motor – Capacitor start induction motor –stepper motor – Universal Motor.	
4	**TRANSDUCERS& CRO:** 4.1 Transducers: Classification of Transducers – Strain gauge: Principle of operation, construction, types, advantage, disadvantage and application, Advantage of semiconductor strain gauge over metallic strain gauge – Photo electric transducer – LVDT – RVDT– Loadcell. 4.2 CRO: CRT – Block diagram and operation of CRO – Applications of CRO – Dual trace – Digital storageOscilloscope:Blockdiagram,working principle – FunctionGenerator : Block Diagram, workingprinciple.	**9** **9**
5	**MEASUREMENT AND INSTRUMENTS:** 5.1 Definition : Definition for Measurement, Accuracy, precision, resolution, Calibration. 5.2 Instruments: Operation of Thermocouple – working principle of Thermistor – PMMC Instrument: Construction and working principle – Moving Iron Instrument: Construction and working principle – Shuntsand Multipliers – Potentiometer – DCammeter – DCvoltmeter – Voltmetersensitivity. 5.3 Measurement: Errors inMeasurement –Temperaturemeasurement using thermocouple –Temperaturemeasurement using thermistors–Resistance measurement: Wheatstone bridge – Measurement of Inductance: Maxwell's bridge – Measurement of Capacitance: Schering Bridge.	**2** **8** **8**

REFERENCEBOOKS:

1."B.L.Theraja,A.K.Theraja"" A Text book of ElectricalTechnology", S. Chand & co publisher, New Delhi 2005.

2.."R.K.Rajput"" Electronic MeasurementsandInstrumentation", S. Chand (Third Edition)-2008.

3. "Dr.M.Arumugam,N.Premkumaran"," ElectricCircuitTheory", KhannaPublishers, New Delhi ,5th edition 1979.

4. "A.K.Sawhney"" A Course in Electrical and Electronic Measurements and Instrumentation", Dhanpat raj & co-1993.

STATE BOARD OF TECHNICAL EDUCATION &TRAINING, TAMILNADU

DIPLOMA IN ENGINEERING/TECHNOLOGY SYLLABUS

N SCHEME

(To be Implementedfor the students admitted from the year 2020 - 2021 onwards)

Course Name   :1040:Electronics and Communication Engineering

Subject Code   : 4040330

Semester   :IIISemester

Subject title   : PROGRAMMING IN C

TEACHINGAND SCHEME OF EXAMINATION

No ofweeks/ semester: 16weeks

Subject	Instruction		Examination			
	Hours /Week	Hours /Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
Programming in C	5	80	25	100*	100	3 Hrs

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

TOPICS&ALLOCATIONOFHOURS

UnitNo.	Topics	No.ofHours
I	BASICS OF 'C'	14
II	COPERATORS ,DECISIONMAKING,BRANCHING AND LOOPING STATEMENTS	15
III	ARRAYS AND STRINGS	15
IV	STRUCTURE AND UNION	15
V	FUNCTIONS &FILES I/O	14
	Revision,Test&Model Exam	7
	TOTAL	80

RATIONALE:

'C' language is the most widely used computer language, which is being taught as a core course. C is the generalpurpose high level language. Due to the flexibility, it is suitable for different development environments. 'C' language has importance and popularity in recently developed and advanced softwareindustry. 'C' language can also be used for system level programming and it is still considered as first priorityprogramming language. This course covers the basic concepts of 'C'.

OBJECTIVES:

The course aims to provide exposure / train the students to do programming in C. AttheendoftheCourse,thestudents will be able to

➢ Know the basics of C.

➢ Writealgorithm andflowchartforanyproblems.

➢ Know operators used in 'C' and Decision making statements.

➢ Define and understand aboutarraysandfunctions.

➢ Defineand understand aboutstructureandunion.

➢ Understand strings, string handling functions.

➢ Developprogramsusing C operators, decision making statements.

➢ Developprogramsusing arrays, function, and structure.

4040330PROGRAMMINGINC
DETAILEDSYLLABUS

Contents: Theory

UNIT	NAMEOF THE TOPICS	HOURS
I	**BASICS OF C:** **1.1 Introduction to C:** History of 'C' – Structure of C program – Steps for execution of C program – Functions performed by Compiler, Linker – Algorithm & flow chart – Low level and High level Programming language – C character set –Tokens –Constants – Key words – Variables – Data types – Declaration of Variables – Assigningvaluestovariables . **1.2 I/O statements:** Formatted input, Formatted output, Unformatted I/O statements.	8 6
II	**C OPERATORS , DECISIONMAKING,BRANCHING AND LOOPING STATEMENTS:** **2.1 C operators:** Arithmetic, Logical, Assignment, Relational,Increment,Decrement,Conditional,Bitwise and Special operators –Precedence and Associativity – C expressions: Arithmeticexpressions, Evaluation ofexpressions. **2.2 Decisionmaking,branching and looping statements:** Simpleifstatement ,if- else,else-if ladderand nestedif-else statement – switchstatement – while, do-while statements – for loop, go to, break& continuestatement – Programtofindwhetherthegivennumberiseven or odd – ProgramtoperformtheArithmeticoperationsusingswitchstatement – Program to find sum of series using "while" loop .	7 8
III	**ARRAYS AND STRINGS:** **3.1 Arrays:** Definition of array – Declaration andinitializationofOnedimensional,Two dimensional arrays – Accessing array elements –Program to find sum of the elements of array – Program for matrix addition. **3.2 STRINGS:** Declaration and initialization of string variables, String handling Functions: strlen (), strcpy() , strcat(), strcmp() – Program to sort the set of strings using string handling functions.	8 7

IV	STRUCTURE AND UNION **4.1 Structure:** Definition of structure – Need of structure – Defining and initializing structure – Arrays of structures, Arrays within structures, structures within structures – ProgramtopreparethetotalmarksforNstudentsbyreadingtheName,Reg. No,Marks1toMarks5usingarrayofstructure. **4.2 Union:** Declaring and Initializing unions – Program to declare, initialize an UNION – Advantages of unions – DifferencebetweenUnionandstructure.	8 7
V	FUNCTION AND C FILES I/O: **5.1 Function:** Types – Inbuilt functions – User defined functions – Function definition – Function call: call by value – Program to find factorial of given N numbers using function– Program to count the number of digits in a number using function. **5.2 C Files I/O:** Opening, Reading, Writing and closing a file – Program using file.	7 7

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REFERNCE BOOKS:

1. "Prof. E. BALAGURUSAMY" "Programming in ANSI C",TATA Mc Graw

   HILL publications - 2008.

2. "YashavantKanetkar"" LetusC", BPBPublications - 2002.

STATE BOARD OF TECHNICAL EDUCATION &TRAINING, TAMILNADU

DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

N-SCHEME

(To be Implementedfor the students admitted from the year 2020 - 2021 onwards)

Course Name   : 1040:Electronics and Communication Engineering

Subject code   : 4040340

Semester   : III

Subject title : ELECTRONIC DEVICES ANDCIRCUITS PRACTICAL

TEACHINGAND SCHEME OFEXAMINATION:

No.ofweeks/ Semester: 16weeks

Subject	Instruction		Examination				
	Hours /week	Hours /semester	Marks				Duration
			Internal Assessment	Board Examination	Total		
Electronic Devices and Circuits Practical	4	64	25	100*	100		3 Hours

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

 RATIONALE:

EveryElectronicsEngineershouldhavesoundknowledgeaboutthecomponentsused in Electronics Industry.This is vitalin R&DDepartment for chip level troubleshooting. To meet theindustrialneeds,diplomaholders   mustbetaughtaboutthemostfundamentalsubject, ElectronicdevicesandCircuits Practical.Bydoing   practical   experience   in this,theywillbeskilledinhandlingall types ofelectronic circuits and ableto applythe skill in electronic systems.

OBJECTIVES:

On completion ofthefollowing experiments, the students must be able to

- ➢ Know the Cold Checking of Active and Passive Component
- ➢ Find out the Unknown Resistance value of a Resistor using Colour Coding
- ➢ Find out the Unknown Capacitance value of a Capacitor using Colour Coding
- ➢ Find out the Unknown Inductance value of an Inductor using Colour Coding

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- Understand the concept, working principle and applications of PN Junction diode
- Understand the concept, working principle and applications of Zener diode
- Understand the concept, working principle and applications of BJT and FET
- Understand the concept, working principle and applications of UJT
- Understand the concept, working principle and applications of SCR
- Understand the concept, working principle and applications of DIAC and TRIAC
- Understand the concept, working principle and applications of Clippers and Clampers
- Understand the concept, working principle and applications of various types of Negative feedback amplifiers
- Understand the concept, working principle and applications of AstableMultivibrator

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4040340 ELECTRONIC DEVICES AND CIRCUITS PRACTICAL
DETAILED SYLLABUS

Contents: Practical

Exercises

Note: At least 5 experiments should be done using Soldering board / Bread board

1. Construct a circuit to test the forward and reverse bias characteristics of a PN Junction Silicon diode. Find the value of its cut-in voltage

2. Construct a circuit to test the forward and reverse bias characteristics of a Zener diode. Find the value of its reverse breakdown voltage

3. Construct a Full wave (center tapped) rectifier and test its input and output waveforms with and without Capacitor filter. Find its maximum voltage.

4. Construct a Full wave (Bridge) rectifier and test its input and output waveforms with and without Capacitor filter. Find its maximum voltage.

5. Construct a Common Emitter Transistor circuit and test its input and output characteristic curves.

6. Construct a Common Source Field Effect Transistor circuit and test its drain and transfer characteristic curves.

7. Construct a circuit to test the Turning on and Turning off characteristics of SCR and find out the forward break over voltage, the value of Latching and Holding currents.

8. Construct a circuit to test the bidirectional characteristics of DIAC and plot its switching characteristics.

9. Construct a circuit to test the bidirectional characteristics of TRIAC and plot its switching characteristics.

10. Construct a Common emitter amplifier circuit and test its frequency response characteristics with and without Current series feedback introduced in it.

11. Construct a circuit to test the switching characteristics of AstableMultivibrator

12. Construct a circuit totest the negative resistance Characteristics of UJT.