STATE BOARD OF TECHNICAL EDUCATION, BIHAR
Scheme of Teaching and Examinations for
IIIRD SEMESTER DIPLOMA IN INSTRUMENTATION AND CONTROL ENGG.

(Effective from Session 2020-21 Batch)
THEORY

Sr. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME	EXAMINATION – SCHEME								Credits
			Periods per Week	Hours of Exam.	Teacher's Assessment (TA) Marks (A)	Class Test(CT) Marks (B)	End Semester Exam. (ESE) Marks (C)	Total Marks (A+B+C)	Pass Marks ESE	Pass Marks in the Subject		Credits
1.	Applied Mathematics	2000301	04	03	10	20	70	100	28	40		03
2.	Computer Programming Through 'C'	2000302	03	03	10	20	70	100	28	40		03
3.	Instrumentation and Process Control	2040303	03	03	10	20	70	100	28	40		03
4.	Basic Electronics Engineering	2040304	03	03	10	20	70	100	28	40		03
5.	Digital Circuits	2040305	03	03	10	20	70	100	28	40		03
		Total: - 16					350	500				15

PRACTICAL

Sr. No.	SUBJECTS	SUBJECT CODE	TEACHINGS CHEME	EXAMINATION – SCHEME					Credits
			Periods per Week	Hours of Exam.	Practical		Total Marks	Pass Marks in the Subject	Credits
					Internal (PA)	External (ESE)			
6.	Computer Programming Through 'C' Lab.	2000306	06 50% Physical 50% Virtual	03	15	35	50	20	03
7.	Electrical Measurements Lab.	2040307	02 50% Physical 50% Virtual	03	15	35	50	20	01
8.	Web Technology Lab	2018308	02 50% Physical 50% Virtual	03	07	18	25	10	01
9.	Electrical & Electronics Workshop Practice	2040309	04 50% Physical 50% Virtual	03	15	35	50	20	02
	Total: - 14						175		07

TERM WORK

Sr. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME	EXAMINATION – SCHEME				Credits
			Periods per week	Marks of Internal (PA)	Marks of External (ESE)	Total Marks	Pass Marks in the Subject	Credits
10.	Electrical & Electronics Workshop Practice (TW)	2040310	01	15	35	50	20	01
11.	PYTHON	2018311	02	07	18	25	10	01
	Total: - 03					75		02
Total Periods per week Each of duration One Hours = 33						Total Marks = 750		24

APPLIED MATHEMATICS

Subject Code 2000301	Theory						Credits
	No. of Periods Per Week			Full Marks	:	100	03
	L	T	P/S	ESE	:	70	
	04	—	—	TA	:	10	
	—	—	—	CT	:	20	

Contents: **Theory**	Hrs.	Marks

Unit -1 Integration:
1.1 Definition of integration as anti-derivative. Integration of standard function.
1.2 Rules of integration (Integrals of sum, difference, scalar multiplication).
1.3 Methods of Integration.
   1.3.1 Integration by substitution
   1.3.2 Integration of rational functions.
   1.3.3 Integration by partial fractions.
   1.3.4 Integration by trigonometric transformation.
   1.3.5 Integration by parts.
1.4 Definite Integration.
   1.4.1 Definition of definite integral.
   1.4.2 Properties of definite integral with simple problems.
1.5 Applications of definite integrals.
   1.5.1 Area under the curve.
   1.5.2 Area between two curves.
   1.5.3 Mean and RMS values
	12	20

Unit -2 Differential Equation 2.1 Definition of differential equation, order and degree of differential equation. Formation of differential equation for function containing single constant. 2.2 Solution of differential equations of first order and first degree such as variable separable type, reducible to Variable separable, Homogeneous, Nonhomogeneous, Exact, Linear and Bernoulli equations. 2.3 Applications of Differential equations. 2.3.1 Laws of voltage and current related to LC, RC, and LRC Circuits.	10	15
Unit - 3 Laplace Transform 3.1 Definition of Laplace transform, Laplace transform of standard functions. 3.2 Properties of Laplace transform such as Linearity, first shifting, second shifting, multiplication by t^n, division by t. 3.3 Inverse Laplace transforms. Properties- linearly first shifting, second shifting. Method of partial fractions, 3.4 Convolution theorem. 3.5 Laplace transform of derivatives, 3.6 Solution of differential equation using Laplace transform (up to second order equation).	08	14

Unit - 4	Fourier Series		
	4.1 Definition of Fourier series (Euler's formula).		07
	4.2 Series expansion of continuous functions in the intervals $(0, 2l)$, $(-l, l)$, $(0, 2\pi)$, $(-\pi, \pi)$	08	
	4.3 Series expansions of even and odd functions.		
	4.4 Half range series.		
Unit - 5	Numerical Methods		
	5.1 Solution of algebraic equations Bisection method.	05	07
	Regula-falsi method.	05	
	Newton – Raphson method.		07
	5.2 Solution of simultaneous equations containing 2 and 3 unknowns Gauss elimination method. Iterative methods- Gauss seidel and Jacobi's methods.		
	Total	48	70

Text /Reference Books:

Name of Authors	Titles of the Book	Name of the Publisher
Mathematics for polytechnic	S. P. Deshpande	Pune Vidyarthi Griha Prakashan, Pune
Calculus: single variable	Robert T. Smith	Tata McGraw Hill
Laplace Transform	Lipschutz	Schaum outline series.
Fourier series and boundary value problems	Brown	Tata McGraw Hill
Higher Engineering Mathematics	B. S. Grewal	Khanna Publication, New Dehli
Introductory Methods of Numerical analysis	S. S. Sastry	Prentice Hall Of India, New Dehli
Numerical methods for scientific & engineering computations	M. K. Jain & others	Wiley Eastern Publication.

COMPUTER PROGRAMMING THROUGH 'C'

Subject Code 2000302	Theory			No of Period in one session :50			Credits
	No. of Periods Per Week			Full Marks	:	100	03
	L	T	P/S	ESE	:	70	
	03	—	—	TA	:	10	
				CT	:	20	

Course Learning Objective:

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

Objective:

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

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

Contents: Theory		Hrs.	Marks
Unit -1	**Introduction to computer software:** ➢ Classification of computer software. • System software. • Application software. ➢ Programming languages. • Machine languages. • Assembly languages. • High level programming languages. ➢ Algorithms and flowchart.	[03]	
Unit -2	**Fundamental of C languages.** ➢ Introduction. • Background. • Characteristics of C. • Uses of C. ➢ Structure of a C program. ➢ Writing the first C program. ➢ Files used in a C program. • Source code files. • Header files. • Object files. • Binary executable files. ➢ Compiling and Executing C programs. ➢ Using comments. ➢ Characters used in C.	[08]	

	➢ Identifier. ➢ Keyword or Reserved words. ➢ Tokens. ➢ Constants. • Numeric constant. • String Character constant. ➢ Variables. ➢ Variable Declaration. ➢ Basic Data Types. ➢ Additional Data types. ➢ Operators and Expressions. ➢ Operator Precedence and Associativity. ➢ Type conversion and Type casting. ➢ Input/ Output statements in C.			
Unit -3	**<u>Decision Control and Looping Statements:</u>** ➢ Introduction to Decision control statements. ➢ Conditional Branching statements. • If statement. • If-else statement. • If-else-if statement. • Switch case. ➢ Iterative statements. • While loop. • Do-while loop. • For loop. ➢ Nested loops. ➢ Break and continue statements. • Break statement. • Continue statement. ➢ Goto statement.	[12]		

Unit -4	**Functions in 'C'.** ➢ Uses of functions. ➢ User defined functions. ➢ Function Declaration. ➢ Calling a function. ➢ Actual and formal Arguments. ➢ Rules to call a function. ➢ Function propotype. ➢ Recursion. • Use of Recursive function. ➢ Local or Internal variables. ➢ Global or External variables. ➢ Void function. ➢ Storage classes in C. • Auto or Automatic Storage class. • Static Storage class. • Extern Storage class. • Register Storage class.	[07]	
Unit -5	**Arrays.** ➢ Introduction. ➢ Declaration of Arrays. ➢ Accessing the Elements of an Array. • Calculating the address of Array elements. • Calculating the length of an Array. ➢ Storing values in Arrays. • Initializing Arrays during Declaration. • Inputting values from the keyboard. • Assigning values to Individual Elements. ➢ Operations on Arrays. • Traversing an Array. • Inserting an Element in an Array. • Deleting an Element from an Array. • Merging Two Arrays. • Searching for a value in an Array. ➢ Passing Arrays to functions. ➢ Two dimensional Arrays. • Declaring Two-dimensional Arrays. • Initializing Two-dimensional Arrays. • Accessing the Elements of two-dimensional Arrays. ➢ Operations on Two-dimensional Arrays.	[07]	

Unit -6	**Pointers.** ➢ Understanding the Computer's Memory. ➢ Introduction to pointers. ➢ Declaring pointer variables. ➢ Pointer Expressions and pointer Arithmetic. ➢ Null pointers. ➢ Passing Arguments to function using pointer. ➢ Pointers and Arrays. ➢ Passing an Array to a Function. ➢ Dynamic Memory Allocation. • Malloc ( ) function. • Calloc ( ) function. • Realloc ( ) function. • Free ( ) function.	[07]	
Unit -7	**Structures and Unions.** ➢ Structures. ➢ Structure variables and Arrays. • Initialization of structure variable and Array. • Dot (•) Operator. • Assigning value of a structure to Another structure. ➢ Structure within structures. ➢ Site of ( ) of a structure. ➢ Unions. ➢ Site of ( ) unions. ➢ Difference between a structure and an union. ➢ Enum Data Type. ➢ Typedef Declaration.	[04]	

Text / Reference Books -

No.	Title		Author
1.	Programming with C. Second Edition. Tata McGraw-Hill, 2000	-	Byron Gottfried
2.	How to solve by Computer, Seventh Edition, 2001, Prentice hall of India.	-	R.G. Dromey
3.	Programming with ANSI-C, First Edition, 1996, Tata McGraw hill.	-	E. Balaguruswami
4.	Programming with ANSI & Turbo C. First Edition, Pearson Education.	-	A. Kamthane
5.	Programming with C. First Edition, 1997, Tara McGraw hill.	-	Venugopla and Prasad
6.	The C Programming Language, Second Edition, 2001, Prentice Hall of India.	-	B. W. Kernighan & D.M. Ritchie
7.	Programming in C, Vikash Publishing House Pvt. Ltd., Jungpura, New Delhi.	-	R. Subburaj
8.	Programming with C Language, Tara McGraw Hill, New Delhi.	-	C. Balagurswami
9.	Programming in C, Galgotia Publications Pvt. Ltd. Dariyaganj, New Delhi.	-	Kris A. Jamsa
10.	The Art of C Programming, Narosa Publishing House, New Delhi.	-	Jones, Robin & Stewart
11.	Problem Solving and Programming. Prentice Hall International.	-	A.C. Kenneth
12.	C made easy, McGraw Hill Book Company, 1987.	-	H. Schildt
13.	Software Engineering, McGraw Hill, 1992.	-	R.S. Pressman
14.	Pointers in C, BPB publication, New Delhi.	-	Yashwant Kanetkar

INSTRUMENTATION AND PROCESS CONTROL

Subject Code 2040303	Theory			No of Period in one session: 50			Credits
	No. of Periods Per Week			Full Marks	:	100	03
	L	T	P/S	ESE	:	70	
	03	—	—	TA	:	10	
				CT	:	20	

Rationale and objectives: -

The instrument part deals with the principles and functioning of measuring instruments. Instrumentation is the use of measuring instruments to monitor and control of process variables within a laboratory, production or manufacturing area. While sensors and values are important in all aspects of engineering, they assume greatest importance in the study of automatic control which is termed process control when applied in process industries.

	Contents: Theory	Hrs.	Marks
Unit-1	**Measurement and Measuring systems: -** 1.1 Introduction 1.2 Measurementsystems 1.3 Methods of measurement 1.4 Classification of Instruments 1.5 Functions of Instrument and measuring system 1.6 Instrument Automation 1.7 Applications of measurement Instrumentation	**[04]**	
Unit-2	**Characteristics of Instruments and measuring systems :-** 2.1 Introduction 2.2 Static characteristics 2.3 Loading effects	**[04]**	
Unit-3	**Errors in Measurement: -** 3.1 Absolute error 3.2 Relative error and percentage error 3.3 Resolution and sensitivity 3.4 Accuracy and Precision 3.5 Types of errors	**[03]**	
Unit-4	**Analog Ammeters and Voltmeters: -** 4.1 Introduction 4.2 Moving Iron and moving Coil instruments 4.3 Dynamometer Type Instruments 4.4 Induction Type instruments	**[06]**	
Unit-5	**Extension of Instrument Range :-** 5.1 Ammeter shunts 5.2 Multipliers for Electrostatic Voltmeters 5.3 Current Transformers 5.4 Potential Transformers	**[04]**	
Unit-6	**Measurement of Power and Energy:-** 6.1 Introduction 6.2 Dynamometer type wattmeter 6.3 Induction type wattmeter 6.4 Measurement of energy	**[06]**	

Unit-7	**Measurement of Resistance, Inductance and capacitance: -**	**[08]**	
	7.1 Introduction		
	7.2 Measurement of low, medium and high resistance		
	7.3 Measurement of Inductance: Maxwell, Anderson, Hay and Owen bridges		
	7.4 Measurement of Capacitance by Schering bridge		
Unit-8	**Basics of Process control:-**	**[05]**	
	8.1 Basic concepts of Process control		
	8.2 Open look and closed look control		
	8.3 Process Variables		
	8.4 Types of control and their applications.		
	8.5 Process leg, measurement lag, dead time		
	8.6 Concept of on-off, Proportional, Integral and derivatic control.		
Unit-9	**Pneumatic Control elements:-**	**[04]**	
	9.1 Pneumatic pressure supply		
	9.2 Pneumatic actuators, relays, pressure switches contractors, etc.		
Unit-10	**Hydraulic control element:-**	**[04]**	
	10.1 Introduction		
	10.2 Hydraulic actuators		
	10.3 Hydraulic valves		
	Total	**48**	

BOOKS: -

1.	Electrical & Electronics Measurements	- A.K.Stwney- Dhanpat rai & Co.
2.	A course in Electronic and Electrical Measurements and instrumentation	- J.B.Gupta- S.K.Kataria & sons.
3.	Advance instrumentation & control	M.F.Kureshi.
4.	Process control by Harrist	P – Mc Graw Hill.
5.	Automatic process control	- Eckman D.P, Willey Eastern.
6.	Automatic process control systems Concepts and Hardware	- Ronald P Hunta P.E., P.H.I, New Delhi.

BASIC ELECTRONICS ENGINEERING

Subject Code 2040304	Theory			No of Period in one session: 50			Credits
	No. of Periods Per Week			Full Marks	:	100	
	L	T	P/S	ESE	:	70	03
	03	—	—	TA	:	10	
				CT	:	20	

Rationale

	Contents: Theory		Hrs.	Marks
Unit -1	**REVIEW OF THE BASIC CONCEPTS**		[04]	
	1.1	Voltage source.		
	1.2	Current source.		
	1.3	Conversion of voltage source into current source and vice-versa.		
	1.4	Parallel division of current and series division of voltage.		
	1.5	KCL and KVL.		
	1.6	Thevenin's and Norton's theorem.		
	1.7	Star delta connection.		
	1.8	Simple Problem.		
Unit -2	**SEMICONDUCTOR PHYSICS AND DEVICES**		[08]	
	2.1	Semiconductor.		
	2.2	Energy band description of semiconductor, effect of temperature on semiconductor.		
	2.3	Intrinsic and Extrinsic semiconductor		
	2.4	N-type and P-type semiconductor		
	2.5	P-N junction diode		
	2.6	V-I characteristics of p-n junction diode.		
	2.7	Simplified model of diode.		
	2.8	Applications of diode.		
	2.9	Diode as a rectifier		
	2.10	Full wave bridge rectifier		
	2.11	Clipper		
	2.12	Clamper		
	2.13	Simple problems related to diodes.		
Unit -3	**SPECIAL PURPOSE DIODE**		[06]	
	3.1	LED		
	3.2	Photo diode		
	3.3	Characteristics and Application		
	3.4	Tunnel diode and Varactor diode and their applications.		
	3.5	Avalanche and Zener effect		
	3.6	Zener diode and its application as a voltage regulator		
	3.7	Simple problems related to these devices.		

Unit -4	**TRANSISTOR AND TRANSISTOR BIASING**		**[12]**	
	4.1	Basic concepts of transistor.		
	4.2	Transistor as an amplifier.		
	4.3	Transistor connection in CE, CB, CC		
	4.4	Input/output mode		
	4.5	Transistor load line analysis		
	4.6	Operating point, cut off and saturation region, transistor biasing		
	4.7	Stabilization		
	4.8	Satiability factor		
	4.9	Thermal runaway		
	4.10	Different methods of transistor biasing		
	4.11	Concepts of h-parameters		
	4.12	H-parameter of a transistor nomenclature etc.		
	4.13	(Simple problems related to dc load line)		
	4.14	Operating point		
	4.15	Biasing and h-parameters.		
Unit -5	**TRANSISTOR AMPLIFIERS**		**[06]**	
	5.1	Single stage transistor amplifier		
	5.2	Phase reversal		
	5.3	DC and AC equivalent circuits		
	5.4	Voltage gain of CE amplifier		
	5.5	Classification of amplifier		
	5.6	Cas cading and its effects		
Unit -6	**JUNCTION FIELD EFFECT TRANSISTOR**		**[04]**	
Unit -7	**NEGETIVE FEEDBACK AMPLIFIERS / OSCILLATOR / MULTIVIBRATORS:-**		**[08]**	
	7.1	Basic concept of feedback		
	7.2	Advantage in disadvantage of –ve feedback		
	7.3	Classification of –ve feedback (in brief)		
	7.4	Barkhamsen's criteria		
	7.5	Oscillators (RC phase oscillator) Multivibrators		
		Total	**48**	

Books Recommended:

1. Fundamentals of Electrical and Electronics Engg. - Dr. Sri Bhagwan Singh and Prof. S. Tarlok Singh (Foundation Publishing house, Patna)
2. Principles of Electronics - Prof. V.K. Mehta (S. Chand)
3. Integrated Electronics - Millimon & Kalkijas
4. Basic Electronics - J. B. Gupta
5. Electronics - Malvino & Leach
6. Basic Electronics - Mittal
7. Basic Electronics - B. K. Mehta

DIGITAL CIRCUITS

Subject Code 2040305	Theory			No of Period in one session: 60			Credits
	No. of Periods Per Week			Full Marks	:	100	03
	L	T	P/S	ESE	:	70	
	03	—	—	TA	:	10	
				CT	:	20	

Rationale

The subject will help the students to learn concepts, facts, principle and working of digital circuits. These ideas can be used for designing sequential and combinational circuits. Which forms the basic of any electronics system.

Objective

The objective of this subject is to enable the students to know basic concepts of digital electronics. After undergoing this course, the students will have the concepts and awareness of various arithmetic circuits, registers, counter design, multiplexers, demultiplexers, encoders and decoder etc.

Contents: Theory		Hrs.	Marks
Unit -1	**INTRODUCTION :-** Digital and Analog systems. Number system: Binary, octal and hexadecimal. Conversion Binary codes: BCD, Gray and ASCII code Binary Addition and subtraction.	[03]	
Unit -2	**LOGIC GATES:-** AND, OR, NOT, NAND, EX-OR and EX-NOR gates. Truth table, symbol, logical expression and realization Universal gates.	[03]	
Unit -3	**ARITHMETIC OPERATION :-** Multiplication and division of two binary numbers. Complementary numbers, Addition and subtraction by one's Complement and Two's complement method.	[4]	
Unit -4	**BOOLEAN ALZEBRA :-** Logic operation Axioms and Laws of Boolean Algebra De-Morgan's Theorem. Duality Reducing Boolean Expressions.	[4]	
Unit -5	**KARNAUGH MAP :-** Introduction The standard sum of Products The standard Product of sums. Minterm and Maxterm specifications of Logical Functions. Karnaugh map representation of Logical Functions. Karnaugh map representation of Two, three and Four variables. Simplification of Logical functions with karnaugh. map.	[6]	

Unit -6	**COMBINATIONAL CIRCUITS: -** Introduction Half Adder, Half Subtractor, Full Adder Decoder. Encoder. Multiplexer. Demultiplexer.	**[6]**	
Unit -7	**SEQUENTIAL CIRCUITS: -** S-R Latch NOR gate and NAND gates. Flip Flops – S-R, D,T,J- kand master slave. Conversion of FFS (S-R to J-K, S-R to D and J-K Ff to T & D FF) MOS FF'S Application of FF'S, Data Storage	**[6]**	
Unit -8	**REGISTERS: -** The shift Register, clocking. Serial- Parallel Data Transfer. Shift-Right- Shift. Left Registers.	**[6]**	
Unit -9	**COUNTERS:-** Introduction. Asynchronous counters. Synchronous counters.	**[4]**	
Unit -10	**OP-AMP AND COMPARATOR :-** The operational Amplifier. Characteristics of an OP-AMP. CMRR The comparator. The Schmitt Trigger circuit.	**[6]**	
	Total	**48**	

BOOKS RECOMMENDED: -

1. Digital integrated electronics   T.M.H   Taub/schilling
2. Digital principles and Applications   T.M.H   Leach/Malvino/Saha
3. Modern Digital electronics   T.M.H   JAIN
4. Fundamentals of Digital electronics   P.H.I   A-Anand kumar
5. Microelectronics   T.M.H.(1987)   J. Millman & A. Galel
6. Digital logic & Computer design   P.H.I, New Delhi   A. Morries Merrow

Reference Books: -

1. Modern digital electronics   T.M.H   JAW
2. Fundamental of Digital electronics   P.H. I   A-Anand Kumar
3. Electronic circuits and systems   T.M.H   Y.N. Bapat
4. Digital electronic   T.M.H   V.K.Puri
5. Liner integrated circuits   Wiley eastern 1991   D. Roy chowdhary& S.B.Jain
6. Digital Electronics & Circuit   Malvino

COMPUTER PROGRAMMING THROUGH 'C' LAB

Subject Code 2000306	Practical			No. of Period in one session:			Credits
	No. of Periods Per Week			Full Marks	:	50	03
	L	T	P/S				
	—	—	06	Internal (PA)	:	15	
				External (ESE)	:	35	

Course Learning Objectives:

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

Course outcomes:

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

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

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

Reference Books:

1. Let Us C, Yashavant Kanetkar
2. Problem Solving and Programming in C, R.S. Salaria, Khanna Publishing House
3. C Programming Absolute Beginner's Guide, Dean Miller and Greg Perry
4. The C Programming Language, Kernighan and Ritchie, Prentice Hall of India
5. Programming in ANSI C, E. Balagurusamy, Tata McGraw-Hill
6. C Programming & Data Structures, B. A. Fouruzan and R. F. Gilberg, CENGAGE Learning.

ELECTRICAL MEASUREMENTS LAB

Subject Code 2040307	Practical						Credits
	No. of Periods Per Week			Full Marks	:	50	01
	L	T	P/S				
	—	—	02	Internal (PA)	:	15	
	—	—	—	External (ESE)	:	35	

CONTENTS: PRACTICAL

Skills to be developed:

Intellectual Skills:

1. Identification of instruments
2. Selection of instruments and equipment for measurement **Motor**

Skills:

1. Accuracy in measurement
2. Making proper connections

List of Practical's:

1. Measurement of Current and Voltages by Low range ammeter and voltmeter respectively with shunt and multiplier.
2. Measurement of Current and Voltages by Low range ammeter and voltmeter respectively by Using Current Transformer and potential Transformer.
3. Measurement of active and reactive power in three phase balanced load by single wattmeter method.
4. Measurement of active and reactive power in three phase balanced load by two wattmeter method and observe the effect of Power Factor variation on Wattmeter reading.
5. Calibration of Energy meter at various power factor by standard energy meter.
6. Measurement of energy in single phase & three phase balanced load using Electronic Energy Meter.
7. Measurement of Low resistance by Kelvin's Double Bridge.
8. Measurement of Medium resistance by Wheatstone bridge.
9. Measurement of Insulation Resistance by Megger.
10. a) Measurement of Resistance, Voltage, Current, Voltage, Current in A.C & D. C. Circuit by using digital multimeter.
    b) Measurement of A.C. Current by Clip-on ammeter
11. Measurement of Earth Resistance by Earth Tester.
12. Measurement of Circuit Parameters by LCR meter.
13. Measurement of power factor of single phase and three phase load by PF meter and verifying through I, V and P measurement.
14. Observe the phase sequence of three phase circuit Using Rotating type phase sequence Indicator.
15. Measurement of Frequency of A.C. Supply Using Weston or Ferro dynamic type Frequency meter.

WEB TECHNOLOGY LAB

SUBJECT CODE: 2018308	**Practical**			No. of period in one session:			Credits
	No. of Periods per Week			Full Marks :	:	25	**01**
	L	T	P/S				
		-	02	**Internal (PA)**	:	07	
				External (ESE)	:	18	

Course Learning Objectives:

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

Course outcomes:

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

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

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

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

Reference Books:

1. "Web Technologies--A Computer Science Perspective", Jeffrey C.Jackson
2. "Internet & World Wide Web How To Program", Deitel, Deitel, Goldberg, Pearson Education
3. "Web programming- Building Internet Application", Chris Bales
4. Web Applications: Concepts and Real World Design, Knuckles

ELECTRICAL & ELECTRONICS WORKSHOP PRACTICE

Subject Code 2040309	Practical			No of Period in one session :			Credits
	No. of Periods Per Week			Full Marks	:	50	
	L	T	P/S				02
	—	—	04	Internal (PA)	:	15	
				External (ESE)	:	35	

RATIONALE :- As a supervisor, electrical and electronic diploma holder has to inspect test and modify the work done by skilled workers. Sometimes he has to demonstrate the correct method and Procedure of doing certain operations. So an electrical & electronic diploma holder must have conceptual understanding of the method of procedure and posses manual skills in addition to supervisory capability**.**

OBJECTIVES :- To develop special skills required for repairing small electrical and electronic domestic appliances, making connections and carrying out work and detecting faults etc. in electrical & electronic equipments and circuits.

LIST OF PRACTICALS :-

	Contents : Practical	Hrs	Marks
Unit -1	1. Acquaintance with required tools and equipment used for electrical & electronics workshop. 2. Soldering the different joint straight or married joint T-joint; also the other electrical and electronic spares in the circuit. 3. To make straight or married joint and T-joint from 7/20 copper wire. 4. Batton, cleat and conduit wiring on a board, giving complete circuit to some lamp points and other load points. 5. To complete the wiring of a fluorescent tube light and to check the defects in choke, starter and tube if any. 6. To connect a table and ceiling fan with regulator and also test their running on power supply. 7. To make an earthing to a motor by earthing wire and measure the earth resistance. 8. To make an extension board, containing two 5A, 2-pin socket, one 5A, 3-pin socket, one 5A switch, one indicator and fuse. 9. To make a series test lamp board, containing one 5A switch, one 2-pin, 5A socket, one bulb holder, one indicator and fuse. 10. Wiring and connection of an electric bell, testing of no-volt coil and also to test the electric bell on power supply. 11. Dismantling, testing, repairing and assembling of domestic appliances like electric iron, room heater, water heater, electric kettle, ceiling fan, table fan and regulators. 12. To make coil for winding of small transformer used in alarm bell. 13. To make start and running winding of a ceiling fan. 14. To test electronic component with multimeter. 15. To measure resistance, voltage and current of an electronic component in a circuit. 16. To prepare a battery Eliminator. 17. To prepare an emergency lamp. 18. To test transistor in absence of their data's indicated by manufacturer, the base, emitter and collector leads whether it is NPN or PNP transistor. 19. To test the diode and also verify that which one is anode and cathode leads. 20. To make an automatic voltage stabilizer. 21. To make a Battery charger for charging the torch battery.		

ELECTRICAL & ELECTRONICS WORKSHOP PRACTICE -TW

Subject Code 2040310	Term Work			No of Period in one session :			Credits
	No. of Periods Per Week			Full Marks	:	50	01
	L	T	P/S	Internal (PA)	:	15	
	—	—	01	External (ESE)	:	35	

RATIONALE :- As a supervisor, electrical and electronic diploma holder has to inspect test and modify the work done by skilled workers. Sometimes he has to demonstrate the correct method and Procedure of doing certain operations. So an electrical & electronic diploma holder must have conceptual understanding of the method of procedure and posses manual skills in addition to supervisory capability.

OBJECTIVES :- To develop special skills required for repairing small electrical and electronic domestic appliances, making connections and carrying out work and detecting faults etc. in electrical & electronic equipments and circuits.

LIST OF PRACTICALS :-

		Contents :Term Work	Hrs/week	Marks
Unit -1	22.	Acquaintance with required tools and equipment's used for electrical & electronics workshop.		
	23.	Soldering the different joint straight or married joint T-joint; also the other electrical and electronic spares in the circuit.		
	24.	To make straight or married joint and T-joint from 7/20 copper wire.		
	25.	Batton, cleat and conduit wiring on a board, giving complete circuit to some lamp points and other load points.		
	26.	To complete the wiring of a fluorescent tube light and to check the defects in choke, starter and tube if any.		
	27.	To connect a table and ceiling fan with regulator and also test their running on power supply.		
	28.	To make an earthing to a motor by earthing wire and measure the earth resistance.		
	29.	To make an extension board, containing two 5A, 2-pin socket, one 5A, 3-pin socket, one 5A switch, one indicator and fuse.		
	30.	To make a series test lamp board, containing one 5A switch, one 2-pin, 5A socket, one bulb holder, one indicator and fuse.		
	31.	Wiring and connection of an electric bell, testing of no-volt coil and also to test the electric bell on power supply.		
	32.	Dismantling, testing, repairing and assembling of domestic appliances like electric iron, room heater, water heater, electric kettle, ceiling fan, table fan and regulators.		
	33.	To make coil for winding of small transformer used in alarm bell.		
	34.	To make start and running winding of a ceiling fan.		
	35.	To test electronic component with multimeter.		
	36.	To measure resistance, voltage and current of an electronic component in a circuit.		
	37.	To prepare a battery Eliminator.		
	38.	To prepare an emergency lamp.		
	39.	To test transistor in absence of their data's indicated by manufacturer, the base, emitter and collector leads whether it is NPN or PNP transistor.		
	40.	To test the diode and also verify that which one is anode and cathode leads.		
	41.	To make an automatic voltage stabilizer.		
	42.	To make a Battery charger for charging the torch battery.		

PYTHON - TW

Subject Code 2018311	Term Work			No of Period in one session :			Credits
	No. of Periods Per Week			Full Marks	:	25	01
	L	T	P/S	Internal (PA)	:	07	
	—	—	02	External (ESE)	:	18	

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

References Books:

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

2. Starting Out with Python, Tony Gaddis, Pearson

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

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

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