

STATE COUNCIL OF TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA
TEACHING AND EVALUATION SCHEME FOR DIPLOMA IN ENGINEERING COURSES

DISCIPLINE: ELECTRICAL ENGINEERING (PT)						SEMESTER: 3 RD						
SL NO	SUBJECT CODE	SUBJECT	PERIODS			EVALUATION SCHEME						
			L	T	P	INTERNAL EXAM			END SEM EXAM	TERM WORK	PRACTICAL EXAM	TOTAL MARKS
						TA	CT	Total				
THEORY												
1.	BST 301	ENGINEERING MATH – III	4	1	0	10	20	30	70			100
2.	PBT 301/ BET104	COMPUTER APPLICATION	4	1	0	10	20	30	70			100
3.	PBT302/ BET 102	BASIC ELECTRONICS	4	1	0	10	20	30	70			100
4.	PET 301/ EET 302	ELECTRICAL ENGINEERING MATERIAL	4	0	0	10	20	30	70			100
PRACTICAL/TERM WORK												
5.	PBP 301/ BEP 104	COMPUTER APPL. LAB			2	-	-		-	25		25
6.	PBP 302/BEP 102	BASIC ELECTRONICS LAB.			2	-	-		-	25		25
7.	PBP 303/ BEP106	MECHANICAL WORKSHOP PRACTICE			5	-	-		-	25	25	50
GRAND TOTAL			16	3	9	40	80	120	280	75	25	500

Total Contact hours per week: 28

Abbreviations: L-Lecture, T-Tutorial, P-Practical, TA- Teacher's Assessment, CT- Class test

Minimum Pass Mark in each Theory Subject is 35% and in Practical subject is 50%

ENGINEERING MATHEMATICS – III

(COMMON TO ELECT/CSE/ETC, AE & I/CP/IT/MECH/AUTO)

Name of the Course: Diploma in Electrical Engineering (PT)			
Course code:	BST 301	Semester	3 rd
Total Period:	60	Examination	3 hrs
Theory periods:	4P / week	Class Test:	20
Tutorial:		Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

A. RATIONALE:

The subject Engineering Mathematics-III, is a common paper for Engineering branches. This subject includes Matrices, Laplace Transforms, Fourier Series, Differential Equations and Numerical Methods etc. for solution of Engineering problems.

B. OBJECTIVE:

On completion of study of Engineering Mathematics-III, the students will be able to:

1. Apply matrices in Engineering mechanics, electrical circuits and linear programming.
2. Transform Engineering problems to mathematical models with the help of differential equations and familiarize with the methods of solving by analytical methods, transform method, operator method and numerical methods.
3. Solve algebraic and transcendental equations by Iterative methods easily programmable in computers.
4. Analysis data and develop interpolating polynomials through method of differences.

C. Topic wise distribution of periods:

Sl. No.	Topics	Period
1	Matrices	04
2	Differential equation	12
3	Laplace transform	14
4	Fourier series	14
5	Numerical methods	04
6	Finite difference & Interpolation	12
	Total:	60

COURSE CONTENTS

	COURSE CONTENTS	Periods
1.	MATRICES	04
	1.1 Define rank of a matrix.	
	1.2 Perform elementary row transformation to determine the rank of a matrix.	
	1.3 State Rouche's Theorem for consistency of a system of linear equations in 'n' unknowns.	
	1.4 Solve equations in three unknowns testing consistency.	
2.	Linear Differential Equations	12
	2.1 Define Homogeneous and non-homogeneous differential equations	

with constant coefficients with examples.

- 2.2 Find general solution of linear equations in terms of C.F. and P.I.
- 2.3 Derive rules of finding C.F. and P.I. in terms of operator D.
- 2.4 Define Partial Differential equations(P.D.E.)
- 2.5 Form partial differential equations by eliminating arbitrary constants and arbitrary functions.
- 2.6 Solve partial differential equations of the form $P.p+Q.q=R$
- 2.7 Solve Engineering problems on 2.1-2.6.

3. LAPLACE TRANSFORMS

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- 3.1 Define Gamma function and $\Gamma(n+1) = n!$ and find $\Gamma(\frac{1}{2}) = \sqrt{\pi}$ (No problem)
- 3.2 Define Laplace transform of a function $f(t)$ and inverse laplace transform.
- 3.3 Derive L.T. of standard functions and explain existence conditions of L.T.
- 3.4 Explain linear, shifting and Change of scale property of L.T.
- 3.5 Formulate L.T. of derivatives, integrals, multiplication by t^n and division by t .
- 3.6 Derive formula of inverse L.T.
- 3.7 Solve Linear Differential Equations with constant coefficients associated with initial conditions using Transform Method(upto 2nd order only).
- 3.8 Solve problems on 3.2- 3.7

4 FOURIER SERIES

14

- 4.1 Define periodic functions
- 4.2 State Dirichlet's conditions for the Fourier expansion of a function and its convergence.
- 4.3 Express periodic function $f(x)$ satisfying Dirichlet's conditions as a Fourier series.
- 4.4 State Euler's formulae.
- 4.5 Define Even and Odd functions and Obtain F.S. in $(0 \leq x \leq 2\pi$ and $-\pi \leq x \leq \pi)$
- 4.6 Obtain F.S. of continuous functions and functions having points of discontinuity in $(0 \leq x \leq 2\pi$ and $-\pi \leq x \leq \pi)$.
- 4.7 Solve problems on 4.1-4.6

5 NUMERICAL METHODS

04

- 5.1 Appraise limitations of analytic method of solution of algebraic and transcendental equations.

- 5.2 Derive Iterative formula for finding the solutions of algebraic and transcendental equations by:
 a) Bisection method
 b) Newton Raphson method
- 5.3 Solve problems on 5.2

6 FINITE DIFFERENCE and INTERPOLATION

12

- 6.1 Explain finite difference and form table of forward and backward difference.
- 6.2 Define shift operator(E) and establish relation between E and difference operator(Δ).
- 6.3 Derive Newton's forward and backward interpolation formula for equal interval.
- 6.4 State Lagrange's Interpolation formula for unequal intervals.
- 6.5 Explain numerical integration and state
 6.5.1 Newton-Cote's formula(No derivation)
 6.5.2 Trapezoidal Rule
 6.5.3 Simpson's 1/3rd rule
- 6.6 Solve Problems on 6.1-6.5

Learning Resources:

Sl.No	Name of Authors	Title of the Book	Name of Publisher
Text Book:			
1	Dr.B.S. Grewal	Higher Engineering Mathematics	Khanna Publishers

Reference Book

- 1 Text book of Engineering Mathematics-III By C.R.Mallick Kalyani Publication

COMPUTER APPLICATION

Name of the Course: Diploma in Electrical Engineering (PT)			
Course code:	PBT 301/ BET 104	Semester	3 rd
Total Period:	75 (60L + 15T)	Examination	3 hrs
Theory periods:	4P / week	Class Test:	20
Tutorial:	1 P / week	Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

A. Objective:

The students will get to know about the fundamentals of computer. They will get acquainted with various components of computer hardware, software etc. Idea on Role of operating system and its usability will also be known. Knowledge on word processing, electronic spreadsheet, presentation software and Internet will also be acquired. The students will be given brief knowledge about Programming methodology and C programming.

B. Topic wise distribution of periods

Sl.No	Topics	Periods(L)
1	Computer Organisation	05
2	Computer Software	07
3	Computer Network and Internet	08
4	File Management and Data Processing	05
5	Problem Solving Methodology	05
6	Overview of C Programming language	15
7	Advanced features of C	15
	Total	60

C. COURSE CONTENT

1.	COMPUTER ORGANISATION	05
1.1	Introduction to Computer	
1.2	Evolution of Computers	
1.3	Generation of Computers	
1.4	Classification of Computers	
1.5	Basic Organisation of Computer (Functional Block diagram)	

1.6	Input Devices, CPU & Output Devices	
1.7	Computer Memory and Classification of Memory	
2.	COMPUTER SOFTWARE	07
2.1	Software concept	
2.2	System software	
2.3	Application software	
2.4	Overview of Operating System	
2.5	Objectives and Functions of O.S	
2.6	Types of Operating System	
2.7	Batch Processing, Multiprogramming, Time Sharing OS	
2.8	Features of DOS, Windows and UNIX	
2.9	Programming Languages	
2.10	Compiler, Interpreter	
2.11	Computer Virus	
2.12	Different Types of computer virus	
2.13	Detection and prevention of Virus	
2.14	Application of computers in different Domain	
3.	COMPUTER NETWORK AND INTERNET	08
3.1	Networking concept, Protocol, Connecting Media,	
3.2	Data Transmission mode	
3.3	Network Topologies,	
3.4	Types of Network	
3.5	Networking Devices like Hub, Repeater, Switch, Bridge, Router, Gateway & NIC	
3.6	Internet Services like E-Mail, WWW, FTP, Chatting, Internet Conferencing, Electronic Newspaper & Online Shopping	
3.7	Different types of Internet connectivity and ISP	
4.	FILE MANAGEMENT AND DATA PROCESSING	05
4.1	Concept of File and Folder	
4.2	File Access and Storage methods.	
4.3	Sequential, Direct, ISAM, Data Capture, Data storage	

4.4	Data Processing and Retrieval	
5.	PROBLEM SOLVING METHODOLOGY	05
5.1	Algorithm, Pseudo code and Flowchart	
5.2	Generation of Programming Languages	
5.3	Structured Programming Language	
5.4	Examples of Problem solving through Flowchart	
6.	OVERVIEW OF C PROGRAMMING LANGUAGE	15
6.1	Constants, Variables and Data types in C	
6.2	Managing Input and Output operations.	
6.3	Operators, Expressions, Type conversion & Typecasting	
6.4	Decision Control and Looping Statements (If, If-else, If-else-if, Switch, While, Do-while, For, Break, Continue & Goto)	
6.5	Programming Assignments using the above features.	
7.	ADVANCED FEATURES OF C	15
7.1	Functions and Passing Parameters to the Function (Call by Value and Call by Reference)	
7.2	Scope of Variables and Storage Classes	
7.3	Recursion Function and Types of Recursion	
7.4	One Dimensional Array and Multidimensional Array	
7.5	String Operations and Pointers	
7.6	Pointer Expression and Pointer Arithmetic	
7.7	Programming Assignments using the above features	
7.8	Structure and Union (Only concepts, No Programming)	

Learning Resources:			
Text Books			
Sl.No	Name of Authors	Title of the Book	Name of Publisher
1.	Reema Thareja	Computer Fundamentals and Programming in C	Oxford University Press
2.	A.N Kamthane	Programming in ANSI C	Pearson Education
3.	Y Kanetkar	Let us C	BPB
4.	E. Balaguruswamy	Computer Fundamentals	TMH

BASIC ELECTRONICS ENGINEERING

Name of the Course: Diploma in Electrical Engineering (PT)			
Course code:	PBT 302 / BET 102	Semester	3 rd
Total Period:	75 (60L + 15 T)	Examination	3 hrs
Theory periods:	4P / week	Class Test:	20
Tutorial:	1 P/ week	Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

A. RATIONALE:

Electronics plays major in our day to day life. In each and every field, electronics systems are used. Basic electronics is one of the subjects which is the base of all advance electronics .It starts with PN junction which makes the student to follow the functioning of all semiconductor based electronics. This is a core group subject and it develops cognitive and psychomotor skills. Basic electronics is one of the subjects which are the base of all advance electronics. The student will also acquire brief knowledge about communication system as well as transducers and measuring instruments.

B. OBJECTIVE:

Student will be able to:

1. Know what is Electronics & its application.
2. Describe the formation of PN junction.
3. Draw the characteristics of basic components like diode, transistor etc.
4. Draw and describe the basic circuits of rectifier, filter, regulator and amplifiers.
5. Know voltage & power amplifiers.
6. Test diode and transistors.
7. Read the data sheets of diode and transistors.

C. Topic wise distribution of periods

Sl. No.	Topics	Periods
1.	Electronic Devices	05
2.	Semiconductor Diode	09
3.	Rectifiers & Filters	08
4.	Transistors	12
5.	Regulated Power Supply	08
6.	Small Signal Amplifiers (CE)	07
7.	Audio & Video Power Amplifier & Oscillator	04
8.	Transducers & Measuring Instruments	04
9.	Communication Systems	03
	TOTAL	60

D. CONTENTS

1. ELECTRONIC DEVICES	05
1.1 Define Electronics & its application.	
1.2 Define Electronic Emission & different types of Emission.	
1.3 Classification of Solid according to electrical conductivity (Conductor, Semiconductor & Insulator) with respect to energy band diagram only.	
1.4 Discuss Intrinsic & Extrinsic Semiconductor.	
1.5 Explain the difference between vacuum tube & semiconductor.	
1.6 State basic concept of integrated circuits (I.C) & its use.	
2. SEMICONDUCTOR DIODE	09
2.1 Define Rectifier & state its use.	
2.1.1 Rectifying diode	
2.1.2 Review of P-type and N-type semiconductor, PN junction Diode, circuit diagram & its symbol, PN junction Barrier voltage, Depletion region, Junction Capacitance.	
2.1.3 Forward & reverse bias & V-I Characteristics of PN junction diode.	
2.1.4 Specifications:-(Definition)	
2.1.5 Forward voltage drop, Reversed saturation current, maximum forward current, power dissipation of diodes of different power ratings	
2.2 Zener Diode	
2.2.1 Construction (reference to doping level)	
2.2.2 Symbol, circuit diagram for characteristics (forward & reverse bias)	
2.2.3 Avalanche & Zener breakdown.	
2.3 Special Diodes	
2.3.1 Tunnel diode	
2.3.2 Optical Diodes	
2.3.3 LED, photo diode & IR LED (Symbol, working principle & application of each)	
3. RECTIFIERS & FILTERS	08
3.1 Rectifier - Definition & Need of rectifier	
3.1.1 Types of Rectifier – Half wave rectifier, Full wave rectifier (Bridge & Center tapped)	
3.1.2 Circuit operation: Input/output waveforms for voltage & current, Average (dc) value of current & voltage (no derivation), Ripple, ripple factor, ripple frequency, PIV of diode used, transformer utilization factor, efficiency of	

	rectifier. (Definition)	
3.1.3	Comparisons of three types of rectifier	
3.2	Filters	
3.2.1	Need of filters & Types of filter [i] Shunt Capacitor [ii] Series Inductor [iii] LC filter [iv] π filter	
3.2.2	Circuit operation, ripple factor, ripple frequency, Input/output waveforms, limitations& advantages. (Definition & no derivation)	
4.	TRANSISTORS	12
4.1	Bipolar Junction Transistor (BJT). Basic concept, Define Transistor	
4.1.1	Types of transistors, symbols, Transistor operation Conventional current flow, relation between different currents in transistor(I_e , I_c & I_b)	
4.1.2	Transistor amplifying action Transistor configurations:- CB, CE, & CC-Circuit diagram to find the characteristics, Input/output characteristics. (No derivation)	
4.1.3	Transistor parameters –Input resistance, output resistance, α , β & relation between them.	
4.1.4	Transistor specification: $V_{CE\text{ Sat}}$, $I_{C\text{ Max}}$, V_{CEO} , I_{CEO} , α , β , V_{CE} Breakdown, Power dissipation (Definition -1 using data sheets)	
4.1.5	Construction, working principle, characteristics of photo Transistor (Introduction to Opto-coupler only)	
4.2	Unipolar Transistor (JFET) Symbol, Construction, working principle & applications	
4.3	Biasing of BJT	
4.3.1	Introduction, need of biasing, Types of biasing circuits (only name),circuit operation of Base biased circuit (only), concept of dc load line, Saturation, Cut off, selection of operating point (Q point), need of stabilization of Q point.	
5.	REGULATED POWER SUPPLY	08
5.1	What is a Regulator?	
5.1.1	Need of regulators, voltage regulation factor	
5.1.2	Concept of load regulation & line regulation	
5.1.3	Basic Zener diode as a voltage regulator	
5.2	Linear Regulators	
5.2.1	Basics block diagram of dc Regulated power supply	
5.3	IC's Voltage Regulator – 78xx, 79xx (as fixed) & LM 317 (as variable)	
6.	SMALL SIGNAL AMPLIFIERS (CE)	07
6.1	Concept of Amplification	
6.1.1	Small signal amplifier using BJT power gain, voltage gain.	
6.1.2	AC Load Line.	
6.1.3	Function of Input & Output coupling capacitors	
6.1.4	Function of emitter bypass capacitor.	
6.2	AC equivalent circuit of transistor CE amplifier (Circuit diagram only)	

6.3 Single stage CE amplifier with voltage divider bias and its explanation.

6.4 Bel, Decibel & Bandwidth (Definition).

6.5 Define Cascade Amplifiers (Multistage Amplifier)

6.5.1 Need of Multistage Amplifiers, Gain of amplifier.

7. AUDIO & VIDEO POWER AMPLIFIER & OSCILLATOR 04

7.1 Define voltage & power amplifier and their application.

7.2 Define Oscillator & its application & types (only names)

7.2.1 Explain essentials of transistor Oscillator.

8. TRANSDUCERS AND MEASURING INSTRUMENTS 04

8.1 Define Transducer.

8.2 Classify different type of Transducers.

8.3 Discuss working of Thermocouple & its application

8.4 Explain working of Multimeter and comparison between Analog and Digital Multimeter

8.5 Explain Block diagram of CRO, Measurement (Frequency & Amplitude) & its use.

9. COMMUNICATION SYSTEM 03

9.1 Define Modulation & its need.

9.2 Name different types of Modulation (AM, FM & PM)

9.3 Discuss Amplitude Modulation & Frequency Modulation (Signal, Carrier Wave &

Modulated Wave) (No Mathematical Derivation.)

9.4 Define Demodulation.

Learning Resources:			
Text Books			
Sl.No	Name of Authors	Title of the Book	Name of Publisher
1.	Mitchel E. Schultz	Grob's Basic Electronics	Tata McGraw Hill
2.	V. K. Meheta & Rohit Mehta	Principle of Electronics	S.Chand & Company Ltd
3.	L. Boylestad & Louis Nashelsky	Electronic Device & Circuit Theory	Pearson Publication
Reference Books			
1.	David A. Bell	Electronics Devices and Circuits	Oxford University Press

Electrical Engineering Material

Name of the Course: Diploma in Electrical Engineering (PT)			
Course code:	PET 301/ EET 302	Semester	3 rd
Total Period:	60	Examination	3 hrs
Theory periods:	4P/week	Class Test:	20
Tutorial:	0	Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

A. Rationale:

Electrical Engg. Materials hold prime importance for Electrical Engineers in design, installation & maintenance of electrical equipments. With the advent of latest metallurgical processes the materials used in the design processes brings safer and hazard free electrical installations. Hence basic knowledge on electrical Engineering materials is essential.

B. Objectives:

1. To clarify the students on insulating, conducting & magnetic materials.
2. To impart knowledge on the Physical, Electrical & Mechanical properties
3. To impart knowledge on practical uses of various materials in different areas.

C. TOPIC WISE DISTRIBUTION OF PERIODS

Sl No.	Topic	Periods
1.	CONDUCTING MATERIALS	16
2.	SEMICONDUCTING MATERIALS	10
3.		09
4.	INSULATING MATERIALS	08
5.	DIELECTRIC MATERIALS	08
6.		09
	MAGNETIC MATERIALS	60
	MATERIAL FOR SPECIAL PURPOSES	

Total:

D. COURSE CONTENT:

1.	Conducting Materials:	16
	1 . 1 Introduction	
	1 . 2 Resistivity, factors affecting resistivity	
	1 . 3 Classification of conducting materials into low-resistivity and high resistivity materials	
	1 . 4 Low Resistivity Materials and their Applications	
	1 . 4.1 Copper	
	1 . 4.2 Silver	

	3.2.5	Chemical properties	
	3.2.6	Ageing	
	3.3	Insulating Materials – Classification, properties, applications	
	3.3.1	Introduction	
	3.3.2	Classification of insulating materials on the basis physical and chemical structure	
	3.4	Insulating Gases	
	3.4.1	Introduction	
	3.4.2	Commonly used insulating gases	
4.		Dielectric Materials:	08
	4.1	Introduction	
	4.2	Dielectric Constant of Permittivity	
	4.3	Polarisation	
	4.4	Dielectric Loss	
	4.5	Electric Conductivity of Dielectrics and their Break Down	
	4.6	Properties of Dielectrics	
	4.7	Applications of Dielectrics	
5.		Magnetic Materials:	08
	5.1	Introduction	
	5.2	Classification	
	5.2.1	Diamagnetism	
	5.2.2	Para magnetism	
	5.2.3	Ferromagnetism	
	5.3	Magnetization Curve	
	5.4	Hysteresis	
	5.5	Eddy Currents	
	5.6	Curie Point	
	5.7	Magneto-striction	
	5.8	Soft and Hard magnetic Materials	
	5.8.1	Soft magnetic materials	
	5.8.2	Hard magnetic materials	
6.		Materials for Special Purposes	09
	6.1	Introduction	
	6.2	Structural Materials	
	6.3	Protective Materials	
	6.3.1	Lead	
	6.3.2	Steel tapes, wires and strips	
	6.4	Other Materials	
	6.4.1	Thermocouple materials	
	6.4.2	Bimetals	
	6.4.3	Soldering Materials	
	6.4.4	Fuse and Fuse materials	
	6.4.5	Dehydrating material	

Learning Resources:**Text Books**

Sl.No	Name of Authors	Title of the Book	Name of Publisher
1	K.B.Raina,S.K. Bhattacharya, T. Joneja	Electrical Engg. Material & Electronic components	S. K. Kataria & Sons
2	R.K.Shukla, Archana Singh	Electrical Engineering Materials	Mc Graw Hill

BASIC ELECTRONICS LAB

Name of the Course: Diploma in Electrical Engineering (PT)			
Course code:	PBP 302/BEP 102	Semester	3 rd
Total Period:	30	Examination	4 hrs
Lab. periods:	2 P / week	Term Work	25
Maximum marks:	25	End Semester Examination:	00

Skills to be developed:

1. Draw the symbols of components
2. Identification & selection of components.
3. Interpretation of circuits.
4. Understand working of Regulated dc power supply.
5. Measure Current, voltage using Instrument

List of Practical

1. Identify different types of tools and essential equipment in Electronics Laboratory (Sl no 1 to 16 of Tool list)
2. Draw the symbols of different Electronic Components
3. Study of Analog & Digital Multimeter (Front Panel) & Measurement of voltage, current and resistance using Multimeter
4. Identify & test the different Active & Passive components, Switches, Cables, Connector & perform Soldering practice & its testing.
5. Study of Front Panel Control of Oscilloscope (Analog & Storage) & measurement of Frequency & Amplitude of wave forms
6. To plot Forward & Reverse basic characteristics of diode.
7. To plot forward & reverse basic characteristics of Zener diode.
8. To study the Rectifier a) Half wave and b) Full wave (draw I/p & o/p wave forms.)
9. To study the Filter circuits. a) Capacitors Filter b) π filter & draw its wave forms.
10. To Plot Input & Output characteristics of transistor in CE mode.
11. To study the Zener Diode as Regulator & calculate load regulation.
12. To study Single stage common emitter amplifier.
13. Project Work - Construct of IC regulated Power Supply using 78xx, 79xx, LM317 as fixed /variable which include rectifier circuit – (**Any one**)

Computer Application LAB

Name of the Course: Diploma in Electrical Engineering (PT)			
Course code:	PBP 301/ BEP 104	Semester	3 rd
Total Period:	30	Examination	4 hrs
Lab. periods:	2 P / week	Term Work	25
Maximum marks:	25	End Semester Examination:	00

1. **BASIC COMPUTER OPERATION** 02P
 Identification of different components of Computer
 Switch on and Booting Process
 Shut down, Restart of compute
2. **OPERATING SYSTEM** 13P
 Basic DOS commands (CLS, DIR, DATE, TIME, VERSION, MD, CD, RD, DEL, COPY, REN, USE OF WILD CARDS, PATH)
 Basic Windows OS operations (DESKTOP, ICONS,, START BUTTON, TASK BAR)
 MOUSE OPERATIONS- SINGLE CLICK, DOUBLE CLICK, DRAG,MAXIMIZE, MINIMIZE, RESTORE
 Windows Explorer, My Computer, Files and Folders, Copy, Cut, Paste
 Utilities: Word, notepad, paint, calculator etc
3. **WORKING WITH MS-OFFICE** 20P
 Basic operations of Word Processing Package. (MS-Word / Apache Open Office Writer)
 Basic operations of Electronic Spread Sheet Package. (MS-Excel / Apache Open Office Calc)
 Basic operations of Presentation Package (MS- Power point / Apache Open Office Impress)
 [Create, Edit, Format, Save, Print/View in the above three packages]
4. **WORKING WITH INTERNET** 10P
 Getting acquainted with Internet connection, Browser, website
 URL, webpage, http, WWW, net browsing
 Creating E-Mail Id, sending and receiving E-mail Chatting
5. **C – PROGRAMMING** 15P
 1. Write a Program in C to find the greatest number among three integers.
 2. Write a Program in C to find the average of n numbers by using for loop.
 3. Write a Program in C to compute $(a + b)^3$
 4. Write a Program in C to convert time in seconds to time in hours, minutes and seconds.
 5. Write a program in C to find the sum of the following series.
 $1 + \frac{1}{x} + \frac{1}{x^2} + \dots + \frac{1}{x^n}$
 6. Write a program in C to determine whether a number is prime or not?
 7. Write a program in C to compute simple interest and compound interest of a given principal, rate of interest and time period.
 8. Write a program in C to check whether a given number is palindrome or not?

9. Write a program in C to compute the sine series.
10. Write a program in C to accept row wise and column wise element in a two dimensional array and print them.
11. Write a program in C to find the number of times an element occurs in an array.
12. Write a program in C to find the vowels in a given string.
13. Write a program in C to find the factorial of a number, by using recursion.
14. Write a program in C to find the sum of Fibonacci series, by using function.
15. Write a program in C to accept a number from keyboard and print it in reverse order of entry, by using function.

MECHANICAL WORKSHOP PRACTICE

Name of the Course: Diploma in Electrical Engineering (PT)			
Course code:	PBP 303/ BEP106	Semester	3 rd
Total Period:	90	Examination	4 hrs
Lab. periods:	6 P / week	Term Work	25
Maximum marks:	50	End Semester Examination:	25

Objective:

1. To demonstrate safely practice in various shops of the workshop.
2. To select suitable tools & equipment in the following shops.
 - (a) Fitting.
 - (b) Sheet Metal.
 - (c) Welding (Gas & Electrical).
 - (d) Turning.
3. To select suitable materials for different process in the above shops.
4. To demonstrate the different processes adopted in the above shops.
5. To finish the jobs within stipulated time and with accuracy as per specifications.

Topic Wise distribution of periods

Sl. No.	Topics	Periods
1	Fitting Shop	24
2	Sheet Metal	18
3	Welding Shop	24
4	Turning Shop	21
5	Exposure to CNC Milling / Lathe Machine	03
	TOTAL	90
1	FITTING SHOP	24
	1.1 Demonstrate safety practices in the fitting shop.	
	1.2 Select suitable holding & clamping devices for fitting jobs.	
	1.3 Select suitable tools like- files, vice, chisels, punch, scriber, hammers, surface plate, V-block, try square, caliper etc.	
	1.4 Demonstrate the following operations: Sawing, Chipping, Fitting, Craping, Grinding, Marking, Reaming, Tapping, Drilling & Angular cutting.	
	1.5 Introduction of chipping, demonstration on chipping and its applications.	
	1.6 Description, demonstration and practice of simple operation of hack saw straight and angular cutting.	
	1.7 Introduction and use of measuring tools used in fitting shop like steel rule, measuring tape, outside micrometer, vernier caliper and vernier height gauge.	
	1.8 Description and Demonstration and practice of thread cutting using taps and dies. Job: Cutting & fitting practice on a square of 50mm X 50mm X 8mm MS Flat.	
	Job: Angular cutting practice of 45 degree (on the above job).	
	Job: Preparation of stud (to cut external threads) with the help of dies (mm or BSW).	

	Job: H-fitting in the mild steel (ms) square. Job: Prepare one job on male female fitting.	
2	SHEET METAL 2.1 Demonstrate safety practices in sheet metal shop. 2.2 Prepare surface development for the jobs according to the drawing. 2.3 Cut M.S and G.P. sheets according to the surface development / drawing using standard sheet metal cutting tools. 2.4 Select hand tools for sheet metal work. 2.5 Demonstrate the process of metal clamp joining and reveted joining of sheet metals. Job: Making of sheet metal joints. Job: Prepare a sheet metal tray or a funnel. Job: Prepare a sheet metal job involving rolling, shearing, creasing, bending & cornering. Job: Prepare a lap riveting joint.	18
3	WELDING SHOP 3.1 Introduction. 3.2 Safety precautions in welding, safety equipments & its application in welding shop. 3.3 Introduction to welding, type of welding, common materials that can be welded, introduction to gas welding equipment, types of flame, adjustment of flame, applications of gas welding, Welding tools & safety precautions. 3.4 Introduction to electric arc welding (AC & DC), practice in setting current & voltage for striking proper arc, precautions while using electric arc welding. Applications of arc welding. Introduction to polarity & their use. 3.5 Demonstrate & use of the different tools used in the welding shop with sketches, Hand shield, helmet, clipping hammer, gloves, welding lead, connectors, aprons, goggles, etc. 3.6 Demonstrate of welding defects & various types of joints & end preparation. Job: Preparation of lap joint by arc welding rod. Job: Preparation of Tee joint by arc welding. Job: Preparation of single V or double V butt joint by electric arc welding. Job: Brazing practice. Use of Spelt or (on MS sheet pieces). Job: Gas welding practice on worn-out & broken parts.	24
4	TURNING SHOP 4.1 Introduction. 4.2 Safety precaution & safety equipments. 4.3 Various marking, measuring, cutting & holding tools. 4.4 Demonstration of different parts of a lathe, demonstration on centering & turning operation in a group of 06 students. Job: plain turning, taper turning & grooving practices on round bar.	21
5	EXPOSURE TO C.N.C MILLING / LATHE MACHINE	03

Learning Resources:

Reference Books

Sl.No	Name of Authors	Title of the Book	Name of Publisher
1.	S.K.Hajara Choudhry	Workshop Technology	Media Promoters Publishers, New Delhi.
2.	B.S. Raghubanshi	Workshop Technology	Dhanpat Rai and Sons
3.	H.S. Bawa	Workshop Technology	TMH.
4.	E Wilkinson	Workshop Familiarization	
5.	Bruce & Meyer	Sheet metal shop practice	
6.	R.S. Khurmi & J.K. Gupta	Workshop Technology	S.Chand

Notes

1. Work, Progress book should be maintained continuously.
2. The roll numbers of the students must be punched on each job.
3. The turning shop job should be done by students' maximum 06 students in a group.