

**GOVERNMENT POLYTECHNIC, NAGPUR.**

(An Autonomous Institute of Govt. of Maharashtra)

**COURSE CURRICULUM****PROGRAMME : DIPLOMA IN ME/PK/MT****LEVEL NAME : BASIC TECHNOLOGY COURSES****COURSE CODE : EC1313****COURSE TITLE : APPLIED ELECTRONICS****PREREQUISITE : NIL****TEACHING SCHEME: TH : 04 ; TU :00; PR :02; TOTAL CREDITS:06 (Hrs/Week)****(1 CREDIT = 1 CLOCK HR.)****EVALUATION SCHEME:**

MARKS	THEORY			TUTORIAL/PRACTICAL			TOTAL
	TERM EXAM	PROG TEST	TOTAL	PRACT EXAM	TERM WORK	ORAL EXAM	
MAX.	80	20	100	---	25@	---	125
MIN.	32	--	40	---	10	---	---

(# - External &amp; Internal Assessment ; @ - Internal Assessment only )

**TIME ALLOTTED FOR TERM EXAM : 03 HRS.****TIME ALLOTTED FOR PROGRESSIVE TEST : 01 HR.**

- ❖ **RATIONALE** : Modern equipment have electronic devices. Understanding the principles of electronic devices is therefore essential for diploma technicians .The purpose of this course is to develop knowledge of fundamental principles and applications of electronics.

❖ **OBJECTIVES :****After completing this course students will –**

- 1.Understand basic principle of electronic devices.
- 2.Understand working principles of electronic devices.
- 3.Appreciate the application of electronic devices in modern equipments.

❖ **SKILLS :**

- Identify and test different components.
- Use principles of circuit operations and its applications.
- Distinguish various elements in digital electronics.
- Understand working of different types of power supplies.
- Use test instruments.

**CONTENTS :****A. THEORY :**

SR. NO.	CHAPTER		MARKS	HOURS
1.	<b>STUDY OF BASIC ELECTRONIC COMPONENTS</b>		16	12
	1.1	Working principle, applications and symbolic representation of diode .		
	1.2	Working principle, applications and symbolic representation of Zener diode.		
	1.3	Working principle, applications and symbolic representation of Varactor diode.		
	1.4	Working principle, applications and symbolic representation of		

		LED diode.		
	1.5	Working principle, applications and symbolic representation of Photo diode.		
	1.6	Working principle, applications and symbolic representation NPN and PNP Transistor.		
	1.7	Definition , application and symbolic representation of Resistors, Inductors, Capacitors.		
2.	<b>BASICS OF DIGITAL TECHNOLOGY.</b>		12	10
	2.1	Digital number system, Binary number system.		
	2.2	Conversion of Binary to Decimal.		
	2.3	Conversion of Decimal to Binary.		
	2.4	Symbolic representation and truth table of OR.		
	2.5	Symbolic representation and truth table of AND.		
	2.6	Symbolic representation and truth table of NOT.		
	2.7	Symbolic representation and truth table of NAND.		
	2.8	Symbolic representation and truth table of NOR.		
	2.9	Symbolic representation and truth table of XOR.		
3.	<b>SIGNAL CONDITIONING</b>		10	08
	3.1	Circuit diagram and input-output waveform of Half wave rectifier.( No mathematical derivations)		
	3.2	Circuit diagram and input-output waveform of Full wave rectifier.(No mathematical derivations)		
	3.3	Block diagram, working, applications of Operational Amplifier.		
	3.4	Block diagram, working, applications of Operational Amplifier.		
4.	<b>OSCILLATORS.</b>		08	08
	4.1	Fundamentals of Oscillators and its applications.		
	4.2	Circuit diagram , working and applications of Hartley oscillator.		
	4.3	Circuit diagram , working and applications of Colppits oscillator.		
	4.4	Circuit diagram , working and applications of Phase shift oscillator.		
5.	<b>CONVERTERS.</b>		08	08
	5.1	Block diagram of A to D converter.		
	5.2	Types of A to D converter.		
	5.3	Block diagram of D to A converter.		
	5.4	Types of D to A converter.		
6.	<b>INTEGRATED CIRCUITS.</b>		12	08
	6.1	Block diagram of IC 741		
	6.2	Pin diagram of IC741 and its applications.		
	6.3	Block diagram of IC 555		
	6.4	Pin diagram of IC 555 and its applications.		
7	<b>MICROPROCESSOR AND MICROCONTROLLORS</b>		14	10
	7.1	Terminology of Microprocessor.		
	7.2	Terminology of Microcontrollors.		
	7.3	Difference between Microprocessor and Microcontrollors.		
	7.4	Classifications and applications of Microcontrollors.		
	7.5	Programmable Logic Controller(PLC)		
	7.6	Basic Arrangement of PLC System		
	7.7	Mechanical partsof PLC system		
	7.8	Block Diargam of Internal Architecture		
	7.9	Commercial Specification of PLC( No. Programming )		
			80	64

**B. LIST OF PRACTICALS/LABORATORY EXPERIENCES/ASSIGNMENTS:**

S.No.	Title of Practical/Lab.Work/Assignments	Hrs.
1.	Study and demonstration of electronic components.	04
2.	Observe waveforms of half wave rectifier.	04
3.	Observe waveforms of Full wave rectifier.	04
4.	To verify the truth table of various logic gates.	04
5.	Study and demonstration of Op-Amp as an amplifier.	04
6.	To observe the output of A to D and D to A Convertor.	04
7.	Demonstration and working of Microprocessor.	04
8.	Demonstration and working of Microcontroller.	04
Total		32

**❖ ASSESSMENT OF LABORATORY EXPERIENCES/ASSIGNMENTS :**

Continuous assessment of Term Work and Term end oral/ practical examination.

**❖ SUGGESTED IMPLEMENTATION STRATEGIES :**

1. Lecture method
2. Improved lecture method.
3. Q & A technique.
4. Demonstration
5. Case study
6. Seminars
7. Field visit

**❖ SUGGESTED LEARNING RESOURCES :**

1. **PRINT** : Text books/Reference books/Manuals/Journals.
2. **NON PRINT** : CDs / PPT / Transperencies / Charts / Models

**C. SPECIFICATION TABLE :**

Chapter No.	Title of Chapter	Marks (1.5 x Marks allotted to chapter)	Distribution of Marks			
			Knowledge	Comprehension	Application	Total
1.	Study of Basic Electronic Components	24	15	04	05	21
2.	Basics of Digital Technology	18	06	06	06	18
3.	Signal Conditioning	15	03	05	07	15
4.	Oscillators	12	04	04	04	12
5.	Converters	12	---	06	06	12
6.	Integrated Circuits	18	08	06	04	15
7.	Microprocessors & Microcontrollers	21	06	06	09	21
<b>Total</b>		<b>120</b>	<b>42</b>	<b>31</b>	<b>43</b>	<b>120</b>

**D. REFERENCE & TEXT BOOKS:**

S.N.	Title	Author, Publisher, Edition and Year Of publication	ISBN Number
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1.	Applied Electronics	R. S. Sedha, S. Chand, Ist,2006	81-219-2783-8
2.	Basics Electronics	B. L. Thereja, S. Chand	
3.	Op-Amp And Linear Integrated Circuits	Ramakant Gaikwad, Prentice Hall Of India, 3 <sup>rd</sup>	81-203-0007-7
4.	Micrprocessor	Gaonkar	

**E. LIST OF EXPERTS & TEACHERS WHO CONTRIBUTED FOR THIS CURRICULUM:**

S.N.	Name	Designation	Institute / Industry
1.	Mr. R. V. Yenkar	HOD EXTC	GPN
2.	Mrs. M. Bawne	Lecturer	GPN
3.	Mrs. Ujwala Potdar	Lecturer	GPN
4.	Miss. Sonali Raulkar	Visiting Lecturer	GPN

Date:.....

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(Member Secretary PBOS)

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(Chairman PBOS)

