

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2022-23 onwards)*

Programme: Diploma in Engineering

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (Nil)	Internal (Nil)	Total Min: (Nil)
DEX 301	Electronics Engineering Components & Materials	3	1	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment/ Quiz/Attendance – Max. Marks: Nil

Pre-Requisite	Basic Knowledge of Electrical & Electronic components & materials.
Course Objective	Impart a basic knowledge of electrical Material with impact of technology.
Course Outcomes	1. Ability to understand basic properties of various passive components.
	2. Ability to understand of Transformer.
	3. Properties and applications of various conducting Materials.
	4. Properties and applications of various Insulating Materials.
	5. Properties and applications of various semiconductor materials.

Unit	Contents (Theory)	Marks Weightage
I	Components: Resistors, Capacitors & Inductors, Cells and Batteries, Primary and secondary cells and batteries and their types. Relays and Switches, Specifications and applications of different types of relays. Switches: Types of manually operated switches, their features and applications	14
II	Material Classification: Classification of materials into conducting, semiconducting and insulating materials with reference to their atomic structure and energy bands. Conducting Materials: Resistivity and factors affecting resistivity, such as temperature, alloying. Super conductivity and super conducting material. Low resistivity materials e.g. copper, aluminum and steel, their general properties as conductor e.g. resistivity, temperature co-efficient, mechanical properties, corrosion, solar ability, contact resistance and practical application. High resistivity materials: manganin, carbon, tungsten, their practical applications.	14
III	Insulating Materials : Properties of insulating material:- Electrical properties, Mechanical properties, Physical properties, Thermal properties, Chemical properties, Insulating materials and their application-Definition and classification of Thermo setting materials e.g. Phenol Formaldehyde, Resins, Thermoplastic materials e.g. Polyvinyl Chloride (P.V.C.), Natural Insulating Materials- Mica and Asbestos, Gaseous Materials e.g. Air, Hydrogen.	14
IV	Semiconductor Materials: type of semi conductors, working and applications of semiconductors, Temperature sensitive elements, photoconductive cells, photo voltaic cells; Varistor, Hall effect generator, LCD, Light dependent resistors, LEDs, piezo electric materials, semiconductor laser and its characteristics, photo conductors photo diodes, avalanche photo diode, photo transistors.	14

School of Research and Technology

Department: Electrical and Electronics Engineering


CHAIRMAN

DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

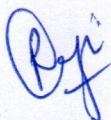
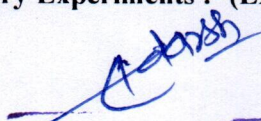
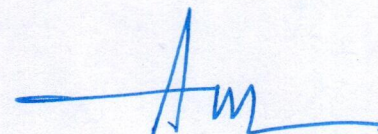
PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2022-23 onwards)**Programme: **Diploma in Engineering**

Semester –III

V	Magnetic Materials: Dia-magnetism, Para magnetism, Ferro- magnetism, magnetisation curve, hysteresis loop, Magnetostriction, Factors affecting permeability and hysteresis, Anti – ferromagnetism, Ferrimagnetism, Magnetic resonance, B-H curve for different magnetic materials, loss of magnetism, impurities in ferromagnetic materials, soft and hard magnetic materials, ferrites.	14
---	---	----

Text Book/References Books/ Websites

1. Bhattacharya SK; Electrical and Electronics Engineering Materials; Khanna Publishers, New Delhi.
2. Grover and Jamwal; Electronics Components and Materials; Dhampat Rai and Co. New Delhi.
3. Dhir; Electrical Engineering Materials; Tata Mc Graw Hill, New Delhi.
4. Kapoor PL; Electrical Engineering Materials; Khanna Publishers; New Delhi.
5. S.P.Seth; Electrical Engineering Materials; Dhampat Rai Publications, New Delhi.

Suggested List of Laboratory Experiments :- (Expandable): Nil

CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2022-23 onwards)

Programme: Diploma in Engineering

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (35)	Internal (15)	Total (50) Min: 20 (D Grade)
DEX 302	Electrical Machine - I	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Knowledge of electrical machines.
Course Objective	Impart a basic knowledge of electrical Machines such as Transformer, DC Generator & Motor, and Induction Motor with impact of technology.
Course Outcome	1. Should be able to understand the construction of D.C. machine, different windings, their merits and demerits.
	2. Become Familiar with the curricular structure of Single Phase Transformer.
	3. Acquire knowledge about various types of Three Phase Machines - Generator, Motor and 3 Phase Induction Motors.
	4. Acquire knowledge about various types of Synchronous Machines.
	5. Acquire knowledge about various types of Single Phase Induction Motors.

Unit	Contents (Theory)	Marks Weightage
I	D.C. Machines: Principle of electromechanical energy conversion, types of d.c. machines, E.M.F. equation, Magnetization and load characteristics, losses and efficiency, need of Starter, three point starter and speed control of DC motors, their applications.	14
II	Transformer(single phase): Principle of operation, types of construction, Phasor diagram, equivalent circuit, efficiency and voltage regulation of single phase transformer, O.C. and S.C. Tests.	14
III	Transformer (Three phase): Three – phase unit transformer and Bank of three single phase transformers with their advantages, Three-phase transformer Groups (Phasor groups) and their connections.	14
IV	Three phase induction Motor: Principle of operation, types and methods of starting, slip torque characteristics, and applications. Synchronous Machines: Principle of Operation of Alternator and synchronous motor.	14
V	Single phase Motors: Principle of operation and methods of starting of single phase induction motor, capacitor start motor, capacitor start capacitor run motor, split phase motor, shaded pole motor and Universal motor.	14

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

DEAN

ACADEMIC AFFAIRS

PEOPLE'S UNIVERSITY, BHOPAL

CARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2022-23 onwards)

Programme: **Diploma in Engineering**

Semester –III

Text Book/References Books/ Websites

1. Asfaq Hussain "Electric Machines", Dhanpat Rai & Co.
2. Dr.P.S.Bimbhra, Electrical Machinery, Khanna Publishers.
3. D.P Kothary & I J Nagrath, Electric Machines, TMH.

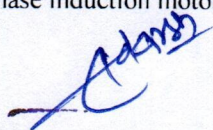
Suggested List of Laboratory Experiments :- (Expandable):

1. To obtain load characteristics of a DC shunt and series generator.
2. To obtain load characteristics of a DC compound generator. (a) Cumulatively compounded
(b) Differentially compounded.
3. To obtain speed – torque characteristics of a DC shunt motor.
4. Speed control of DC shunt motor by field control.
5. Speed control of DC shunt motor by armature control.
6. To obtain efficiency & voltage regulation of a single phase transformer.
7. O.C and S.C test in a single phase transformer.
8. To obtain the V curve of the synchronous motor.
9. Study of single phase induction starting.
10. Load test on three phase induction motor.



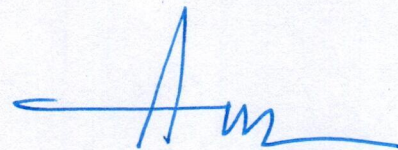
CHAIRMAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL



DEAN

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL



DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2022-23 onwards)

Programme: Diploma in Engineering

Semester –III

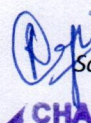
Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (35)	Internal (15)	Total (50) Min: 20 (D Grade)
DEX 303	Electronic Devices and Circuits	3	1	1						

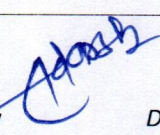
Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Basic Knowledge of Electronic Devices and Circuits.
Course Objective	To introduce semiconductor devices, FET and UJT, their characteristics, operations, circuits and applications.
Course Outcome	1. Ability to understand basics of Semiconductors.
	2. Properties and applications of various Types of diodes.
	3. Properties and applications of Transistor.
	4. Ability to design and analyze simple BJT and UJT circuits.
	5. Properties and applications of Operational amplifier.

Unit	Contents (Theory)	Marks Weightage
I	Semiconductor: Difference between conductor and semiconductor. Intrinsic and extrinsic, doping, types of material used in doping, p-type and n-type semiconductors. Energy band diagrams, effect of temperature on semiconductor, majority and minority carrier, generation and recombination of charges, process of diffusion, diffusion and drift currents. Properties of silicon and germanium.	14
II	P-N junction: depletion layer, potential barrier, working of PN Junction diode with no bias, forward bias and reverse Bias, current components in p-n diode, current equation, V-I characteristics, reverse saturation current, cut in voltages of Si and Ge diode.	14
III	Bipolar junction transistor: Formation of PNP & NPN Transistor & their symbolic representation. Different transistor configuration and their performance characteristics. Modes of operation of transistor in active, cut-off and saturation mode.	14
IV	Field Effect Transistor: Construction – Working principle of FET – Difference between FET and BJT –Characteristics of FET – Applications – FET amplifier (Common source amplifier). Uni-Junction Transistor: Construction – Equivalent circuit – Operation – Characteristics, applications	14


School of Research and Technology
CHAIRMAN


Department: Electrical and Electronics Engineering
DEAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL***(Applicable for Admitted from Academic Session 2022-23 onwards)***Programme: **Diploma in Engineering**

Semester –III

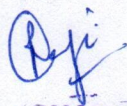
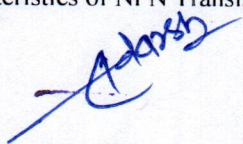
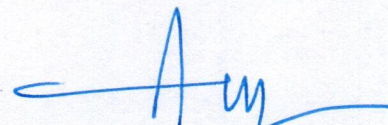
V	Operational amplifier: Differential amplifier specifications, ideal and practical OPAMP characteristics, slew rate. Applications of Op-Amp: Inverting and non-inverting amplifier Analog computation, summer (inverting and non-inverting), average, integrator, differentiator, scalar, log and antilog amplifier	14
---	---	----

Text Book/References Books/ Websites

1. V.K.Mehta; Principle of Electronics, S.CHAND Publications.
2. Dr.R.S.Sedha; Electronic Devices & Circuits, S.CHAND Publications.
3. Sanjeev Gupta; Electronic Devices & Circuits, Dhampat Rai Publications.
4. Sendra and Smith; Microelectronics, Oxford Press.

Suggested List of Laboratory Experiments :- (Expandable):

1. To Study the V-I Characteristics of Silicon Diode.
2. To Study the V-I Characteristics of Germanium Diode.
3. To Study the V-I Characteristics of Zener Diode.
4. To Study the V-I Characteristics of Light Emitting Diode (LED).
5. To Study of Vactor Diode.
6. To Study of Half Wave Rectifier.
7. To Study of Full Wave Rectifier.
8. To Study of Full Wave Bridge Rectifier.
9. To Study the V-I Characteristics of PNP Transistor.
10. To Study the V-I Characteristics of NPN Transistor.


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2022-23 onwards)

Programme: Diploma in Engineering

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (35)	Internal (15)	Total (50) Min: 20 (D Grade)
DEX 304	Electrical Measurement & Instrumentation	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Basic Knowledge of electrical measuring instruments.
Course Objective	Explain basic concepts and definitions in measurement, the bridge configurations and their applications.
Course Outcome	1. Identify various types of electronic instrument suitable for specific measurement.
	2. Classify various errors present in measuring instruments.
	3. Ability to understand Wattmeter and Energy meters.
	4. Ability to understand the Wattmeter and Energy meters and Measurement of resistance.
	5. Describe the working principle of A. C. Bridges used in measurement systems.

Unit	Contents (Theory)	Marks Weightage
I	Principles of Measurement and Instrumentation: Basic Objectives of measurements, analog versus digital measurements Parameters of Measuring devices, Accuracy, Precision, Error (Gross, Systematic & Random), Linearity, Hysteresis, Resolution, Measurement of current, voltage, Resistance and power, Introduction of Multimeter.	14
II	Electrical measuring instruments - Construction, operation. Deflecting, controlling and damping forces, supporting systems, moving coil, electro-dynamometer, moving iron and induction type instruments, simple numerical. Hot wire type instruments, vibration galvanometer, shunt and multipliers, CT & PT.	14
III	Wattmeter and Energy meters – Dynamometer and induction type wattmeter, Induction type energy meters. Measurement of 1-phase and 3-phase power in balanced and unbalanced load condition, 3 phases wattmeter.	14
IV	Measurement of resistance – Classification of resistance, measurement of low, medium, and high resistance. Kelvin's double bridge, wheat-stone bridge, Ammeter, voltmeter method and ohmmeter, multimeter, megger, Importance of earth resistance, Earth tester.	14
V	A. C. Bridges – Measurement of inductance and capacitance by A.C. bridges. Maxwell, Anderson, Hays, Desauty and Wien's bridge. (no phasor diagram) Additional measuring instruments – Electrical resonance, Weston and vibration reed frequency meter, dynamometer power factor meter, Weston synchro scope, Merz price maximum demand meter, Rotating type phase sequence indicator.	14

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

DEAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2022-23 onwards)

Programme: **Diploma in Engineering**

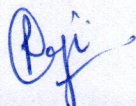
Semester –III

Text Book/References Books/ Websites

1. A.K. Sawhney; "Electrical & Electronic Measurements & Instrument"; Dhanpat Rai & Sons Pub.
2. E W Golding & F C Widdis; "Electrical Measurement & Measuring Instruments"; Wheeler Pub.
3. Buckingham & Price; "Electrical Measurements"; Prentice Hall.

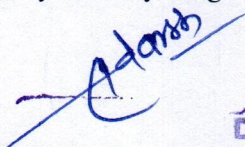
Suggested List of Laboratory Experiments :- (Expandable):

1. Measurement of low resistance by Kelvinn Double bridge.
2. Measurement of medium resistance by wheat stone bridge.
3. Measurement of insulation resistance by Megger.
4. Calibration of Voltmeter, Ammeter, Wattmeter, Energy meter.
5. Measurement of P.F. by ammeter, voltmeter and wattmeter method.
6. Measurement of 3-phase power by two wattmeter method.
7. Measurement of inductance by Maxwell's bridge.
8. Measurement of inductance by Hay's bridge.
9. Measurement of inductance by Anderson's bridge.
10. Measurement of capacitance by De Sauty bridge.



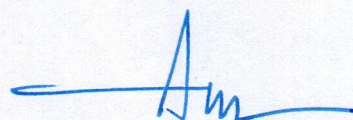
CHAIRMAN

**BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL**



DEAN

**FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL**



DEAN

**ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL (M)**

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2022-23 onwards)

Programme: Diploma in Engineering

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (35)	Internal (15)	Total (50) Min: 20 (D Grade)
DEX 305	Circuit Theory	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Knowledge of Circuit theory.
Course Objective	Impart a basic knowledge of electrical quantities such as current, voltage, power, energy, frequency to understand the impact of technology.
Course Outcome	1. Understand the mathematical problems of Electrical circuit.
	2. Acquire knowledge about various types of theorems and Network solutions.
	3. Acquire knowledge about various types of RLC circuits.
	4. Analyze and synthesis of transient response and two port network.
	5. Analyze and synthesize the frequency domain analysis and time domain.

Unit	Contents (Theory)	Marks Weightage
I	Circuit theory concepts : Active & Passive elements, dependent and independent sources ,KCL, KVL, Ohms law ,transformation of source, Active and Passive circuits - Junction, branch and loop in circuits -Insufficiency of Ohm's law to solve complex circuits, Kirchhoff's laws KCL & KVL, Star - Delta configurations, star delta transformations .	14
II	Network Theorems: Ideal Voltage, Ideal current source - Source transformation technique Super position theorem- Thevenin's Theorem -Norton's Theorem- Maximum power transfer theorem with reference to D.C.-Problems on the above.	14
III	Response of RLC Circuits: Formulation of integro differential equations in RLC networks, duality, Initial conditions. Response of RL, RC, RLC networks subjected to internal energy. Response of networks to impulse, step, ramp, exponential and sinusoidal excitations. Transient and steady state response.	14
IV	Resonance: Series & parallel resonance, Bandwidth, Q-factor. Coupled circuit -Analysis of circuits with mutual inductance. Three phase circuits. Generation of 3 phase voltages star - delta connections, solution of 3 phase balanced circuits. Power measured by two wattmeter method.	14
V	Two port parameters: Impedance, Admittance, transmission & Hybrid parameters of two port passive networks. Their inter relationships. Terminated two ports. Inter connection of two ports.	14

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

FACULTY OF ENGINEERING

PEOPLE'S UNIVERSITY, BHOPAL

DEAN

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY


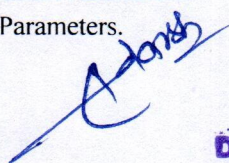
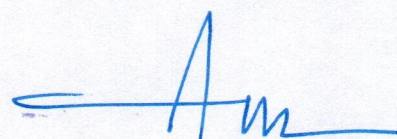
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2022-23 onwards)**Programme: **Diploma in Engineering****Semester –III****Text Book/References Books/ Websites**

1. M.E. Van Valkenburg; Network Analysis; PHI.
2. Mithal GK; Network Analysis; Khanna Publisher.
3. Hayt W.H. & J.E. Kemmerly; Engineering Circuit Analysis; TMH.
4. Roy Choudhary D; Network and systems; New Age Publication.
5. A.Chakraborti; Circuit theory; Dhanpat Rai Publication.

Suggested List of Laboratory Experiments :- (Expandable):

1. Determine the loop currents (KVL) in any DC network.
2. Determine the node voltages (KCL) in any DC network.
3. Verification of principle of superposition with DC sources.
4. Verification of Thevenin, theorems in DC circuits.
5. Verification of Norton theorems in DC circuits.
6. Verification of Maximum power transfer theorems in DC circuits..
7. Study of RLC series resonance.
8. Study of RLC Parallel resonance.
9. Study of Transmission Parameters.
10. Study of Hybrid Parameters.

**CHAIRMAN****BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL****DEAN****FACULTY OF ENGINEERING****PEOPLE'S UNIVERSITY, BHOPAL****DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL**

PEOPLE'S UNIVERSITY, BHOPAL***(Applicable for Admitted from Academic Session 2022-23 onwards)***Programme: **Diploma in Engineering**

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (Nil)	Internal (Nil)	Total Min: Nil	External (35)	Internal (15)	Total (50) Min: 20 (D Grade)
DEX 306	Electrical & Electronics Workshop	-	-	1						

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

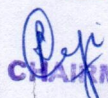

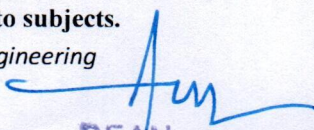
Pre-Requisite	Basic Knowledge of Various electrical & electronic components.
Course Objective	The main objective is to make the students able to understand, design and prepare electrical and electronics circuits using basic concepts.
Course Outcome	1. Ability to understand various tools & components of electronic workshop.
	2. Ability to understand soldering and desoldering.
	3. Ability to understand Passive & active components.
	4. Ability to understand Voltage Sources.
	5. Ability to understand PCB layout and circuit.

Unit	Contents (Theory)	Marks Weightage
1	<p>Electronic Workshop Tools: Bread board, Copper clad laminate sheet, Solder iron, solder-stand, solder-wire, flux, flexible wire, hookup wire, cables, relays, switches, connectors, fuses, Cutter, Plier, screwdriver set, wire stripper, desolder pump, De-solder wick, drilling machine</p> <p>Electronic circuit on bread board ,Soldering/Disoldering, electronic circuit on general purpose PCB.</p> <p>Passive & active components: Different types of: resistors, inductors, capacitors, potentiometers, Thermistors, Transformer, auto transformer Diode, Zener diode, Varactor diode, LED, Photo diode, BJT, Photo transistor, FET, LDR, Solar cell, Photocell, Optocoupler.</p> <p>Voltage Sources: DC battery (Pencil cell :1.5V, +9V, Rechargeable Cell, Mobile battery) AC power supply, DC power supply ,Measuring Instruments: Different types of Voltmeters, Ammeters, Watt meters, multimeter, LCR-Q meter, CRO, DSO, Function Generator.</p> <p>Printed circuit boards (PCB): Types, Single sided, Double sided, Design and fabrication of a single sided PCB for a simple circuit with manual etching (Ferric chloride) and drilling Methods.</p> <p>Assembling of electronic circuit/system on general purpose PCB, Solder and de-solder electronic components on different types of PCB. Identify and test electrical/electronic active and passive components, Use basic source and measuring instruments (power supply, function generator, CRO, DMM) Identify and rectify open circuit, and short circuit faults in PCB/System.</p>	50

Text Book/References Books/ Websites: Nil**Suggested List of Laboratory Experiments :- (Expandable):****Student should perform & test at least 10 electronic components/instruments related to subjects.**

School of Research and Technology

Department: Electrical and Electronics Engineering


CHAIRMAN

DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2022-23 onwards)

Programme: **Diploma in Engineering**

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
DPE-307	Professional Skill	L	T	P	External (Nil)	Internal (Nil)	Total	External (Nil)	Internal (50)	Total (50)
		-	-	1			Min: Nil			Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test –Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 50	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/ Attendance – Max. Marks: 50

Pre-Requisite	Nil
Course Objective	The main objective is to make the students able to understand reasoning, English and Quantitative aptitudes.
Course Outcome	Able to solve problems ask in the competitive exams.

Unit	Contents (Theory)	Marks Weightage
I	Quantitative Aptitude: Percentages/Profit & Loss, Time and Work, Simple and Compound Interest, Series and Progression.	50
II	Reasoning : Puzzles and Seating Arrangement, Data Sufficiency, Coding-decoding, Blood Relation, Order and Ranking, Alpha Numeric Symbol Series, Logical Reasoning:	
III	English: free quizzes related to Synonyms, Antonyms, One Word Substitution, Idioms and Phrases, Spelling Correction; Fill in the Blanks and Common Errors in English.	

Text Book/References Books/ Websites

1. R.S. Aggarwal; Quantitative Aptitude for Competitive Examinations.
2. Arihant Publications; Fast Track Objective Arithmetic.
3. R S Aggarwal; Verbal and Nonverbal Reasoning.
4. M K Pandey; Analytical Reasoning.
5. B S Sijwali, Indu Sijwal; A New Approach to Reasoning Verbal and Non-Verbal (English) 1st Edition.
6. SP Bakshi; Objective General English.
7. Wren and martin; English grammar book.
8. Neetu singh; Plinth to paramount English.
9. Norman Lewis; Word power made easy (Mainly for development of vocab).
10. <https://www.playquiz2win.com/engquizmenu.html>.
11. <https://www.sawaal.com>.

Suggested List of Laboratory Experiments :- (Expandable):

Students should solve various problems and quiz on the above mention topics, and prepare an assignment.

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

DEAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL (M.P.)

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2019-20 onwards)*Programme: **Diploma in Engineering**

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (Nil)	Internal (Nil)	Total
DPE4011	E-Commerce and E- Business	3	1	-						Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil

Pre-Requisite	Nil
Course Objective	Know how to optimize and stay safe when selling online Have an outline strategy for e-Commerce for your business Understand the risks around Cyber Security when trading and doing business online.
Course Outcome	1. To understand technical aspect of E-commerce and E-Business.
	2.To describe the process of E-commerce and E-business
	3.To understand Infrastructure design issues of E-commerce

Unit	Contents (Theory)	Marks Weightage
I	Introduction of E-Commerce: Definition of E-Com, different types of E-com, E-commerce trade cycle, Advantages and disadvantages of E-com, Traditional commerce Vs E-commerce.	14
II	Overview of Hardware and Software Technologies of E-Commerce: Client side programming (Dream weaver , Front page), Server side programming (PHP), Database connectivity , session tracking , middleware technologies from E- com.	14
III	Payment System of E-Commerce: Traditional payment model, Characteristics of payment, system, SET Protocol for credit card payment, E-cash, E-check, smart cards.	14
IV	Introduction to E business: Definition of E business, Characteristics, elements of e business, roles, Impact of E business, challenges of E business.	14
V	Developing E Business-models: E- business structure, Evolution of E –business and its business models stages, Characteristics of Internet based software and E-business solutions.	14

Text Book/References Books/ Websites

1. Henry Chan; E-Commerce Fundamentals and application; Wiley publication.
2. Dave Chaffey; E –business and E – commerce Management; Pearson, 3rd edition.

Suggested List of Laboratory Experiments :- (Expandable): Nil

[Signature]
 School of Research and Technology
CHAIRMAN

[Signature]
 Department: Electrical and Electronics Engineering
DEAN
/ FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

[Signature]
DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Diploma in Engineering

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
DPE4012	Rural Technology & Community Development	L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
		3	1	-			Min: 40 (D Grade)			Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil

Pre-Requisite	Nil
Course Objective	To get an exposure to a new rural area and the socio-economic condition of people.
Course Outcome	1. To understand Rural areas problems.
	2. To describe the process by which we improve the living conditions of rural India.
	3. To understand how we help community of rural areas.

Unit	Contents (Theory)	Marks Weightage
I	Introduction: Definition, various sources, types of waste, problem associated with waste, effects of waste- on society, on human health, on animals. Recycling of waste.	14
II	Municipal & Solid waste: Definition-Sources of solid waste, types of solid waste, Composition of solid waste, collection methods and techniques of solid waste, industrial & agricultural waste.	14
III	Hazardous & E-waste: Definition- sources of hazardous waste, collection of hazardous waste. Medical waste & Nuclear waste, disposal method and treatment. Definition- sources of E-Waste, E-waste – non-recycling impacts, recycling of e-waste.	14
IV	Collection, Treatment & Disposal: methods of residential and commercial waste collection, collection vehicles, manpower. Segregation & composting of solid wastes. Method & techniques for treatment of solid waste.	14
V	Disposal of Solid Wastes: Refuse disposal systems, incinerations, principle features of an incinerator, site selection and plant layout of an incinerator. Sanitary landfill, advantages and disadvantages of sanitary land fill - site selection. Dumping-open & sea dumping.	14

Text Book/References Books/ Websites

1. Vikram Singh ; Rural Development in India; Satyam Law International.
2. Katar Singh; Rural Development Principle Policies & Management;
3. Jerry W. Rabinson; Introduction to Community Development; SAGE.
4. Rhonda Phillips, Robert H. Pittman; An Introduction to Community Development; Taylor & Fransis.

Suggested List of Laboratory Experiments :- (Expandable): Nil

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY BHO

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2019-20 onwards)*Programme: **Diploma in Engineering**

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
DPE4013	Waste Management	3	1	-			Min: 40 (D Grade)			Min: Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: NIL	Assignment/Quiz/Attendance – Max. Marks: NIL

Pre-Requisite	Nil
Course Objective	To apply the knowledge of engineering for effective solid waste collection systems, for waste collection route optimization and for processing of solid waste.
Course Outcome	1. Ability to understand about basic concept of waste management.
	2. Ability to understand about recycling of various wastes.
	3. Ability to understand about waste collection, handling and disposal.

Unit	Contents (Theory)	Marks
I	Introduction: Definition, various sources, types of waste, problem associated with waste, effects of waste- on society, on human health, on animals. Recycling of waste.	14
II	Municipal & Solid waste: Definition-Sources of solid waste, types of solid waste, Composition of solid waste, collection methods and techniques of solid waste, industrial & agricultural waste.	14
III	Hazardous & E-waste: Definition- sources of hazardous waste, collection of hazardous waste. Medical waste & Nuclear waste, disposal method and treatment. Definition- sources of E-Waste, E-waste – non-recycling impacts, recycling of e-waste.	14
IV	Collection, Treatment & Disposal: methods of residential and commercial waste collection, collection vehicles, manpower. Segregation & composting of solid wastes. Method & techniques for treatment of solid waste.	14
V	Disposal of Solid Wastes: Refuse disposal systems, incinerations, principle features of an incinerator, site selection and plant layout of an incinerator. Sanitary landfill, advantages and disadvantages of sanitary land fill - site selection. Dumping-open & sea dumping.	14

Text Book/References Books/ Websites

1. Jagbir Singh, AL. Ramanathan; Solid Waste Management: Present and future challenges; I.K. International Publishing House Pvt Ltd.
2. George Tchobanoglous and Hillary theisen, Samuel Vigil; Integrated solid waste management, McGraw Hill.
3. T. V. Ramachandra; Management of Municipal Solid Waste; TERI press.

Suggested List of Laboratory Experiments :- (Expandable): Nil

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

DEAN

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY BHOPALFACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPALBOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL***(Applicable for Admitted from Academic Session 2019-20 onwards)***Programme: **Diploma in Engineering**

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (Nil)	Internal (Nil)	Total
DEX402	Energy Conservation & Management	3	1	-						Min: Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Nil Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil

Pre-Requisite	Knowledge of environment studies.
Course Objective	To apply energy conservation principles and management techniques to different energy conversion systems.
Course Outcome	After learning the course the students should be able to:
	1. Outline energy scenario, audit and management.
	2. Apply energy conservation policy, regulations in industrial practices.
	3. Evaluate energy economics.
	4. Identify opportunities for rational use of energy.
	5. Analyze electrical systems for energy conservation.

Unit	Contents (Theory)	Marks Weightage
I	Energy Scenario- Various types of renewable and non-renewable energy, Energy consumption and use pattern, energy consumption and environment. Energy Management and audit- Energy Management and its objectives, energy audit, need of energy audit, types of energy audit, energy auditing Instruments.	14
II	Waste heat recovery- Sources of waste heat, advantages of waste heat recovery, commercial waste heat recovery devices-Remunerator, Heat Regenerators, heat pumps etc. Agricultural use of waste heat. Heating ventilation and air conditioning- Definition of Heating, ventilation and air conditioning, Energy saving opportunities in Heating ventilation and air Conditioning, Conducting Audit in Heating ventilation and air conditioning.	14
III	Role of maintenance in energy conservation- Types of maintenance breakdown, Predictive & preventive, maintenance and energy conservation. Demand side management –Benefits, Demand side management, techniques, implementation of Demand side management programme, Tariff options of Demand side management.	14
IV	Energy conservation in various sectors- 1) For residential and commercial sector, 2) in transportation, 3) in energy intensive industries. Power factor improvement- Causes of low power factor, advantages of power Factor improvement, and methods of power factor improvement.	14

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL***(Applicable for Admitted from Academic Session 2019-20 onwards)***Programme: **Diploma in Engineering**


Semester –IV

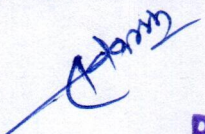
V	Energy intensive industries benefits, types of co-generation, Economic Analysis of energy conservation-Economic analysis of investment, Economic analysis techniques, Risk analysis.	14
---	---	----

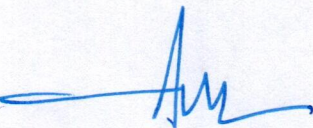
Text Book/References Books/ Websites

1. Energy Conservation and Management by S. K. Soni and Manoj Nair, Satya Prakashan, New Delhi.
2. Energy management- W.R.Murphy & G.M. ckey, Butter worths.
3. Electrical Energy utilization & conservation – Dr. S.C.Tripathi.
4. Four books published by BEE (Bureau of Energy Efficiency) Govt. of India.

Suggested List of Laboratory Experiments :- (Expandable): Nil


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Diploma in Engineering

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (35)	Internal (15)	Total (50)
DEX 403	Digital Circuits & Systems	3	1	1			Min: 40 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Basic Knowledge of Digital Circuits & System.
Course Objective	To understand number representation and conversion between different representation in digital electronic circuits. To analyze logic processes and implement logical operations using combinational logic circuits, characteristics of memory and their classification and concepts of sequential circuits and to analyze sequential systems in terms of state machines.
Course Outcome	At the end of this course student will:
	1. Understand various types of number systems and their conversions.
	2. Simplify the Boolean expressions and apply the Boolean theorems through logical gates.
	3. Design and implement variety of logical devices using combinational circuits concepts.
	4. Demonstrate and compare the construction of programmable logic devices and different types of ROM.
	5. Analyze sequential circuits like Registers and Counters using flip-flops.

Unit	Contents (Theory)	Marks Weightage
I	Number Systems -Introduction of Analog & Digital Signal. Difference between analog & Digital signal. Introduction of Number system. Binary, Hexadecimal, Octal, Decimal and their inter conversion. Binary Codes: Weighted and Non-weighted code and their use. 8421 code, BCD code, XS-3 code, Gray code.	14
II	Boolean Algebra: Law of Boolean Algebra. Explain standard representations for logical functions (SOP and POS form). De Morgan's theorem. Introduction of Logic Gates with truth table, Introduction of Universal gates and special gates. K-Map Simplification: Simplification of Boolean functions with Karnaugh Map method. Simplification of Boolean equation using K-Map (up to four variables).amplifier.	14
III	Combinational logic circuits: Half adder circuit and full adder circuit and explain its operation with truth table. Realize full-adder using two Half-adders and an OR gate and write truth table. Brief introduction of Multiplexer, De Multiplexer, Encoder & Decoder.	14

School of Research and Technology

Department: Electrical and Electronics Engineering

DEAN

DEAN

CHAIRMAN

FACULTY OF ENGINEERING

ACADEMIC AFFAIRS

BOARD OF STUDIES (ENGINEERING)

PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –IV

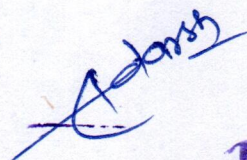
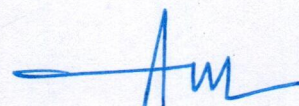
IV	Sequential Logic Circuits: Definition of Sequential circuits, Definition of Latch & Flip-Flop and their differences. RS Flip-Flop, JK Flip-Flop, D Flip-Flop. Registers: Definition of Register, Shift Register (SISO, SIPO, PISO, and PIPO) with their truth tables.	14
V	Memories: RAM organization - Address Lines and Memory Size, Read/write Operations, Static RAM - Bipolar RAM cell, Dynamic RAM, SD RAM, and DDR RAM. Read only Memory, ROM organization, Expanding memory, PROM, EPROM, and EEPROM.	14

Text Book/References Books/ Websites

1. Morris Mano; Digital Design; Prentice Hall of India Pvt. Ltd.
2. H.Taub & D. Schilling; Digital Integrated Electronics; McGraw Hill.
3. Douglas L. Perry VHDL; McGraw Hill, Inc; 2nd Edition, 1993.
4. J.Millman and Halkias; "Integrated Electronics, Analog and Digital Circuits and Systems; Tata McGraw Hill.
5. A.Anand Kumar; Digital Electronics; TMH.

Suggested List of Laboratory Experiments :- (Expandable):

1. To study of Basic Logic Gates- AND, OR & NOT.
2. To study of Universal Gates-NAND, NOR.
3. Implementation of Basic Gates with the help of Universal gates.
4. Study of BCD to Grey code Conversion.
5. Implementation of De Morgan's Theorem.
6. Study of Half Adder & Full Adder.
7. Study of Encoder.
8. Study of Decoder.
9. Study of Multiplexer.
10. Study of Demultiplexer.


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Diploma in Engineering

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total (50)
DEX 404	Electrical Machine -II	3	1	1	External (70)	Internal (30)	Min: 40 (D Grade)	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Basic Knowledge thorough comprehension of the electrical machines: three phase induction and synchronous machine, single phase motors.
Course Objective	Students will be able to analyze, select, and control electric machines and understand modern electric drives that are important in today's industry.
Course Outcome	1. Industrial application of induction motor, starting and control mechanism
	2. Operation and working of synchronous motor, load characteristics
	3. Classification and importance of special motors.
	4. To understand the Electric Drives.
	5. To understand the Converting Apparatus.

Unit	Contents (Theory)	Marks Weightage
I	Induction Motor:- Rotating magnetic field for 3 phase concept of motors and its reversing. Construction and working of 3 phase induction motor (squirrel cage and wound rotor motor). Double squirrel cage induction motor. Rotor frequency, rotor e.m.f., rotor current and rotor power factor. Torque- slip characteristics. Methods of starting of induction motor. On line, auto transformer, star delta manual/automatic starters for induction motor. Starter for slip ring induction motor. Application of induction motor.	14
II	Synchronous Machines:- Construction, Principle of operation, Regulation of synchronous generators, Salient pole synchronous machines, Direct and Quadrature axis reactances, Starting of synchronous motor, V curves, synchronous condenser, hunting and its elimination, Load and Torque angles of synchronous machines, comparison between induction motor and synchronous motor, uses of synchronous motor.	14
III	F.H.P. Motors:- Classification of F.H.P. motors, Production of rotating Magnetic field in 1 phase motors, Construction working and application of- (i) Capacitor motor (all types), (ii) Shaded pole motor, (iii) 1 phase synchronous motor, (iv) 1 phase series and universal motor, (v) Servo Motor (DC & AC).	14

School of Research and Technology

Department: Electrical and Electronics Engineering

DEAN

FACULTY OF ENGINEERING

PEOPLE'S UNIVERSITY, BHOPAL

DEAN

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

CHAIRMAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –IV

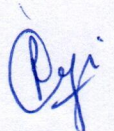
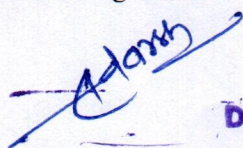
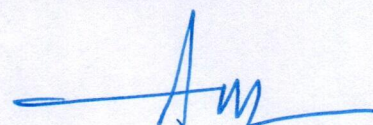
IV	Electric Drives:- Advantages of electric drives, Characteristics of different mechanical loads., Types of motors used in electric drive, Use of fly wheels for fluctuating load (only physical concept), Types of enclosures, Methods of power transfer by devices like belt drive, gears, pulley, Examples of selection of motors for particular loads.	14
V	Converting Apparatus:- Introduction to different types of converting apparatus e.g. metal rectifier etc.	14

Text Book/References Books/ Websites

1. Asfaq Hussain "Electric Machines", Dhanpat Rai & Co.
2. Dr.P.S.Bimbhra, Electrical Machinery, Khanna Publishers.
3. D.P Kothary & I J Nagrath, Electric Machines, TMH.

Suggested List of Laboratory Experiments :- (Expandable):

1. To determine performance characteristics of a poly phase induction motor. (load v/s efficiency, load v/s power factor, load v/s slip)
2. To start a 3 phase induction motor and to determine its slip at various loads.
3. To connect and start an induction motor by using star delta starter, auto transformer starter, rotor starter and to change its direction of rotation.
4. To perform open circuit and block rotor test on a 3 ph. induction motor and to determine its efficiency.
5. Determination of performance curve and hence the core loss of a single phase series motor Voltage and Current ratio of metal rectifier.
6. Sequential operation of motors using timers.


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2019-20 onwards)*Programme: **Diploma in Engineering**

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (35)	Internal (15)	Total (50)
DEX 405	Analog & Digital Communication	3	1	1			Min: 40 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Understanding digital communications systems through design and analysis of various basic digital modulation systems, as well as analog communications systems through design and analysis of various basic modulation systems.
Course Objective	This course introduces you to the basic principles and techniques used in analog and digital communications.
Course Outcome	On successful completion of the course students will be able to:
	1. Identify the basic elements of a communication system
	2. Analyze baseband signals in time domain and in frequency domain
	3. Compare and contrast various analog and digital modulation and demodulation techniques
	4. Evaluate the performance of modulation and demodulation techniques in various transmission environments
	5. Explain the importance of synchronization in communication systems

Unit	Contents (Theory)	Marks Weightage
I	Communication System: Introduction to Analog and Digital signals, Basic difference between analog & digital signal, Basic communication system, Elements of communication system - Transmitters, Transmission channels & receivers, Applications of communication system, Introduction to analog and digital communication.	14
II	Modulation & Demodulation: Introduction to Modulation & demodulation, Need of Modulation, Types of Modulation, Introduction to Amplitude modulation, Phase Modulation & Frequency Modulation.	14
III	Amplitude Modulation: Time domain & frequency domain representation of AM signal, modulation index, illustration of the carrier and side band components; transmission bandwidth for AM Modulation. Digital modulation techniques: Analysis, Generation and Detection (Block Diagram), Amplitude shift keying (ASK), frequency shift keying (FSK), phase shift keying (PSK), Quadrature amplitude modulation (QAM).	14

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

FACULTY OF ENGINEERING

DEAN

BOARD OF STUDIES (ENGINEERING)

PEOPLE'S UNIVERSITY, BHOPAL

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY

PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –IV

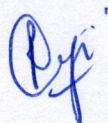
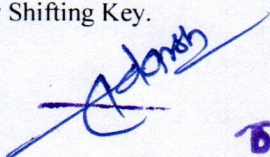
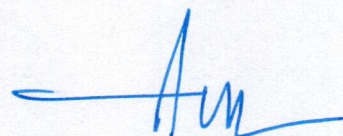
IV	Digital communication & digital modulation: Introduction to digital communication, Sampling theorem , Types of sampling , Instantaneous, Natural and Flat Top, aperture effect, aliasing, pulse modulation, Pulse Amplitude Modulation (PAM), Pulse Position and pulse width modulation and their typical applications	14
V	Pulse code modulation: Quantization, Quantization Error, Basics of Pulse Code Modulation (PCM), Companding, Inter-symbol Interference, Differential PCM (DPCM), Delta Modulation (DM), Limitations of delta modulation and Adaptive Delta Modulation (ADM), asynchronous transmission, synchronous transmission.	14

Text Book/References Books/ Websites

1. B.P. Lathi; Modern Analog and Digital Communication System; Wiley Eastern limited.
2. Taub and Schilling; Principles of communication Systems; TMH Publications.
3. Singh and Sapre; Communication Systems; TMH Publications.
4. S Haykin; Communication Systems; John Wiley and Sons Inc.

Suggested List of Laboratory Experiments :- (Expandable):

1. To Perform DSB Amplitude Modulation.
2. To Perform DSB Amplitude Demodulation.
3. To Perform Pulse Code Modulation.
4. To Perform Pulse Amplitude Modulation.
5. To Perform Pulse Width Modulation.
6. To Perform Pulse Position Modulation.
7. To Study Sampling Theorem.
8. To Perform Amplitude Shifting Key.
9. To Perform Phase Shifting Key.
10. To Perform Frequency Shifting Key.


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –IV

DEX 406	Software Lab	L	T	P	External (Nil)	Internal (Nil)	Total	External (35)	Internal (15)	Total (50)
		-	-	1			Nil			Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Nil
Course Outcome	Ability to understand Electronic Software's and their uses.

Unit	Contents (Theory)	Marks Weightage
I	<p>Study of circuit simulation software (any one-TINA-PRO/PSPICE/CIRCUIT MAKER/ GPSIM/SAPWIN/ Mentor PADS etc).</p> <p>Overview and Study of the key features and applications of the software. Application of the software in the field of Electronic Devices, Electronic Instrumentation and Network Analysis.</p> <p>Design, Optimization and simulation of</p> <ol style="list-style-type: none"> 1. Basic Electronic circuits (examples rectifiers, clippers, clampers, diode, transistor characteristics etc). 2. Transient and steady state analysis of RL/ RC/ RLC circuits, realization of network theorems. 3. Use of virtual instruments built in the software. 	50

Text Book/References Books/ Websites: Nil**Suggested List of Laboratory Experiments :- (Expandable):**

1. To Design, Optimization and simulation of rectifiers.
2. To Design, Optimization and simulation of diode.
3. To Design, Optimization and simulation of transistor.
4. To Design, Optimization and simulation of clippers and clampers.
5. To Design, Optimization and simulation of transient and steady state analysis of RL/ RC/ RLC circuits.
6. To Design, Optimization and simulation of realization of network theorems.

School of Research and Technology

CHAIRMAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

Department: Electrical and Electronics Engineering

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (100)
DEX 407	Industrial Training-I	-	-	2	(Nil)	(Nil)	Nil	(70)	(30)	Min: 40 (D Grade)

Duration of Theory (Externals): -Nil

Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test – Max Marks: -Nil	Assignment/Quiz/Attendance Max. Marks: -Nil
Practical Internal Max Marks: 30	Lab work & Sessional – Max Marks: 25	Assignment / Quiz/ Attendance Max. Marks: 05

Pre-Requisite	Nil
Course Objective	The objective of Industrial Training is to enable students to gain relevant and related practical experience which will prepare them for their likely responsibilities in future.
Course Outcome	1. Participate in the projects in industries during his or her industrial training.
	2. Describe use of advanced tools and techniques encountered during industrial training and visit.
	3. Interact with industrial personnel and follow engineering practices and discipline prescribed in industry.
	4. Develop awareness about general workplace behavior and build interpersonal and team skills.
	5. Prepare professional work reports and presentations.

Unit	Contents (Theory)	Marks Weightage
I	<p>As a part of the Diploma in Engineering curriculum, DPE 407, Industrial Training -I is a Practical course, which the students should undergo in reputed Private / Public Sector / Government organization / companies as industrial training of minimum two weeks to be undergone by the student in the semester break after III semester theory examinations.</p> <p>Training period: Minimum of two weeks or 15 (Fifteen) Days.</p> <p>Companies / Areas covered: Any field related to concern branch / discipline of Diploma in Engineering.</p> <p>Grading: As per Scheme.</p> <p>Note: Presentation will take place the following week after you complete your training. The presentation is evaluated by your class in-charge. Report must be submitted during power point presentation. A Viva voce comprising comprehensive questions based on training undergone.</p> <p>Etiquette: Dress properly, Behave well, Portray good image as a university student, Be punctual, Observe work ethics, Concern for safety, Be professional.</p>	100

Text Book/References Books/ Websites: Nil**Suggested List of Laboratory Experiments :- (Expandable): Nil**

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

FACULTY OF ENGINEERING

PEOPLE'S UNIVERSITY, BHOPAL

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (Nil)	Internal (Nil)	Total
DEX 5011	Signal & System	3	1	-						Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil

Pre-Requisite	Basic Knowledge of Analog & Digital Signals.
Course Objective	To describe various signals and systems mathematically and understand how to perform mathematical operations on them.
Course Outcome	1. Understand and analyse the mathematical modelling of various signals and systems.
	2. Analyse continuous and discrete time linear time invariant systems.
	3. Represent any arbitrary signal in time and frequency domain.
	4. Analyze the signals with different transform technique.
	5. Evaluate and analyse various signals in terms of Fourier and Laplace transform.

Unit	Contents (Theory)	Marks Weightage
I	Signals: Analog & Digital Signals, Continuous time signals, Discrete time signals, Basic elementary signals- Unit Step, Unit Ramp and Unit Impulse signal. Periodic & Non Periodic signals, Even & Odd signals, Power & Energy signals.	14
II	Classification of systems: CT systems and DT systems- – Linear & Nonlinear, Time-variant & Time-invariant system, Causal & Non-causal system, Stable & Unstable system. Numerical based on system.	14
III	Laplace Transform: (LT) of continuous time signals, Properties of Laplace transform (Linearity, Time shifting, Time scaling, Time Reversal, Differentiation in s-domain, Differentiation in time domain, Integration in time domain, Initial & Final value theorem).	14
IV	Fourier Series: Fourier series of continuous time signals, Trigonometric & Exponential Fourier series. Questions based on Fourier Series.	14
V	Fourier Transform: Fourier transform of continuous time signals (CTFT), Properties of Fourier transform (Linearity, Time shifting, Time scaling, Time reversal, Frequency shifting, Multiplication etc). Numerical based on Fourier Transform.	14

Text Book/References Books/ Websites

1. Dr. Sanjay Sharma; Signals & Systems; Katson Publications.
2. Farooq Hussain; Signals & Systems; Umesh Publication.
3. B.P.Lathi; Signal & System; B.S.Publication.

Suggested List of Laboratory Experiments :- (Expandable): Nil

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPALFACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPALDEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Diploma in Engineering

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
DEX 5012	Electrical & Electronics Engineering Drawing	L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
		3	1	-			Min: 40 (D Grade)			Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil

Pre-Requisite	Knowledge of basic electrical & electronics engineering drawing
Course Objective	Students will demonstrate skills in Electrical & Electronics Engineering Drawing.
Course Outcome	1. Estimating and costing market survey, calculation of material and labour cost, idea of tender
	2. Earthing of electrical installation, pipe earthing and plate earthing and determine earth wire size.
	3. Estimation of power wiring, determine size of cable, main switch and starter of power circuit
	4. Estimation of overhead and underground distribution lines.
	5. Estimation of small Sub-Station.

Unit	Contents (Theory)	Marks Weightage
I	Principles of Estimating and Costing: Purpose of estimating and costing, essentials of estimating and costing-market survey, price list and net prices, preparation of list of materials, calculation of material and labour cost, contingencies, overhead charges, profit and total cost, quotations-comparative statement and orders, idea about tender forms.	14
II	Earthing:- Need for earthing of electrical installations, advantages and disadvantages, effect of improper earthing, I.S. specifications regarding earthing of electrical installations, points to be earthed as per I.E. rules. Methods of earthing-plate and pipe earthing. Determination of size of earth wires and earth plates for different capacities of electrical installations, specification of earthing materials and their cost, Earthing of power plant and grid substation.	14
III	Estimation of Power Wiring: - I.S. specifications and I.E. rules, calculation of current for single and three phase motors. Determination of sizes of cables, conductor's distribution board, main switches and starters for power circuits. Cost of equipments and accessories and schedule of materials. Estimation and cost of material and work for small workshops.& lecture hall.	14
IV	Estimation of Overhead and Underground Distribution Lines:- Main components of overhead lines-line supports, cross-arm, clamps, conductors and stay sets, lightening arrestors, danger plates, ant climbing devices, bird guards, jumpers etc., concreting of poles, earthing of transmission line, formation of lines, specification of materials for O.H. lines, I.S. specification and I.E. rules.	14

School of Research and Technology

Department: Electrical and Electronics Engineering

Paji

CHAIRMAN

Adarsh

DEAN

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

Am

DEAN

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

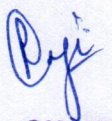
Semester –IV

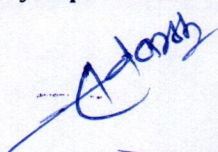
V	Estimation of Small Sub-Station:- Main equipments and auxiliaries installed on the substation. Estimation of materials required for a small distribution substation (indoor and outdoor type-platform and pole mounted). Costing of material and work of above substations.	14
---	--	----

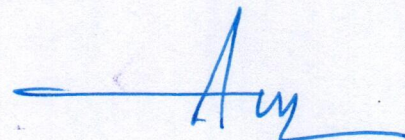
Text Book/References Books/ Websites

1. K Bhattacharya, "Electrical Engineering Drawing & Design Estimating". Wiley Eastern Ltd. New Delhi.
2. Surjeet Singh, "Electrical Design & Drawing" S.K.Kataria & Sons New Delhi.

Suggested List of Laboratory Experiments :- (Expandable): Nil


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL***(Applicable for Admitted from Academic Session 2019-20 onwards)***Programme: **Diploma in Engineering**

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (Nil)	Internal (Nil)	Total Min: Nil
DEX 5013	Electric Traction	3	1	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – NIL Max Marks: NIL	Assignment/Quiz/Attendance – Max. Marks: NIL

Pre-Requisite	Knowledge of Electric Traction
Course Objective	To understand the better coverage of subject in traction systems, auxiliary equipment, electric locomotives, control of traction motors and future-trends.
Course Outcome	1. Identify different traction systems.
	2. Differentiate speed time curve of different services of traction system.
	3. Use traction system auxiliaries.
	4. Use various speed control methods applicable to traction motors.
	5. Get exposure with modern trends in traction.

Unit	Contents (Theory)	Marks
I	Introduction: General features of electrical traction, Mechanics of train movement, Nature of traction load, Speed-time curves, Calculations of traction drive rating and energy consumption, Train resistance, Methods of speed control and braking of motors for traction load, Electric drive systems for electric traction.	14
II	Traction Systems and Latest Trends: types of traction systems and their significance. Steam, diesel, diesel-electric, Battery and electric traction systems State the desirable features of traction motors. Compare different traction motors. Explain different types of electric braking system	14
III	Fundamental of Electric Drives: Basic concepts, Characteristics and operating modes of drive motors, Starting, braking and speed control of motors, Selection of motors and rating	14
IV	Traction Motors:- working of various A.C. motors as traction motors. Compare different traction motors. Features of traction motors, Working of D.C. series motor as traction motor.	14
V	Traction Systems and Latest Trends: Detail the latest trends in traction. General arrangement of different types of Electric traction systems and their significance	14

Text Book/References Books/ Websites

1. Rattan SS; Theory of Machines; TMH.
2. Ambekar AG; Mechanism and Machine Theory; PHI.

Suggested List of Laboratory Experiments :- (Expandable): Nil

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN**DEAN****DEAN**
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2019-20 onwards)*Programme: **Diploma in Engineering**

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
DEX 502	Control System	3	1	-			Min: 40 (D Grade)			Min: Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Nil Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil

Pre-Requisite	Basic Knowledge of Control Systems
Course Objective	To understand concepts of the mathematical modeling, feedback control and stability analysis in Time and Frequency domains.
Course Outcome	1. Ability to understand properties of a control system.
	2. Ability to understand Time response analysis.
	3. Ability to understand Time domain stability analysis.
	4. Sketch the root locus and determine the location of the closed
	5. Sketch the other plots.

Unit	Contents (Theory)	Marks Weightage
I	Basic Control System Terminology and Classification of control System, Examples of control System, Transfer Function of Linear Control System, Block Diagram Representation, Signal flow Graph Techniques.	14
II	Time Response Analysis- Standard Test Signals, Time Response of 1st Order System, Control System, Time Response of Prototype 2nd Order System, Performance Specification of 2nd Order System, Steady-State Errors and Error Constants	14
III	Time Domain Stability Analysis- Concept of Stability of Linear Systems, Effects of Location of Poles on Stability, Necessary Conditions for Stability, Routh-Hurwitz Stability Criteria, Relative Stability Analysis,	14
IV	Polar Plot- Root Locus Concept, Guidelines for Sketching Root-Locus,. Frequency Domain Stability Analysis- Performance Specification in Frequency Domain, Co-relation between frequency Domain and Time Domain,	14
V	Other plots- Bode Plot, Minimum-Phase and Non-Minimum Phase System, Polar Plots, Inverse Polar Plot, Nyquist Stability Criterion. Numerical based on above plots.	14

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

DEAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering**

Semester –IV

Text Book/References Books/ Websites

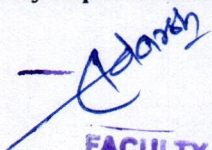
1. Nagrath and Gopal; Control System Engineering; New Age International Publishers.
2. Samarjit Ghose; Control Systems Theory and Applications; Pearson Education.
3. B. S. Manke ; Linear Control System (with MATLAB Application); Khanna Publishers.
4. Ogata; Modern Control Engineering; PHI.

Suggested List of Laboratory Experiments :- (Expandable): Nil



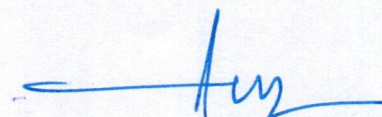
CHAIRMAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL



DEAN

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL



DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL (M.P.)

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (35)	Internal (15)	Total (50)
DEX 503	Power System	3	1	1			Min: 40 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

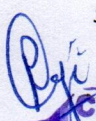
Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Knowledge of power system equipment.
Course Objective	To introduce the students to the general structure of the network for transferring power from generating stations to the consumers.
Course Outcome	1. Become Familiar with the curricular structure of Transmission System.
	2. Understand the quality requirements and quality testing procedures of selected Cables.
	3. Acquire knowledge about various types of Conductors, Line Parameter and its Performances.
	4. Ability to understand the distribution system.
	5. Ability to understand the underground cables.

Unit	Contents (Theory)	Marks Weightage
I	Electrical Design of Lines: Layout of different transmission and distribution systems, advantages of high voltage transmission, concept of short, medium and long lines, parameters of lines, performance of short lines (Regulation, efficiency, vector diagrams), corona formation and its effects on performance of lines	14
II	Constructional Features of Transmission Lines: Concept of Transmission, single line diagram of complete power system, standard voltages of A.C. Transmission, efficiency (no derivation). H.V.D.C. transmission system, advantages and Disadvantages of H.V.D.C. Types of supports, types of conductors, types of insulators, their properties, selection and testing, voltage distribution of string insulators, equalization of potential. Vibration dampers.	14
III	Economic Principle of Transmission: Kelvin's law, limitations of Kelvin's law, Modification in Kelvin's law. Mechanical design of lines, Sag measurement, uses of sag template Indian Electricity Rules pertaining to clearance, stringing of lines.	14
IV	Distribution System: Feeders distributors and service mains, radial and ring main distributors, A.C. distributors fed from one end and both ends. Simple problems on size of feeders and distributors. Construction of Distribution Lines: Erection of pole, fixing of insulators on conductors, testing, operation and maintenance of lines.	14
V	Underground Cables: Power cable construction, comparison of overhead lines and underground cables, laying of cables, cable jointing, use of epoxy resin kits. Fault location, Murray loop test, testing of cables.	14

School of Research and Technology

Department: Electrical and Electronics Engineering


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering****Semester –IV****Text Book/References Books/ Websites**

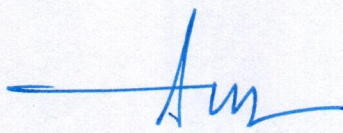
1. M.L. Soni, Gupta, Bhatnagar, Chakrabarthy, "A Text book on Power Systems Engineering", Danpat Rai & Sons, 2007.
2. Wadhwa, C.L., 'Electrical Power Systems', Wiley Eastern Limited India, 1985.
3. S.N. Singh, 'Electric Power Generation, Transmission and Distribution', Prentice Hall of India Pvt. Ltd, New Delhi, 2002.
4. B.R. Gupta, "Generation of Electrical Energy", Eurasia Publishing House (Pvt.) Ltd., Ramnagar, New Delhi, 1983.

Suggested List of Laboratory Experiments :- (Expandable):

1. To study of Electrical design of transmission line.
2. To study of Mechanical design of transmission line.
3. Design of various types of tower.
4. Study of different types of insulators.
5. To Study and Explanation of Kelvin's law with its limitations.
6. To Study of Thermal power Station.
7. To Study of Nuclear power Station.
8. To Study of Hydroelectric power Station.


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY BHOPAL

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Diploma in Engineering

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
DEX 504	Switchgear & Protection	L	T	P	External (70)	Internal (30)	Total (100)	External (35)	Internal (15)	Total (50)
		3	1	1			Min: 40 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Knowledge of Transmission & Distribution, Power System Analysis.
Course Objective	To develop an ability and skill to design the feasible protection systems needed for each main part of a power system in students.
Course Outcome	1. Ability to maintain different types of protective relays in power system for primary and backup protection.
	2. Maintain different types of circuit breakers in power system also Knowledge of the fundamental components and arc.
	3. Student will be able to protect transformer, alternator, motor and bus bar.
	4. Ability to understand the circuit breaking.
	5. Ability to understand the apparatus protection.

Unit	Contents (Theory)	Marks Weightage
I	Introduction to Protection System: Functions of protective relaying, protective zones primary and backup protection, desirable qualities of protective relaying, basic terminology. Relays: Electromagnetic, attracted and induction type relays, thermal relay, gas actuated relay.	14
II	Relay Application and Characteristics: Amplitude and phase comparators, over current relays, directional relays, distance relays, differential relay. Static Relays: Comparison with electromagnetic relay, classification and their description, over current relays, directional relay, distance relays, differential relay.	14
III	Protection of Transmission Line: Over current protection, distance protection, pilot wire protection carrier current protection, protection of bus, auto reclosing,	14
IV	Circuit Breaking: Properties of arc, arc extinction theories, restriking voltage transient, current chopping resistance switching, capacitive current interruption, short line interruption, circuit breaker ratings. Testing of Circuit Breaker: Classification, testing station and equipments, testing procedure, direct and indirect testing.	14

School of Research and Technology

Department: Electrical and Electronics Engineering

Pepi

Adash

Am

CHAIRMAN

DEAN

DEAN

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –IV

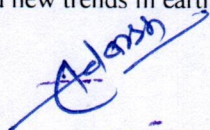
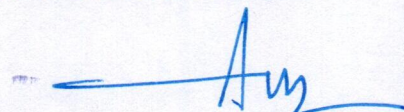
V	Apparatus Protection: Protection of transformer, Buchholz relay, generator and motor. Circuit Breaker: Operating modes selection of circuit breakers, constructional features and operation of Bulk Oil, Minimum Oil, Air Blast SF6, Vacuum and DC circuit breakers.	14
---	---	----

Text Book/References Books/ Websites

1. Rao S. S. "Switchgear and Protection", Khanna Publishers.
2. Ravindranath B. and M. Chander "Power system Protection and Switchgear", Wiley Eastern Ltd.
3. Ram B. and D. N. Vishwakarma, "Power System Protection and Switchgear", Tata Mc. Graw Hill.
4. Paithankar Y. G. and S R Bhide, "Fundamentals of Power System Protection", Prentice Hall of India.
5. Rao T. S. M, "Power System Protection: Static Relays with Microprocessor".

Suggested List of Laboratory Experiments :- (Expandable):

1. To study different switchgear equipments used in electrical power system.
2. To identify the components of different types of circuit breakers with their specification.
3. To study various types of over current relays and to plot the performance characteristics of an over current relay.
4. To understand the protection schemes of alternator and to sketch labeled schematic diagram of various types of protection of alternation.
5. To understand the protection scheme of transformer through a visit to local high voltage substation and to sketch labeled schematic diagram of various types of protection of transformer.
6. To understand various types of neutral earthing and specifications of earthing at different substation different location and new trends in earthing.


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering**

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (35)	Internal (15)	Total (50) Min: 20 (D Grade)
DEX 505	Power Electronics	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Knowledge of different power electronics device.
Course Objective	To familiarize students to the principle of operation, design and synthesis of different power conversion circuits and their applications.
Course Outcome	1. Introduction of power electronic device and brief description of SCR.
	2. Principle of operation of GTO, MOSFET, IGBT.
	3. Detail description of inverter and their utilization.
	4. Principle of operation - step-up and step-down choppers.
	5. Ability to understand the operation and analysis of single phase.

Unit	Contents (Theory)	Marks Weightage
I	Introduction: Advantages and application of power electronic devices characteristics, Symbol & application of power diodes, power transistors, Principle of operation of SCR, brief idea of construction of SCR, Static characteristics of SCR, Method for turning on of SCR, Turnoff methods.	14
II	Power Transistors: Principle of operation of GTO, Principle of operation of MOSFET, Principle of operation of IGBT. And characteristics of GTO, MOSFET, IGBT	14
III	Inverters: Series and parallel inverter, Voltage source & current source inverter, Single phase and three phase bridge inverter, Self cumulated inverters. Voltage control of single phase and three phase bridge inverter, Harmonics & their reduction techniques.	14
IV	Choppers: Principle of operation - step-up and step-down choppers. Switching regulators - Buck regulators - Boost regulators - Buck-boost regulators - Switched mode power supply - principle of operation and analysis.	14
V	Controlled Rectifiers: Operation and analysis of single phase (Half wave & Full Wave) and multiphase (Three Phase) controlled rectifier circuit.	14

[Signature]

School of Research and Technology

CHAIRMAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

[Signature]

Department: Electrical and Electronics Engineering

FACULTY OF ENGINEERING

PEOPLE'S UNIVERSITY, BHOPAL

[Signature]

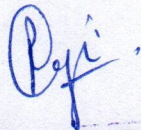
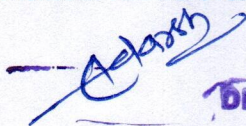
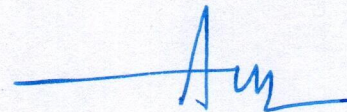
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering****Semester –IV****Text Book/References Books/ Websites**

1. M Ramsmoorthy, An Introduction to transistor and their application, Affiliated East-West Press.
2. P.C. Sen, Power Electronics, TMH.
3. Chakravarti A., Fundamental of Power Electronics and Drives, Dhanpat Ray & Co.,
4. Dr. P.S. Bhimbhra, Power Electronics, Khanna Pub.
5. Vedam Subramanyam, Power Electronics New Age International Revised II ed. 2006.

Suggested List of Laboratory Experiments :- (Expandable):

1. To Study & plot the V-I characteristics of the SCR.
2. To draw V-I characteristics of IGBT.
3. Study of SCR commutation circuits and check the performance of one commutation circuit.
4. Thyristorised speed control of a D.C. Motor.
5. Speed Control of induction motor using Thyristor.
6. To Study V-I characteristics of full wave rectifier with R load.

**CHAIRMAN****BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL****DEAN****FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL****DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL**

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Diploma in Engineering

Semester –IV

DEX 506	Minor Project	L	T	P	External (Nil)	Internal (Nil)	Total	External (35)	Internal (15)	Total (50)
		-	-	1			Nil			Min: 20 (D Grade)

Duration of Theory (Externals): Nil


Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Student should have basic knowledge of engineering principles.
Course Objective	To enable student analytical and practical exposure by giving hands on experience with learned knowledge through different courses.
Course Outcome	The student will be able to-An ability to utilize technical resources.
	1. Identify, analyze & define the problem.
	2. Generate alternative solutions to the problem identified.
	3. Compare & select feasible solutions from alternatives generated.
	4. Compare machines/devices/apparatus for performance practices.
	5. Work effectively in a team.

Unit	Contents (Theory)	Marks Weightage
I	<p>The student should prepare a working system or some design or understanding of a complex system (on minor level) that he/she has selected for his/her minor project work using system analysis tools and submit the same in the form of a write-up i.e. detail project report.</p> <p>The student should maintain proper documentation of different stages of project such as concept evaluation, requirement specification, objectives, work plan, analysis, design, implementation and test plan wherever applicable.</p> <p>Each student is required to prepare a project report based on the above points and present the same at the final examination with a demonstration of their project.</p>	50

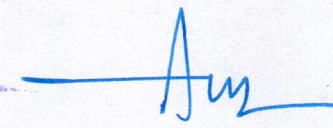
Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil


CHAIRMAN
 BOARD OF STUDIES (ENGINEERING)
 PEOPLE'S UNIVERSITY, BHOPAL
 School of Research and Technology


DEAN
 FACULTY OF ENGINEERING
 PEOPLE'S UNIVERSITY, BHOPAL

Department: Electrical and Electronics Engineering


DEAN
 ACADEMIC AFFAIRS
 PEOPLE'S UNIVERSITY, BHOPAL

Syllabus

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Diploma in Engineering

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (Nil)	Internal (Nil)	Total	External (70)	Internal (30)	Total (100)
DEX 507	Industrial Training-II	-	-	2	(Nil)	(Nil)	Nil	(70)	(30)	Min: 40 (D Grade)

Duration of Theory (Externals): -Nil

Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test – Max Marks: -Nil	Assignment/Quiz/Attendance Max. Marks: -Nil
Practical Internal Max Marks: 30	Lab work & Sessional – Max Marks: 25	Assignment / Quiz/ Attendance Max. Marks: 05

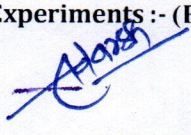
Pre-Requisite	Basic principles and theory knowledge of concern discipline of engineering.
Course Objective	To expose students to the real working environment and get acquainted with the organization structure, business operations and administrative functions.
Course Outcome	1. Get experience of real life working environment.
	2. Gain practical knowledge, new skills and be aware of current technologies.
	3. Provide opportunities to students to be as prospective employees.
	4. Analyze problems and find/suggest possible solutions.
	5. Present a project report both in oral and written form based on work experiences.

Unit	Contents (Theory)	Marks Weightage
I	<p>As a part of the Diploma in Engineering curriculum, DPE 407, Industrial Training -I is a Practical course, which the students should undergo in reputed Private / Public Sector / Government organization / companies as industrial training of minimum two weeks to be undergone by the student in the semester break after III semester theory examinations.</p> <p>Training period: Minimum of two weeks or 15 (Fifteen) Days.</p> <p>Companies / Areas covered: Any field related to concern branch / discipline of Diploma in Engineering.</p> <p>Grading: As per Scheme.</p> <p>Note: Presentation will take place the following week after you complete your training. The presentation is evaluated by your class in-charge. Report must be submitted during power point presentation. A Viva voce comprising comprehensive questions based on training undergone.</p> <p>Etiquette: Dress properly, Behave well, Portray good image as a university student, Be punctual, Observe work ethics, Concern for safety, Be professional.</p>	100

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil


CHAIRMAN
 School of Research and Technology
BOARD OF STUDIES (ENGINEERING)
 PEOPLE'S UNIVERSITY, BHOPAL


DEAN
 Department of Electrical and Electronics Engineering
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
 ACADEMIC AFFAIRS
 PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –VI

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (Nil)	Internal (Nil)	Total
DEX 6011	Utilization of Electrical Power	3	1	-						Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Pre-Requisite	Knowledge of heating welding and electric power utilization.	
Course objective	This subject gives a comprehensive idea in utilization of electrical power such as drives, electric heating, electric welding and illumination, electric traction.	
Course Outcome	1. Maintain various electrical appliances and drives used in industry and elsewhere.	
	2. Design Electric Traction and discuss specific energy consumptions.	
	3. Articulate different types of Electric Heating, welding and Illumination.	
	4. Able to Electrochemical Processes.	
	5. Able to Electric Traction.	

Unit	Contents (Theory)	Marks Weightage
I	Electric Heating: Advantages and methods of electric heating, Resistance heating, Electric arc heating, Induction heating, Dielectric heating.	14
II	Electric Welding: Electric Arc Welding Electric Resistance welding Electronic welding control Electrolyte Process: Principles of electro deposition, Laws of electrolysis, applications of electrolysis.	14
III	Illumination: Various Definitions : flux, solid angle, luminous intensity, illumination, luminous efficiency, depreciation factor coefficient of utilization, space to height ratio, reflection factor, laws of illumination, requirements of good lighting, Design of indoor lighting and outdoor lighting systems.	14
IV	Electrochemical Processes: Need of electro-deposition. Faraday's laws in electro- deposition. Simple numerical problems, Refrigeration and Air Conditioning: Refrigeration systems, domestic refrigerator, water cooler Types of air conditioning, Window air conditioner.	14
V	Electric Traction: Types of electric traction, systems of track Electrification Traction mechanics- types of services, speed time curve and its simplification, average and schedule speeds, Tractive effort, specific energy consumption, mechanics of train movement, coefficient of adhesion and its influence.	14

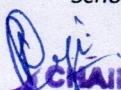
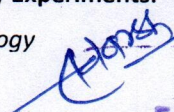
Text Book/References Books/ Websites

1. Art and Science of Utilization of Electrical Energy H. Partab Dhanpat Rai and Sons, New Delhi 1986.
2. Utilization of Electric Power and Electric Traction J. B. Gupta S. K. Kataria and Sons.
3. Utilization of Electric Power Er. R. K. Rajput Laxmi.
4. Utilization of Electrical Power and Electric Traction G. C. Garg Khanna Publishers.
5. Utilization of Electrical Power including Electric drives and Electric Traction N. V. Suryanarayana New Age International (P) Limited, Publishers 1996.

Suggested List of Laboratory Experiments: - Nil

School of Research and Technology

Department: Electrical and Electronics Engineering


CHAIRMAN

DEAN**DEAN**
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –VI

Subject Code	Subject Title	Credit			Theory			Practical		
DEX 6012	Design of Electric Machine	L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
		3	1	-			Min: 40 (D Grade)			Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil

Pre-Requisite	Knowledge of Different type of electrical machine. DC Machines and Transformers, Synchronous and Induction Machines.
Course objective	The goal of this course is to provide advanced knowledge and understanding about the construction and design of the electrical machines.
Course Outcome	1. Ability to understand the knowledge of different machine parameters.
	2. Students will be able to design different type of electrical machines.
	3. Awareness of industrial parameters of Electrical Machine Design.
	4. Student is able to understand the design concepts of Induction Motors & Synchronous Machines.
	5. Student understands the importance of design of machines based on their applications.

Unit	Contents (Theory)	Marks Weightage
I	Introduction: Major considerations in Electrical Machine Design – Electrical Engineering Materials – Space factor – Choice of Specific Electrical and Magnetic loadings – Thermal considerations – Heat flow – Temperature rise and Insulating Materials – Rating of machines – Standard specifications.	14
II	Transformers: Output Equations – Main Dimensions – kva output for single and three phase transformers – Window space factor – Design of core and winding – Overall dimensions – Operating characteristics – No load current – Temperature rise in Transformers – Design of Tank – Methods of cooling of Transformers.	14
III	DC Machines: Output Equations – Main Dimensions – Choice of Specific Electric and Magnetic Loading - Magnetic Circuits Calculations- Net length of Iron -Real & Apparent flux densities – Selection of number of poles – Design of Armature – Design of commutator and brushes.	14
IV	Induction Motors: Output equation of Induction motor – Main dimensions – Choice of Average flux density – Length of air gap- Rules for selecting rotor slots of squirrel cage machines – Design of rotor bars & slots – Magnetic leakage calculations –Magnetizing current – Short circuit current - Losses and Efficiency.	14

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

DEAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

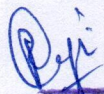
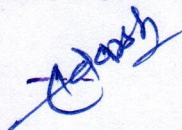
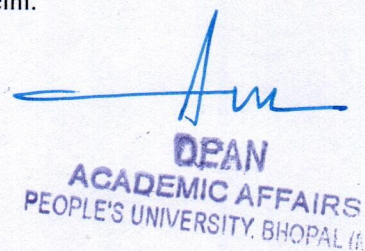
PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –VI

V	Synchronous Machines: Output equations – choice of Electrical and Magnetic Loading – Design of salient pole machines – Short circuit ratio – Design of rotor – Design of damper winding – Determination of full load field mmf – Design of field winding – Design of turbo alternators – Rotor design.	14
---	---	----

Text Book/References Books/ Websites

1. Nagarajan V.S., Rajini.V ; “Electrical Machine Design”; Pearson.
2. Sawhney, A.K.; “A course in Electrical Machine Design” ;Dhanpat Rai & Sons, New Delhi, 1996.
3. Rai, H.M.; “Principles of Electrical Machine Design”; Sathyaprakashan New Delhi, 4th Edition, 1995.
4. Surjeet Singh; “Electrical Design & Drawing”; S.K.Kataria & Sons New Delhi.

Suggested List of Laboratory Experiments :- (Expandable): Nil

CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL (U)

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –VI

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (Nil)	Internal (Nil)	Total Min: Nil
DEX 6013	Renewable Energy Sources	3	1	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – NIL Max Marks: NIL	Assignment/Quiz/Attendance – Max. Marks: NIL
Pre-Requisite	Knowledge of Non conventional energy sources.	
Course objective	To create awareness among the students about the different types of non-conventional energy resources and emphasize its importance.	
Course Outcome	1. To understand the various forms of conventional energy resources.	
	2. To learn the present energy scenario and the need for energy conservation.	
	3. To analyze the environmental aspects of renewable energy resources.	
	4. To analyze the Energy storage and hybrid system configurations.	
	5. To analyze the Grid Integration.	

Unit	Contents (Theory)	Marks
I	Energy Scenario: Classification of Energy Sources, Energy resources (Conventional and nonconventional), Energy needs of India, Energy efficiency and energy security. Energy and its environmental impacts, Distributed generation.	14
II	Solar Energy: Introduction to solar energy, Solar thermal Systems: Types of collectors, Collection systems, efficiency calculations, applications. Photo voltaic (PV) technology: Present status, solar cells, cell technologies, characteristics of PV systems, integrated PV system, its components, Peak power operation.	14
III	Wind Energy: Introduction to wind energy, wind speed and power relation, power extracted from wind, Wind power systems: system components, Introduction to hydro power and hydro power plant, Types of Turbine, Turbine rating. Choice of generators, turbine rating etc .	14
IV	Energy storage and hybrid system configurations: Energy storage, Battery – types, equivalent circuit, performance characteristics, battery design, charging and charge regulators. Battery management. Flywheel-energy relations, components, benefits over battery. Fuel Cell energy storage systems. Bio-Mass and Bio-Fuels.	14
V	Grid Integration: Stand alone systems, Concept of Micro-Grid and its components, Hybrid systems, load sharing, Hybrid system economics, Stable operation, Transient-safety, Operating limits of voltage, frequency, stability margin, energy storage, and load scheduling. Effect on power quality, harmonic distortion, voltage transients and sags, voltage flickers, dynamic reactive power support, Systems stiffness.	14

Text Book/References Books/ Websites

1. G.S. Sawhney; Non-conventional sources of energy; PHI.
2. D.P. Kothari; Renewable energy sources and emerging technologies; PHI.
3. C.L. Wadhwa; Electrical power systems; New Age International Publishers.

Suggested List of Laboratory Experiments :- (Expandable): Nil

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPALFACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPALDEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2019-20 onwards)*Programme: **Diploma in Engineering**

Semester –VI

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
DEX 602	Generation, Transmission and Distribution	3	1	-			Min: 40 (D Grade)			Min: Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Nil Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil

Pre-Requisite	Knowledge of generating power plant.
Course objective	The objective of this course is to enable the students to understand the economic aspects of power generation, analyse the performance of transmission lines, distribution systems.
Course Outcome	1. To understand the development of electrical energy needs of various consumer areas.
	2. Introduction to thermal power generation and their drawbacks and impact on the environment
	3. Introduction to renewable energy resources and their advantages over conventional sources.
	4. Determine the parameters of transmission line.
	5. To understand the classification of distribution system.

Unit	Contents (Theory)	Marks Weightage
I	Non Conventional Sources Of Energy - Concept and need of primary and secondary energy sources, difference between conventional and non-conventional sources of energy, concept of solar , wind, biogas, ocean, tidal, geothermal, fuel cell , MHD and their practical applications	14
II	Conventional Sources Of Energy - Detailed study of generating stations - thermal, hydro, nuclear, schematic diagram, site selection main components and auxiliaries for above power stations. Study of gas turbines plant and diesel power plant. Advantages, disadvantages of thermal hydro, nuclear, gas turbine plant and diesel power plant.	14
III	Concept Of Load - Types of load, load curve, load duration curve, connected load, demand factor, average load, maximum demand, load factor, diversity factor, plant utilization factor, capacity factor, reserve capacity. Simple numerical on above terms.	14
IV	Types of Transmission line - T and Π network of medium Transmission line, transmission efficiency, Ferranti effect, simple problems of short and medium Transmission line. Difference between overhead line and underground cables. Classification and construction of L.T. and H. T. cables, Methods of laying.	14

Chairman, School of Research and Technology

DEAN

Faculty of Engineering, Department of Electrical and Electronics Engineering

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL

BOARD OF STUDIES (ENGINEERING)

PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**


Semester –VI

V	Classification of distribution system - ring main, radial and interconnected system. Concept of feeder, distributor and service mains in distribution system. Simple problems.	14
---	---	----

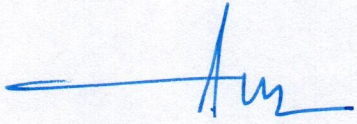
Text Book/References Books/ Websites

1. G. R. Nagpal, Power Plant Engineering, Khanna Publisher.
2. M.V. Deshpandey, Modern Design of Power Station.
3. J.B. Gupta, Electrical Power, S. K. Kataria & Sons.
4. V.K. Mehta Power System, S Chand & Co Ltd.
5. G.D Rai Non Conventional energy sources. Khanna Publisher.
6. S.L Uppal Electrical Power, Khanna publisher.

Suggested List of Laboratory Experiments :- (Expandable): Nil


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2019-20 onwards)*Programme: **Diploma in Engineering**

Semester –VI

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (35)	Internal (15)	Total (50)
DEX 603	Electrical Drives	3	1	1			Min: 40 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Basic Knowledge of electrical drives.
Course objective	To understand the basic concept of working and control of modern electrical drives.
Course Outcome	1. Introduction to Electrical drives and their applications in the Industry.
	2. Review of conventional methods & convertor control methods used in speed control of DC motor.
	3. Understand the basics of Induction motor drive.
	4. Learn and analyze Traction Drives.
	5. Learn and analyze Special Drives.

Unit	Contents (Theory)	Marks Weightage
I	Introduction- Block Diagram representation of Electrical Drives, Elements of drive systems, Requirement of electric drives, Fundamental torque equation, load equalization, use of fly wheel etc. Basic Concepts of Electric Drives, Merits and demerits of electric drives, factors governing selection of Electrical Drives, classification of Electrical Drives.	14
II	DC Drives: Introduction to DC Drives and speed controlling, Armature voltage control, Flux control, Introduction to Electrical Braking, Types of Electrical Braking Phase controlled and chopper controlled drives, Transient & Steady state analysis, Energy recovery systems.	14
III	Induction motor drive- Introduction to the concept of controlling the speed of induction motor, stator voltage control using A.C. voltage controller, stator frequency control, V/F control of induction motor, rotor side control of induction motor, static rotor resistance control, Slip power recovery schemes, Kramer drive, Scherbius drive.	14
IV	Traction Drives - Introduction to Traction drive, nature of traction load, conventional ac and dc traction drive, CSI fed squirrel cage induction motor drive, load commutated inverter synchronous motor drive, PWM VSI fed induction motor drive.	14
V	Special Drives- Fundamentals of Switched reluctance motors, Stepper Motors, Permanent Magnet Motor Introduction to vector control; Digital control of drives.	14

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

FACULTY OF ENGINEERING

PEOPLE'S UNIVERSITY, BHOPAL

DEAN

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPALBOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

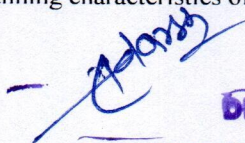
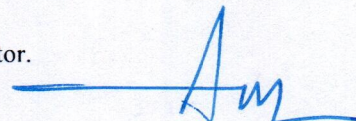
Semester –VI

Text Book/References Books/ Websites

1. Pillai S. K. ; "A first course on Electrical Drives"; Second edition, Wiley Eastern.
2. Dubey G. K. ; "Fundamentals of Electrical Drives"; Narosa Publishing House.
3. Murphy M. D. and Tumbuli F.; "Power Electronic Control of AC Motors"; Pergamon Press, Oxford University Press.
4. P.V. Rao; "Power semiconductor Drives"; BS Publications.
5. Dubey G. K.; "Power Semiconductor Controlled Drives"; Prentice-Hall, Englewood Cliffs.
6. Bose B. K.; "Power Electronics and AC Drives"; Prentice-Hall.

Suggested List of Laboratory Experiments :- (Expandable):-

1. To study the electrical braking of a DC drive.
2. To control the speed of DC shunt motor using armature voltage control.
3. To control the speed of DC shunt motor using armature flux control.
4. To study the performance of a permanent magnet brushless dc motor drive.
5. To study the starting and running characteristics of converter fed DC traction motor.

**CHAIRMAN****BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL****DEAN****FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL****DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL**

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –VI

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)	External (35)	Internal (15)	Total (50) Min: 20 (D Grade)
DEX 604	Microprocessors and Interfacing	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	To understand basic of processor and microprocessor and interfacing with real world
Course objective	Outline the history of computing devices, architecture of 8085 microprocessors and Peripheral Devices and their Interfacing.
Course Outcome	1. Define the history of microprocessors
	2. Describe the architecture & organization of 8085 Microprocessor.
	3. Understand the fundamentals of Instruction sets of Intel 8085.
	4. Understand the Peripheral Devices and their Interfacing.
	5. Students will be able to use the 8259 interfacing chip.

Unit	Contents (Theory)	Marks Weightage
I	Introduction- Organisation and Block-Diagram of a Simple Micro-Computer, Word-length of a Computer/Microprocessors, Microcontrollers, Embedded Microprocessors, Hardware, Software, Firmware, CPU/Microprocessor – Schematic Diagram, Memory, Buses, Input device, Output device, Microprocessor Applications.	14
II	Introduction to 8085 – Microprocessor - Architecture, Pin-description, System Bus – Address Bus, Data Bus, Control Bus, Instruction Cycle, Timing-diagram.	14
III	Instruction sets of Intel 8085- Addressing Modes, Groups of Instructions. Simple Programming on Addition, Subtraction, Multiplication, Counting, Looping, BCD to BINARY conversion, BINARY to BCD conversion, sorting etc.	14
IV	Peripheral Devices and their Interfacing - Address space partitioning – Memory mapped I/O Scheme, I/O mapped I/O scheme, Memory and I/O interfacing, Data-transfer schemes, Interrupts of Intel 8085, Brief Introduction to 8255, 8253. Interfacing of these chips with Microprocessor.	14
V	8259 interfacing chip – Pin description, interfacing of 8259 and I/O devices, Internal Register of 8259. Introduction to 8086, pin-description, operating modes, pin –description for Minimum and Maximum mode, operation, Registers.	14

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

FACULTY OF ENGINEERING

DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPALBOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**


Semester –VI

Text Book/References Books/ Websites

1. Digital Computer Electronics – By – Malvino, Brown.
2. Microprocessor Architecture, Programming & Applications – By – R.S.Gaonkar.

Suggested List of Laboratory Experiments :- (Expandable):

1. To study and analyze the interfacing of 16×2 LCD.
2. To study of implementation, analysis and interfacing of seven segment display.
3. To study of implementation of stepper motor angle control.
4. To study of implementation of DC motor control using PWM method.
5. To study and observation of position control of servo motor.
6. To study implementation and programming of pressure measurement.
7. To study implementation and programming of temperature measurement.


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

Semester –VI

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (250)
DEX 605	Major Project	-	-	5	(Nil)	(Nil)	Nil	(175)	(75)	Min: 100 (D Grade)

Duration of Theory (Externals): 3 Hours

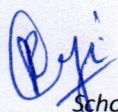
Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 75	Lab work & Sessional – Max Marks: 70	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Knowledge of Concern Subject.
Course objective	The objective of Major Project is to provide students with practical exposure to the real world of business and consulting whereby they get an opportunity to apply the knowledge and skill acquired through the course.
Course Outcome	The student will be able to-An ability to utilize technical resources:
	1. Identify, analyze & define the problem.
	2. Generate alternative solutions to the problem identified.
	3. Compare & select feasible solutions from alternatives generated.
	4. Design, develop, manufacture & operate equipment/program.
	5. Acquire higher-level technical knowledge by studying recent development in Engineering field.

Unit	Contents (Theory)	Marks Weightage
I	<p>The student should prepare a working system or some design or understanding of a complex system that he/she has selected for his project work using system analysis tools and submit the same in the form of a write-up i.e. detail project report. The student should maintain proper documentation of different stages of project such as need analysis, market analysis, concept evaluation, requirement specification, objectives, work plan, analysis, design, implementation and test plan wherever applicable. Each student is required to prepare a project report based on the above points and present the same at the final examination with a demonstration of the working system, if applicable.</p> <p>Evaluation will be based on his/her performance in technical work pertaining to the solution of a small size problem, project report, and presentation of work and defending it in a viva-voce.</p>	250

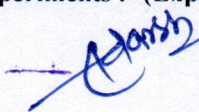
Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil

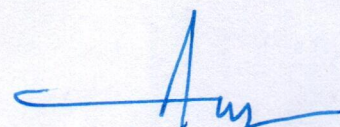


School of Research and Technology

CHAIRMAN



DEAN

FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL


DEAN

ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPALBOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2019-20 onwards)*Programme: **Diploma in Engineering**

Semester –VI

DPE 606	Development of Professional life Ethics and Humanities	L	T	P	External (Nil)	Internal (Nil)	Total	External (35)	Internal (15)	Total (50)
		-	-	1			Nil			Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Nil
Course Outcome	Ability to use of presentation aids, Presentation skills, Interview Technique and ethics

Unit	Contents (Theory)	Marks Weightage
1	<p>Presentation Skills Body Language -- Dress Like The Audience Posture, Gestures, Eye Contact And Facial Expression. Presentation Skill – Stage Fright, Voice And Language – Volume, Pitch, Inflection, Speed, Pause; Pronunciation, Articulation, Language, Practice of Speech; Use of Aids –OHP,LCD Projector, White Board</p> <p>Group discussion and Interview technique – Introduction to group discussion, Ways to carry out group discussion, Parameters— Contact, body language, analytical and logical thinking, decision making Interview Technique Necessity, Tips For Handling Common Questions</p> <p>Working in Teams: Understand and work within the dynamics of a groups. Tips to work effectively in teams, Establish good rapport, interest with others and work effectively with them to meet common objectives, Tips to provide and accept feedback in a constructive and considerate way, Leadership in teams, handling frustrations in group.</p> <p>Professional Ethics: The foundations and norms of professional ethics. The need for separate code of conduct for professionals. The relation between professional and general ethics. Moral conflict and the issue of autonomy of professional ethics. Impact of Violation of Professional Ethics on Society, Remedies.</p>	50

Text Book/References Books/ Websites

1. Michael Hatton ; Presentation Skills (Canada – India Project) ;ISTE New Delhi.
2. Richard Hale ,Peter; Target setting and Goal Achievement; Whilom Kogan page India .
3. Chakravarty, Ajanta ; Time management ;Rupa and Company.
4. Harding ham; Working in Teams;A Orient Longman.
5. Koehn, D.; The Ground of Professional Ethics, Routledge, 1995.
6. Wuest, D.E; Professional Ethics and Social Responsibility, Rowman & Little field, 1994.

School of Research and Technology

Department: Electrical and Electronics Engineering

CHAIRMAN

DEAN

DEAN


BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPALFACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPALACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY

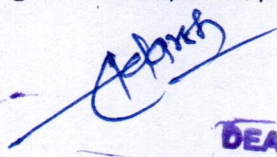
PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2019-20 onwards)**Programme: **Diploma in Engineering**

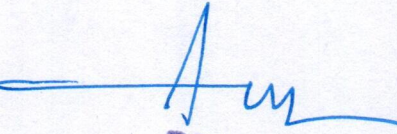
Semester –VI

Suggested List of Laboratory Experiments :- (Expandable):

1. Deliver a seminar for 10-12 minutes using presentation aids on the topic given by your teacher.
2. Watch/listen an informative session on social activities. **Make a report** on topic of your interest using audio/visual aids.
3. **Mini Project** on Task Management. Decide any task to be completed in a stipulated time with the help of teacher. Write a report on the group task assigned by teacher related to social and technical activities.
4. Conduct an interview of a personality and write a report on it.
5. Discuss a topic in a group and prepare minutes of discussion. **Write thorough description** of the topic discussed.
6. **Arrange an exhibition**, displaying flow-charts, posters, paper cutting, photographs etc on the topic given by your teacher.


CHAIRMAN
BOARD OF STUDIES (ENGINEERING)
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL


DEAN
ACADEMIC AFFAIRS
PEOPLE'S UNIVERSITY, BHOPAL