Programme Structure

SCHOOL OF ENGINEERING & TECHNOLOGY

Diploma in Electrical Engineering With Specialisation in Electric Vehicle / PV Solar System

Programme Code: 0105

Batch: 2024-2027

Vision of the University

To be recognized as an Institution of excellence, facilitating learning, fostering creativity, knowledge creation, innovations, consultancy and leadership in multiple areas to build a conscious community that will positively impact living beings for a sustainable future.

Mission of the University

1. **Offers a wide range of Undergraduate and Post graduate Courses.**
   To create conducive environment for an interactive and application oriented experiential learning making the Institute a preferred destination for work and study.
2. **Research, Innovation, Consultancy & Entrepreneurial Culture**
   To Foster creativity, research and innovation orientation in students and faculty in basic and applied areas in all of its disciplines, provide cost effective solutions and nurture entrepreneurial capabilities to accelerate growth.
3. **Social Relevance with local actions on global thoughts**
   To act as a catalyst in social change by developing academic, social, political, technological, scientific, industrial and business leadership in the spirit "Think Globally and Act Locally"; by providing ample opportunities to develop team spirit, sportsmanship and love for culture and national heritage.

Core Values

Integrity
Leadership
Diversity
Community

Vision of the School of Polytechnic

To become a center of excellence for providing quality and value based education in the field of diploma engineering that will produce skilled technocrats to meet industry requirements.

Mission of the School of Polytechnic

- To provide technical knowledge and skills by using latest engineering tools.
- To facilitate industry-institute interaction to explore the industrial knowledge of the students.
- To inculcate ethical and professional values among students.
- To impart quality education to the students coming from rural parts and to conduct different curricular & co-curricular activities to enhance the academic.

Core Values

Integrity
Leadership
Diversity
Community

Programme Educational Objectives (PEO's)

PEO 1. To provide solid foundation in electrical engineering along with good communication and entrepreneurship skills for tackling social issues.

PEO 2. To impart students with good scientific and engineering knowledge in order to analyse, design and create novel products for giving practical solutions to real life problems.

PEO 3. To create engineers with sound technical knowledge for facing all sorts of challenges in industry or in pursuance of higher studies.

PEO 4. To motivate students, to acquire aptitude for lifelong learning along with leadership skills, team spirit and ethical values so that they upgrade themselves with the latest trends in the field of engineering in order to serve the society.

PROGRAMME OUTCOMES (POs)

PO 1. Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

PO 2. Problem analysis: Identify and analyse well-defined engineering problems using codified standard methods.

PO 3. Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.

PO 4. Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.

PO 5. Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices.

PO 6. Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.

PO 7. Life-long learning: Ability to analyse individual needs and engage in updating in the context of technological changes.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO 1. An ability to specify, design and analyse systems that efficiently generate, transmit, distribute and utilize electrical power.

PSO 2. An ability to analyse and design electrical machinery, electrical/electronic circuits, electrical/solid state drive systems, lighting systems and deliver technological solution by assimilating advances in allied disciplines.

PSO 3. An ability to specify, design, implement and test analog and embedded signal processing electronic systems using the state of the art components and software tools.

PSO 4. An ability to analyse, design and implement the learning in electrical instrumentation, control and automation applications.

SDGI GLOBAL UNIVERSITY, GHAZIABAD

SCHOOL OF ENGINEERING & TECHNOLOGY

SCHEME OF STUDIES AND EVALUATION FOR DIPLOMA IN ELECTRICAL ENGINEERING (ELECTRIC VEHICLE)

W.E.F. Session: 2025-26 **(Batch : 2024-2027)** **Semester - III**

S. No	Status	Paper Code	Subjects	Study Scheme Lec / Week			Hours	Credits	CIE	ESE	Total	Pass Marks
				L	T	P						
1	DC	D06AS24301	*Applied Mathematics -III	3	1	-	4	3	50	50	100	40
2	DC	D061024302	Electrical Instrumentation and Measurement	3	0	-	3	3	50	50	100	40
3	DC	D061024303	Electrical Machines - I	3	1	-	4	3	50	50	100	40
4	OE	D061024304	*Digital Electronics	3	1	-	4	3	50	50	100	40
5	VAC	D06VA24305	*Human Values & Professional Ethics	3	0	-	3	3	50	50	100	40
6	DC	D061024352	Electrical Instrumentation and Measurement Lab	-	-	2	2	1	60	40	100	40
7	DC	D061024353	Electrical Machines - I Lab	-	-	4	4	2	60	40	100	40
8	OE	D061024354	*Digital Electronics Lab	-	-	2	2	1	60	40	100	40
9	SE	D061024360	Electrical Simulation Lab	-	-	4	4	2	60	40	100	40
Total				15	3	12	30	21	490	410	900	360

*Subjects denotes the subject that are common with other Diploma programs.

Semester 3rd

SCHOOL OF ENGINEERING & TECHNOLOGY

APPLIED MATHEMATICS-III

(D06AS24301)

L	T	P
3	1	0

JUSTIFICATION

Contents of this course provide understanding of some elementary and advanced mathematics algorithms and their applications of solving engineering problems. Content of this course will enable students to use some advanced techniques like Beta-Gamma function, Fourier series, Laplace transform and probability distributions in solving complex engineering problems.

DETAILED CONTENTS

UNIT 1: Matrices **10 Hours**

1.1 Algebra of Matrices, Inverse Addition, Multiplication of matrices, Null matrix and a unit matrix, Square matrix, Symmetric, Skew symmetric, Hermitian, Skew hermition, Orthagonal, Unitary, diagonal and Triangular matrix, Determinant of a matrix. Definition and Computation of inverse of a matrix.

1.2 Elementry Row/Column Transformation Meaning and use in computing inverse and rank of a matrix.

1.3 Linear Dependence, Rank of a Matrix Linear dependence/independence of vectors, Definition and computation of rank of matrix. Computing rank through determinants, Elementary row transformation and through the concept of a set of independent vectors, Consistency of equations.

1.4 Eigen Pairs, Cayley-Hamilton Theorem Definition and evaluation of eign values and eign vectors of a matrix of order two and three, Cayley-Hamilton theorem (without Proof)and its verification, Use in finding inverse and powers of a matrix

UNIT 2: Differential Calculus **08 Hours**

2.1 Function of two variables, identification of surfaces in space, conicoids

2.2 Partial Differentiation Directional derivative, Gradient, Use of gradient f, Partial derivatives, Chain rule, Higher order derivatives, Euler's theorem for homogeneous functions, Jacobians

2.3 Vector Calculus Vector function, Introduction todouble and triple integral,differentiation and integration of vector functions, gradient, divergence and curl, differential derivatives

UNIT 3: Differential Equation **10 Hours**

3.1 Formation, Order, Degree, Types, Solution Formation of differential equations through physical, geometrical, mechanical and electrical considerations, Order, Degree of a differential equation, Linear, nonlinear equation.

3.2 First Order Equations Variable seperable, equations reducible to seperable forms, Homogeneous eqution, equations reducible to homogeneous forms, Linear and Bernoulli form exact equation and their solutions

3.3 Higher Order Linear Equation : Property of solution, Linear differential equation with constant coefficients (PI for X= eax , Sinax, Cosax, Xn , eaxV, XV

3.4 Simple Applications LCR circuit, Motion under gravity, Newton's law of cooling, radioactive decay, Population growth, Force vibration of a mass point attached to spring with and without damping effect. Equivalence of electrical and mechanical system

UNIT 4: Integral Calculus-II **10 Hours**

4.1 Beta and Gamma Functions, Definition, Use, Relation between the two, their use in evaluating integrals

4.2 Fourier Series Fourier series of f(x),-n<x

4.3 Laplace Transform Definition, Basic theorem and properties, Unit step and Periodic functions, inverse laplace transform, Solution of ordinary differential equations

UNIT 5: Probability and Statistics **08 Hours**

5.1 Probability Introduction, Addition and Multiplication theorem and simple problem.

5.2 Distribution Discrete and continuous distribution, Bionimal Distribution, Poisson distribution, Normal Distribution.

TEXT BOOKS

1. A Text Book on Applied Mathematics-III by Ajay Kumar; Jai Prakash Nath Publications, Meerut.
2. A Text Book on Applied Mathematics-III by Rupa Sharma; Asian publishers, Muzaffarnagar.

REFERENCE BOOKS

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,
3. Applied Mathematics-III by Chauhan and Chauhan, Krishna Publications, Meerut.
4. Applied Mathematics-II by Kailash Sinha and Varun Kumar; Aarti Publication, Meerut.
5. E-books/e-tools/relevant software to be used as REFERENCE by AICTE/ NITTTR, Chandigarh.

SCHOOL OF ENGINEERING & TECHNOLOGY

ELECTRICAL INSTRUMENTATION & MEASUREMENT (D061024302)

L	T	P
3	0	0

JUSTIFICATION

Diploma holders in Electrical Engineering have to work on various jobs in the field as well as in testing laboratories and on control panels, where he performs the duties of installation, operation, maintenance and testing by measuring instruments. Persons working on control panels in power plants, substations and in industries will come across the use of various types of instruments and have to take measurements.

Instruments used to read and observe the general electrical quantities like current, voltage, power, energy, frequency, resistance etc. and their wave shapes, have been incorporated in this subject. So the technician will know the construction and use of various types of electrical instruments.

DETAILED CONTENTS

UNIT 1: Introduction to Electrical Measuring Instruments: **08 Hours**

1.1 Concept of measurement and instruments

1.2 Concept of measurement of electrical quantities and instruments for their measurements, sources of error.

1.3 Types of electrical measuring instruments– indicating, integrating and recording type instruments

1.4 Essentials of indicating instruments – deflecting, controlling and damping torque.

Ammeters and Voltmeters (Moving coil and moving iron type)

1.5 Concept of ammeter and voltmeters and difference between them

1.6 Construction and working principles of moving Iron and moving coil instruments

1.7 Merits and demerits, sources of error and application of these instruments

UNIT 2: Wattmeter's (Dynamometer Type) & Energy meter **08 Hours**

2.1 Construction, working principle, merits and demerits of dynamometer type wattmeter, Digital wattmeters.

2.2 Power Measurements in 3-phase circuits by two wattmeter method in balanced and unbalanced circuits and simple problems,

2.3 Three wattmeter method.

2.3 Induction Type: Construction, working principle, merits and demerits of single phase and three-phase energy meters

2.4 Errors and their compensation

2.5 Simple numerical problems

2.6 Construction and working principle of maximum demand indicators

2.7 Digital energy meter (diagram, construction and application)

Unit 3: Electronic Instruments: **06 Hours**

3.1 Cathode Ray Oscilloscope: Block diagram, working principle of CRO and its various controls. Applications of CRO.

3.2 Digital Multimeter

3.3 Study of LCR meters and their applications

Unit 4: Miscellaneous Measuring Instruments: 08 Hours

4.1 Construction, working principle and application of Meggar, Earth tester (analog and digital) Multimeter, Frequency meter (dynamometer type) single phase power factor meter (Electrodynamometer type). Working principle of synchro scope and phase sequence indicator, tong tester (Clamp-on meter)

4.2 Instrument Transformers: Construction, working and applications a) CT b) PT

4.3 Smart Metering System : AMI (Advance Metering Infrastructure), Functions of AMI, cyber Security, Advantages Smart Meter Technology: AMR (Automatic Metering Reading), inverse/reverse metering system in solar power plant, MRI (Meter Reading Instrument)

UNIT 5: Transducers 08 Hours

5.1 Transducers : Introduction, Types of Transducers (1 phase,3 phase) Basic concept of pressure measurement, flow measurement, level measurement, displacement measurement using transducers

5.2 Measurement of Temperature: Different types of thermometers, thermocouple, resistance temperature detector and their construction, principle and working. Thermal Imager Camera (Concept)

TEXT BOOKS

1. A Text Book on Electrical Instrumentation and Measurement by Dr. Tara Bisht & Pooja Yadav; Asian publisher; Muzaffarnagar.
2. A Text Book on Electrical Instrumentation and Measurement by Rajneesh Mishra; Jai Prakash Nath Publications, Meerut.
3. A Text Book on Electrical Instrumentation and Measurement by Rakesh Mohan; NavBharat Publications, Delhi.

REFERENCE BOOKS

1. Electrical Measurements and Measuring Instruments by SK Sahdev, Uneek International Publications, Jalandhar
2. A Course in Electrical Measurement and Measuring Instruments by AK Sawhney and PL Bhatia; Dhanpat Rai and Sons, New Delhi
3. Electric Instruments by D. Cooper
4. Experiments in Basic Electrical Engineering by SK Bhattacharya and KM Rastogi, New Age International (P) Ltd., Publishers, New Delhi
5. Electronics Instrumentation by Umesh Sinha, Satya Publication, New Delhi
6. Electrical Measurement and Measuring Instruments by JB Gupta, SK Kataria and Sons, New Delhi
7. Electrical Measurement and Measuring Instruments by ML Anand, SK Kataria and Sons, New Delhi

ELECTRICAL MACHINES-I
(D061024303)

L	T	P
3	1	0

JUSTIFICATION

Electrical machines is a subject where a student will deal with various types of electrical machines which are employed in industries, power stations, domestic and commercial appliances etc. After studying this subject, an electrical diploma holder must be competent to repair and maintain these machines and give suggestions to improve their performance. Practical aspects of the subject will make the students capable of performing various tests on the machines as per latest BIS specifications

DETAILED CONTENTS

UNIT 1: Introduction to Electrical Machines **09 Hours**

1.1 Magnetic Materials classification, Basic terminologies of Magnetism, Electromagnetism, Electric and magnetic Circuit, Series and Parallel Magnetic Circuit,
1.2 Right Hand Thumb rule, Flemings right Hand Rule, Flemings Left Hand Rule
1.3 Faraday's laws of Electromagnetic Induction, Lenz's Law
1.4 Eddy Current and Hysteresis Losses and Factors affecting them
1.5 Definition of motor and generator
1.6 Torque development due to alignment of two fields and the concept of torque angle
1.7 Electro-magnetically induced emf, self and Mutually induced emf
1.8 Elementary concept of an electrical machine
1.9 Comparison of generator and motor

UNIT 2: DC Generators **09 Hours**

2.1 Main constructional features, Principle of working, Types of armature winding
2.2 Function of the commutator for motoring and generation action
2.3 Factors determining induced emf
2.4 Factors determining the electromagnetic torque
2.5 Classification of DC generators
2.6 Various Characteristics of DC generator
2.7 Armature Reaction
2.8 Methods to improve commutation
2.9 Rating and Specifications of DC machines

UNIT 3: DC Motors **10 Hours**

3.1 Significance of back e.m.f., the relation between back emf and Terminal voltage
3.2 Classification of DC motor
3.3 Expression for Speed and Torque
3.4 Performance and characteristics of different types of DC motors
3.5 Speed control of dc shunt/series motors
3.6 Losses in a DC machine/motor
3.7 Determination of losses by Swinburne's test
3.8 Need of starter, three point dc shunt motor starter and 4 point starter

3.9 Electric Braking
3.10 Applications of DC motors
3.11 Faults in dc machines and their retrospective

UNIT 4: Single phase Transformers **10 Hours**

4.1 Introduction
4.2 Constructional features of a transformer and parts of transformer
4.3 Working principle of a transformer
4.4 EMF equation
4.5 Transformer on no-load and its phasor diagram
4.6 Transformer – neglecting voltage drop in the windings – Ampere turn balance – its phasor diagram
4.7 Mutual and leakage fluxes, leakage reactance
4.8 Transformer on load, voltage drops and its phasor diagram
4.9 Equivalent circuit diagram
4.10 Relation between induced emf and terminal voltage, voltage regulation of a transformer- mathematical relation
4.11 Losses in a transformer
4.12 Open circuit and short circuit test. Calculation of efficiency, condition for maximum efficiency-maintenance of Transformer, scheduled Maintenance.
4.13 Auto transformer construction, working and applications
4.14 Different types of transformers including dry type transformer.
4.15 Rating and Specifications of single phase transformer

UNIT 5: Three Phase Transformer **08 Hours**

5.1 Construction of three phase transformers and accessories of transformers such as Conservator breather, Buchholz Relay, Tap Changer (off load and on load) (Brief idea)
5.2 Types of three phase transformer i.e. delta-delta, delta-star, star-delta and star-star
5.3 Star delta connections (relationship between phase and line voltage, phase and line current)
5.4 Conditions for parallel operation (only conditions are to be studied)
5.5 Difference between power and distribution transformer three phase transformers
5.6 Cooling of transformer
5.7 Rating and Specifications of three phase transformers.

TEXT BOOKS

1. Electrical machines-I by Dr. Tara Bisht& Pooja Yadav, Asian Publishers, Muzaffarnagar.
2. Electrical machines-I by V D Gupta, Jai Prakash Nath Publishers, Meerut.
3. Electrical machines-I by Dinesh Kumar, Jai Prakash Nath Publishers, Meerut.
4. Electrical machines-I by Arya Gupta, Asian Publishers, Muzaffarnagar.

REFERENCE BOOKS

1. Electrical Machines by SK Bhattacharya, Tata Mc Graw Hill, Education Pvt Ltd. New Delhi
2. Electrical Machine by B.L. Thareja, S. Chand Publication, New Delhi.
3. Electrical Machines by SK Sahdev, Uneek Publications, Jalandhar
4. Electrical Machines by Nagrath and Kothari, Tata Mc Graw Hill, New Delhi
5. Electrical Machines by JB Gupta, SK Kataria and Sons, New Delhi
6. Electrical Machines by Smarajit Ghosh-Pearson Publishers, Delhi.
7. E-books/e-tools/relevant software to be used as REFERENCE by AICTE/ NITTTR, Chandigarh.

SCHOOL OF ENGINEERING & TECHNOLOGY

DIGITAL ELECTRONICS

(D061024304)

L	T	P
3	1	0

JUSTIFICATION

Digital electronics has made extremely rapid advances in the last five decades. It has important applications in communication entertainment, instrumentation, control, automation etc. Thus it appears that there is no end to its usefulness. In fact, the light and the new world belong to it. So it is necessary to give the knowledge of digital electronics to the electrical students. Microprocessor is one of the most exciting technological advancement among the semiconductor devices in recent times. It has a tremendous impact on the Industrial processes due to its high reliability, flexibility and control capacity both at the design and the Implementation stages. The decreasing cost with increasing facilities act as catalysts in widening their scope of applications.

DETAILED CONTENTS

UNIT 1: Number Systems **10 Hours**

1.1 Decimal, binary, octal and hexa-decimal number systems and their interconversion

1.2 Binary and Hexadecimal addition, subtraction and multiplication

1.3 1's and 2's complement methods of addition/subtraction

1.4 **Gates:** Definition, symbol and truth tables for inverter, OR, AND, NAND, NOR and X-OR exclusive-AND gates.

1.5 **Boolean Algebra: Boolean** Relations and their applications, De-Morgan's Theorems, K-Map upto four variables.

UNIT 2: Combinational Circuits **08 Hours**

2.1 Half adder, Full adder

2.2 Encoder, Decoder

2.3 Multiplexer/ Demultiplexer

2.4 Display Devices (LED, LCD and 7-segment display)

UNIT 3: Flip-Flops : **10 Hours**

3.1 J-K Flip-Flop

3.2 R-S Flip-Flop

3.3 D Type flip flop

3.4 T-Type Flip-Flop

3.5 Applications of Flip-Flops

3.6 Introduction of Shift Registers and Counters

UNIT 4: A/D and D/A Converters **08 Hours**

4.1 A/D and D/A Converters

4.2 A/D converter (Counter ramp, successive approximation method of A/D Conversion)

4.3 D/A converters (Binary weighted, R-2R D/A Converter)

UNIT 5: Semi-conductor Memories **08 Hours**

5.1 Types of semi-conductor memories: RAM, ROM, EPROM, EEPROM

5.2 Static and dynamic RAM

5.3 Merits, demerits, and applications.

TEXT BOOKS

1. Digital Electronics by Rahul Wadhwa; Asian Publishers, Muzaffarnagar.
2. Digital Electronics by Er. Ashish Tripathi, Jai Prakash Nath Publications, Meerut.
3. Digital Electronics by R K Saroj, Jai Prakash Nath Publications, Meerut.

REFERENCE BOOKS

1. Modern Digital Electronics by RP Jain, Tata McGraw Hill, Education Pvt. Ltd. New Delhi
2. Digital Principles and Electronics by Malvino and Leach, Tata McGraw Hill, New Delhi
3. Digital Electronics by SN Ali
4. Digital Electronics by Rajive Sapra, Eshan Publications, Ambala City
5. Digital Fundamentals by Floyd and Jain , Pearsons Education (Singapore) Pte Ltd Patparganj, Delhi 110092
6. Digital Electronics by Jamwal, Dhanpat Rai and Co. New Delhi
7. E-books/e-tools/relevant software to be used as REFERENCE by AICTE/NITTTR, Chandigarh.

HUMAN VALUES & PROFESSIONAL ETHICS
(D06VA24305)

L	T	P
3	0	0

JUSTIFICATION

To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value based living in a natural way. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature

DETAILED CONTENTS

UNIT 1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education **08 Hours**

1.1 Understanding the need, basic guidelines, content and process for Value Education

1.2 Self-Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self-exploration

1.3 Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority

1.4 Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario

UNIT 2: Understanding Harmony in the Human Being - Harmony in Myself! **08 Hours**

2.1 Understanding human being as a co-existence of the sentient 'I' and the material the Body'

2.2 Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha

2.3 Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer).

2.4 Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail

UNIT 3: Understanding Harmony in the Family and Society- Harmony in Human- Human Relationship **08 Hours**

3.1 Understanding Harmony in the family – the basic unit of human interaction

3.2 Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; a. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship

3.3 Understanding the meaning of Vishwas; Difference between intention and competence

3.4 Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship

3.5 Understanding the harmony in the society (society being an extension of

family): Samadhan, Samridhi, Abhay, Sah-astitvaas comprehensive Human Goals

3.6 Visualizing a universal harmonious order in society- Undivided Society (Akhand Samaj)

UNIT 4: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence **06 Hours**

4.1 Understanding the harmony in the Nature

4.2 Interconnectedness and mutual fulfillment among the four orders of nature recyclability and self-regulation in nature

4.3 Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space

4.4 Holistic perception of harmony at all levels of existence

UNIT 5: Implications of the above Holistic Understanding of Harmony on Professional Ethics **06 Hours**

5.1 Natural acceptance of human values

5.2 Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order

5.3 Strategy for transition from the present state to Universal Human Order:

a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers

b) At the level of society: as mutually enriching institutions and organizations

5.4 To inculcate Human Values among Students: The Role of self ,Parents and Teachers

5.5 Practical Session also Includes Different Yogic Exercises and Meditation Session

TEXT BOOKS

1. Universal Human Values by Ankit Kumar, J.N.P Meerut.

REFERENCE BOOKS

1. Value Education websites, http://uhv.ac.in, http://www.aktu.ac.in
2. Story of Stuff, http://www.storyofstuff.com
3. Al Gore, an Inconvenient Truth, Paramount Classics, USA
4. Charlie Chaplin, Modern Times, United Artists, USA
5. IIT Delhi, Modern Technology–the Untold Story
6. Case study Hevade Bazar Movie

L	T	P
0	0	2

JUSTIFICATION

Diploma holders in Electrical Engineering have to work on various jobs in the field as well as in testing laboratories and on control panels, where he performs the duties of installation, operation, maintenance and testing by measuring instruments. Persons working on control panels in power plants, substations and in industries will come across the use of various types of instruments and have to take measurements.

Instruments used to read and observe the general electrical quantities like current, voltage, power, energy, frequency, resistance etc. and their wave shapes, have been incorporated in this subject. So the technician will know the construction and use of various types of electrical instruments.

DETAILED CONTENTS

1. Use of analog and digital multimeter for measurement of voltage, current (A.C/D.C) and resistance.
2. Measurement of pressure by using LVDT.
3. To measure power, power factor in a single-phase circuit, using wattmeter and power factor meter and to verify results with calculations.
4. Measurement of power and power factor of a three-phase balanced load by two wattmeter method.
5. Measurement of voltage and frequency of a sinusoidal signal using CRO and draw wave shape of signal.
6. Use of LCR meter for measuring inductance, capacitance and resistance.
7. To record all electrical quantities from the meters installed in the institution premises.
8. To measure Energy at different Loads using Single Phase Digital Energy meter.
9. Measurement of temperature by using thermocouple.
10. Calibration of single phase and three-phase energy meter and digital energy meter.

SCHOOL OF ENGINEERING & TECHNOLOGY

ELECTRICAL MACHINES-I LAB

(D061024353)

L	T	P
0	0	4

JUSTIFICATION

Electrical machines is a subject where a student will deal with various types of electrical machines which are employed in industries, power stations, domestic and commercial appliances etc. After studying this subject, an electrical diploma holder must be competent to repair and maintain these machines and give suggestions to improve their performance. Practical aspects of the subject will make the students capable of performing various tests on the machines as per latest BIS specifications.

DETAILED CONTENTS

1. Study the Constructional Details of various DC machines, DC power supply present in electrical Machine Lab.
2. Study of DC series motor with starter (to operate the motor on no load for a moment).
3. Speed control of DC shunt motor (i) Armature control method (ii) Field control method.
4. Determine efficiency of DC motor by Swinburne's Test at (i) rated capacity (ii) half full load.
5. Study the Constructional Details of transformer installed in the institute.
6. To understand the basic operation of a transformer and the relationship between primary and secondary voltages.
7. To perform open circuit and short circuit test for determining: (i) equivalent circuit (ii) the regulation and (iii) efficiency of a transformer from the data obtained from open circuit and short circuit test at full load.
8. To find the efficiency and regulation of single phase transformer by actually loading it.
9. Checking the polarity of the windings of a three phase transformer and connecting the windings in various configurations.
10. Finding the voltage and current relationships of primary and secondary of a three phase transformer under balanced load in various configurations conditions such as (a) Star-star (b) Star-delta (c) Delta-star (d) Delta - Delta configuring conditions.

DIGITAL ELECTRONICS LAB
(D061024354)

L	T	P
0	0	2

JUSTIFICATION

Digital electronics has made extremely rapid advances in the last five decades. It has important applications in communication entertainment, instrumentation, control, automation etc. Thus it appears that there is no end to its usefulness. In fact, the light and the new world belong to it. So it is necessary to give the knowledge of digital electronics to the electrical students. Microprocessor is one of the most exciting technological advancement among the semiconductor devices in recent times. It has a tremendous impact on the Industrial processes due to its high reliability, flexibility and control capacity both at the design and the Implementation stages. The decreasing cost with increasing facilities act as catalysts in widening their scope of applications.

DETAILED CONTENTS

1. Verification and interpretation of truth table for AND, OR, NOT, NAND, NOR, X-OR gates
2. Verification NAND and NOR as Universal Gates.
3. Construction of Half Adder using gates
4. Construction of Full Adder using gates
5. To verify the truth table for SR flip-flop
6. To verify the truth table for JK flip-flop
7. Construction and testing of synchronous counter
8. Construction and testing of Asynchronous counter
9. Verification of operation of a 8-bit D/A Converter
10. Verification of operation of a 8-bit A/D Converter

ELECTRICAL SIMULATION LAB
(D061024360)

L	T	P
0	0	4

JUSTIFICATION

All equipment, installations, circuits and other electrical and electronic systems in commercial, power and industrial sector need drawings for their manufacturing, installation, operation and maintenance. A diploma holder in Electrical Engineering must possess the skill of reading, interpreting different drawings and simulating electrical and electronics circuits for most of the activities. With the evolution of various computer softwares, the conventional role of draftsman has been is now taken over by Computer software. Computer Aided Drawing (CAD) and simulation (MATLAB/SIMULINK) software will be used to perform various practical exercises in this course. This will enable the students to become competent to function in the fast growing information technology environment by enhancing their computer aided drawing, designing and simulating skills in the field of electrical and electronics engineering.

DETAILED CONTENTS

1. To draw the circuit of a single-phase half-wave rectifier circuit using MATLAB/Simulink software.
2. To draw the circuit of a single-phase full-wave rectifier circuit using MATLAB/Simulink software.
3. Draw and print out a single phase half wave rectifier circuit using MATLAB/Simulink/open source software.
4. Draw and print out a single phase Full wave rectifier circuit using MATLAB/Simulink/open source software.
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