Programme: Diploma in Electrical Engineering (DEE)   **Semester: III**   **Implemented from: 2017-18**

COURSE CODE	COURSE	GR	TEACHING SCHEME (HRS/WK)				EXAMINATION SCHEME													
			L	T	P	CR	PAPER HRS	TH Max	TH Min	IST	TOTAL Max	TOTAL Min	PR Max	PR Min	OR Max	OR Min	TW Max	TW Min	TOTAL MARKS
172MA31	Mathematics III	A	3	1		4	3	80	32	20	100	40					25@	10	125
172EE32	Network Analysis	C	3	1	2	6	3	80	32	20	100	40	25**	10			25@	10	150
172EE33	Electronics	C	3		2	5	3	80	32	20	100	40	25**	10			25@	10	150
172EE34	Measuring Instruments & Instrumentation	C	3		2	5	3	80	32	20	100	40	25**	10			25@	10	150
172EE35	Power Plant Engineering	C	3	2		5	3	80	32	20	100	40			25**	10	25@	10	150
172EE36	Electrical Workshop	C	1		2	3							50**	20			25@	10	75
172EE37	Product Study Analysis	A			2	2											25@	10	25
172EE38	Development of Professional practice	M			2	2											25@	10	25
	TOTAL		16	04	12	32		400		100	500		125		25		200		850

Abbreviations: B – Basic; C – Core; A – Applied; M – Management; L – Theory Lecture; T – Tutorial; P – Practical; TH – Theory Paper; IST – In-Semester Test Exam; OR – Oral Exam; TW- Term Work. * Assessment by Internal Examiner ** Assessment by External And Internal Examiner @ : TW assessment by Internal Examiner Extra co curricular activity –Activity is coordinated by teacher as per the activity mentioned in curriculum.   PR – Practical

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	THIRD
COURSE TITLE	MATHEMATICS III
COURSE CODE	172MA31

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
					TH			TOTAL		PR		OR		TW		TOTAL MARKS
L	T	P	CR	PAPER HRS	Max	Min	IST	Max	Min	Max	Min	Max	Min	Max	Min	
3	1	-	4	3	80	32	20	100	40	-	-	-	-	25@	10	125

* Assessment by Internal Examiner ** Assessment by External And Internal Examiner   @ TW assessment by Internal Examiner

Course Objectives:

After studying this subject, students will be able to

1. To make students well versed in various methods of integration for solving problems.
2. To expose students to the techniques of solving differential equations.
3. To impart knowledge of Laplace Transform.

Course Outcomes:

Student should be able to

CO1	Apply formulae and different methods of integration in engineering concepts.
CO2	Apply definite integral to find area under curve and volume of solid of revolution.
CO3	Use different methods to solve differential equations.
CO4	Apply formulae of Laplace Transform to solve engineering problems

Course Content:

SECTION-I							
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1	**Integration**	14	24	1	40%	40%	20%
1.1	Definition of integration. Integration of standard functions.						
1.2	Theorems of integration.						

	1.3	Methods of Integration						
		1.3.1 Integration by substitution						
		1.3.2. Integration by trigonometric transformation.						
		1.3.3 Integration of rational functions.						
		1.3.4 Rules of partial fractions, Integration by partial fractions.						
		1.3.5 Integration by parts.						
2		**Definite Integral**	10	16	2	30%	30%	40%
	2.1	Definition of definite integral.						
	2.2	Properties of definite integral with simple problems.						
	2.3	Reduction formulae.						
	2.4	Applications of definite integral						
		2.4.1 Introduction to curves- circle, parabola, ellipse, loop of the curve.						
		2.4.2 Area under the curve.						
		2.4.3 Mean and RMS values						
SECTION-II								

SECTION-II

3		**Differential Equations:**	12	20	3	30%	30%	40%
	3.1	Order and degree of differential equations.						
	3.2	Formation of differential equations.						
	3.3	Solution of differential equations of first order and first degree.						
		3.3.1 Variable separable method.						
		3.3.2 Reducible to variable separable Method						
		3.3.3 Homogeneous differential equation						
		3.3.4 Exact differential equation.						
		3.3.5 Introduction of integrating factor.						
		3.3.6 Linear differential equation.						
		3.3.7 Bernoulli's differential equation.						

4		**Laplace Transform**	12	20	4	40%	40%	20%
	4.1	Properties of Laplace Transform						
	4.2	4.2.1 Linearity property.						
		4.2.2 First Shifting property.						
		4.2.3 Multiplication by t^n						
		4.2.4 Division by t.						
		4.2.5 Laplace Transform of derivatives						
	4.3	Inverse Laplace Transform						
		4.3.1 Definition						
		4.3.2 Inverse Laplace Transform of standard Functions						
		4.3.3 Method of partial fractions.						
	4.4	Solution of differential equations using Laplace Transform.						

List of Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	1	Integration	1	1
2	1	Integration by substitution method	1	1
3	1	Integration by partial fractions.	1	1
4	1	Integration by parts.	1	1
5	2	Definite integral.	1	2
6	2	Applications of definite integrals	1	2
7	3	Order, degree and formation of the differential equation.	1	3
8	3	Solution of differential equation of first order, first degree.	1	3
9	4	Laplace Transform	1	4
10	4	Inverse Laplace Transform	1	4

Reference Books:

Sr. No.	Author	Title	Publisher and Edition
1	S. P. Deshpande	Mathematics for Polytechnic	Pune Vidyarthi Griha Prakashan.
2	H.K.Dass	Advanced Engineering Mathematics	S.Chand & Company Ltd. Delhi
3	Dr.B.S.Grewal	Higher Engineering Mathematics	Khanna Publishers Delhi

Subject Coordinator

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean – Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	Third
COURSE TITLE	Network Analysis
COURSE CODE	172EE32

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	1	2	6	3	80	32	20	100	40	25**	10	-	-	25@	10	150

* Assessment by Internal Examiner ** Assessment by External And Internal Examiner   @ TW assessment by Internal Examiner

Course Objectives:

After studying this subject, students will be able to

1. Understand basic circuit analysis.
2. Solve and analyze different networks.
3. Solve Differential Equation in time domain and using Laplace Transform.
4. Find the various parameters of two port network.

Course Outcomes:

Student should be able to

CO1	Analyze different resistive circuit using node & mesh analysis with independent and dependent source and verify results.
CO2	Analyze different Network theorems for dc circuits with independent & dependent sourc and verify results.
CO3	Explain the concept of transient analysis using classical methods (differential equations) and Laplace transform methods.
CO4	Determine network functions and two port parameters.

Course Content:

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
		SECTION-I						
1		**Nodal and mesh analysis of resistive circuits using dependent sources:**	4	8	1	40%	40%	20%
	1.1	Introduction to independent & dependent source						
	1.2	Source Transformation for circuits with independent & dependent sources						
	1.3	Mesh analysis of circuits with independent & dependent sources						
	1.4	Nodal analysis of circuits with independent & dependent sources						
2		**Network Theorems (For D.C circuits) with Dependent sources:**	10	16	1, 2	25%	25%	50%
	2.1	Thevenin's Theorem						
	2.2	Norton's Theorem						
	2.3	Superposition Theorem						
	2.4	Maximum power Transfer Theorem						
3		**Transient Analysis using differential equation technique:**	10	16	3	25%	25%	50%
	3.1	Concept of initial condition, final (steady-state) conditions & time constant.						
	3.2	Analysis of transient Response in Series & parallel RL, RC and RLC Circuit with D.C. Excitation,						
	3.3	Different Types of Second Order Responses: condition for under-damped, critically damped & over-damped.						
	3.4	Natural and Forced response.						

		SECTION-II						
4		**The Laplace Transformation & its application in circuit analysis:**	10	16	3	40%	40%	20%
	4.1	Definition of Laplace transform, Laplace transforms of standard time signals Unit step, Unit Ramp, and Unit Impulse functions						
	4.2	Initial value and final value theorems.						
	4.3	Solving Differential Equations in complex Domain using Laplace transforms.						
	4.4	Step & impulse Response of R-L & R-C Circuit.						
5		**Network Functions; Poles and Zeros:**	8	10	3	20%	30%	50%
	5.1	Network functions for one port and two port networks						
	5.2	Driving point impedance and Admittance						
	5.3	concept of transfer functions, poles and zeros of network functions						
	5.4	Restrictions on Pole and zero locations for driving point functions and Transfer functions, time domain behavior from pole - zero plot.						
6		**Two –Port Networks**	6	14	4	35%	35%	30%
	6.1	Introduction to two port network.						
	6.2	Two port impedance & admittance Parameters.						
	6.3	Hybrid parameters (h parameters) & Transmission parameters (ABCD parameters)						
	6.4	Relationship between parameter sets. Various Combinations of Two-Port Network (series, parallel & cascade combinations)						

Practical Course Outcomes:

CO1	Use network theorems for solution of DC network.
CO2	Concept of transient analysis using differential equation and Laplace transform methods.
CO3	Find the various parameters of two port network
CO4	Understand the use of MULTISIM / MATLAB for circuit analysis.

List of Practical's/Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	1	Determine the loop currents in any DC network	2	1
2	1	Determine the node voltages in any DC network	2	1,2
3	2	Verification of principle of superposition with DC sources.	2	1,2
4	2	Verification of Thevenin's theorems in DC circuits	2	1,2
5	2	Verification of Norton theorems in DC circuits	2	1,3
6	2	Verification of Maximum power transfer theorems in DC circuits	2	1,2
7	3	Transient Response of First Order RC circuit.	2	2
8	3	Transient Response of First Order CR circuit.	2	2
9	3	Transient Response of Second Order RC-RC circuit.	2	2
10	3	Transient Response of Second Order RC-CR circuit.	2	2
11	6	To calculate and verify Z parameter of two-port network.	2	2
12	6	To calculate and verify Y parameters of two-port network.	2	2
13	6	To calculate and verify H parameters of two-port network	2	2
*Note : Atleast some practical should be conducted using MULTISIM/ MATLAB.				

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	W H Hayt, S M Durbin, J E Kemmerly	Engineering Circuit Analysis	7th Edition Tata McGraw Hill Education.
2	D. Roy Choudhury	Networks and Systems	2nd Edition, New Age International.
3	M. E. Van Valkenburg	Network Analysis	3rd Edition, PHI Learning

Reference books:

Sr. No.	Author	Title	Publisher and Edition
1	F. F. Kuo	Network Analysis and synthesis	John Wiley and sons
2	C. L. Wadhwa	Network Analysis and synthesis	New Age international.

Websites:

http://nptel.ac.in/courses/108105053/7

https://watch?v=dGu2mxpTRPs

https://www.maplesoft.com/content/EngineeringFundamentals

Subject Coordinator

Curriculum Coordinator

**Head
Diploma in Electrical Engineering**

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	THIRD
COURSE TITLE	Electronics
COURSE CODE	172EE33

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	5	3	80	32	20	100	40	25**	10	-	-	25@	10	150

* Assessment by Internal Examiner ** Assessment by External And Internal Examiner @ TW assessment by Internal Examiner

Course Objectives:

After studying this subject, students will be able to

1) Identify different diodes on their characteristics and application basis.
2) Prepare different types of rectifier and filter circuits.
3) Analyze different configurations of Bipolar Junction Transistor circuits.
4) Build small signal amplifier and switch applications of Transistor.
5) Use Field Effect transistor in voltage amplifier & switching application
6) Use Unijunction Transistor in relaxation oscillator circuit.

Course Outcomes:

Student should be able to

CO1	Understand the basic concept of semiconductor junctions
CO2	Acquire a basic knowledge of semiconductor devices and their applications
CO3	Learn to analyses circuits using semiconductor devices using mathematical tools
CO4	Understand the operation of various discrete semiconductor component and their applications

Course Content:

		SECTION-I						
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Semiconductor Physics**	3	4	1	80%	10%	10%
	1.1	Germanium & Silicon Intrinsic semiconductor, P & N type Extrinsic Semiconductor. Effect of temperature on semiconductor.						
2		**PN Junction Diode**	26	26	1, 2, 3	70%	15%	15%
	2.1	Germanium & Silicon PN junction diode, their construction, working under unbiased, forward bias & reverse bias conditions, Forward & Reverse Characteristics of Ge & Si diodes. V- I characteristics of P-N junction diode. Circuit diagram for characteristics (Forward & Reverse), Ideal Diode Model.						
	2.2	Zener Diode : Construction, Characteristics, Various Specifications (Ratings). Application in a simple voltage regulator circuit.						
	2.3	Regulated Power Supply: Definition of regulator, Need of regulator Voltage regulation factor, Concept of load regulation and line regulation						
	2.4	Diodes: Special purpose diodes: Schottkey diode, LED, IRLED, LASER diode (Symbol,operating principle and applications of each)						
	2.5	Filter types:						

		C, L, LC, CLC (π). Comparision, merits & demerits. Dependence of ripple factor on load						
	2.6	Rectifiers & Filters: Half Wave Rectifier (HWR), Full Wave Rectifier (FWR) -centre tap transformer and bridge type. Their comparision on the basis of circuit operation, waveforms, average(dc) value of rectifier output,ripple factor, ripple frequency, transformer utilization factor, rectification efficiency, advantages and disadvantages						
3		**Unijunction Transistor (UJT)**	03	10	1, 4	80%	10%	10%
	3.1	Construction, principle of operation, characteristic and UJT Relaxation Oscillator circuit.						
SECTION-II								
4		**Bipolar Junction Transistors (BJT)**	8	10	2, 3	70%	15%	15%
	4.1	Construction, working principle of PNP and NPN transistors, characteristics of CB, CE and CC configurations.DC and AC current gains α, β, γ. Requirement of biasing, different types of biasing circuits fixed, bias circuit with emitter resistor, collector to base biasing circuit, voltage divider biasing circuit. Thermal stability factor, Transistor Specifications. Transistor Testing.						
	4.2	**Power amplifier** Introduction, classification, class A, class B, class AB, class C (Efficiency of each).						

		Class A push pull amplifier.						
5		**Applications of BJT**	7	8	2, 3	70%	15%	15%
	5.1	Small Signal Voltage Amplifier: Analysis of CE single stage Small Signal Amplifier using approximate hybrid equivalent circuit. (amplifier input, output impedance, current & voltage gain). RC coupled two stage amplifier. Frequency response of RC coupled Amplifier. DC load line, Operating point, AC Load line						
	5.2	Need of Cascaded amplifier: Types of coupling,Transformer couple, Direct couple(Circuit diagram and function of each component)						
	5.3	Application of BJT CE inverter switch						
6		**Oscillators**	5	7	2, 4	80%	10%	10%
	6.1	RC Phase Shift, Wien Bridge, Hartley & Colpitt Oscillators. Concept of feedback, Types of feedback, Positive feedback, Negative feedback, Barkhausen's Criterion.Crystal Oscillator (Circuit Diagram & Working)						
7		**Field Effect Transistors (FET)**	12	15	2, 4	80%	10%	10%
	7.1	Construction, principle of operation of P & N channel type (JFET)Junction Field Effect Transistor & Metal Oxide Semiconductor Field Effect Transistor (MOSFET). Depletion & Enhancement type of MOSFET. Their construction, working, important specifications (parameters) of JFET & MOSFET's. CMOS Inverter						

| 7.2 | Characteristics, Transfer Curve of above FET's. Comparison of BJT and FET.(Types of carriers, switching speed,Thermal stability, space in case of IC fabrication, control parameter,input impedance, offset voltage, power gain at audio frequencies) | | | | | | | |

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

List of Practicals/Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	1	Characteristics of Germanium and Silicon Diode.	2	1
2	1	Characteristics of Zener Diode	2	2
3	4	Input and Output characteristics of Common Emitter BJT	2	2
4	1	Diode rectifier circuits (HWR and FWR), without and with C – type filter.	2	2
5	4	Single stage CE Small Signal Amplifier. (With un- bypassed & bypassed R_E)	2	3
6	4	BJT CE switch application	2	2
7	3	UJT characteristics and UJT Relaxation Oscillator circuit.	2	4
8	1	Zener Diode voltage regulator.	2	2
*Note : Atleast some practical should be conducted using multisim.				

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Robert Boylestad & Louis Nashelsky	Electronic Devices and Circuit Theory	9th Edition, Prentice Hall India Private Limited.

Reference books:

Sr. No.	Author	Title	Publisher and Edition
1	N. N. Bhargava, D.C.Kulashreshtha, S.C. Gupta –TTTI Chandigharh	"Basic Electronics & Linear Circuits"	Tata McGraw Hill
2	Albert Malvino David J Bates	Electronics principles	Tata McGraw Hill.
3	David A Bell	Electronic Devices & circuits	Oxford

Websites:

http://nptel.ac.in

https://watch?v=B3pZrDw7GfY

https://watch?v=wzPRgL8oR_A

Subject Coordinator

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	Third
COURSE TITLE	Measuring Instruments and Instrumentation
COURSE CODE	172EE34

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	5	3	80	32	20	100	40	25**	10	-	-	25@	10	150

* Assessment by Internal Examiner ** Assessment by External And Internal Examiner   @ TW assessment by Internal Examiner

Course Objectives:

After studying this subject, students will be able to

1. Know the construction of the instruments.
2. Understand the principles and operation of different measuring instruments.
3. Select the appropriate instrument for measurement.
4. Observe reading and interpret the values from different meters.
5. Give the applications of the instruments.

Course Outcomes:

Student should be able to

CO1	Understand the underlying principles of all analogue instruments
CO2	Learn how to extend the range of AC and DC meters.
CO3	Learn to use AC and Dc bridges to find out the value of electrical parameters.
CO4	Become aware of the basic principle of operation of specific digital instruments

Course Content:

		SECTION-I						
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Fundamentals of Measuring Instruments**						
	1.1	Error classification, Desirable characteristics of measuring instruments: accuracy, sensitivity, selectivity, reproducibility, precision, errors, drift	8	10	1	80%	10%	10%
	1.2	Classification of measuring instruments						
	1.3	Different torques in analog instruments: Deflecting, controlling and damping torque. Methods of developing these torques						
2		**Basics of CRO**						
	2.1	Block diagram, function of each block, front panel diagram, application, observation of waveform, Digital storage Oscilloscope (Block Diagram only)	3	6	1, 4	0%	50%	50%
3		**Extensions of Range of Ammeter and voltmeter**						
	3.1	Construction and principle of operation of PMMC instrument and Moving Iron instrument						
	3.2	Ammeter and voltmeter(DC), multi-range ammeters, multi-range voltmeters. Loading effect of voltmeter and solid state voltmeter, extension of range of voltmeter and ammeter and problems based on the same.	7	14	2	80%	10%	10%
	3.3	Extension of range of A. C. Ammeters: Using Current transformers: Construction and principle of operation, precautions						

No	Sub	Topic				R	U	A
	3.4	Extension of range of A. C. Voltmeters Using Potential transformers Construction and principle of operation, precautions						
4		**Indicating Devices**	6	10	1	0%	50%	50%
	4.1	Classification of Displays						
	4.2	Light emitting diodes, liquid crystal displays and other displays						
SECTION-II								
5		**DC and AC Bridges**	7	12	3	80%	10%	10%
	5.1	Principal of Wheatstone bridge, limitations of Wheatstone bridge measurement of medium resistance by ammeter, voltmeter method. Kelvin's double bridge for measurement of low resistance						
	5.2	Meggar and analog multimeter						
	5.3	A.C. bridges, Maxwell Inductance bridge, Schering bridge and Wien Bridge.						
6		**Digital Instruments**	7	12	4	75%	20%	5%
	6.1	Digital Multimeters, Digital Frequency Meter (basic circuit) Digital Measurement of Time (periodic measurement), Universal Counter.						
7		**Recorders**	5	8	1	80%	10%	10%
	7.1	Strip chart recorder, XY recorder						
	7.2	Comparison between strip chart recorder and XY recorder						
8		**Digital Phase meter**	5	8	1	10%	80%	10%
	8.1	Block diagram and working of digital phase meter						
	8.2	Requirement of signal generator and theory of signal generator, Function generator						

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

List of Practical's/Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	1	Errors in measurements: Resistance, Series and parallel connected resistances.	2	1
2	3	Measurement of medium resistance using V-I method.	2	1
3	5	Measurement of Inductance using A.C. Bridge	2	3
4	5	Measurement of capacitance using A.C. Bridge	2	3
5	3	Extension of range of voltmeter	2	2
6	3	Extension of range of ammeters.	2	2
7	5	Measurement of high resistance using Meggar	2	3
8	3	Study of Front panel of DSO	2	1
		*Note : Atleast some practical should be conducted using multisim.		

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	H. S. Kalsi	Electronic Instrumentation	2nd Edition (Tata McGraw - Hill Publishing Company Limited).

Reference books:

Sr. No.	Author	Title	Publisher and Edition
1	A K Sawhney	A Course in Electrical and Electronics Measurements	18th Edition , Dhanpat Rai & Company Private Limited
2	Albert D Helfrick and William D Cooper	Modern Electronic Instrumentation and measurement techniques	3rd Edition, Prentice Hall India Private Limited.

Subject Coordinator

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean -- Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	THIRD
COURSE TITLE	Power Plant Engineering
COURSE CODE	172EE35

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME											
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	2	-	5	3	80	32	20	100	40	-	-	25**	10	25@	10	150

* Assessment by Internal Examiner ** Assessment by External And Internal Examiner   @ TW assessment by Internal Examiner

Course Objectives: '

After studying this subject, students will be able to

1. Classify the different sources of electric power generation.

2. Decide the various factors governing selection of site for power plant and list their merits.

3. Describe principle and operation of power generation.

4. Identify and describe the function of each component of power plant.

5. Select the power generation technique based on economy.

6. Compare between various sources of power generation.

Course Outcomes:

Student should be able to

CO1	Get the knowledge of different sources of electric power generation
CO2	Get the knowledge of principle and operation of power generation
CO3	To understand function of each component of power plant.
CO4	To understand constructional details of power plant

Course Content:

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
SECTION-I								
1.		**Basics of Power Generation**	03	05	1	40%	40%	20%
	1.2	Various sources of energy						
	1.3	Overview of electrical power Generation in India and future perspectives.						
2.		**Economics of Power Generation**	06	10	2	40%	30%	30%
	2.1	Terms commonly used in system operation: connected load, firm power, cold reserve, hot reserve, spinning reserve.						
	2.2	Curves used in system operation such as Load-curve, load duration curve, integrated duration curve. (Simple numerical based on plotting above curves.)						
	2.3	Factors affecting the cost of Generation: Average demand, Maximum demand, demand factor, plant capacity factor, plant use factor, diversity factor, load factor and plant load factor (Simple numerical based on above)						
	2.4	Choice of Size & number of Generator Units, difficulties involved in it.						
3.		**Conventional Power Plant**	15	25	3 & 4	40%	40%	20%
	3.1	**Thermal Power Plant:** -Schematic diagram and working of Thermal Power Station. Main parts of Thermal plant in brief (Boiler, Economizer, Air pre-heater, Super-heaters & re-heaters. Steam prime movers, Condensers. Spray ponds & Cooling towers). Selection of site for						

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
		thermal power stations. List of thermal power stations in Maharashtra state with their capacities.						
	3.2	**Hydro Power Plant: -** Block diagram and working of Hydro Power Station. Brief introduction about main parts of the Hydro Power Plant Selection of site for hydro power stations. List of hydro power stations in Maharashtra state with their capacities						
	3.3	**Nuclear Power Plant: -** Schematic diagram and working of Nuclear Power Station. Brief introduction about main parts of the Nuclear Power Plant. Construction and working of various types of Nuclear Reactor. List of Nuclear power stations in Maharashtra state with their capacities.						

SECTION-II

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
4		**Non-conventional energy sources**	10	16	2 & 3	20%	40%	40%
	4.1	Types of non-conventional energy sources Solar Energy, Wind Energy, Bio-mass & Bio-gas energy, Geo-thermal Energy, Ocean energy. Schematic and brief working of these power plant.						
5		**Present plant study of Solar Power Plant & Wind Power Plant**	9	15	2 & 3	40%	40%	20%
	5.1	**Solar Power Plant** -Potential of solar energy, Solar Radiation Photovoltaic effect for solar energy, Brief introduction of PV material, working & applications of solar energy. PV system design and installation						

		steps						
	5.2	**Wind Power Plant** -Wind Energy, Selection of site for wind mills, Principle of electricity generation with the help of wind energy, Block diagram and working of Wind energy plant and its applications, List of major wind farms in the Maharashtra state with their approximate capacities.						
6		**Combined Power Station**	5	9	3 & 4	20%	40%	40%
	6.1	Diesel Power Station -Advantages and disadvantages. Schematic arrangement. Choice of site. Principle and operation of station. Application.						
	6.2	Combined Cycle Power Station- Working principle of gas combined cycle advantages and disadvantages of open cycle, closed cycle, block diagram, application						

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

List of Practical/Assignments/Tutorials:

Sr. No.	Assignments/Tutorials	CO
1	Four Assignments should be taken on the basis of syllabus	1, 2
2	A case study should be done on any one of the power stations in Maharashtra. (Thermal and Hydro).	3, 4
3	Brief report on Design and installation of small Solar/wind Power plant	1,2, 3
4	Visit to one of the power stations during academic session (Thermal or Hydro).	4

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	J. B. Gupta	A course in Electrical Power	S. K. Kataria & Sons

Reference books:

Sr. No.	Author	Title	Publisher and Edition
1	B. R. Gupta	Generation of Electrical Energy	Eurasia Publishing House Pvt. Ltd
2	Soni, Gupta, Bhatanagar	A course in Electrical Power	Dhanapatrai and Sons
3	S. N. Singh	A course in Electrical Power	PHI Learning
4	M. V. Deshpande	Elements of Electrical Power Station Design	PHI Learning
5	G. D. Rai	Non-Conventional Energy Sources	Khanna Publications

Subject Coordinator

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	THIRD
COURSE TITLE	Electrical Workshop
COURSE CODE	172EE36

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
1	-	2	3	-	-	-	-	-	-	50**	20	-	-	25@	10	75

* Assessment by Internal Examiner ** Assessment by External And Internal Examiner   @ TW assessment by Internal Examiner

Course Objectives:

The student should able to:

1) Explain the importance of earthing in electrical equipment's.
2) Explain the construction and working principle of different electric indicating instruments.
3) Do calibration of ammeter, voltmeter and wattmeter's.
4) Explain common measurements and precautions to be taken in the installation of electrical equipment/gadget and study of their symbols and units.
5) Do the Installation, Estimation and costing of house wiring.

Course Outcomes:

Student will be able to:

CO1	Get the basic knowledge of electrical engineering like earthing, Insulation resistance.
CO2	To select proper schemes, instruments and materials for sustainable development.
CO3	Hands on practices by students to improve their Skills in practical life.
CO4	To understand and distinguish different components and symbols used in electrical circuits and common measurements and precaution.
CO5	Get the professional knowledge of electrical engineering.

DEE, VJTI

Course Content:

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		Study of units and symbol used for different electrical quantities.	01		4	10%	40%	50%
		Introduction to symbols and their units in Electrical Engineering.						
		Introduction to symbols and their units in Electronics Engineering.						
2		Principle and methods of Earthing used in high voltage electrical equipment's.	02		1		50%	50%
3		Earth resistance and insulation resistance measurement techniques.	02		1	20%	40%	40%
4		Indian Standards of Electrical wiring.	02		5	40%	20%	40%
5		House wiring and cost estimation of at least 4 companies.	02		5	30%	30%	40%
6		New trends in electrical wiring, Relays and Switches like MCB.	02		5	25%	25%	50%
7		Operation /working and repair/Maintenance of home appliances.	02		2,3	25%		75%
8		DSO and CRO operation and working	01		2		50%	50%
9		Role of Electrical Contractor, Supervisor, Lineman, Apprentice Engineer in Electric Supply Board.	01		5	30%		70%
10		Tender floating and notices and documentation regarding tender.	01		5	50%		50%

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

List of Practical's/Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1.	1	Units used for different electrical quantities.	2	4
2.	2	Earthing of high voltage equipment.	2	1
3.	3	Magnetic effects of electric current	2	2
4.	3	Measurement of Earth resistance and Insulation resistance	2	1
5.	4	Need & types of insulating materials used for wire & cables	2	5
6.	6	Testing of Installation (New and extended) with Continuity test.	2	5
7.	4	Cost estimation of at least 4 companies.	2	5
8.	7	Identification of faults in different electrical equipment.	2	3
9.	6	MCB rating of each circuit used for residential purpose.	2	5

10.	8	Basic operation of CRO and DSO and measurement using CRO and DSO	2	2
11.	9,10	Who are electrical contractor, electrical supervisors, lineman, apprentices a) What is contract? b) Type of engineering contracts and their meaning c) What is tender? d) Different ways of writing tenders and meaning of each e) Tender notice and Tender documents f) What is Work Order? g) Stages in preparing Tender documents.	2	5
12.	-	Mini group hardware project based on above syllabus. (Max.6 Students in one group)	2	3

* Minimum 8 and maximum 12 practical's/experiment sessions to be included in a course in a term

Text Books:

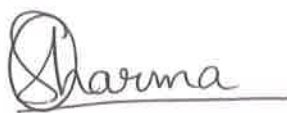| Sr. No.	Author	Title	Publisher and Edition
1.	Dr. S. L. Uppal,	Electrical Wiring, Estimating and Costing 5th Edition	Khanna Publisher
2.	Arora	A Handbook of Electrical Wiring Estimating and Costing, 2008 Edition	RB Publications
3.	Trevor Linsley, Newnes	Basic Electrical Installation Work, 3rth Edition	Butterworth-Heinemann Publishers

Reference books:

Sr. No.	Author	Title	Publisher and Edition
1.	K B & Raina and S K Bhattacharya	Electrical Design Estimating and costing, 2009 Edition,	New Age International(P) Limited.

Subject Coordinator

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	THIRD
COURSE TITLE	Product Study Analysis
COURSE CODE	172EE37

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
-	-	2	2	-										25@	10	25

* Assessment by Internal Examiner ** Assessment by External And Internal Examiner   @ TW assessment by Internal Examiner

Course Objectives:

After studying this subject, students will be able to

1) Identify different electronics gadgets with specifications.

2) Present market survey in a seminar.

Course Outcomes:

Student should be able to

CO1	Acquire information regarding different electronics gadgets from different sources.
CO2	Interpret the data acquired from different sources.
CO3	Prepare a report on market survey.

Course Content:

SECTION-I							
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1	**Market Survey:** A group of four to six students should collect information from the market regarding specifications, brand name, applications and cost of any three	12		1 & 2	25%	25%	50%

						R	U	A
		manufacturers for various electronics gadgets such as CRO, Multimeter, UPS, DC Power supply, Function generator, Mobile handset, TV set, Computer, Laptop, Printer, Scanner, Flash Drive, External hard disk, Digital watch, Digital Security Gadgets (CCTV, Spy Camera etc.) of brand name, specifications, cost and applications.						
2		**Seminar:** Any one seminar on the topics suggested: Students (Group of 4 to 5 students) has to search / collect information about the Electronics Products and 10 pages and deliver a seminar for 10 minutes. Any other suitable topic	20		1, 2 & 3	25%	25%	50%
		Total	32					

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

Subject Coordinator

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	THIRD
COURSE TITLE	Development of Professional Practice
COURSE CODE	172EE38

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
-	-	2	2	-	-	-	-	-	-	-	-	-	-	25@	10	25

* Assessment by Internal Examiner ** Assessment by External And Internal Examiner   @ TW assessment by Internal Examiner

Course Objectives:

After studying this subject, students will be able to

1. Acquire information from different sources
2. Prepare notes for given topic
3. Present given topic in a seminar
4. Interact with peers to share thoughts
5. Take the advantages of E-learning sources

Course Outcomes:

Student will be able to:

CO1	Become more familiar with library; to gain benefits.
CO2	Interact with different lecturers for optimal learning of day to day technology.
CO3	Manage, prepare & learn about latest technologies.
CO4	Gain practical knowledge of working models and latest patents.
CO5	Acquire information from different sources and display in newspaper format.
CO6	Gain information about technology that can be used in different cultural activities.
CO7	Learn about actual industrial life.
CO8	Learn management.
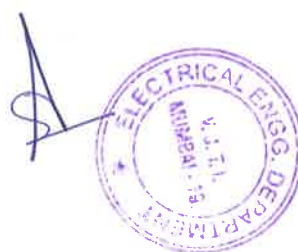
Course Content:

Sr. no.		Activity	Hours	Marks	CO	R Level	U Level	A Level
1		**Department Library**	8		1	20%	20%	60%
	1.1	Form the library committee.						
	1.2	Decide the policy for update.						
	1.3	Maintain the exam question papers & question banks.						
	1.4	Book distribution & new book purchase.						
	1.5	Student co-ordination / discipline.						
	1.6	Financial assistance (Sponsorship).						
2		**Guest Lecture**	8		2 & 7	20%	20%	60%
	2.1	Form committee.						
	2.2	Decide the policy lecture plan.						
	2.3	Communicate to guest & publicity of lecture.						
	2.4	Arrangement of Hall & student co-ordination / discipline.						
	2.5	Financial assistance from College.						
	2.6	Summary Report writing						
3		**Quiz Competitions**	8		3 & 4	20%	20%	60%
	3.1	Form committee.						
	3.2	Decide the policy competition plan.						
	3.3	Inter class compilation & department competition.						
	3.4	Questionnaire preparation.						
	3.5	Communicate to judges & publicity of competition.						
	3.6	Arrangement of hall & student co-ordination/ discipline.						
	3.7	Financial assistance from College.						

	3.8	Summary Report writing						
4		**Project & Poster/Paper Competitions**	8		3	20%	20%	60%
	4.1	Form committee.			&			
	4.2	Decide the policy competition plan.			4			
	4.3	Inter class compilation & department competition.						
	4.4	Communicate to judges & publicity of competition.						
	4.5	Arrangement of Hall & student co-ordination/ discipline.						
	4.6	Financial assistance from College.						
	4.7	Summary Report writing						
5		**Department News Paper**	8		5	20%	20%	60%
	5.1	Form committee.						
	5.2	Decide the different groups for news section.						
	5.3	Publicity of paper & financial assistance from College.						
6		**Departmental Cultural Activities**	8		6	10%	10%	80%
	6.1	Form committee.						
	6.2	Decide the plan for cultural activities.						
	6.3	Inter class compilation & department competition.						
	6.4	Communicate to guest & publicity of activities.						
	6.5	Arrangement of Hall & student co-ordination/ discipline.						
	6.6	Financial assistance from College.						
	6.7	Summary Report writing						
7		**Industry Association**	8		2	20%	20%	60%
	7.1	Form committee.			&			
	7.2	Decide the plan for Industrial Meet.			7			
	7.3	Communicate with the alumni from						

		Industry for a meet / lecture.						
	7.4	Communication to guest & publicity of meet / lecture.						
	7.5	Arrangement of Hall & student co-ordination / discipline.						
	7.6	Financial assistance from College.						
	7.7	Summary Report writing						
8		**Indoor Games**	8		8	10%	10%	80%
	8.1	Form committee.						
	8.2	Decide the plan for indoor games (Chess & Carom).						
	8.3	Inter class compilation & department competition.						
	8.4	Communication to judges & publicity of competition.						
	8.5	Arrangement of Hall & student co-ordination/ discipline.						
	8.6	Financial assistance from College.						
	8.7	Summary Report writing						
Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).								

Subject Coordinator

Curriculum Coordinator   Head   Dean - Diploma

Diploma in Electrical Engineering