Veermata Jijabai Technological Institute (V.J.T.I)

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

COURSE CODE	COURSE	GR	TEACHING SCHEME (HRS/WK)				EXAMINATION SCHEME													TOTAL MARKS
			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	
172EE41	Electrical Machine I	C	3		3	6	3	80	32	20	100	40	25**	10			25@	10	150
172EE42	Utilization of Electrical Energy	C	3	2		5	3	80	32	20	100	40			25**	10	25@	10	150
172EE43	Power System I	C	3	2		5	3	80	32	20	100	40			25**	10	25@	10	150
172EE44	Principle Of Communication Engineering	C	3		2	5	3	80	32	20	100	40	25**	10			25@	10	150
172EE45	Integrated Circuits	C	3		2	5	3	80	32	20	100	40	25**	10			25@	10	150
172EE46	C programming	B	2		2	4							25**	10			25@	10	50
172EE47	Development of Life Skill	M			2	2											25@	10	25
172EE48	Development of Professional practice	M			2	2											25@	10	25
	TOTAL		17	4	13	34		400		100	500		100		50		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   PR – Practical Exam; OR – Oral Exam; TW- Term Work.

* Assessment by Internal Examiner ** Assessment by External And Internal Examiner @ : TW assessment by Internal Examiner Extra co curriculum activity –Activity is coordinated by teacher as per the activity mentioned in curriculum.

Note : Students should go for four weeks industrial training during summer break after fourth semester. Students should prepare training report of industrial training which will be evaluated during fifth semester.

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	FOURTH
COURSE TITLE	Electrical Machine-I
COURSE CODE	172EE41

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	-	3	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:

At the end of Diploma Program, student will be able to

1) Know the constructional details & working principles of dc machines & transformers.
2) Test motors & transformers.
3) Evaluate the performance of dc motors & transformers by conducting various tests.
4) Decide the suitability of dc generator motor & transformer for particular purpose.
5) Write the specifications of dc machines & transformers as per requirement.
6) Operate any machine properly.

Course Outcomes:
Student should be able to

CO1	Get the knowledge of DC machine.
CO2	Get the knowledge of principle and operation of DC motor.
CO3	Understand constructional details of transformer.
CO4	Understand function of each component of transformer.

Course Content:

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
SECTION-I								
1.		**DC Machines**	12	20	1	40%	40%	20%
	1.2	Construction & working principle of DC machines						
	1.3	**GENERATORS:** -Types of generators. -Emf equation. -Armature reaction & Commutation (Concept only). -Application of DC generators.						
2.		**DC Motor**	12	20	2	40%	30%	30%
	2.1	Working principle, back emf, torque equation.						
	2.2	Characteristics of series, shunt & compound motors.						
	2.3	Speed control of dc motor.						
	2.4	Starting of dc motor – 3 point starter and 4 point starter.						
	2.5	Losses, efficiency and testing of dc machine Applications of above motors.						
SECTION-II								
3.		**SINGLE PHASE TRANSFORMER**	18	30	3 & 4	40%	40%	20%
	3.1	Introduction. Construction & working principle of operation.						
	3.2	Ideal transformer and actual transformer.						
	3.3	Emf equation, transformation ratio, kVA rating.						
	3.4	Equivalent circuit and phasor diagrams.						
	3.5	Test on transformer- Open circuit test, Short circuit test, Polarity test.						
	3.6	Regulation. Power & distribution transformer, all day efficiency, energy efficiency.						
	3.7	Losses & Efficiency of a single phase transformer.						
	3.8	Single phase auto transformer: principle ,advantages & disadvantages.						
4		**THREE PHASE TRANSFORMER**	6	10	3	40%	40%	20%

4.1	-Construction and operation -Connections -Vector groups			& 4			
4.2	**SPECIAL PURPOSE TRANSFORMER** -Current transformer. -Potential transformer -Isolation transformer						
TOTAL		48	80				

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

List of Practical/Assignments/Tutorials:

Sr. No.	Practical	CO
1	a) To identify the constructional parts of D. C. machine.	1&2
	b) To plot the O.C.C. of a given d. c. machine and to find critical resistance.	
2	To find the performance of d. c shunt motor by conducting load test	1&2
3	a) To control the speed of d. c. shunt motor above and below normal speed.	1&2
	b) To reverse the direction of rotation of d. c. motor.	
4	To identify the constructional details of 1-phase and 3-phase transformer.	3&4
5	To measure the performance of single phase transformer by direct loading and to find transformation ratio.	3&4
6	To measure performance of single phase transformer by O.C. and S.C. test.	3&4
7	To identify terminal polarity of corresponding phases of 3-phase transformer & to calculate transformation ratio.	3&4
8	To observe the phase difference between primary & secondary voltage of 3-phase transformer for various vector groups.	3&4

Books & Websites:-
Text Books:

Sr. No.	Author	Title	Publisher and Edition
1.	S K Bhattacharya	Electrical Machines, 3rd Edition	Tata McGraw-Hill Publishing Company Limited

Reference books:

Sr. No.	Author	Title	Publisher and Edition
1	P.S. Bhimbra	Electrical Machinery, 5th Edition	Khanna Publishers
2	H. Cotton	Electrical Technology, 7th Edition	CBS Publishers

			and Distributors
3	B.L Theraja and A. K Theraja	Electrical Technology -Vol. II, 23rd Revised Edition	S Chand & Company Ltd
4	Samarjit Ghosh	Electrical Machines, 1st Edition	Pearson Education

Websites:
http://www.electricaleasy.com
https://www.youtube.com/watch?v=D4RFFnzRdkk
http://nptel.ac.in/courses/108105017/

Subject Coordinator

Curriculum Coordinator **Head** **Dean - Diploma**
Diploma in Electrical Engineering

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	Fourth
COURSE TITLE	Utilization of Electrical Engineering
COURSE CODE	172EE42

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	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: '

At the end of Diploma Program, student will be able to

1. Compare different methods of electric heating & welding.
2. Study of different types of elevators
3. Explain the importance of good illumination
4. Get the knowledge of electrical energy conservation.

Course Outcomes:
Student should be able to

CO1	Get the knowledge of different methods of electric heating & welding.
CO2	Get the knowledge of different types of elevators
CO3	To understand the importance of good illumination
CO4	Get the knowledge of electrical energy conservation.

Course Content:

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1.		**Electric Welding**	12	16	1	20%	40%	40%
	1.1	Meaning of the term Welding, Requirements of good welding, Advantages of electric welding, Classifications of welding system, meaning of term plastic & Fusion welding.						
	1.2	Resistance Welding principle and operation, applications of each type, advantages & disadvantages, Safety Equipment's						
	1.3	Arc Welding: Principle and operation of Metal & Carbon Arc Welding. Use of DCSP for Carbon arc welding. Advantages and Disadvantages and applications						
2.		**Electric Heating**	12	16	1	20%	40%	40%
	2.1	Concept of electrical heating, Classification of Electric Heating Advantages & disadvantages , Modes of Heat transfer with definitions						
	2.2	Resistance Heating:- Properties of material used as a heating element, Causes of failure of heating element						
	2.3	Arc Heating: - Principle of Arc Heating, Properties of material used for electrode, advantages of graphite electrode over carbon electrode						
	2.4	Direct and Indirect Arc Furnace Constructional features and operation of arc Furnace						
	2.5	Induction Heating: - Working Principle, Constructional features, Principle of operation, Advantages & Disadvantages & Applications						
	2.6	Eddy Current Heating: - Principle, Nature of Supply used, Advantages, Disadvantages & Applications. Dielectric Heating: - Principle, Nature of supply used, Advantages, Disadvantages & Applications.						
3.		**Elevators**	6	8	2	20%	40%	40%
	3.1	Types of electric elevators						
	3.2	Size and shape of elevators cars. Location of elevators						
	3.3	Speed of elevators						
	3.4	Types of elevators machine, elevators motors						

	3.5	Power transmission gears braking.						
		Safety in elevators						
4		**Fundamentals of Illumination**	6	10	3	40%	40%	20%
	4.1	Fundamentals of Illumination						
	4.2	Illumination terminology: Illumination, Light intensity, Lumen, Lux						
	4.3	Laws of Illumination (Simple numerical)						
	4.4	Features of good Illumination scheme and Advantages of good Illumination scheme						
5		**Lamps & Lighting Accessories**	10	16	3 &4	20%	20%	60%
	5.1	Working principle, Construction, Operation and applications of: Fluorescent Tube, CFL, Mercury Vapour, Sodium Vapour and Metal Halide lamps						
	5.2	Types of Lighting Schemes: - direct, Semi-Direct, Indirect & semi- Indirect lighting Schemes with Applications.						
	5.3	General requirements for lighting schemes-Factory Lighting , Street Lighting, Flood Lighting, Railway platform Lighting, Lighting for Advertisement/Hoardings ,Sports Lighting						
6		**Illumination Control & Control Circuits**	8	14	4	25%	25%	50%
	6.1	Purpose of lighting control						
	6.2	Working principle and operation of Dimmer a. Resistance type dimmer b. Salt water dimmer Dimmer Transformer 1) Auto transformer dimmer 2) Two winding transformer dimmer Electronic Dimmer: working principle and operation a. Thyrister operated dimmer b. Triac operated dimmer						
	6.3	Polar curve : its meaning and applications for designing the lamps						
	6.4	Control of Enhance Lighting						

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	Conduct illumination assessment in workplace using luxmeter	4
3	Write a report on illumination scheme used in industry by visiting small or medium industry.	4

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	H. Partab	Art & Science of Utilization of Electrical Energy	Dhanpat Rai & Sons

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	N. V. Suryanarayana	Utilisation of Electrical Power	Wiley Eastern Limited
2	Jack l. Lindsey	Applied illumination engineering	The Fairmont Press Inc
3	J.B.Gupta	Utilization of Electric Power & Electric Traction	S.K.Kataria & Sons
4	H. Partab	Art & Science of Utilization of Electrical Energy	Dhanpat Rai & Sons

Subject Coordinator

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	FOURTH
COURSE TITLE	POWER SYSTEM – I
COURSE CODE	172EE43

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME											
					TH			TOTAL		PR		OR		TW		
L	T	P	CR	PAPER HRS	Max	Min	IST	Max	Min	Max	Min	Max	Min	Max	Min	TOTAL MARKS
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 various types of Transmission & distribution system.
2. Identify various components & know their functions.
3. Know types of conductors used in transmission and distribution circuits
4. Know the effect of changes in parameters on performance of the lines
5. Draw substation layout as per the requirements

Course Outcomes:

Student should be able to

CO1	Know various types of transmission and distribution system.
CO2	Know types of conductors used in transmission and distribution system.
CO3	Know the effects of changes in parameters on performance of the lines
CO4	Draw substation layout as per the requirements.

Course Content:

		SECTION-I						
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	C O	R Level	U Level	A Level
1		**Introduction to Power system**	6	10	1	40%	40%	20%
	1.1	Structure of power system.						
	1.2	Need of Transmission and Distribution system						
	1.3	Various Transmission and Distribution systems (A.C and D.C, their comparison in terms of efficiency, size of the conductor required).						
	1.4	Single line diagram						
	1.5	Various voltage level at transmission and distribution level. Problems related to above topic.						
2		**Transmission line parameters**	10	18	2	40%	40%	20%
	2.1	Line Resistance						
	2.2	Line Inductance –Flux linkage of conductor, inductance of 1-phase and 3-phase (Derivations of Self GMD and Mutual GMD) (only 2 wire and 3 phase system with symmetrical spacing)						
	2.3	Capacitance of transmission Line-Capacitance of single phase overhead line, Capacitance of three phase overhead line						
	2.4	Transposition of conductors						
	2.5	Overhead line conductor- bundled conductors and strain						
	2.6	Skin effect and Proximity effect. Problems related to above topic						
3		**Cables**	8	12	2	40%	40%	20%
	3.1	General construction of Cable						

	3.2	Insulating materials for cables						
	3.3	Types of cables and their voltage ratings						
	3.4	Grading of cables i.e. capacitance and intersheath grading						
	3.5	Types of cable faults. (Problems based on Grading/Fault location)						
4		**Study of Mechanical design of transmission lines**	10	16	3	40%	30%	30%
	4.1	Main components of overhead lines.						
	4.2	Line supports, Conductor material						
	4.3	Types of line insulators (string efficiency)						
	4.4	Spacing between conductors of overhead lines						
		Sag and tension calculation for overhead lines including effects of ice and wind for equal and unequal supports. Problems related to above topic						
5		**Substations components and its role**	10	16	4	40%	40%	20%
	5.1	Bus-bar, Feeder and Distributor						
	5.2	Their role and connections in power system						
	5.3	Ring system and Radial system						
	5.4	Calculation of DC distributors.						
	5.5	Role of Substation (Transmission and Distribution)						
	5.6	Their types (Outdoor and Indoor), Choice of their location, installation and size						
	5.7	Gas Insulated Sub-stations (In-Brief)						
6		**Smart grid**	4	8	4	40%	40%	20%
	6.1	Introduction to smart grid						
	6.2	Comparison of transmission line with smart grid						

List of Assignments:

Sr. No.	Assignment	CO
1	Five Assignments should be taken on the basis of syllabus.	1,2,3
2	Study on practical transmission and distribution system (report to be made).	3,4
3	Visit to substation & write brief report on it	1

Text Books:

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

Reference Book

Sr. No.	Author	Title	Publisher and Edition
1	V. K. Mehta	Principles of Power System	S. Chand
2	V. Kamraju	Electrical Power Distribution System	Mc. Graw Hill
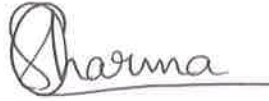
Text Books:

Sr. No.	Author	Title	Publisher and Edition
1.	V.K.Mehta	Principles of Power System	S.Chand
2.	V. Kamraju	Electrical Power Distribution System	Mc.GrawHill
3.	S.Sivanagaraju S.Satyanarayana	Electrical Power Transmission and Distribution	Pearson
4.	Soni,Gupta, Bhatnagar	A Course in Electrical Power	Dhanpat Rai
5.	S.L.Uppal	A Course in Electrical Power	S.K.Khanna
6.	J.B.Gupta	Transmission and Distribution of Electrical Energy	S.K.Khanna

Subject Coordinator

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	FOURTH
COURSE TITLE	Principles Of Communication Engineering
COURSE CODE	172EE44

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 different types of communication system and explain electromagnetic spectrum.
2. Describe and compare amplitude modulation & Frequency modulation.
3. Understand working of modulators and Demodulators of AM and FM.
4. Describe different types of Pulse modulation techniques like PAM, PWM, and PPM.
5. Describe different parameter of transmission line and their application as resonant lines.
6. Describe different types of Antenna and their Radiation pattern.
7. Understand basics of fiber optic communication and concept of RADAR.
8. Understand concept of different multiplexing technique and modes of data transmission.

Course Outcomes:

Student will be able to:

CO1	Describe basic elements of a communication system.
CO2	Evaluate analog modulated waveform in time /frequency domain and also find Modulation Index.
CO3	Implement various analog and Pulse modulation and demodulation techniques.
CO4	Analyze the performance of communication techniques in various transmission environments.
CO5	Understand basic concept of optical communication, RADAR and Multiplexing techniques.

DEE, VJTI

Course Content:

		SECTION-I						
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Introduction to electronic communication**	03	05	1	40%	60%	-
	1.1	Introduction to electronic communication.						
	1.2	Block Diagram of Communication system.						
	1.3	Modulation, Need for modulation, Types of Electronics communications.						
	1.4	Types of Electronics communications, Simplex, Duplex – Full & Half, Digital, Analog.						
	1.5	Applications of communication, The electromagnetic spectrum (different bands & their frequencies), Concept of Transmission bandwidth.						
	1.6	Noise in communication system and types.						
2		**Amplitude & Frequency modulation – demodulation**	10	20	1,2,3	-	50%	50%
	2.1	Basic Definition: Modulation index – definition, its effect on modulated signal, simple numerical, Frequency modulation, Deviation ratio, maxes. Deviation ratio.						
	2.2	Mathematical expression of amplitude modulated wave & FM modulated wave and its meaning (concept of sidebands), Bandwidth requirement, Representation of AM & FM signal in time & frequency domain.						
	2.3	Power relation in AM & FM wave, simple numerical.						
	2.4	Types of AM & FM modulators demodulators.						

	2.5	Characteristics of radio receiver- Sensitivity, Selectivity and Fidelity, Principle of heterodyne, Block diagram of super heterodyne receiver and it's working.					
3		**Pulse Communication**	06	15	3	30%	30%	40%
	3.1	Introduction, comparison with Continuous Wave Modulation					
	3.2	Sampling theorem, Nyquist rate, aliasing, natural & flat top sampling.					
	3.3	PAM, PWM, PPM definition, generation, block diagram, waveform analysis, and their comparison.					
	3.4	Digital Modulation Techniques: ASK, FSK, PSK definition & waveforms (Only Concept).					
SECTION-II								
Unit & Sub-Unit		**Topics/Sub-topics**					
4		**Transmission Lines & Antennas**	10	15	4	30%	50%	20%
	4.1	Fundamentals of transmission line: Balanced and Unbalanced line, Equivalent circuit of transmission line.					
	4.2	Attenuation in a transmission line, Velocity factor and Characteristics impedance of transmission line, Standing wave – SWR, VSWR, Reflection coefficient, simple numerical.					
	4.3	Transmission line as circuit elements: Quarter wave & half wavelength line, Impedance matching, Properties of line of various lengths, Stubs.					
	4.4	Basic definitions: Polarization, Radiation,					

						R	U	A
		Radiation pattern and directivity, Gain, Effective radiated power, Antenna aperture, Antenna reciprocity, Antenna intensity, Radiation resistance.						
	4.5	Basic Antennas: Half wave Dipole, Folded dipole, Ground plane, Directional, Yagi-Uda(Parasitic arrays), Driven arrays.						
5		**Fiber-Optic Communications & Radar**	07	15	4,5	30%	30%	40%
	5.1	Fiber-Optic System and Application, Light Communication, Reflection, Refraction, Refractive Index.						
	5.2	Fiber-Optic Cables: Construction, Step index, Graded index, Single-mode Step index, Multi-mode Graded index, Multi-mode Step index.						
	5.3	Optical cable connectors, Transmitters and Receivers.						
	5.4	Concept of Radar and types of Radar.						
	5.5	Analysis of Pulse Radar system and its applications.						
6		**Data Communications & Multiplexing**	04	10	5	50%	50%	–
	6.1	Modes of Data transmission: serial, parallel, Synchronous, asynchronous communication.						
	6.2	Definition and Working Principle of Modems (Concept Only).						
	6.3	Protocols: Asynchronous and Synchronous						
	6.4	Concept of Multiplexing: FDM, TDM, WDM (Concept only).						
	6.5	General Block Diagram study of FDM and TDM Transmitters & Receivers.						

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
I	2	Observe AM & FM Signal using Arbitrary Function Generator.	2	1,2,3
II	2	Generate an AM signal using BJT amplifier	2	2,3
III	2	Demodulate an AM signal using Peak Detector	2	3
IV	2	Generate a FM signal using timer IC and using VCO IC	2	3
V	2	Demodulate a FM signal using PLC IC.	2	3
VI	2	Plot graph of selectivity of VCO IC.	2	3
VII	2	Study BJT as a Mixer application.	2	2,3
VIII	3	Generate a PAM, PWM, PPM signal using kit.	2	3
IX	4	Measure the directivity and radiation pattern of Yagi uda antenna.	2	3
X	4	Plot the directional pattern of given antenna.	`2	4
XI	5	Setting up Fiber Optical Analog Link	2	5
XII	5	Study of Propagation loss and bending loss in Optical fiber	2	5
XIII	5	Measurement of Numerical Aperture	2	5
* Minimum 8 and maximum 12 practicals/experiment sessions to be included in a course in a term				

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Louis E. Frenzel	Communication Electronics	Tata McGraw-Hill 4th Edition
2	B.P. Lathi, Zhi Ding	Modern Digital and Analog Communication system	Oxford University Press, Fourth edition.

Reference books :

Sr. No.	Author	Title	Publisher and Edition
1	George Kennedy, and Davis	Electronic Communication Systems	Tata McGraw-Hill 4th Edition
2	Wayne Tomasi	Electronic Communication Systems Fundamental Through Advanced	Pearson Education 5th Edition
3	Taub, Schilling and Saha	Taub's Principles of Communication systems	Tata McGraw Hill, Third edition.
4	P. Sing and S.D. Sapre	Communication Systems: Analog and Digital	Tata McGraw Hill, Third edition.
5	Simon Haykin, Michel Moher	Introduction to Analog and Digital Communication	Wiley, Second edition

Subject Coordinator

Curriculum Coordinator

**Head
Diploma in Electrical Engineering**

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	FOURTH
COURSE TITLE	Integrated Circuits.
COURSE CODE	172EE45

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	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 various Analog and Digital Integrated Circuits Chips.

2) Select the proper Integrated Circuit Chip and use in the required circuit application.

3) Identify the difference between operational amplifier/comparator and classify their Linear and Non-linear applications.

Course Outcomes:

Student should be able to

CO1	Understand the basic structure of number systems and codes
CO2	Familiarize the concept of digital building blocks and their applications
CO3	Learn the basics of OP-AMPs and its applications
CO4	Analyze and understand the working of specially purpose IC's

Course Content:

SECTION-I								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Number Systems and Codes**	4	8	1	80%	10%	10%
	1.1	Review of number system conversions between binary, decimal, octal, hexadecimal, BCD						

	1.2	Binary addition, subtraction, division and multiplication.						
	1.3	Use of 1's and 2's complement in binary, BCD addition & subtraction						
2		**Combinational and Sequential logic circuits**	10	16	2	80%	10%	10%
	2.1	**Logic Gates:** AND, OR, NOT, EX-OR, Universal Gates (NAND and NOR). Boolean Algebra, Laws, De Morgan's Theorems, simplifications of logic expressions by using Boolean Algebra and Karnaugh maps up to 3 input variables						
	2.2	**Flip Flops:** S-R, D, J-K, T- type.						
	2.3	**Counters:** Asynchronous, Synchronous, Up-Down, mod-n,decade and BCD counters						
	2.4	**Registers:** Shift (left, right, bi -directional) registers						
3		**Logic families**	4	8	2	70%	15%	15%
	3.1	Bipolar(TTL), Unipolar (CMOS). Their characteristics & comparison						
4		**Encoders, Decoders, Multiplexers and Demultiplexers**	4	8	2	70%	15%	15%
	4.1	Their necessity, operations & applications						
		SECTION-II						
5		**Operational Amplifiers**	16	18	3	80%	10%	10%
	5.1	Block diagram, operating principle, electrical specifications of IC 741C, necessity of negative feedback. Op-Amp IC-741 pin diagram and function. Open loop and closed loop configuration of Op-Amp, its comparison. Virtual ground, virtual short concept. Open loop configuration – Inverting , Non-						

		inverting Close loop configuration – Inverting, non- inverting, differential amplifier, unity gain amplifier (voltage follower), inverter(sign changer)						
	5.2	**Applications**: Voltage comparator, Schmitt trigger, Integrator, Differentiator, precision (Half and full wave) rectifier, low pass, high pass, band pass and band reject filters						
	5.3	**Oscillators:** Concept of oscillators,Types of oscillators: Phase shift oscillators, Wien bridge oscillators using IC-741						
6		**IC 555 and its Applications**	6	12	4	80%	10%	10%
	6.1	Block diagram of IC 555. **Applications:** Astable Multivibrator, Monostable (timer) Multivibrator, Bistable Multivibrator, Schmitt trigger, Dual timer IC 556 used in sequential timer applications.pin diagram and function of each pin.						
7		**Linear Regulator IC's**	4	10	4	80%	10%	10%
	6.1	Fixed Voltage Regulator IC 78XX and 79XX series. Adjustable Voltage Regulator IC LM 317 and LM 337.						
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	To verify the truth table of TTL logic gate IC's 7408, 7432, 7400, 7402, 7486.	2	2
2	2	To built S-R latch using TTL 7400 and 7402 IC's.	2	2

3	2	To store a 2 bit and a 4 bit word using D latches IC 7475	2	2
4	2	Toggle & frequency divider application of J K flip flop IC 7476A.	2	2
5	2	Study of binary counter IC 7493. Obtaining mod-2 to mod-15 circuits from it.	2	2
7	5	Inverting, Non-Inverting, Voltage Follower, Inverting Adder, Differer Integrator applications using IC 741C OP-AMP.	2	3
8	5	Square Wave Generator using IC 741C	2	3
9	6	Timer IC 555 applications: square waveform generator, Monostable Multivibrator, Bistable Multivibrator, Sequential timer, Schmitt trigge	2	4
		*Note : Atleast some practical should be conducted using multisim.		

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Ramakant A Gayakwad	OP-AMPS and Linear Integrated Circuits,	4th Edition Prentice Hall of India Limited.
2	A P Malvino & Leach	Digital Principles & Applications	5th Edition, (Tata McGraw – Hill Publishing Company Limited).

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	R.P. Jain	Modern Digital Electronics	4th Edition Tata McGraw - Hill Publishing Company Limited.
2	Robert F Coughlin & Fredrick F Driscoll,	Operational Amplifiers and Linear Integrated Circuits	6th Edition Pearson Education Asia.

Subject Coordinator

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	FOURTH
COURSE TITLE	'C' Programming
COURSE CODE	172EE46

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	4	-	-	-	-	-	-	25**	10	-	-	25@	10	50

* 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) Understanding / identifying the concepts of C programming.
2) Interpret program output.
3) Debug and edit programs.
4) Develop programs.

Course Outcomes:

Student should be able to

CO1	Explore the basic concepts of programming language such as declaration initialization of variables and data types.
CO2	Develop, debug and edit programs
CO3	Interpret program output.
CO4	Analyze and understand logical structure of a computer program.

Course Content:

SECTION-I								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Basics of C programming:**	6		1, 2, 3 & 4	20%	40%	40%
	1.1	History of C						
	1.2	C character set, data types, Tokens in C, constants, variables, keywords, identifiers.						
	1.3	C operators- arithmetic, logical, assignment, relational, increment and decrement, conditional, bit wise, special, operator precedence,						
	1.4	Basic Structure of a C Program (a) C Header Files and Standard Library Functions (b) Input and Output functions						
	1.5	Problem solving techniques : flowchart and algorithm.						
	1.6	C Program (a) Steps to compile and execute a C program (b) C Instructions						
2		**Decision Making:**	6		1, 2 & 3	40%	20%	40%
	2.1	Decision making and branching: if-statement – if, if-else, else-if ladder, nested if else Switch case statement, break statement						
	2.2	Decision making and looping - while, do, do-while statement, for loop, continue statement						
3		**Arrays & Strings:**	6		1, 2 & 3	30%	30%	40%
	3.1	**Array:** Declaration of Arrays and initialization of one dimensional, two Dimensional and character arrays. Accessing array elements.						

						R	U	A
	3.2	**Strings** : Declaration and initialization of string variables, string handling functions from standard library – strlen(), strcpy(), strcat(), strcmp()						
SECTION-II								

SECTION-II

						R	U	A
4		**Functions & Structures:**	5		1, 2 & 3	40%	30%	30%
	4.1	**Functions:** Need of functions, scope and lifetime of variables, defining functions, function call, call by value, call by reference, return values, storage classes.						
	4.2	**Category of function:** No argument No return value, No argument with return value, argument with return value, recursion, command line arguments.						
5		**Pointers:**	5		1, 2 & 3	40%	30%	30%
	5.1	Understanding pointers, declaring pointer variable, initialization of pointer variable, accessing address of a variable, pointer expressions, pointers arithmetic						
6		**Structures:**	4		1, 2 & 3	20%	40%	40%
	6.1	Defining structure, declaring and accessing structure members, initialization of structure, arrays of structure.						

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

Practical Course Outcomes:

Student should be able to

CO1	Get the knowledge of tarbo C software.
CO2	Understand the rules for connecting program
CO3	Debug and edit programs using tarbo C
CO4	Built logic for the given problem.

List of Practicals/Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	1	To print any character like ' @ ' or our college name on output window.	1	1
2	2	To find the greatest/smallest of the given three numbers.	1.5	2,3,4
3	2	To check whether given number is odd or even.	1.5	2,3,4
4	2	To display MENU 1 ADDITION, 2 SUBTRACTION, 3 MULTIOLICATION & 4 DIVISION using switch case statement	1.5	2,3,4
5	2	To display all even no. from 1-100.	1.5	2,3,4
6	3	To arrange the given array in ascending and descending order.	2	2,3,4
7	3	To demonstrate output of standard library function using string length, strcpy, strcmp.	2	2,3,4
8	4	To calculate area of circle & rectangle using functions.	2	2,3,4
9	4	To find factorial of given number by recursion method.	2	2,3,4
10	5	To demonstrate call by reference and call by value.	2	2,3,4
11	4	To maintain and manipulate student data using structure.	2	2,3,4

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Balaguruswamy	Programming in C	Tata McGraw - Hill Publishing Company Limited

Reference books:

Sr. No.	Author	Title	Publisher and Edition
1	Yashwant P Kanetkar	Let us ' C '	BPB Publications
2	Herbert Schildt	The complete reference C	McGraw-Hill, Osborne Media

Subject Coordinator

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	FOURTH
COURSE TITLE	Development of Life Skills
COURSE CODE	172EE47

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. To train students in overcoming stage fright, to attain composure, to organize thought process and develop voice modulation and body language.

2. To develop students' interpersonal skills and leadership quality, to improve their listening and persuasive skills, and train them in the ways of identifying the source of information, collecting and planning.

3. To prepare students for interview, make them aware of personal grooming and concept of time, to teach students positive thinking as an ongoing process, to have optimistic approach, to cultivate right values and attitude.

Course Outcomes:

Student will be able to:

CO1	Understand and appreciate importance of life skills
CO2	Use self-analysis and apply techniques to develop personality
CO3	Improve the presentation skills.
CO4	Improve reading, listening and notes taking skills

DEE, VJTI

Course Content:

Unit &Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
		SECTION-I						
1		**Oral Skills and Writing Skills**	08		1& 4	-	50%	50%
	1.1	**SELF ANALYISIS-** Need of Self Analysis, Attitude and types (positive, negative, optimistic and pessimistic) Guidelines for developing positive attitude.						
	1.2	Group Discussion						
2		**SELF DEVELOPMENT**	8		2	20%	40%	40%
	2.1	Goal setting and its importance						
	2.2	Characteristics of Goal setting (**SMART**- **S**pecific, **M**easurable, **A**ttainable, **R**ealistic, **T**ime bound)						
	2.3	Time Management - Importance, prioritization of work, time matrix, time savers, and time wasters.						
	2.4	Stress Management - Definition, types of stress, causes of stress, managing stress, and stress busters2.2						
		SECTION-II						
3		**PRESENTATION TECHNIQUES**	08		3	20%	40%	40%
	3.1	Importance of presentation						
	3.2	Components of effective presentation (Body language, voice culture , rehearsal,etc)						
	3.3	Preparing for presentation						
	3.4	Use of audio/video aids. (audio, video, transparency's, PowerPoint presentations, etc)						
	3.5	Performing presentation (Seminars, paper presentations, compering, etc)						

4		**Managerial Skills**	08		3	20%	10%	70%
	4.1	Resume writing						
	4.2	Interview Techniques						

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

List of Practical/Assignments/Tutorials:

Sr. No.	Practicals	CO
1	Students deliver a prepared speech.	1
2	Group discussions conducted in class	4
3	Group of 6-7 students make a power point presentation	2&3
4	Assignments on resume writing and summarization	3
5	Mock interviews in class	3

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Raman Meenakshi	Business Communication-	Oxford, India,First edition, 2008

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	T. Kalayani Chakravarti and Dr.Latha Chakravarti	Soft Skills for Managers	biztantra
2	Ros Jay and Antony Jay	Effective Presentation	Pearson – Prentice Hall
3.	SekaranUma,	OrganisationalBehaviour,	New Delhi, Second edition,2008 Tata Mcgraw Hill

Subject Coordinator

Curriculum Coordinator

Head
Diploma in Electrical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	DEE
SEMESTER	FOURTH
COURSE TITLE	Development of Professional Practice
COURSE CODE	172EE48

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:

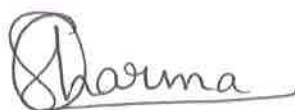| CO1	Become more familiar with library; to gain benefits.
CO2	Interact with different lecturers for optimal learning of day to day technology.
CO3	Manage, prepare & learn about latest technologies.
CO4	Gain practical knowledge of working models and latest patents.
CO5	Acquire information from different sources and display in a 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 & 4	20%	20%	60%
	4.1	Form committee.						
	4.2	Decide the policy competition plan.						
	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						

						R	U	A
		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 & 7	20%	20%	60%
	7.1	Form committee.						
	7.2	Decide the plan for Industrial Meet.						
	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
Diploma in Electrical Engineering

Dean - Diploma

DEE, VJTI