



Veermata Jijabai Technological Institute (V.J.T.I.)
(Central Technological Institute, Maharashtra State, INDIA)
H. R. Mahajani Marg, Matunga, Mumbai 400019
Tel.No. +91 22 24198101-02 Fax: +91 22 24102874
Website: www.vjti.ac.in

Programme: Diploma in Electronics Engineering (DEInE)

Semester: IV

Implemented from: 2017

OURSE CODE	COURSE	G R	TEACHING SCHEME (HRS/WK)				EXAMINATION SCHEME												
			L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
								Max	Min		Max	Min	Max	Min	Max	Min			
173EX41	Principles of Communication	C	3		2	5	3	80	32	20	100	40	25**	10			25@	10	150
173EX42	Control System	C	3		2	5	3	80	32	20	100	40	25**	10			25@	10	150
173EX43	Electronics II	C	3		2	5	3	80	32	20	100	40	25**	10			25@	10	150
173EX44	Instrumentation and Electrical System	C	3		2	5	3	80	32	20	100	40	25**	10			25@	10	150
173EX45	Linear Integrated Circuits	C	3		2	5	3	80	32	20	100	40	25**	10			25@	10	150
173EX46	C programming	B	2		2	4							25**	10			25@	10	50
173EX47	Product Study Analysis	B			2	2											25@	10	25
173EX48	Development of Professional practice	B			2	2											25@	10	25
TOTAL			17		16	33		400		100	500		150				200		850

Abbreviations: B – Basic; C – Core; A – Applied; M – Management; L – Theory Lecture; T – Tutorial; P – Practical; TH – Theory Paper; IST – In-Semester Tests PR – Practical Exam; OR – Oral Exam; TW- Term Work.

* assessment by Internal Examiner ** assessment by External Examiner @ : TW assessment by Internal Examiner

NOTE: a) During Summer Break after IV semester (i.e. between IV and V Semester), students have to undergo mandatory 6 weeks industrial training in large or medium scale industries relevant to the branch or discipline of engineering. This training would be evaluated during V semester.

b) Students have to prepare report of training, which will be evaluated during V semester.

Curriculum Coordinator



Head

Diploma in Electronics Engg.

Dean - Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DEInE
SEMESTER	: IV
COURSE TITLE	: PRINCIPLES OF COMMUNICATION
COURSE CODE	: 173EX41

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME					EXAMINATION SCHEME											
L	T	P	CR	PAPER HRS	TH			TOTAL		PR		OR		TW		TOTAL MARKS
					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

Course Objectives:

The student should be able to

1. Classify different types of communication systems and understand electromagnetic spectrum.
2. Describe and compare amplitude modulation & Frequency modulation.
3. Understand working of modulators and Demodulators of AM and FM.
4. Working and troubleshooting of AM / FM radio receivers.
5. Understand concept and working of Pulse modulation techniques like PAM, PWM and PPM.
6. Describe different parameters of transmission line and their application as resonant lines.
7. Understand working of Antennas and their radiation patterns.
8. Understand different types of wave propagation and their application.

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.



Course Content:

SECTION-I							
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level (%)	U Level (%)	A Level (%)
1	Introduction to electronic communication	02	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 modulation & Demodulation	10	15	2,3	12	50	38
2.1	Basic Definition: Modulation index – definition, its effect on modulated signal, simple numerical.						
2.2	Mathematical representation of amplitude modulated wave & its meaning (concept of sidebands), Bandwidth requirement, Representation of AM signal in time & frequency domain.						
2.3	Power relation in AM wave, simple numerical.						
2.4	Different types of AM modulators and Demodulators.						
2.5	Single sideband, Double Sideband Modulators and their application.						
3	Frequency Modulation and Demodulation	12	20	2,3	25	50	25
3.1	Basic Definition: Frequency modulation, Deviation ratio, maxes. Deviation ratio.						
3.2	Mathematical representation of frequency modulation and its meaning, Representation of frequency modulated signal in time domain and frequency domain, Bandwidth requirement – simple numerical.						
3.3	Concept with graph-pre emphasis and de-emphasis and comparison of FM and AM.						
3.4	Different type of FM modulators and discriminators.						
3.5	Characteristics of radio receiver- Sensitivity, Selectivity and Fidelity, Tune Radio Frequency receiver and its limitations.						
3.6	Principle of heterodyne, Block diagram of super heterodyne receiver and its working with waveforms, Need of AGC and its type – simple, delayed (with graph).						

[Handwritten signature]



SECTION-II

Unit & Sub-Unit	Topics/Sub-topics						
4	Pulse Communication	08	15	2,3	25	48	27
4.1	Introduction, comparison with Continuous Wave Modulation						
4.2	Sampling theorem, Nyquist rate, aliasing, natural & flat top sampling.						
4.3	PAM, PWM, PPM definition, generation, block diagram, waveform analysis, and their comparison.						
5	Transmission lines	07	10	4	-	50	50
5.1	Fundamentals of transmission line: Balanced and Unbalanced line, Equivalent circuit of transmission line, General equivalent circuit, RF equivalent circuit.						
5.2	Wave-lengths of signal, Attenuation in a transmission line, Velocity factor and Characteristics impedance of transmission line, Methods of calculations & simple numerical.						
5.3	Standing wave – SWR, VSWR, Reflection coefficient, simple numerical.						
5.4	Transmission line as circuit elements: Quarter wave & half wavelength line, Impedance inversion by quarter wavelength line, Quarter wave transformer & impedance matching, Properties of line of various lengths, Stubs – single & double, Balun's Counters.						
6	Antennas & Wave Propagation	09	15	4	33	34	33
6.1	Magnetic and Electric field in transmission line and Antenna operation, Near field Far field.						
6.2	Basic definitions: Polarization, Radiation, Radiation pattern and directivity, Gain, Effective radiated power, Antenna aperture, Antenna reciprocity, Antenna intensity, Radiation resistance.						
6.3	Basic Antennas: Half wave Dipole, Folded dipole, Ground plane, Conical, Directional, Yagi-Uda(Parasitic arrays), Driven arrays.						
6.4	Impedance matching: Q Section, Antenna tuners, Balun.						
6.5	Fundamental of electromagnetic wave and Transverse electromagnetic wave, Ground wave, Ionosphere, Sky wave propagation.						
6.6	Definition – critical frequency, max. useable frequency, skip distance, fading, Concept of actual height and virtual height.						
6.7	Space wave propagation, Duct propagation, Troposphere scatter propagation.						




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

Notes: This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.

Practical Course Outcomes:

Student will be able to

CO1	Observe analog modulated waveform and analyze the concept of Modulation Index.
CO3	Implement various analog and Pulse modulation and demodulation circuits using hardware as well as software simulation.
CO4	Analyze the performance of Antenna in wireless transmission environments.

List of Practical/Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
I.	2,3	Observe AM & FM Signal using Arbitrary Function Generator.	3	1
II.	2	Generate an AM signal using BJT amplifier	3	1,2
III.	2	Generate an AM signal using Balanced modulator IC AD633N and on multisim	3	1,2
IV.	2	Demodulate an AM signal using Peak Detector	3	1,2
V.	3	Generate a FM signal using timer IC	3	1,2
VI.	3	Generate a FM signal using VCO IC.	3	1,2
VII.	3	Demodulate a FM signal using PLC IC.	3	2
VIII.	3	Plot graph of selectivity of VCO IC.	3	2
IX.	3	Study BJT as a Mixer application.	3	2
X.	4	Generate a PAM signal	3	2
XI.	4	Generate a PWM signal	3	2
XII.	4	Generate a PPM signal using kit.	3	2
XIII.	6	Measure the directivity and radiation pattern of Yagi uda antenna.	3	3
XIV.	6	Plot the directional pattern of given antenna.	3	3

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

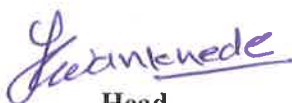


Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	George Kennedy and Davis	Electronic Communication Systems.	4 th Edition, Tata McGraw-Hill
2	Louis E. Frenzel	Communication Electronics.	4 th Edition, Tata McGraw-Hill

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	Roddy & Collen.	Electronic Communications.	4 th Edition, Prentice Hall India Pvt. Ltd.
2	Wayne Tomasi.	Electronic Communication Systems Fundamental Through Advanced.	5 th Edition, Pearson Education.
3	Hsu & Mitra.	Analog & Digital Communication.	1 st Edition, Tata McGraw-Hill.

**Curriculum Coordinator****Head
Diploma in Electronics Engg.****Dean - Diploma**

DIPLOMA PROGRAMME	: Diploma in Electronics Engineering
PROGRAMME CODE	: DEInE
SEMESTER	:IV
COURSE TITLE	:CONTROL SYSTEM
COURSE CODE	: 173EX42

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			
3	-	2	5	3	80	32	20	100	40	25*	10	-	-	25@	10	150

Course Objectives:

After studying this subject, student will be able to:

1. Learn the classification of control system.
2. Understand Steady state, time response, and frequency response analysis.
3. Learn Stability analysis with RH criteria and Bode plot.

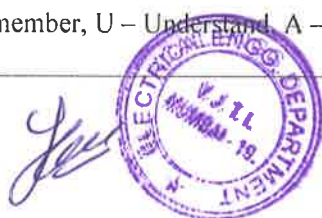
Course Outcomes:

CO1	Simplify complicated block diagrams and signal flow graphs.
CO2	Relate transient performance parameters, overshoot, rise time and peak time and settling time, to poles and zeros of transfer function for continuous systems.
CO3	Analyse steady state analysis of control systems.
CO4	Stability of control system using RH criterion and Bode plot, Root locus, polar plot



Course Content:

SECTION-I							
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level (%)	U Level (%)	A Level (%)
1	Introduction to control system	6	10	1	33	40	27
1.1	Different Types of Control Systems with examples						
1.2	Open Loop & Closed Loop Control Systems: Definition, Block Diagram						
1.3	Concept of transfer function						
2	Mathematical Modelling of Dynamic Systems	8	14	1	20	50	30
2.1	Modelling in Frequency Domain (Transfer function Approach for RLC circuits)- Block diagram reduction Algebra						
2.2	Signal flow graphs and Mason's gain formula						
3	Time Response Analysis	10	16	2,3	20	50	30
3.1	Time domain analysis- first order system, impulse and step response analysis of second order system						
3.2	Steady-state Error Analysis "Type" of the systems						
3.3	Static Error Coefficients and Steady-State Errors						
SECTION-II							
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level (%)	U Level (%)	A Level (%)
4	Root Locus Method	6	10	4	20	60	20
	Root Locus concept, rules and construction of approximate (without scale) root loci						
5	Stability Analysis	8	14	4	20	50	30
	Concept of Stability, Routh-Hurwitz stability criterion, Relative stability						
6	Frequency Response Analysis	10	16	4	22	56	22
	Frequency Domain Specification (no derivations) Determination of Stability from Bode and Polar Plots						
<p>Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxonomy).</p>							



Practical Course Outcomes:

Student should be able to

1. Determine transient domain specifications.
2. Determine frequency domain specifications.

List of Practicals / Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	3	Time response of First order systems.	2	1
2	3	Time response of Second order systems (Over damped)	2	1
3	3	Time response of Second order systems (under damped)	2	1
4	4	Bode Plot of First order systems.	3	2
5	6	Bode Plot of Second order systems(Over damped)	3	2
6	6	Bode Plot of Second order systems(Critically damped)	3	2
7	6	Bode Plot of Second order systems(under damped)	3	2
8	6	Determination of transfer function by Drawing Bode Plot	3	2
9	6	Polar plot of first order system.	3	2
10	6	Polar plot of second order system.	3	2

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Katsuhiko Ogato	Modern Control Engineering	4 th Edition Prentice Hall of India Ltd.
2	I J Nagrath and M Gopal	Control Systems Engineering	5 th New Age International



Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	Norman S Nise	Control Systems Engineering	5 th Edition, Wiley India Pvt. Ltd.
2.	B. C Kuo and F Golnaraghi	Automic Control System	8 th Edition Wiley India Pvt. Ltd.


Curriculum Coordinator


Head Diploma in Electronics Engg.


Dean Diploma



DIPLOMA PROGRAMME	: Diploma in Electronics Engineering
PROGRAMME CODE	: DEInE
SEMESTER	: IV
COURSE TITLE	: Electronics - II
COURSE CODE	: 173EX43

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

Course Objectives:

In Electronics – I the students were introduced to diodes, BJT & UJT. Their construction, characteristics and few applications were dealt with. In Electronics – II few newer semiconductor devices like FET will be introduced and other important applications of BJT & FET will be covered.

Course Outcomes:

Student should be able to

CO1	Explain the constructional and characteristic difference of different types of FET and transistor.
CO2	Identify different types of FET biasing circuit.
CO3	Analyze different types of small and Large Signal Amplifier circuits using BJT and JFET
CO4	Analyze different configurations of Transistor circuits.
CO5	Apply concept of feedback to improve stability of circuits and frequency response.
CO6	Design circuits using the transistors and oscillators.



Course Content:

SECTION I							
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level (%)	U Level (%)	A Level (%)
1	Field - Effect Transistors :						
1.1	Introduction, Construction & Characteristics of Junction Field Effect Transistor (JFET), Symbol	10	16	CO1 CO2	40	40	20
1.2	Drain and Transfer Characteristics (Shockley's Equation), Their important specifications (parameters) mentioned in manufacturer's data sheets						
1.3	Metal Oxide Semiconductor Field Effect Transistor (MOSFET). Depletion-type, Enhancement-type MOSFET's, Their construction, characteristics & parameters						
1.4	Vertical MOSFET (VMOS) & Complementary MOSFET (CMOS). JFET Voltage Variable Resistor (VVR) and CMOS inverter switch applications. Application of FET and MOSFET						
2	FET Biasing :						
2.1	Fixed Bias, Self Bias and Voltage Divider biasing circuits of JFET.	7	12	CO1 CO2	30	40	30
2.2	Biasing circuits of depletion and enhancement type MOSFET.						
3	JFET Small – Signal Analysis :						
3.1	Introduction, FET small signal model	07	12	CO1 CO2	30	40	30
3.2	JFET fixed bias, self bias voltage divider bias configurations.						
3.3	JFET source follower (Common Drain) configuration, JFET common gate configuration.						
SECTION-II							
4	BJT and FET Amplifier Frequency Response :						
4.1	Low frequency response of RC coupled, transformer coupled, direct coupled,	05	12	CO3 CO5			
4.2	Introduction to high frequency response of BJT and JFET (No detail analysis).						
4.3	Multistage (cascaded) frequency effects.						
5	Differential Amplifiers:						
5.1	Working of basic BJT differential amplifier, different configuration of Differential amplifier.	5	14	CO1 CO3 CO5			
5.2	AC and DC analysis of differential amplifier, Voltage gain, input impedance and output impedance of (Dual Input Balanced Output, Dual Input Unbalanced Output, Single Input Balanced Output & Single						





		Input Unbalanced Output					
5.3		Common mode rejection ratio, configurations of re model differential amplifiers). (No Derivations)					
6		Feedback and Oscillator Circuits :					
6.1		Concept of negative & positive feedback. General block diagram of feedback amplifier , sampling network , comparator or mixer network	06	14	CO4 CO5 CO6		
6.2	Four basic feedback topology, comparison of topology, RC phase shift, Wien Bridge						
6.3	RC phase shift, Wien Bridge, Hartley and Colpitt Oscillator circuits.LC oscillator,(Application, Advantages and disadvantages) Multivibrator using Transistor and it's working.						
Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxonomy).							

Practical Course Outcomes:

Student should be able to

CO1	Identify different FET's on their construction, characteristics and application basis
CO2	Small signal analysis and frequency response of transistor and FET.
CO3	Explain the effects influencing the frequency response of amplifiers.
CO4	Provide working of different types of oscillator circuits.
CO5	Understand the use of MULTISIM for circuit analysis.

List of Practical/Assignments/Tutorials:

Sr. No	Unit	Practical/Assignment	Appro x. Hours	CO
1	2	Study of N Channel JFET drain and transfer characteristics.	2	1
2	1	Study of N channel JFET small signal amplifier.	2	1,2
3	2	Study of JFET used as a shunt and series switch.	2	1,2,
4	4	Low frequency response of single and two stage RC coupled BJT CE small signal amplifier. Calculation of bandwidth.	2	1,2,3
5	2	Study of RC Phase shift and Wien Bridge Oscillator circuits.	2	1,4,5
6	1	Study of Hartley or Colpitt Oscillator circuit.	1	1,4,5
7	1	To plot frequency response of any one of the following IC power amplifier: LM 380, LM 386, TBA810.	1	4,5

*Note : Atleast some practical should be conducted using Multisim.



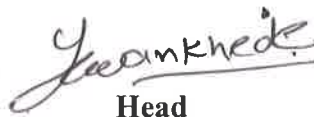
Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Boylestead & Nashelsky	Electronic devices and Circuits Theory"	9 th edition. PHI.
2	V.K .Mehta	Principles of Electronics	S.Chand Publication
3	Millman & Halkies	Electronic Devicce and Circuits	Second Edition. Tata McGraw Hill.

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	David Bell	Electrical and Electronics Materials	Oxford University Press
2	Bhargava, Kulshrestha and Gupta	Basic Electronics and Linear Circuits	4 th Edition, Tata McGraw - Hill Publishing Company Limited
3	S. Salivahanan, N Suresh Kumar	Electronic Devices and Circuits	3 rd Edition, Mc Graw Hill Education


Curriculum Coordinator


Head
Diploma in Electronics
Engg.


Dean - Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DEInE
SEMESTER	: IV
COURSE TITLE	: Instrumentation and Electrical System
COURSE CODE	: 173EX44

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			
3	-	2	5	3	80	32	20	100	40	25**	10	-	-	25@	10	150

Course Objectives:

The main objective of introducing this subject in the diploma course of Electronics engineering is to expose the student with fundamental knowledge on Modern Engineering practices that require adequately precise and fast measurement. It will impart knowledge related to the applications of the different types of sensors and transducers while teaching the various topics of this course. The addition of electrical components like transformer and AC, DC maotors will help students to select suitable motors for particular application

Course Outcomes:

CO1	Understand the Basic Principle of Measurement.
CO2	Learn the basic principles of sensors and transducers.
CO3	Select the most suitable transducer based on its performance characteristics, for specific measurement.
CO4	Realise the process of Data Acquisition.
C05	Select suitable motor for particular application



Course Content:

SECTION-I							
Unit & Sub-Unit	Topics/Sub-topics	Hou rs	Mark s	C O	R Leve l	U Leve l	A Level
1.	Basic concepts and Classification :- Introduction, System Configuration, Problem Analysis, Basic Characteristics of Measuring Devices, Error, Calibration of Transducers-Classification and requirements, Selection Criteria, Types.	03	6	1,2	50%	30%	20%
2.	Displacement and Strain: LVDT, RVDT, Capacitive, Resistive, Principle of Working, Advantages, Disadvantages and Applications. Strain Gauge- Types of strain gauge, theory of operation of resistance strain gauge, types of electrical strain gauge, Load cell, Strain Gauge Circuits.	07	10	2	50%	30%	20%
3.	Pressure Measurement: Pressure -Absolute, Gauge, Atmospheric, Vacuum. definition, Concept and Units, Manometers, Elastic Pressure Transducers – Bourdon Tube, Bellows, Diaphragm, Capsule, Variable Reluctance type, Variable capacitance type, Thin film pressure transducer	05	08	2	50%	30%	20%
4.	Flow measurement Difference between mass flow rate and volumetric flow rate, Head type flow meters, Turbine Meters, Anemometer, Rotameter, Ultrasonic flow meters. Magnetic field measurement Hall effect and hall effect transducer, Measurement of A.C. current by Hall effect transducer.	05	10	2	50%	30%	20%
SECTION-II							
Unit & Sub-Unit	Topics/Sub-topics						
5.	Temperature Measurement Temperature Scales and their Conversion.Principle of Working, Construction, Advantages & Disadvantages and Applications of- Filled Systems – Liquid and Gas Filled thermometers, Bimetallic Thermometers, RTDs, Thermocouples – Seeback & Peltier Effect, Law of Intermediate Metals and Temperatures ,Cold Junction compensation (CJC), CJC 2888222by electronic means, thermocouple types and their ranges, , Pyrometers – Radiation and Infrared	08	12	2	50%	30%	20%



6.	Level Measurement Conductivity, capacitance, ultrasonic and Nucleonic type , Float and Tape type.	06	10	2	50%	30%	20%
7	Data Acquisition Generalized Data Acquisition System, Multi-channel DAS, Data logger.	04	08	5	50%	50%	
8	Single Phase Transformer Introduction, Construction. Principle of operation, Different losses in transformer, Transformer efficiency and voltage regulation by direct load test.	04	06	5	20%	60%	20%
9	D.C.Motor Construction & working principle of DC motors, Methods of excitation, EMF equation, Starting of dc motor (series & shunt), Speed control of dc motor, Efficiency of DC Motors, Applications of DC Motors	03	05	5	20%	60%	20%
10	Three Phase Induction Motor Construction.Principle of operation. Speed control of three phase induction motor. Applications of three phase induction motor	03	05	5	20%	60%	20%
	Total	48	80				

Part II:- Practicals

List of Laboratory Experiments:

1. To study Instrumentation Amplifier using 3 op-Amps.
2. To plot the Characteristics of Thermocouple.
3. To plot the Characteristics of Thermistor.
4. Speed Measurement by using photoelectric pick- up.
5. Speed Measurement by using Magnetic pick- up.
6. Displacement or Position Measurement by Ultrasonic distance meter.
7. Displacement Measurement using LVDT.
8. Angular Displacement Measurement using RVDT.
9. To study characteristics of resistance wire strain gauge.
10. To study the hall Effect.
11. To study the Effect of Piezoelectric
12. To study the effect of LDR.
13. To study the limit switches.
14. Capacitive type limit measurement.
15. Load test on single phase transformer.
16. Speed control of D.C. shunt motor.
17. Load test on D.C. shunt motor.
18. Speed control of three phase induction motor.





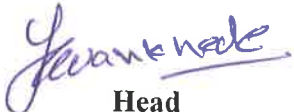
Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Rangan Mani Sharma	Modern Control Engineering, 2 nd Edition	Tata McGraw – Hill.
2	D.V.S. Murthy	Control Systems Engineering, 1 st Edition	Transducers and Instrumentation
3	S.K.Singh	Industrial Instrumentation and Control, 3 rd Edition	Industrial Instrumentation and Control,
4	D.Patranabis	Principles of Industrial Instrumentation, 2 nd Edition	Tata McGraw- Hill.
5	B.C.Nakra, &K.K.Chawdhry,	Instrumentation Measurement and Analysis, 2 nd Edition	Tata McGraw- Hill,
6	B.L Theraja and A K Theraja,	Electrical Technology -Vol. II, 23 rd Revised Edition	S Chand & Company Ltd.
7	S K Bhattacharya	Electrical Machines, 3 rd Edition	Tata McGraw- Hill Publishing Company Limited
8	P.S. Bhimbra,	Electrical Machinery, 5 th Edition	Khanna Publishers

Reference books

Sr. No.	Author	Title	Publisher and Edition
1	A.K.Sawhney	A Course In Electrical & Electronics Measurements & Instrumentation	Dhanpat Rai & Co.
2	Bela Liptak Kriszta Venczel	Process Measurement - Instrument Engineers Handbook, 3 rd Edition	Chilton Book Company
3	B.G. Liptak	Process Measurement and Analysis, 'Instrument Engineers Handbook, Volume I, 4th Edition	CRC Press


Curriculum Coordinator


Head
Diploma in Electronics Engg.


Dean - Diploma



DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DEInE
SEMESTER	: IV
COURSE TITLE	: LINEAR INTEGRATED CIRCUITS
COURSE CODE	: I73EX45

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			
3		2	5	3	80	32	20	100	40	25*	10	-	-	25	10	150
										*				@		

Course Objectives:

1. Understand the working and applications of linear integrated circuits.
2. Understand the advantages of Integrated circuits over discrete circuits.
3. Design circuits and systems for particular applications using linear integrated circuits.

Course Outcomes:

Student should be able to

CO1	Describe electrical characteristics of a standard operational amplifier.
CO2	Analyze effects of negative feedback on operational amplifier circuit.
CO3	Identify various linear and nonlinear applications of operational amplifier.
CO4	Describe the use of operational amplifier in waveform generator circuits.
CO5	Explain the working along with applications of specialized integrated circuits.



Course Content:

SECTION-I							
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level (%)	U Level (%)	A Level (%)
1	Introduction to Operational Amplifiers :						
1.1	Block diagram representation of a typical OP-AMP, Schematic Symbol.	03	04	CO1	50	50	-
1.2	Types of ICs, Development of ICs (SSI, MSI, LSI, VLSI Packages).						
2	Interpretation of Data Sheets & characteristics of an OP-AMP :						
2.1	Electrical characteristics & Parameters of μ A741C OP-AMP, ideal OP-AMP,	03	04	CO1 CO5	25	50	25
2.2	Equivalent circuit of OP-AMP, Ideal Voltage Transfer Curve,						
2.3	Open loop Configurations (differential, inverting & non-inverting amplifiers).						
3	An OP-AMP with negative feedback :						
3.1	Negative feedback, Block diagram representation of feedback configurations.	06	12	CO1 CO2	33	34	33
3.2	Study of Voltage Series & Voltage Shunt Feedback Amplifiers (Closed loop voltage gain, input impedance, output impedance, bandwidth, total output offset voltage with feedback),						
3.3	Voltage Follower						
3.4	Study of Differential Amplifiers using one and three op-amps.						
4	General Linear Applications :						
4.1	DC & AC Amplifiers, AC Amplifiers with single supply voltage,	12	20	CO1 CO3	30	30	40
4.2	Summing, Scaling & Averaging Amplifiers (inverting, non-inverting & differential).						
4.3	Voltage to current converter, Current to voltage converter applications.						
4.4	OP-AMP Integrator, Differentiator Circuits(Advantages over passive circuits)						
4.5	Active Filters : First order, Second order low pass, high pass filters,						
4.6	Bandpass&BandrejectFilters (Wide & Narrow), All Pass filters.						
Section II							
5	Non Linear Applications :						
5.1	Voltage comparators & op-amps.	07	14	CO1 CO3 CO5	25	25	50
5.2	Study of Monolithic comparator IC LM339.						
5.3	Voltage comparator applications: Level Detector, on-off control, Window Detector,						
5.4	bar-graph meter, Pulse Width Modulation, Schmitt Trigger,						



5.5	Precision rectifiers (HWR & FWR), Peak Detectors, Sample & Hold circuits.						
6	Signal Generators :						
6.1	Phase Shift & Wien Bridge Sine Wave Oscillators,	04	06	CO1 CO4	33	34	33
6.2	Square Wave, Triangular Wave & Saw Tooth Wave Generators.						
6.3	Square wave generator using IC 741.						
7	Specialized IC Applications :						
7.1	Four. Quadrant Analog Multiplier IC AD633						
7.2	Function Generator VCO IC 566 study and applications.						
7.3	Phase Locked Loop IC NE 565, its applications like frequency multiplier, FM Demodulation, Frequency Shift Keying Demodulation.	13	20	CO1 CO4 CO5	30	30	40
7.4	Fixed Positive & Negative linear voltage regulator ICs 78XX, 79XX series. Adjustable voltage regulator IC LM 317 & LM 337.						
7.5	Introduction to Switching Regulators. (SMPS)						
Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms’s Revised Taxonomy).							

Practical Course Outcomes:

Student should be able to

CO1	Analyze important types of Analog integrated circuits (IC 741C, OPA 640P, IC LM 339, IC 555, LF 351C, PLL IC 565).
CO2	To design circuits for particular applications using linear integrated circuits.
CO3	Understand the use of MULTISIM.

List of Practical/Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment	Appro x. Hours	CO
1	2,3	Inverting, Non-Inverting, Voltage Follower, Inverting Adder, Differentiator, integrator applications using IC 741C OP-AMP.	02	1, 2,3
2	4	Filter applications: Low pass, high pass, wide band pass & narrow band reject (notch) using Wide Band OP-AMP OPA 640P.	02	1,2
3	5	Quad Comparator IC LM 339 applications like voltage level detector, Window Detector, Bar Graph Meter, astablemultivibrator, Schmitt trigger & PWM.	02	1,2,3
4	5	Schmitt Trigger circuit using IC 741 and IC 555.	02	1,2
5	6	Square Wave Generator, Triangular Wave Generator using IC 741C.	02	1,2
6	6	Square waveform generator using IC 741/ IC 555.	02	1,2
7	6	Phase Shift & Wien Bridge Oscillator circuits using OP-AMP LF 351C.	02	1,2,3



8	5	Precision Half Wave & Full Wave Rectifiers (Positive & Negative) using IC741.	02	1,2
9	7	PLL IC 565 used in frequency multiplier & frequency modulation circuit.	02	1,2
10	7	Amplitude Modulation(AM) and Amplitude Shift Keying(ASK) using AD633 IC.	02	1,2
*Note : The students must perform at least one experiment in MULTISIM software.				

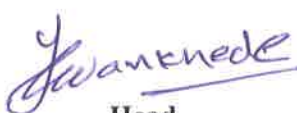
Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Ramakant A Gayakwad	OP-AMPS and Linear Integrated Circuits, 4 th Edition	Prentice Hall of India Private Limited.

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	Robert F Coughlin & Fredrick F Driscoll.	Operational Amplifiers and Linear Integrated Circuits, 6 th Edition	Pearson Education Asia.
2	Sergio Franco	Design with Operational Amplifiers and Analog Integrated Circuits, 4 th Edition	Tata McGraw - Hill Publishing Company Ltd


Curriculum Coordinator


Head
Diploma in Electronics
Engg.


Dean - Diploma



DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DEInE
SEMESTER	: IV
COURSE TITLE	: C PROGRAMMING
COURSE CODE	: 173EX46

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	M in	Max	Min	Max	Min			
2	-	2	4							25**	10			25 @	10	25

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.

(Handwritten signatures)



Course Content:

SECTION-I								
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level	
1	Basics of C programming:							
1.1	History of C	6		1,2,3,4				
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:							
2.1	Decision making and branching: if-statement – if, if-else, else-if ladder, nested if else Switch case statement, break statement	6		1, 2, 3				
2.2	Decision making and looping - while, do, do-while statement, for loop, continue statement							
3	Arrays & Strings:							
3.1	Array: Declaration of Arrays and initialization of one dimensional, two Dimensional and character arrays. Accessing array elements.	6		1, 2, 3				
3.2	Strings : Declaration and initialization of string variables, string handling functions from standard library – strlen(), strcpy(), strcat(), strcmp()							
SECTION-II								
4	Functions :							
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.	5		1, 2, 3				
4.2	Category of function: No argument No return value, No argument with return value, argument with return value, recursion, command line arguments.							

(Handwritten signatures)



5		Pointers:					
	5.1	Understanding pointers, declaring pointer variable, initialization of pointer variable, accessing address of a variable, pointer expressions, pointers arithmetic	5		1, 2, 3		
6		Structures:					
	6.1	Defining structure, declaring and accessing structure members, initialization of structure, arrays of structure.	4		1, 2, 3		
		Total	32				

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

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 Practical/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 MULTIPLICATION & 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

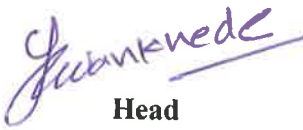


Text Books:

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

Reference books and Websites:

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

**Curriculum Coordinator****Head
Diploma in Electronics Engg.****Dean - Diploma**

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DEInE
SEMESTER	:IV
COURSE TITLE	: PRODUCT STUDY ANALYSIS
COURSE CODE	: 173EX47

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			
-	-	2	2	-										25@	10	25

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 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.) Public Address Systems, Spike Guard Suppressors for Computers,	12		1,2					

(Handwritten signatures)



		Light/Fan Dimmers of brand name, specifications, cost and applications.																		
2		<p>Product Report: A report is to be prepared by each group based on the market survey done in Market Survey, and submitted as term-work.</p> <p>Seminar: Individual student from each group has to give seminar in the classroom on their surveyed product and submit the seminar report as term-work.</p>	20			1, 2, 3														
		Total	32																	
<p>Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms’s Revised Taxonomy).</p>																				


Curriculum Coordinator


Head
Diploma in Electronics Engg.


Dean - Diploma



DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DEInE
SEMESTER	: III
COURSE TITLE	: DEVELOPMENT OF PROFESSIONAL PRACTICE
COURSE CODE	: 173EX38

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			
		2	2											25	10	25
														@		

Course Objectives:

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:

CO1	Student should be able to acquire information from different sources.
CO2	Students should be able to develop their interpersonal skills.
CO3	To improve ownership of professional growth and learning.
CO4	To conduct and manage various events.

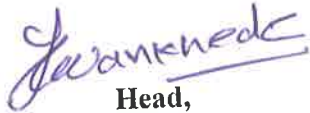
(Handwritten signatures)



	Form committee.			2				
	Decide the policy lecture plan.							
	Communicate to guest & publicity of lecture.							
	Arrangement of Hall & student co-ordination / discipline.							
	Financial assistance from College.							
	Summary Report writing							
3	Quiz Competitions	04						
	Form committee.			2				
	Decide the policy competition plan.							
	Inter class compilation & department competition.							
	Questionnaire preparation.							
	Communicate to judges & publicity of competition.							
	Arrangement of hall & student co-ordination/ discipline.							
	Financial assistance from College.							
	Summary Report writing							
4	Project & Poster/Paper Competitions	04						
	Form committee.			4				
	Decide the policy competition plan.							
	Inter class compilation & department competition.							
	Communicate to judges & publicity of competition.							
	Arrangement of Hall & student co-ordination/ discipline.							
	Financial assistance from College.							
	Summary Report writing							
5	Department News Paper	04						
	Form committee.			1				
	Decide the different groups for news section.							
	Publicity of paper & financial assistance from College.							
6	Departmental Cultural Activities	04						
	Form committee.			4				
	Decide the plan for cultural activities.							
	Inter class compilation & department							

	competition.						
	Communicate to guest & publicity of activities.						
	Arrangement of Hall & student co-ordination/ discipline.						
	Financial assistance from College.						
	Summary Report writing						
7	Industry Association	04					
	Form committee.				3,4		
	Decide the plan for Industrial Meet.						
	Communicate with the alumni from Industry for a meet / lecture.						
	Communication to guest & publicity of meet / lecture.						
	Arrangement of Hall & student co-ordination / discipline.						
	Financial assistance from College.						
	Summary Report writing						
8	Indoor Games	04					
	Form committee.				2		
	Decide the plan for indoor games (Chess & Carom).						
	Inter class compilation & department competition.						
	Communication to judges & publicity of competition.						
	Arrangement of Hall & student co-ordination/ discipline.						
	Financial assistance from College.						
	Summary Report writing						


Curriculum Coordinator


Head,
Diploma in Electronics Engg.


Dean - Diploma

