W.B.S.C.T.E.

TEACHING AND EXAMINATION SCHEME FOR DIPLOMA COURSES

COURSE NAME: ELECTRICAL ENGINEERING

COURSE CODE : EE

DURATION OF COURSE : 6 SEMESTERS

SEMESTER: FOURTH SEMESTER **SCHEME : C**

Sr.No.	SUBJECT	PERIODS			EVALUATION SCHEME							Credits
	THEORY	L	T	P	SESSIONSAL EXAM			ESE	PR(INT.)	PR (EXT.)		
					TA	CT	Total					
1	Electrical Machine II	03		03	10	20	30	70	25	50		5
2	Electrical Measurement & Control	03	--	02	10	20	30	70	25	25		4
3	Transmission & Distribution of Power	03	_	02	10	20	30	70	25	25		4
4	Applied and Digital Electronics	03	--	02	10	20	30	70	25	25		4
5	Power Plant Engineering	04	--		10	20	30	70				4
6	Computer aided Electrical Drawing		--	03	--	--	--	--	25	25		2
7.	Development of Life Skill - II	01	--	02					25	25		2
8.	Professional Practice - II			02					50			1
	Total	**17**		**16**	**50**	**100**	**150**	**350**	**200**	**175**		**26**

STUDENT CONTACT HOURS PER WEEK: **33 HRS**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH

ABBREVIATIONS: CT- Class Test, TA - Teachers Assessment, L - Lecture, T - Tutorial, PR (INT.) – Practical (Internal) PR(EXT.)- Practical(External), ESE - End Semester Exam.

TA: Attendance & surprise quizzes = 6 marks. Assignment & group discussion = 4 marks.

Total Marks : 875

Minimum passing for sessional marks is 40%, and for theory subject 40%.

Name of the Subject : Electrical Machine – II	
Course Code : EE/S4/EM II	**Semester : Fourth**
Duration : One Semester	**Maximum Marks : 175**
Teaching scheme :	**Examination scheme :**
Theory: 3 Hrs./ Week	Mid Semester Exam: 20 Marks
Practical: 3 Hrs./ Week	Assignment & Quiz: 10 Marks
	End Semester Exam: 70 Marks
	Practical: 75 Marks
Credit: 05	

Aim:

Sl. No.	
1.	Students will be able to analyze the performance of 3-phase and single phase A.C motors and 3-phase Alternators both qualitatively and quantitatively.
2.	These machines are used widely in various Industries and Power plants. So knowledge gained by the students will be helpful in their job in industry and power plants.

Objective:

Sl. No.	Student will be able to:
1.	Interpret the constructional details & working principles of A.C motors & generators.
2.	Test A.C motors & generators.
3.	Evaluate the performance of A.C machines by conducting different tests.
4.	Decide the suitability of AC machines for particular purpose.
5.	Write specifications of A.C motor & generators as required.
6.	Operate AC motor & generators as per requirement.

Pre-Requisite:

Sl. No.	
1.	Three phase & single phase A.C fundamentals, Electromagnetism.
2.	Basic electronics engineering.

	Contents (Theory):	Hrs./Unit	Marks
Unit : 1	**1. Three-Phase Induction Motor:** 1.1 Construction of 3-phase induction motor. 1.2 Production of rotating magnetic field. 1.3 Working principle of 3-phase induction motor. 1.4 Concept of Synchronous Speed & Slip. 1.5 Equation of rotor induced emf, current, frequency, reactance & impedance under standstill and running condition. **(Numerical)** 1.6 Vector diagram (at no-load & running condition). 1.7 Concept of Equivalent circuit (at no-load, at blocked rotor and at running condition).**(No Numerical)** 1.8 Derivation of Torque equation, Starting torque, Running torque, Maximum torque and condition for maximum torque. **(Numerical)** 1.9 Torque- Slip characteristics, Effect of change in rotor circuit resistance and supply voltage on Torque-Slip characteristics. 1.10 Power stages in 3-phase induction motor and their relation, Losses, Efficiency. **(Numerical)** 1.11 Starting methods of 3-phase induction motor by– a) Rotor resistance starter. b) Direct -On-Line starter. c) Autotransformer starter.	**14**	**24**

	d) Star-Delta starter (Manual & Automatic).**(Numerical for all starter)** 1.12 Speed control of 3-phase induction motor by – a) Changing supply frequency. b) Pole changing method. c) Changing Rotor circuit resistance & stator reactance. d) Changing supply voltage. 1.13 Braking of 3-phase induction motor by – a) Plugging. b) Rheostatic method. c) Regenerative method. 1.14 Cogging & Crawling (simple idea) 1.15 Concept of Double cage rotor & Deep-bar rotor. 1.16 Motor enclosures and specification as per I.S Code. 1.17 Industrial applications of 3-phase induction motor.		
Unit : 2	**2. Alternator:** 2.1 Construction of 3-phase alternator, Description of salient & non-salient rotor. 2.2 Methods of excitation systems of 3-phase alternator by – a) Static excitation. b) Brushless excitation. c) DC generator. 2.3 Advantages of Stationary armature and Rotating field system. 2.4 Armature winding – Single layer and multilayer, Concentrated and Distributed (Concept only). 2.5 Derivation of E.M.F. equation of 3-phase alternator, Effect of Coil span factor and Distribution factor on emf, Winding factor. **(Numerical)** 2.6 Factors affecting the terminal voltage of alternator – a) Armature resistive drop b) Leakage reactance drop. c) Armature reaction at various p.f, concept of Synchronous reactance. 2.7 Phasor diagrams of cylindrical rotor alternator at lagging, leading & unity p.f. loads. 2.8 Voltage regulation of 3-phase alternator by – **(Numerical)** a) Synchronous Impedance Method. 2.9 Open circuit characteristics, Short circuit characteristics of alternator and determination of synchronous reactance. 2.10 Active & Reactive power equations in terms of load angle at steady state for non-salient pole alternator. 2.11 Steady-state characteristics of Alternator – a) Terminal voltage vs. Load current, at different p.f, b) Field current vs. Load current at different p.f, c) Active & Reactive Power vs. load angle (non-salient alternator). 2.12 Short circuit ratio (SCR) – concept & significance. 2.13 Method of control of Active & Reactive Power of an alternator. 2.14 Reasons & advantages of Parallel operation. 2.15 Synchronization of two or more alternators by - a) Three lamps method. b) Synchroscope. 2.16 Parallel operation of (i) an alternator & infinite bus and (ii) Between two alternators & Load sharing between them.**(Numerical)**	**14**	**24**
Unit : 3	**3. Synchronous Motor:** 3.1 Construction and working principle. 3.2 Methods of starting by – a) An auxiliary motor. b) Damper winding.	**08**	**08**

	3.3 Effect of variation of Load – Speed vs. Torque characteristics. 3.4 Effect of variation of excitation at infinite bus (over and under excitation) – V curves & inverted V-curves. 3.5 Hunting, George's phenomenon. 3.6 Applications of synchronous motor, Synchronous condenser.		
Unit : 4	**4. Single phase motors:** 4.1 Double-revolving field theory. 4.2 Construction, Principle of operation and Applications of different types of single-ph Induction motors – a) Split phase (resistance) type. b) Capacitor start type. c) Capacitor run type. d) Shaded pole motors.	**05**	**08**
Unit : 5	**5. Special Machines:** 5.1 Linear induction motor. 5.2 Induction generator. 5.3 A.C series motor. 5.4 Reluctance Motor.	**07**	**06**
	Total	**48**	**70**

Practical:

Skills to be developed:

Intellectual skills:

1. Analytical skills.
2. Identification skills.

Motor skills:

1. Measurement (of parameters) skills.
2. Connection (of machine terminals) skills.

List of Practical: (At least Eight Experiments are to be performed)

1. a) To measure the slip of 3-phase induction motor by – (i) Stroboscopic method, (ii) Tachometer.
   b) To reverse the direction of rotation of 3-phase induction motor.
2. To perform No-load test and Blocked-rotor test on 3-phase induction motor & draw the equivalent circuit from the two tests.
3. To perform the load test on 3-phase induction motor and to study the performance characteristics of the motor.
4. To control the speed of 3-phase Induction motor by– (i) Frequency changing method, (ii) Pole-changing method.
5. To start a 3-phase Slip-ring induction motor by rotor resistance starter and determine the effect of the rotor resistance on the torque-speed curves of an induction motor.
6. To observe the effect of excitation and speed on induced e.m.f of a 3-phase alternator and plot the O.C.C. of the alternator.
7. To find the percentage regulation of 3-phase alternator by synchronous impedance method at various power factor and load.
8. To synchronise two 3-phase alternator for parallel operation by **-** a) Three lamp method, b) Synchroscope & to study the sharing of load between the alternators.

9.	To list and explain various starting methods of 3-phase synchronous motor and applying any one of them to start the synchronous motor. Plot V-curve & inverted V-curve of the same motor.
10.	To study the effect of capacitor on the starting and running condition of a single-phase Induction motor, and to determine the method of reversing the direction of rotation.

Text books:

Sl No.	Titles of Book	Name of Author	Name of Publisher
1.	Electrical Machines	S.K.Bhattacharya	T.M.H Publishing Co. Ltd.
2.	Electrical Machinery	Dr. S.K.Sen	Khanna Publisher
3.	Electrical Machines	J.B.Gupta	S.K.Kataria & Sons.
4.	The performance and design of Alternating Current machines	M.G.Say	C.B.S Publishers & Distributors
5.	Electrical Machinery	P.S.Bhimbra	Khanna Publisher
6.	Electrical Technology- Vol-II	B.L.Thereja	S.Chand
7.	Electrical Machines	M.N.Bandyopadhyay	P.H.I. Pvt. Ltd.
8.	Electrical Machines	Ashfaq Husain	Dhanpat Rai & Co.
9.	Principles of Electrical Machines and Power Electronics	P.C.Sen	Wiley India
10.	Electrical Machines-I	K.Krishna Reddy	Scitech Publication (India) Pvt. Ltd.
11.	Electrical Machines	Nagrath & Kothari	T.M.Hill
12.	Electrical Technology	H.Cotton	C.B.S. Publisher New Delhi
13.	Electrical Machines	S. Ghosh	Pearson Publisher
14.	Electrical Machines	M.V.Deshpande	PHI

EXAMINATION SCHEME (THEORITICAL)

GROUP	UNIT	ONE OR TWO SENTENCE ANSWER QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	**TO BE ANSWERED**	MARKS PER QUESTION	TOTAL MARKS
A	1, 4,5	12	TWENTY	ONE	1 X 20 = 20	FIVE	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10 X 5 = 50
B	2,3,6	11				FOUR			

Note: Paper-setter should take into account the marks which have been allotted in each unit and set the paper accordingly so that all units get the importance as allotted.

EXAMINATION SCHEME (SESSIONAL)

1. **Continuous Internal Assessment of 25 marks** is to be carried out by the teachers throughout the Fourth Semester. **Distribution of marks: Performance of Job – 15, Notebook (Drawing) – 10.**
2. **External Assessment of 50 marks** shall be held at the end of the Fourth Semester on the entire syllabus. One Experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. **Distribution of marks: On spot job – 35, Viva-voce – 10.**

Name of the Course: Electrical Measurement & Control	
Course Code: EE/S4/EMC	**Semester: Fourth**
Duration: one Semester	**Maximum Marks: 150**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Assignment & Quiz: 10 Marks
Practical: 2 hrs./week	End Semester Exam.: 70 Marks
	Practical : 50 Marks
Credit: 4(Four)	

Aim:

Sl. No.	
1.	Electrical power system, Electrical machine control, Industrial process control and many other systems such as Biomedical, environmental, defence etc. nowadays use sophisticated instruments and their related systems for fast, accurate and reliable measurements, operations and control.
2.	Being Electrical Diploma Holders has a role of supervisor, Maintenance engineer and to assist in carrying out testing and R & D work in electrical, Industrial, Electronics and communication field.
3	He must understand the basics, facts, concepts and principles of various modern Instruments and control system.

Objective:

Sl. No.	The students will be able to:
1.	Identify the components of Instrumentation system for processing given Input to get desired Output.
2.	Identify appropriate transducers/sensors for given application and to know how to use them.
3.	Identify basic signal conditioning circuit components for Instrumentation system in Industrial process, Electrical power system, Electrical machine operation, Measurement and control.
4.	Identify the digital instruments and display devices for various applications.
5.	Understand basic control system theory, stability concept
6.	Understand basics of P, PI, PD system and their application in real system.

Pre-Requisite:

Sl. No.	
1.	Basic knowledge of Applied Electronics, Circuit theory, Electrical machines.

Contents (Theory)		Hrs./Unit	Marks
Unit: 1	**Transducers:** 1.1 Concept of Transducers 1.2 Classification of Transducers Primary and Secondary Transducers, Electrical and Mechanical Transducers, Analog and Digital Transducers, Active and passive Transducers 1.3 Construction, working principle and application (with diagram & explanation) of following transducers: 1.3.1 RTD, Thermistor, Thermocouple. 1.3.2 Potentiometer (various types) 1.3.3 strain gauge (No derivation only formula) Types of strain gauges, Bridge circuit for strain gauge, application in load & Torque measurement 1.3.4 Bourden tube, Bellows, Diaphragm. 1.3.5 LVDT and RVDT, measurement for displacement. 1.3.6 Capacitive transducers, Application in pressure measurement. 1.3.7 Piezoelectric transducer, load cell. 1.3.8 Contacting and non contacting tachometer, speed measurement 1.3.9 Electromagnetic and turbine flow meter.	15	20
Unit: 2	**Signal conditioning:** 2.1 Concept of signal conditioning. 2.2 Block diagram of AC and DC signal conditioning and working. 2.3. V to I converter, I to V converter, V to F converter. 2.4 Instrumentation Amplifier. 2.5 Filters - Types and frequency response (No derivation) and circuits. 2.6 Multiplexing – Fundamentals, different types.	06	10
Unit: 3	**Digital instruments and Display Devices** 3.1 Digital display devices (LED, seven segment only) 3.2 Concept of 3 ½ ,4 ½ digit. 3.3 Digital voltmeter- Integrating type, Successive approximation. 3.4 Digital frequency meter. 3.5 C.R.O. – Block diagram representation & operation, applications (observation & measurement of voltage, current, phase difference & frequency)	07	10
Unit: 4	**Pilot Devices** 4.1 Pilot Devices - Definition of pilot devices, Function of pilot devices. List of different pilot devices. 4.2 – Construction, working and applications of: Push Button, Limit Switch, Float Switch, Electromagnetic Relay, Pressure switch, Thermostats plugging switch, Proximity switch.	05	10

Unit: 5	**Control System:** 5.1 Introduction to control system, classification of control system, Feedback control system 5.2 Properties of control system: idea on stability, steady state and transient error. (no mathematical deduction) 5.3 Control system components: Synchro, D.C Servomotor, A.C. Servo motor, A.C. Tachometer (only basic operating principle & construction and diagram, no deduction) 5.4 Concept of transfer function, poles and zeroes, transfer function of first & second order system (no deduction), time response characteristics of first and second order system to unit step excitation (no deduction). 5.5 Block diagram representation of control system, Transfer function from Block diagram reduction technique, Signal flow graph. Application of Mason gain formula (maximum two non touching loops). 5.6 Stability concept: characteristic equation, Deciding stability from pole zero concept, Routh criteria. **(Numerical)** 5.7 Control action of a system with ON/OFF, P, PI, PD, PID controller, Practical application of these controllers (with block diagram only).	15	20
Total		**48**	**70**

Contents (Practical)

Sl. No.	Skills to be developed
1.	Intellectual Skills: i) Interpret results ii) Calculate values of various components for given circuits. ii) Select Instruments
2.	Motor Skills: i) Connect the instruments properly. ii) Take accurate readings. iii) Draw phasor diagram and graphs.

List of Laboratory Experiments:

Sl. No.	**Laboratory Experiments: (At least eight experiments are to be performed)**
1.	To measure Linear displacement by LVDT & plot characteristics.
2.	To measure displacement by Strain gauge & plot characteristics.
3.	To measure temperature by pt-100, thermistor and thermocouple along with simple resistance bridge.
4.	To plot characteristics of potentiometer and observe the loading effect on output of potentiometer.
5.	To study the following signal conditioning circuits and observe and plot the output (i) V to I Converter, (ii) I to V Converter, (iii) V to F Converter using Op-AMP 741.
6.	To measure angular speed by contact type, non- contact type tachometer, Digital Tachometer, Proximity sensor.
7.	To plot frequency response of Active filters (any two):- I) Low pass filter II)High pass filter III) Band pass filter Iv) Band stop filters.

8.	To study the principle of operation and connection of pilot devices like – Push Button Switch, Limit Switch, Selector switch, Pressure switch, Float switch.
9.	To measure voltage, current and Phase difference and Frequency using CRO.
10.	To study open loop control of any physical control system and study of closed loop control of the same system using P, PI and PID controller.
11.	To study the position control system using servomotor.
12.	To study the operation of an instrumentation amplifier using OPAMP.

Text Books

Sl No.	Name of Authors	Titles of the Book	Name of Publisher
1.	A.K.Sawhney	Electrical and Electronics Measurement and Instrumentation	Dhanpat Rai & Co.
2.	H.S.Kalsi	Electronic Instrumentation	Tata McGraw Hill
3.	D.Patranabis	Principles of Industrial Instrumentation	Tata McGraw Hill
4.	A.K.Sawhney	Process control & instrumentation	Dhanpat Rai & Co.
5.	Donald P. Eckman	Industrial Instrumentation	Wiley Eastern Ltd.
6.	B.C.Kuo	Automated Control Systems	Wiley India
7.	Nagrath Gopal	Control System Engineering	New Age International
8.	R. Anandanatarajan, P.Ramesh Babu	Control System Engineering	Scitech Publication (India) ltd.
9.	S.K. Bhattachrya Brijinder Singh	Control of Electrical Machines	New Age International
10.	K.Lal Kishore	Electronic Measurement and Instrumentation	Pearson
11.	M.Gopal	Control Systems Principles and Design	McGraw Hill Education (India) Pvt.Ltd

E X A M I N A T I O N S C H E M E (THEORITICAL)

<table>
<tr><th rowspan="2">GROUP</th><th rowspan="2">UNIT</th><th colspan="4">ONE OR TWO SENTENCE ANSWER QUESTIONS</th><th colspan="4">SUBJECTIVE QUESTIONS</th></tr>
<tr><th>TO BE SET</th><th>TO BE ANSWERED</th><th>MARKS PER QUESTION</th><th>TOTAL MARKS</th><th>TO BE SET</th><th><u>TO BE ANSWERED</u></th><th>MARKS PER QUESTION</th><th>TOTAL MARKS</th></tr>
<tr><td>A</td><td>1</td><td>7</td><td rowspan="3">TWENTY</td><td rowspan="3">ONE</td><td rowspan="3">1 X 20 = 20</td><td>FOUR</td><td rowspan="3">FIVE, TAKING AT LEAST ONE FROM EACH GROUP</td><td rowspan="3">TEN</td><td rowspan="3">10 X 5 = 50</td></tr>
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</table>

Note: Paper-setter should take into account the marks which have been allotted in each unit and set the paper accordingly so that all units get the importance as allotted.

E X A M I N A T I O N S C H E M E (SESSIONAL)

1. **Continuous Internal Assessment of 25 marks** is to be carried out by the teachers throughout the Fourth Semester. **Distribution of marks: Performance of Job - 15, Notebook - 10.**
2. **External Assessment of 25 marks** shall be held at the end of the Fourth Semester on the entire syllabus. One Experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. **Distribution of marks: On spot job - 15, Viva-voce - 10.**

Name of the Subject: Transmission and Distribution of Power	
Subject Code: EE/S4/TDP	**Semester: FOURTH**
Duration: one Semester	**Maximum Marks: 150**
Teaching Scheme	**Examination Scheme**
Theory: 3 Hrs./Week	Mid Semester Exam.: 20 Marks
Tutorial: nil	Assignment & Quiz: 10 Marks
Practical: 2 Hrs./Week	End Semester Exam.: 70 Marks
Credit: 04	Practical Exam.: 50 Marks

Aim:

Sl. No.	
1.	Electrical diploma pass outs should know systems for electrical energy transmission & distribution. They also will be able to identify various components & their functions.
2.	They will be able to measure system performance. They will be able to deal with various aspects of transmission and distribution system at different stages including erection and maintenance. Hence he should be well acquainted with the materials required and the methods employed for erection and maintenance.
3.	On completion the study of transmission & distribution, he/she will be able to work as technician/supervisor in power industry, manufacturing industry & public utilities.

Objective:

Sl. No.	Student will be able to:
1.	Interpret various types of transmission & distribution systems.
2.	Identify various components & Know their functions.
3.	Calculate voltage regulation & efficiency of transmission system.
4.	Calculate voltage drop of distribution system.

Pre-Requisite:

Sl. No.	
1.	Basic Electrical Engineering.
2.	Electrical Power Generation

Contents (Theory)		Hrs./Unit	Marks
Unit: 1	**Basics Of Transmission**: 1.1 Layout of a Power System by single line concept. 1.2 Concept of Primary & Secondary transmission & distribution. 1.3 Advantages and limitations of using high voltage for power transmission. 1.4 Comparison between AC & DC power transmission systems. 1.5 Kelvin's laws for the economic choice of conductor size – related problem.	04	4
Unit: 2	**Transmission Line Components:** 2.1 Main components of Overhead lines (names & functions only). 2.2 Types of conductors-Copper, Aluminum & state their trade names. 2.3 Solid, Stranded & bundled conductors.	12	16

	2.4 types of supports – RCC/PCC poles, steel tower 2.5 Comparison between single circuit and double circuit design 2.6 conception of ground wire. 2.7 Line insulators – requirements, types, and field of applications. 2.8 failure of insulators, creepage distance (definition & significance only) 2.9 Distribution of potential over a string of three suspension insulators. --- Problems. 2.10 Concept of string efficiency, Methods of improving string efficiency. ---- Problems. 2.11 Corona – corona formation, advantages & disadvantages, factors affecting corona, important terms related to corona. 2.12 Calculation of Span length & sag Calculation , effect of wind pressure, temperature and ice deposition----- Problems. 2.13 Stringing chart and its uses. 2.14 Spacing of conductors, length of span, Relevant I.E. Rules.		
Unit: 3	**Tansmission Line Parameters:** 3.1 R,L & C of 1-ph & 3-ph transmission line & their effects on line.(No deduction and Problems) 3.2 Skin effect, proximity effect & Ferranti effect. 3.3 Concept of transposition of conductors & necessity.	03	3
Unit: 4	**Underground Cables:** 4.1 Classification of cables and Comparison with overhead lines. 4.2 Cable construction. 4.3 Description of (i) PVC, (ii) PILC (iii) FRLS (Fire Retardant Low Smoke), (iv) XLPE cables & (v) Gas filled (SF6) cables 4.4 Cable Rating and De-rating factor. 4.5 Cable laying	04	7
Unit:5	**Performance Of Transmission Line:** 5.1 Classification of transmission lines. 5.2 Losses, Efficiency & Regulation of line. 5.3 Performance of single phase short transmission line(Numerical based on it) 5.4 Effect of load power factor on performance. Power Factor Improvement Using Static condenser and Synchronous condenser – related problems. 5.5 Medium transmission lines-End condenser, Nominal T & Nominal Pi Network with vector diagram.---- no problem.	09	15
Unit:6	**Extra High Voltage Transmission:** 6.1 EHVAC Transmission, Reasons for adoption & limitations. 6.2 Regional Grid System (Conception only). 6.3 Concept about FACTS and its applications. 6.4 HVDC Transmission – Advantages, Limitations. 6.5 Discussion on few HVDC system in Indian scenario.	03	5

Unit:7	**Components of Distribution System:** 7.1 Introduction. 7.2 Classification of distribution system. 7.3 A.C distribution. 7.4 Connection schemes of distribution system. 7.5 Requirements of Distribution systems. 7.6 Design consideration. 7.7 A.C. distribution calculations. 7.8 Methods of solving A.C.-1 phase & 3 Ø -phase connection (balanced) distribution system. (Numericals based on 1-ph & 3-ph balanced distribution system)	08	12
Unit:8	**Substations:** 8.1 Introduction. 8.2 Classification of indoor & outdoor sub-stations. 8.3 Advantages & Disadvantages. 8.4 Selection & location of site. 8.5 Main connection schemes. 8.6 Equipments and circuit element of substations – their symbols & function. 8.6.1 Bus bar's material, types in detail. 8.6.2 Connection diagram and layout of sub-stations with proper notation.	05	8
	Total	**48**	**70**

Contents (Practical)

Sl. No.	Skills to be developed
1.	**Intellectual Skills:** 1.1 Identification & selection of components. 1.2 Making proper connections
2.	**Motor Skills:** 2.1 Ability to measure various parameters. 2.2 Ability to follow standard test procedures.
LIST OF	**EXPERIMENTS : (At least Eight Experiments are to be performed)**
	3.1 To demonstrate the improvement of P.f. using static condenser.
	3.2 To demonstrate various system faults by D.C. network analyzer.
	3.3 To study active and reactive power flow through transmission lines.
	3.4 To study the supply system of 6.6 KV/400V sub-station to a housing complex using slides/model.
	3.5 To study various types of turbine used in Power station using slides/models.
	3.6 To study different types of excitation system for alternator using slides/models.
	3.7 To study different kinds of insulators (Insulators are required to be available in laboratory)
	3.8 To study PILC, PVC, FRLS and XLPE cables. (Cables are required to be available in laboratory)
	3.9 To measure Solar Radiation with the help of Pyranometer.
	3.10 To demonstrate the photo voltaic system used in street lighting – PV module, CCU, Battery, CFL.
	3.11 To study power generation by wind power – using model / slides.

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
V. K. Mehta	Principles of power system		S. Chand & Company
SoniGupta-Bhatnagar	A Course in electrical power		Dhanpat Rai
J. B. Gupta	Transmission & distribution of electrical energy		S.K. Kataria & Sons.
Nagsarkar & Sukhija	Power System Analysis		Oxford University Press
Tarlok Singh.	Transmission & Distribution of Power		S.K. Kataria & Sons.
Dr. K.Uma Rao	Power System Operation and Control		Wiley-India
A. T. Starr	Generation, Transmission and Utilization of Electric Power		Pitman
C.L.Wadhwa.	Electrical Power System		Wiley Eastern Ltd

E X A M I N A T I O N S C H E M E (THEORITICAL)

GROUP	UNIT	ONE OR TWO SENTENCE ANSWER QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	**TO BE ANSWERED**	MARKS PER QUESTION	TOTAL MARKS
A	1, 2, 3,4	12	TWENTY	ONE	1 X 20 = 20	FOUR	FIVE taking at least THREE from each Group	TEN	10 X 5 = 50
B	5,6,7,8	12				FIVE			

Note: Paper-setter should take into account the marks which have been allotted in each unit and set the paper accordingly so that all units get the importance as allotted.

E X A M I N A T I O N S C H E M E (SESSIONAL)

1. **Continuous Internal Assessment of 25 marks** is to be carried out by the teachers throughout the Fourth Semester. **Distribution of marks: Performance of Job – 15, Notebook – 10.**
2. **External Assessment of 25 marks** shall be held at the end of the Fifth Semester on the entire syllabus. One Experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. **Distribution of marks: On spot job – 15, Viva-voce – 10.**

Name of the course : Applied and Digital Electronics	
Course Code : EE/S4/ADE	**Semester : Fourth**
Duration : One Semester	**Maximum Marks : 150**
Teaching scheme :	**Examination scheme :**
Theory: 3 Hrs./ Week	Mid Semester Exam: 20 Marks
Practical: 2 Hrs./ Week	Assignment & Quiz: 10 Marks
	End Semester Exam: 70 Marks
	Practical: 50 Marks
Credit: 04	

Aim:

Sl. No.	
1.	It intends to teach the operating principles and applications of different types of Amplifiers and Oscillators.
2.	The subject also includes the Basic Digital logic circuits and their applications, D/A & A/D converters etc.
2.	Understanding of the subject will provide skill to the students for trouble shooting & testing of some basic Amplifier circuits, Oscillator circuits and Digital logic circuits.

Objective:

Sl. No.	Student will be able to:
1.	Illustrate the Amplifier circuits and Oscillator circuits.
2.	Describe the Digital logic circuits, Flip-flop, Counter, Register, D/A & A/D converter.
3.	Test the Amplifier circuits, Oscillator circuits and Digital logic circuits.

Pre-Requisite:

1.	Knowledge of Basic Electronics.
2.	Knowledge of Analog & Digital Electronics.

Contents (Theory):		Hrs./Unit	Marks
Unit : 1	**1. Amplifiers:** **1. Power Amplifiers:** 1.1.1 Classification of power amplifiers – Class-A, Class-B, Class-AB, Class-C operation, Advantage & disadvantages of these amplifiers. 1.1.2 a) Operation of Class-A Push-pull amplifier. b) Operation of Class-B Push-pull amplifier. c) Operation of Class-AB Push-pull amplifier. **1.2 FET Amplifier:** 1.2.1 Biasing methods of FET. 1.2.2 Common-Source amplifier - working principle & applications. 1.2.3 Introduction to MOSFET – Types of MOSFET, construction, working principle and applications. 1.2.4 CMOS – construction and application. frequency. **1.3 Operational Amplifier:** 1.3.1 Basic differential amplifier circuit using BJT. 1.3.2 Pin diagram of OPAMP IC741& functions of each pin. Definition of offset voltage, input bias current, input offset current, differential mode gain, CMRR, slew rate 1.3.3 OPAMP as Non-inverting and Inverting amplifier, Adder, Subtractor, Integrator, Differentiator, Unity Gain Buffer, Schmitt Trigger, Zero Crossing Detector. 1.3.4 Instrumentation amplifier – Operating principle using OPAMP, Applications.	**10**	**16**
Unit : 2	**2. Feedback Amplifiers & Oscillators:** 2.1 Theory of Positive & Negative feedback. 2.2 Types of negative feedback amplifiers –shunt-voltage, series-voltage, shunt-current, series-current feedback. 2.3 Introduction to oscillator, Block diagram of sine wave oscillator, requirement of oscillation, Barkhausen criterion. 2.4 Wien bridge oscillator, Colpitt oscillator – operating principle, frequency of oscillation.	**08**	**14**

Unit : 3	**3. Boolean Algebra & Combinational Logic Circuits:** 3.1 Number Systems – Decimal, Binary, Octal, Hexadecimal, BCD number system & their inter-conversion. 3.2 Symbolic representation & Truth tables for logic gates - NOT, OR, AND, NAND, NOR, XNOR, XOR. 3.3 Rules & laws of Boolean algebra, Demorgan's Theorems. 3.4 Max. term & Min. term, Simplification of Boolean expression using karnaugh map (upto 4 variable). 3.5 Realisation of Boolean expression with Logic gates. 3.6 Half adder, Full adder, Half subtractor, Full subtractor, Parity Generator and checker, Digital comparator 3.7 Code converter, Encoder, Decoder, Multiplexer, Demultiplexer	**08**	**14**
Unit : 4	**4. Sequential Logic Circuits:** 4.1 Flip-flops – RS, D, T, JK, JK Master Slave Flip Flops using basic gates, preset and clear signals. 4.2 Counters - Asynchronous & Synchronous Counter, Mod-N counter, Up Down Counter, Ring counter, 4.3 Registers - Shift register, Serial in Serial out, Serial in Parallel out, Parallel in serial out, Parallel in Parallel out.	**10**	**14**
Unit : 5	**5. Data Converters & Memory Devices:** 5.1 D/A Converter: Basic concepts, Weighted Resistor D/A converter, R-2R Ladder D/A converter. 5.2 A/D Converter: Successive approximation method, Dual slope method. 5.3 Concept of - Static Memory & Dynamic Memory, SDRAM, DDR RAM, PROM, EEROM, EPROM. 5.4 Comparison of Logic families – DTL,TTL and ECL Gates	**12**	**12**
	Total	**48**	**70**
Practical:			
Skills to be developed:			
Intellectual Skills:			
1. To locate the faults in circuits.			

2. Interpretation of circuits & corresponding waveforms.
Motor Skills:
1. Ability to draw the circuit diagrams.
2. Ability to interpret the circuits.
List of practicals:
1. Applied Electronics: (At least Three Experiments are to be performed) :
1.1 To study RC phase shift oscillator and find out frequency of oscillation.
1.2 To study Colpitt's oscillator and find out frequency of oscillation.
1.3 To plot frequency response of FET amplifier.
1.4 To construct Adder, Subtractor, Unity gain buffer circuit using OPAMP.
2. Digital Electronics: (At least Five Experiments are to be performed)
2.1 To realize OR, AND, NOT and XOR gates using Universal gates.
2.2 To realize Half Adder / Full Adder/ Full Subtractor.
2.3 To verify the function of SR, D, JK and T Flip-flops.
2.4 To implement Encoder and Decoder circuit.
2.5 To implement Multiplexer and Demultiplexer circuit.
2.6 To construct binary Asynchronous or Synchronous counter.
2.7 To construct controlled shift register & verify SISO, SIPO, PISO, PIPO operation.
2.8 To demonstrate D/A converter using trainer kit.
2.9 To demonstrate A/D converter using trainer kit.
List of Text Books:

Sl. No.	Name of Author	Title of the Books	Name of Publisher
1.	Albert Malvino & D.J.Bates	Electronic Principles	T.M.Hill
2.	Y.N.Bapat	Electronic Circuits & Systems	T.M.Hill
3.	R.S.Sedha	Applied Electronics	S.Chand & Co.
4.	Allen Mottershed	Electronic Devices & Circuits	P.H.I. Pvt. Ltd.
5.	J.B.Gupta	Electronics Engineering	S.K.Kataria & Sons.
6.	P.John Paul	Electronic Devices & Circuits	New Age International

7.	Chereku & Krishna	Electronic Devices & Circuits	Pearson Education
8.	Malvino & Leach	Digital Principles & Applications	T.M.Hill
9.	Jain	Modern Digital Electronics	T.M.Hill
10.	V.Kumar	Digital Technology	New Age Publisher
11.	S.P. Bali	2000 solved problems in Digital Electronics	T.M.H
12	M. Moris Mano	Digital Logic and Computer Design	Pearson
13	Khan & Khan	Digital Logic Design	Scitech Publication (India) Ltd.
14.	G.K. Karate	Digital Electronics	Oxford University Press

E X A M I N A T I O N S C H E M E (THEORITICAL)

GROUP	UNIT	ONE OR TWO SENTENCE ANSWER QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	**TO BE ANSWERED**	MARKS PER QUESTION	TOTAL MARKS
A	1, 2,3	12	TWENTY	ONE	1 X 20 = 20	FIVE	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10 X 5 = 50
B	4,5	11				FOUR			

Note: Paper-setter should take into account the marks which have been allotted in each unit and set the paper accordingly so that all units get the importance as allotted.

E X A M I N A T I O N S C H E M E (SESSIONAL)

1. **Continuous Internal Assessment of 25 marks** is to be carried out by the teachers throughout the Fourth Semester. **Distribution of marks: Performance of Job – 15, Notebook (Drawing) – 10.**
2. **External Assessment of 25 marks** shall be held at the end of the Fourth Semester on the entire syllabus. One Experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. **Distribution of marks: On spot job – 15, Viva-voce – 10.**

Name of the Course: Computer aided Electrical Drawing	
Course Code: EE/S4/ED	**Semester: Fourth**
Duration: one Semester	**Maximum Marks: 50**
Teaching Scheme	**Examination Scheme**
Theory:	**Practical : 50 Marks**
Tutorial:	
Practical: 03 hrs/week	
Credit: 02	

Aim:	
Sl. No.	
1.	Students will be able to be able to know various commands of AutoCAD.
2.	Electrical Drawing indicates the symbolic representation and position of components. It also shows the power flow through them for a given systems. Ability to draw, read and understand the drawing will facilitate the visualization of the complete installation which makes it easy to troubleshooting, maintenance of the system.

Objective:	
Sl. No.	The students will be able to,
1.	Read electrical drawing for any system to understand the working of the system and its components.
2.	Find the important points in the circuit diagrams or layout for troubleshooting and maintenance.
3.	Use graphic software to draw the circuit for various types of electrical systems.

Pre-Requisite:	
Sl. No.	
1.	Basic Electrical Engineering
Sl. No.	Skills to be developed
1.	Intellectual Skills: i) Analytical Skill ii) Identification skill
2.	Motor Skills: i) Operate various parts of computer properly. ii) Problem solving skill.

Contents	
Sl. No.	
1.	**CAD** : Necessity and its application in Engineering Field
2.	**Awareness of commands :** Limit, zoom, pan, line, circle, polyline, multiline, arc, text, dimension, hatch, layer, offset, trim, extend, erase, scale, dist, area, fillet, chamfer, array, block, attribute etc.
3.	To draw a sheet of a sample figure (to be provided by the subject teacher) using different **edit/modify option of CAD**
4.	To draw a sheet of electrical symbols for representation of Electrical machines, Equipments, accessories, switching and protection equipment as per IS 2032 **using CAD.**

5.	To draw electrical wiring with accessories on a single storied building (3 BHK) plan, showing Energy meter, Main switch, Distribution Board, Light points, Socket outlets **using CAD.**
6.	A three phase induction motor is to be started and stopped using star delta starter. Draw i) Schematic diagram for the control circuit, ii) power circuit, iii) Complete wiring diagram **using CAD.**
7.	A three phase induction motor is to be started and stopped direct on line (D.O.L.) from different locations through push buttons such that the motor can be started from one location and stopped from other location or vice versa. Draw i) Schematic diagram for the control circuit, ii) Complete wiring diagram (showing overload and short circuit protection) **using CAD.**

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Sham Tickoo & Shafali Pandita	AutoCAD Electrical 2010 for Engineers		Pearson
Goutam Pohit & Goutam Ghosh	Machine Drawing with Auto CAD		Pearson
Surjit Singh	Electrical Engineering Drawing (Part I & Part II)		S.K.Kataria & Sons
Onstolt	AutoCad 2012 and Autocad LT 2012		Wiley India
K. Venugopal, V.Prabhu Raja	Computer aided drafting & modelling		Scitech Publication (India) Pvt. Ltd.

E X A M I N A T I O N S C H E M E (SESSIONAL)

1. **Continuous Internal Assessment of 25 marks** is to be carried out by the teachers throughout the Fourth Semester. **Distribution of marks: Performance of Job – 15, Notebook (Drawing) – 10.**
2. **External Assessment of 25 marks** shall be held at the end of the Fourth Semester on the entire syllabus. One Sheet per student from any one of the above is to be drawn. Sheet is to be set by lottery system. **Distribution of marks: On spot job – 15, Viva-voce – 10.**

Name of the Course: Power Plant Engineering	
Course Code: EE/S4/PPE	**Semester: Fourth**
Duration: one Semester	**Maximum Marks:**
Teaching Scheme	**Examination Scheme**
Theory: 4 Hrs/Week	Mid Semester Exam.: 20 Marks
Tutorial:	Assignment & Quiz: 10 Marks
Practical:	End Semester Exam.: 70 Marks
Credit: 04	

Aim:

Sl. No.	
1.	This is a core technology subject. The knowledge of the principle of generation of electricity, methods of generation of electricity & recent trends in generation of electricity is essential for Diploma Engineer.
2.	This subject will provide the basis for further studies in transmission, distribution and power system operation. Also the subject will provide the knowledge about the recent trends in non conventional energy sources & their working principles.

Objective:

Sl. No.	The student will be able to:
1.	Explain the working of different power plants
2.	Identify different components of various systems in generating stations
3.	Select suitable sites for different power stations
4.	Define the terms used in economics of power generation and explain their relation
5.	Select alternative energy sources for given conditions
6.	Explain the working of wind mills and solar systems
7.	Explain working of domestic & commercial D. G. Set
8.	Explain working of Gas Turbine

Pre-Requisite:

Sl. No.	
1.	Energy conversion

Contents		Hrs./Unit	Marks
Unit: 1	1.1 **Basics of Power Generation** 1.1 Importance of electrical power in day today life 1.2 Different forms of energy 1.3 Comparison of sources of energy 1.4 Power crisis in India and Future Trend 1.5 Overview of method of electrical power generation	02	3
Unit: 2	**Thermal Power Stations** 2.1 List of thermal power stations in the state with their capacities 2.2 Selection of site for thermal power stations. 2.3 Layout and working of thermal power station	08	8

	with block diagram. 2.4 Operation of following components: 2.4.1 Boiler 2.4.2 Economizer. 2.4.3 Air pre heater 2.4.4 Super-heaters & re-heaters. 2.4.5 Steam prime movers. 2.4.6 Condensers. 2.4.7 Spray ponds & cooling towers. 2.5 Quality of fuel and its effect on quality of power generation. 2.6 Merits and demerits of Thermal Power Plants. 2.7 Simple Problems.		
Unit: 3	**Nuclear Power Stations** 3.1 Selection of site for Nuclear Power plants. 3.2 Nuclear fission process 3.3 Block diagram and working of Nuclear Power station. 3.4 Construction and working of nuclear reactor. 3. 5 Fuels used in Nuclear Power Station 3. 6 Merits and demerits of Nuclear Power Plants 3. 7 List of Nuclear power stations in state & county with their capacities.	06	7
Unit: 4	**Hydro Power Stations** 4.1 Selection of site and classification of Hydro-electric Power Plants 4.2 Layout and working of Hydro Power Station. 4.3 Types of Turbines & generators used 4.4 Pumped storage Power Plant 4.5 Merits and demerits of Hydro Power Station 4.6 List of Hydro Power stations with their capacities & number of units in the state. 4.7 Simple Problem.	06	7
Unit: 5	**Diesel Electric Power Stations** 5.1 Selection of site for Diesel Electric Power Station. 5.2 Elements of diesel Electric power plants and their working. 5.3 Operation, maintenance & trouble shooting chart of diesel Electric plant. 5.4 Merits, demerits and applications of diesel electric power stations 5.5 Performance and thermal efficiency of Diesel Electric Power Plant.	06	5
Unit :6	**Gas Turbine Power Plants** 6.1 Selection of site for Gas Turbine Power Station. 6.2 Fuels for gas turbine 6.3 Elements of simple gas turbine power plants 6.4 Merits, demerits and application Gas turbine power plants.	03	5
UNIT:7	**Non-Conventional Energy Sources** 7.1 Types of non-conventional energy sources. 7.2 Solar Energy 7.2.1 Potential of solar energy. 7.2.2 Solar collector (Flat Plate Collector & Concentrating Collector) 7.2.3 Comparison of performances of	20	20

	different collectors. 7.2.4 Solar water heater. 7.2.5 Solar Thermal Power Plant - System block diagram with description & efficiency. 7.2.6 Photovoltaic cell : Principle of operation, Types, conversion efficiency, V-I characteristics. 7.2.8 Solar Cell Materials. 7.2.9 Photovoltaic system of power generation – Solar PV arrays, solar cell connecting arrangements, storage batteries, inverters, advantages & disadvantages. 7.2.11 Limitation of using solar energy systems. 7.3 Wind Energy. 6.3.1 Selection of site for wind mills 6.3.2 Principle of electricity generation with the help of wind energy 6.3.3 Block diagram and working of Wind energy plant and its applications 6.3.4 List of major wind farms in the state with their approximate capacities 7.4 Brief idea and application of i) Bio Mass and bio gas energy. ii) Geothermal Energy.		
Unit: 8	**Economics Of Power Generation** 8.1 Terms commonly used in system operation: connected load, firm power, cold reserve, hot reserve, spinning reserve. 8.2 Terms used in system operation such as Load-curve, load duration curve, integrated duration curve. (Simple numerical based on plotting above curves.) 8.3 Factors affecting the cost of Generation: Average demand, Maximum demand, plant capacity factor & plant use factor, Diversity factor& load factor. (Simple numericals based on above)	08	08
Unit : 9	**Interconnected Power Systems** 9.1 Advantages of Interconnection. 9.2 Base load & peak loads, load allocation among various types of power stations 9.3 Load sharing and transfer of load between power stations. 9.4 Inter connection of power stations at state and national level	05	07
	Total	64	70

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
J.B.Gupta	A course in Power System		S.K.Kataria & Sons
Umesh Rathore	Energy Management		S.K.Katharia & Sons
Dr. R.KSingal	Non-conventional Energy		S.K.Katharia & Sons

	Resources		
Dr. S. L. Uppal	Electrical Power		Khanna Publishers.
Soni – Gupta - Bhatnagar	A course in Electrical Power		Dhanpatrai & Sons
Prof. G. D. Rai	Non conventional Energy sources		Khanna, New Delhi
A.K.Raja,M. Dwibedi & A.P.Srivastava	Introduction to Non conventional Energy sources		Scitech Publication (India) Pvt. Ltd.
Prof. Arrora and Dr. V. M. Domkundwar	A course in Power Plant Engineering		Dhanpatrai & Sons
K.K. Ramalingam	Power Plant Engineering		Scitech Publication (India) Pvt. Ltd.
S P Sukhatme	Solar Energy		Tata Mc Grawhill Publishing co. Ltd.
Godfrey Boyle	Renewable Energy		Oxford University Press
P.K.Nag	Power Plant Engineering		T.M.H.

E X A M I N A T I O N S C H E M E (THEORITICAL)

GROUP	UNIT	ONE OR TWO SENTENCE ANSWER QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	**TO BE ANSWERED**	MARKS PER QUESTION	TOTAL MARKS
A	1, 2, 3,4,5,6	12	TWENTY	ONE	1 X 20 = 20	FIVE	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10 X 5 = 50
B	7,8,9	11				FOUR			

Note: Paper-setter should take into account the marks which have been allotted in each unit and set the paper accordingly so that all units get the importance as allotted.

Name of the Course: Development of Life Skills - II	
Course Code: EE/S4/DLSII	**Semester: FOURTH**
Duration: one Semester	**Maximum Marks: 50**
Teaching Scheme	**Examination Scheme**
Theory: 01 hrs / week	Internal Sessional: 25
Tutorial:	External Sessional : 25
Practical: 02 hrs / week	
Credit:	

Aim:

Sl. No.	
1.	In today's competitive world, the nature of organizations is changing at very rapid speed. In this situation the responsibility of diploma holder is not unique. He will be a part of a team in the organization. As such the individual skills are not sufficient to work at his best.
2.	This subject will develop the student as an effective member of the team. It will develop the abilities and skills to perform at highest degree of quality as an individual as well as a member of core group or team.
3.	Such skills will enhance his capabilities in the field of searching, assimilating information , managing the given task, handling people effectively ,solving challenging problems .

Objective:

Sl. No.	**The students will be able to:**
1.	• Developing working in teams.
2.	• Apply problem solving skills for a given situation.
3.	• Use effective presentation techniques.
4.	• Apply techniques of effective time management.
5.	• Apply task management techniques for given projects.
6.	• Enhance leadership traits.
7.	• Resolve conflict by appropriate method.
8.	• Survive self in today's competitive world.
9.	• Face interview without fear.
10.	• Follow moral and ethics.

Pre-Requisite:

Sl. No.	
1.	Team Work and Presentation Skills
2.	Positive attitude and thirst of learning

	Contents	Hrs./Unit	Marks
Unit - 1	**Interpersonal Relation** Importance, Interpersonal conflicts, Resolution of conflicts, Developing effective interpersonal skills - communication and conversational skills, Human Relation Skills (People Skills)	5	

Unit - 2	**Problem Solving** **I) Steps in Problem Solving (Who? What? Where? When? Why? How? How much?)** 1. Identify, understand and clarify the problem 2. Information gathering related to problem 3. Evaluate the evidence 4. Consider feasible options and their implications 5. Choose and implement the best alternative 6. Review **II) Problem Solving Technique** 1. Trial and Error, 2. Brain Storming 3. Thinking outside the Box	8	
Unit - 3	**Presentation Skills** Concept, Purpose of effective presentations, ***Components of Effective Presentations*** : understanding the topic, selecting the right information, organising the process interestingly, Good attractive beginning, Summarising and concluding, adding impact to the ending, ***Use of audio-visual aids*** - OHP, LCD projector, White board, ***Non-verbal communication*** : Posture, Gestures, Eye-contact and facial expression, Voice and Language - Volume, pitch, Inflection, Speed, Pause, Pronunciation, Articulation, Language Handling questions - Respond, Answer, Check, Encourage, Return to presentation ***Evaluating the presentation*** - Before the presentation, During the presentation, After the presentation	8	
Unit - 4	**Looking for a Job** Identifying different sources announcing Job vacancies, Skim, scan and read advertisements in detail, write efficacious CVs, write covering letters to accompany CVs, write Job Application Letters - in response to advertisements and self-applications	5	
Unit - 5	**Job Interviews** ***Prepare for Interviews*** : Intelligently anticipating possible questions and framing appropriate answers, Do's and don'ts of an interview (both verbal and non-verbal), ***Group Discussion:*** Use of Non-verbal behaviour in Group Discussion, Appropriate use of language in group interaction, Do's and don'ts for a successful Group Discussion	10	
Unit - 6	**Non-verbal - graphic communication** Non - verbal codes: A - Kinesics, B - Proxemics, C- Haptics, D - Vocalics,	6	

	E- Physical appearance, F- Chronemics, G - Artifacts Aspects of Body Language		
Unit - 7	**Formal Written Skills:** Memos, E-mails, Netiquettes. Business correspondence - Letter of enquiry, Letter of Placing Orders, Letter of Complaint	6	
	Total	**48**	

Sessional Activities	
Sl. No.	Skills to be developed
Unit - 1 Interpersonal Relation	Case Studies: 1. from books 2. from real life situations 3. from students' experiences Group discussions on the above and step by step write of any one or more of these in the sessional copies
Unit - II Problem Solving	Case Studies: 1. from books 2. from real life situations 3. from students' experiences Group discussions on the above and step by step write of any one or more of these in the sessional copies
Unit - III Presentation Skills	Prepare a Presentation (with the help of a Powerpoint) on a Particular topic. The students may refer to the Sessional activity (sl. No. 8) of the Computer Fundamental syllabus of Semester 1. For engineering subject-oriented technical topics the co-operation of a subject teacher may be sought. Attach handout of PPT in the sessional copy
Unit - IV Looking for a job	Write an effective CV and covering letter for it. Write a Job Application letter in reponse to an advertisement and a Self Application Letter for a job.
Unit - V Job Interviews & Group Discussions	Write down the anticipated possible questions for personal interview (HR) along with their appropriate responses Face mock interviews. The co-operation of HR personnels of industries may be sought if possible Videos of Mock Group Discussions and Interviews may be shown
Unit - 7 Formal Written Skills	write a memo, write an effective official e-mail, write a letter of enquiry, letter of placing orders, letter of complaint

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
K. R.Laksminarayanan & T. Murugaval	Managing Soft Skills		Scitech Publications (India) Pvt. Ltd.
Barun K. Mitra	Personality Development and Soft Skills		Oxford University Press

Note : For any modification please refer www.webscte.org/syllabus.html of "Development of Life Skill-II"

Name of the Subject : Professional Practices II		
Course Code: EE/S4/PFII	**Semester: Fourth**	
Duration: one Semester	**Maximum Marks: 50**	
Teaching Scheme	**Examination Scheme**	
Theory:	Mid Semester Exam.: Marks	
Tutorial:	Assignment & Quiz: Marks	
Practical: 2 hrs / week	End Semester Exam.: Marks	
	Practical : 50 Marks	
Credit: 1		

Aim:

Sl. No.	
1.	Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.
2.	While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.
3	The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Objective:

Sl. No.	The student 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	Prepare a report on industrial visit, expert lecture

Pre-Requisite:

Sl. No.	
1.	Desire to gain comparable knowledge and skills of various activities in various areas of importance.
2.	Eagerness to cohesively participate in group work and to share thoughts with group members.
3.	Knowledge of electrical engineering upto 4th semester.

Activities

Sr . No.	Activities	Hours
1.	Industrial / Field Visit : Structured Field visits be arranged and report of the same should be submitted by the individual student, to form part of the term work. Visits to **<u>any ONE</u>** (not already visited in 3rd semester) from the list below: i) Electrical machine manufacturing industry ii) Multistoried building for power distribution	**06**

	iii) Load dispatch center iv) Transformer repair workshop. v) Foundry (to see furnaces and oven) vi) Food Processing industry (overall technical and other activities) vii) An industry automation in manufacturing viii) District Industries Centre (to know administrative set up, activities, various schemes etc) ix) Any loco shed x)Signaling system of a railway station xi) Any captive power plant. xii) Motor rewinding in a motor rewinding shop	
2.	**Guest Lecture by professional / industrial expert**: Lectures by Professional / Industrial Expert to be organized from **any TWO of** the following areas: i) Modern concept of lighting / illumination ii) Viability of electric traction in 21st Century iii) Modern techniques in Power Generation iv) Role of power factor improvement as a tool in reducing cost of generation v) Digital metering vi) Hydro power generation vii) Functioning of Electricity regulatory Commission. viii)Introduction and application areas for MEMS (Micro Electromechanical System) ix) Interview techniques x)Free and open source software xi) Cyber crime & Cyber laws xii)Social networking – effects & utilities xiii) Ethical Hacking. xiv) Role of micro, small and mediun enterprise. In Indian economy. Individual report of the above lecture should be submitted by the students.	**4**
3.	**Seminar:** Any one seminar on the topics suggested below: Students (Group of 4 to 5 students) have to search / collect information about the topic through literature survey/ internet search / visit and discussion with expert or concerned persons 1. Water Supply scheme / Problems of drinking water in rural area 2. Schemes of power generation in coming five years 3. Impact of load shedding on rural population 4. Parallel computing 5. Distributed processing 6. Embedded system 7. Computer security 8. Bio – technology	**12**

	9. Multimedia techniques. 10. Magnetic levitation system	
4.	**Students' Activities / mini project:(any one)** i) Collect information from market regarding technical specification, identification no, their meaning, manufacturers' names and cost of electronic devices like diode, zener diode, transistors, JFET, MOSFET, ic 555, ic 741, digital ics (All items studied upto 4th semester). Submit the report along with power point presentation. Students are encouraged to use **open software** ii) Collect information from market regarding specification and cost of items (at least four each) used in electrical wiring for Domestic, commercial and industrial use. They will submit individual report on the same. Students are encouraged to use open software. iii) make a market survey of all transducers available (studied in fourth semester) their specifications, manufacturers' names, cost etc. Prepare a power point presentation. Students are encouraged to use **open software** for such purpose.	**10**

EXAMINATION SCHEME (SESSIONAL)

1. **Continuous internal assessment of 50 marks** is to be carried out by the teachers throughout the fourth semester. **Distribution of marks: Student's activities/mini Project = 20, seminar = 10, field visit = 10, guest lecture attendance and report = 10**