



SCHEME OF STUDIES & EXAMINATIONS
Department: Electrical Engineering – 7th Semester

S. No	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total Marks	Total Credits	Duration of Exam
			L	T	P		Theory	Prac.			
1.	EE401B	SENSORS & TRANSDUCERS (EE, EEE, IC, common with 5 th sem. AEI)	3	1	-	25	75	-	100	4	3
2.	EE403B	ELECTRIC DRIVES (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
3.	EE405B	DIGITAL SIGNAL & IMAGE PROCESSING (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
4.	EE407B	POWER SYSTEM OPERATION AND CONTROL	3	1	-	25	75	-	100	4	3
5.		Open ELECTIVE	4	-	-	25	75	-	100	4	3
6.	EE423B	ELECTRIC DRIVES LAB. (EE, EEE, IC)			2	20	-	30	50	1	3
7.	EE425B	DIGITAL SIGNAL & IMAGE PROCESSING LAB. (EE, EEE, IC)	-	-	2	20	-	30	50	1	3
8.	EE415B	PROJECT	-	-	4	100	-	-	100	4	-
9.	EE433B	PROFESSIONAL TRAINING – II	-	-	2	50	-	-	50	2	-
		TOTAL	16	04	10	295	375	60	730	28	

LIST OF OPEN ELECTIVES:

1	MEI 623B	ENTREPRENEURSHIP	6	BT401B	BIOINFORMATICS
2	BME451B	MEDICAL INSTRUMENTATION	7	AE417B	MODERN VEHICLE TECHNOLOGY
3	ECE305B	CONSUMER ELECTRONICS	8	CE451B	POLLUTION & CONTROL
4	EE451B	ENERGY AUDIT	9	CSE411B	MANAGEMENT INFORMATION SYSTEM
5	EEE457B	ENERGY RESOURCES & TECHNOLOGY	10	IT413B	CYBER SECURITY

Note:

- Assessment of Professional Training-II, undergone in summer vacations at the end of 6th semester, will be based on seminar, viva-voce, report & certificate of professional training obtained by the students from the industry / institute / research lab / training centre, etc.
- Student will be permitted to opt for any one professional elective. However, departments will offer only those electives for which they have the requisite expertise. The choice of students for any elective shall not be binding on the department to offer, if department does not have the necessary expertise. Minimum strength of students shall be twenty.
- Project load will be treated as 2 hrs. per week for project coordinator including his own guiding load of 1 hour, and 1 hour for each participating teacher irrespective of number of students/groups under him/her. Project will commence in VII Semester where student will identify project problem, complete design, procure the material, start the fabrication, complete the survey, etc. depending upon nature of the problem. Project will continue in VIII semester.
- Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of moral values & ethics is given in General Proficiency Syllabus.
- The students will be allowed to use non-programmable scientific calculator in the examination. However, sharing/exchange of calculator is prohibited in the examination.
- Electronics gadgets including Cellular phones are not allowed in the examination.



SYLLABUS: B Tech (EE)

Department: Electrical Engineering – 7th Semester

Subject: Sensors And Transducers

Subject Code: EE401B

Detailed Content

Unit No.1

- Topic No.1 : Basic Concepts Of Sensors And Transducers And Their Classification
- Topic No.2 : Characteristics And Choice Of Transducers, Factors Influencing The Choice Of Transducers, Resistive Transducers
- Topic No.3 : Potentiometers, Loading Effect, Construction Of Potentiometers, Materials Used For Potentiometers
- Topic No.4 : Strain Gauges, Theory Of Strain Gauges, Types Of Strain Gauges, Semiconductor Strain Gauges
- Topic No.5 : Rossetts, Load Cells. Thermistors, Thermometers, Thermocouples And Their Application

Unit No.2

- Topic No.6 : Variable Inductance Transducers, Linear Variable Differential Transformer(Lvdt), Rotary Variable Differential Transformer(Rvdt)
- Topic No.7 : Synchros, Control Type Synchro Systems, Synchros As Torque Transmitters
- Topic No.8 : Capacitive Transducers, Transducers Using Change In Area Of Plates, Transducers Using Change In Distance Between Plates, Differential Arrangement, Variation Of Dielectric Constant For Measurement Of Displacement And Liquid Level, Frequency Response Of Capacitive Transducers
- Topic No.9 : Piezoelectric Transducers, Modes Of Operation Of Piezoelectric Crystals, Properties Of Piezoelectric Crystals, Equivalent Circuit Of Piezoelectric Transducers, Loading Effects And Frequency Response, Impulse Response Of Piezoelectric Crystals

Unit No.3

- Topic No.10 : Hall Effect Transducers, Photovoltaic Cells, Photoconductive Cells
- Topic No.11 : Semiconductor Photodiode, Phototransistors, Measurement Of Angular Velocity
- Topic No.12 : Electrical Tachometers, Electromagnetic Tachometer Generators, Digital Methods, Photoelectric Tachometers, Stroboscope And Stroboscopic Methods
- Topic No.13 : Measurement of Low Pressure Using Various Methods, Measurement of Acceleration, Flow Liquid Level And Humidity Employing Different Transducers.

Unit No.4

- Topic No.14 : Chemical Sensors, Measurement Of Ph Values, Measurement Of Thermal Conductivity.
- Topic No.15 : Data Acquisition In Instrumentation Systems, Various Types Of Data Acquisition Systems, Method Of Data Transmission
- Topic No.16 : General Telemetry System, Types Of Telemetry Systems, Landline Telemetry And Radio Frequency (R.F.) Telemetry.
- Topic No.17 : Recent Trends in Sensor Technology, Smart Sensors, Basic Building Blocks Of Smart Sensors, Application of Smart Sensors.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT BOOKS:

1. A.K.Sawhney, "A Course In Electrical And Electronics Measurement And Instrumentation,"Dhanpatrai& Co.
2. D.V.S.Murti, " Transducers And Instrumentation," Phi.
3. D.Patranabis, " Principles Of Electronic Instrumentation," Phi
4. Electronic Instrumentation And Measurements : David A.Bell , Oxford University Press.
5. Electronic Measurements And Instrumentation : K.Lal Kishore, Pearson

REFERENCE BOOKS:

1. D. Patranabis, "Sensors And Transducers," Phi.
2. D.A.Bell, "Electronic Instrumentation And Measurements, "Phi.
3. Rangan, Sharma And Mani, "Instrumentation Devices And Systems," Tmh.



SYLLABUS: B Tech (EE)

Department: Electrical Engineering – 7th Semester

Subject: Electric Drives

Subject Code: EE403B

Detailed Content

Unit No.1.1 Electrical Drives

- Topic No.1 : Introduction, Advantages
- Topic No.2 : Choice Of Electrical Drive Machines
- Topic No.3 : Status Of Ac And Dc Drives

Unit No.1.2 Dynamics Of Electrical Drives

- Topic No.4 : Fundamental Torque Equations, Multi-Quadrant Operation
- Topic No.5 : Equivalent Values Of Drive Parameters
- Topic No.6 : Load Torque Components, Types Of Loads
- Topic No.7 : Steady State Stability, Load Equalization

Unit No.1.3 Control Of Electrical Drives

- Topic No.8 : Modes Of Operation
- Topic No.9 : Closed Loop Control Of Drives
- Topic No.10 : Sensing Of Current And Speed

Unit No.2 Dc Motor Drives

- Topic No.11 : Speed-Torque Characteristics Of Different Types Of Dc Motors
- Topic No.12 : Starting, Types Of Braking, Transient Analysis
- Topic No.13 : Speed Control Methods, Static Control Of Dc Motors
- Topic No.14 : Converter Fed Dc Drive & Chopper Fed Dc Drive

Unit No.3 Induction Motor Drives

- Topic No.15 : Characteristics, Analysis And Performance
- Topic No.16 : Starting, Braking Method, Transient Analysis
- Topic No.17 : Methods Of Speed Control, Vector Control
- Topic No.18 : Static Control Techniques- Stator Frequency Control, Stator Voltage Control, Rotor Resistance Control
- Topic No.19 : Static Scherbius System & Static Kramer System

Unit No.4.1 Selection Of Motor Power Rating

- Topic No.20 : Heating And Cooling
- Topic No.21 : Determination Of Motor Rating, Continuous, Short Time And Intermittent Duty Rating
- Topic No.22 : Determination Of Moment Of Inertia Of The Flywheel

Unit No.4.2 Traction Drives

- Topic No.23 : Nature Of Traction Load, Important Features Of Traction Drives,
- Topic No.24 : Static Control Of Traction Drives; Comparison Between Ac And Dc Traction

Study Scheme				Evaluation Scheme			Total Marks
L	T	P	Credits	Internal Assessment	External Assessment (Examination)		
3	1	-	4	Max. Marks	Max. Marks	Exam Duration	
				25	75	3 hours	100

TEXT BOOKS:

1. Fundamentals of Electrical Drives, G.K.Dubey, Narosa Publishing House

REFERENCE BOOKS:

1. Power Semiconductor controlled drives, G.K.Dubey, Prentice Hall.
2. Electric Drives: V.Subrahmaniyam TMH
3. Electric Drives: Leonard, Narosa Pub.
4. Electric Drives: Diwan
5. Power Electronics : M.D.Singh, K.B.Knanchandani : McGraw Hill

SYLLABUS: B Tech (EE)



Detailed Content

Unit No.1 Signals and Signal Processing

- Topic No.1 : Characterization & Classification Of Signals Typical Signal Processing Operations
- Topic No.2 : Example Of Typical Signals, Typical Signals Processing Applications
- Topic No.3 : Discrete- Time Random Signals. Discrete Time Signals, Operations On Sequences, The Sampling Process
- Topic No.4 : Discrete-: Time Systems, Time-Domain Characterization Of Lti Discrete Time Systems, Correlation Of Signals

Unit No.2.1 Transform-Domain Representation Of Signals

- Topic No.5 : Discrete-Time Fourier Transform, Discrete Fourier Transform, DFT Properties
- Topic No.6 : Computation Of The DFT Of Real Sequences
- Topic No.7 : Linear Convolution Using The Dft. FFT Algorithms

Unit No.2.2 Digital Processing Of Continuous-Time Signals

- Topic No.8 : Sampling Of Continuous Signals, Analog Filter Design, Anti-Aliasing Filter Design
- Topic No.9 : Sample-And-Hold Circuits, A/ D & D/ A Converter
- Topic No.10 : Reconstruction Filter Design

Unit No.3.1 Digital Filter Structure

- Topic No.11 : Lock Diagram Representation, Signal Flow Graph Representation
- Topic No.12 : Equivalent Structures, Fir Digital Filter Structures
- Topic No.13 : IIR Filter Structures, Parallel All Pass Realization Of IIR Transfer Function
- Topic No.14 : Digital Sine-Cosine Generator

Unit No.3.2 Digital Filter Design

- Topic No.15 : Impulse Invariance Method Of IIR Filter Design
- Topic No.16 : Bilinear Transform Method Of IIR Filter Design, Design Of Digital Iir Notch Filters
- Topic No.17 : Fir Filter Design Based On Truncated Fonner Sens, Frequency Sampling Approach, Applications Of DSP

Unit No.4.1 Multirate Digital Signal Processing

- Topic No.18 : Introduction To Multirate Digital Signal Processing
- Topic No.19 : Sampling Rate Conversion, Filter Structures
- Topic No.20 : Multistage Decimator And Interpolators, Digital Filter Banks

Unit No.4.2 Digital Image Processing

- Topic No.21 : Digital Image Representation
- Topic No.22 : Fundamental Steps In Image Processing, Elements Of Digital Image Processing Systems

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week		Internal Assessment		External Assessment (Examination)			
L	T	P	Credits	Max. Marks	Exam Duration		
3	1	-	4	25	75	3 hours	100

TEXT BOOKS:

1. Digital Signal Processing : Proakis and Manolakis; PHI Pub.
2. Allan Y. Oppenheim & Ronald W. Schacter , "Digital Signal Processing", PHI, 2004. REFERENCE
3. Digital Signal Processing, Ambedkar, Cengage Publishers
4. Digital Signal Processing : Salivahanan & Gnanapriya; TMH Pub.

REFERENCE BOOKS:

1. J. R. Johnson, "Introduction to Digital Signal Processing", PHI, 2000.
2. B. Somanthan Nair, "Digital Signal Processing: Theory, Analysis & Digital Filter Design", PHI, 2004
3. Sanjit K. Mitra, "DSP a Computer based approach", TMH, 2nd Ed., 2001.
4. Rafael C. Gonzalez, Richard E. Woods, "Digital Image Processing", PHI, Second Edition, 2008.
5. C.-T. Chen, "Digital Signal Processing", Oxford, 2007.
6. S. Sridhar, "Digital Image Processing", Oxford, 2011.ws
7. Fundamentals of Speech Recognition: Lawrence Rabiner & Biing-Hwang Juang. Yegnanarayana, Pearson
8. Simon Haykin : Adaptive Filter Theory, Pearson.



SYLLABUS: B Tech (EE)

Department: Electrical Engineering – 7th Semester

Subject: Power System Operation And Control

Subject Code: EE407B

Detailed Content

Unit No.1 Automatic Generation Control

- Topic No.1 : Single Area Load Frequency Control , Load Frequency Vs Economic Control
- Topic No.2 : Two Area Load Frequency Control
- Topic No.3 : Speed Governor, Dead Band, Digital Load Flow Control
- Topic No.4 : Decentralized Control, Application To Matlab

Unit No.2 Excitation & Voltage Control

- Topic No.5 : Exciters , Boost Buck Excitation System , static Excitation System, Brushless Excitation System
- Topic No.6 : Development Of Excitation System, Transfer Function
- Topic No.7 : First Bench Mark Model

Unit No.3 Power System Stability

- Topic No.8 : Definitions: Angular Stability- Steady State Stability, Dynamic Stability, Transient Stability
- Topic No.9 : Mechanics Of Angular Momentum, Swing Equation, Equal Area Criteria, Critical Clearing Angle, Solution Of Swing Equation
- Topic No.10 : Stability Study In Multi-Machine System, Application Of Matlab
- Topic No.11 : Technique Of Improving Transient Stability, Voltage Stability, Voltage Collapse, V-P And V-Q Curves.

Unit No.4 Economic Load Dispatch

- Topic No.12 : Generation Operation Cost
- Topic No.13 : Economic Dispatch Problem
- Topic No.14 : Economic Dispatch Including Transmission Loss
- Topic No.15 : Derivation Of Transmission Loss Formula.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT BOOKS:

1. Power Systems Engineering By S K Gupta, Umesh Publication, New Delhi
2. Power System Analysis By O I Elgerd: Tmh Publication New Delhi
3. Modern Power System By Nagrath Kothari: Tmh Publication New Delhi
4. Power System Analysis And Stability By S Svadhera: Khanna Publication New Delhi
5. Power System Analysis By Hadi Sadat: Tmh Publication, New Delhi
6. Power System Dynamics & Stability By Sauer And M A Pai: Person Education
7. Power System Stability And Control:Parbhakundur, Mcgraw Hill.

REFERENCE BOOKS:

1. Power System Operation And Control By S Sivanagaraju & G Sreenivasan: Pearson Education
2. Advanced Power System Analysis & Dynamics By L P Singh: Wiley Eastern Ltd New Delhi
3. Elements Of Power System Analysis By W D Stevenson: Mgh Publication New Delhi
4. Power System Dynamics By M A Pai: Prentice Hall New Delhi
5. Dynamic Control Of Large Electric Power Systems By Illic: Tbi Pub,
6. Power Generation, Operation And Control By Alen J. Wood By Wiley.
7. Power System Analysis: T.K.Nagsarkarm.S.Sukjija, Oxford University Press



SYLLABUS: B Tech (EE)

Department: Electrical Engineering – 7th Semester

Subject: POLLUTION & CONTROL

Subject Code: CE451B

Detailed Content

UNIT.1 WATER POLLUTION

- Topic no.1 : Classification of water pollutants,
- Topic no.2 : water characteristics,
- Topic no.3 : Effluent standards, primary treatment, secondary treatment – aerobic (activated sludge, aerated lagoons
- Topic no.4 : Trickling filter, roughing filter,
- Topic no.5 : Rotating biological contactor) anaerobic (contact process, UASB).

UNIT .2.1 AIR POLLUTION

- Topic no.6 : Classification of air pollutants,
- Topic no.7 : Particulates: Physical characteristics,
- Topic no.8 : Mode of formation, setting properties,
- Topic no.9 : Control measures

UNIT .2.2 HYDROCARBONS

- Topic no.10 : Nature; sources, control, Carbon Monoxide: Source,
- Topic no.11 : Harmful effects on human health,
- Topic no.12 : Control measures. Oxides of Sulphur and Nitrogen Sources,
- Topic no.13 : Effects on human health and plants. Control measure.

UNIT.3.1 SOLID WASTE

- Topic no.14 : Types, sources and properties of solid waste, methods of solid waste treatment and disposal

UNIT.3.2 SOLID WASTEMANAGEMENT

- Topic no.15 : Generation, Collection and techniques for ultimate disposal,
- Topic no.16 : Elementary discussion on resource and energy recovery.

UNIT .4

- Topic no.17 : Elementary treatment of nuclear pollution, metal pollution,
- Topic no.18 : Noise pollution their effects & control.
- Topic no.19 : Trace element: Mechanism of distribution, essential and non essential elements,
- Topic no.20 : Trace of element in marin environment, its ecological effects and biological effects.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

SUGGESTED BOOKS:

1. Environmental Engg.: by Howard s. Peavy& Others, MGH International.
2. Metacaf – EDDY – Waste-water engineering revised by George Teholonobus (TMH)
3. Environmental Chemistry by B.K. Sharma, Goel Publishing, Meerut.
4. Environmental Chemistry, A.K.DE, Wiley Eastern.
5. Air Pollution: H.C. Perking – McGraw Hill.

SYLLABUS: B Tech (EE)



Subject: Electric Drives Lab

Subject Code: EE423B

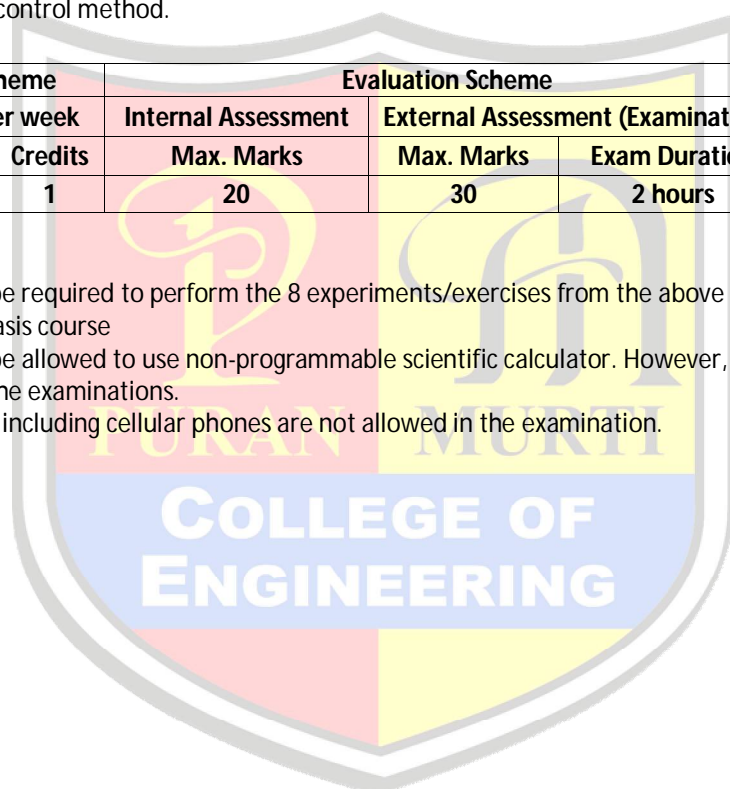
LIST OF EXPERIMENTS:

1. Speed control of dc motor using dc chopper.
2. Speed control of dc motor using single-phase converter.
3. Speed control of dc motor using 3-phase converter.
4. Speed control of dc motor using single- phase dual converter.
5. Inverter fed single-phase induction motor drive.
6. CSI fed induction motor drive.
7. Speed control of single- phase induction motor using ac regulator.
8. Regenerative braking of dc motor using single- phase converter.
9. Speed control of single-phase induction motor using cycloconverter.
10. Static rotor resistance control method.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week		Credits	Internal Assessment	External Assessment (Examination)			
L	T		P	Max. Marks	Max. Marks	Exam Duration	
-	-	2	1	20	30	2 hours	50

NOTE:

1. The students will be required to perform the 8 experiments/exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.





SYLLABUS: B Tech (EE)

Department: Electrical Engineering – 7th Semester

Subject: Digital Signal & Image Processing Lab

Subject Code: EE423B

LIST OF EXPERIMENTS:

Perform the following experiments using MATLAB:

1. To represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine).
2. To develop program for discrete convolution.
3. To develop program for discrete correlation.
4. To understand stability test.
5. To understand sampling theorem.
6. To design analog filter (low-pass, high pass, band-pass, band-stop).
7. To design digital IIR filters (low-pass, high pass, band-pass, band-stop).
8. To design FIR filters using windows technique.
9. To design a program to compare direct realization values of IIR digital filter
10. To develop a program for computing parallel realization values of IIR digital filter.
11. To develop a program for computing cascade realization values of IIR digital filter
12. To develop a program for computing inverse Z-transform of a rational transfer function.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	50
-	-	2	1	20	30	2 hours	

NOTE:

1. The students will be required to perform the 8 experiments/exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.



SYLLABUS: B Tech (EE)

Department: Electrical Engineering – 7th Semester

Subject: Project

Subject Code: EE415B

- The primary objective of this course is to develop in students the professional quality of synthesis employing technical knowledge obtained in the field of Engineering & Technology through a project work involving design, analysis augmented with creativity, innovation and ingenuity.
- Project involving design/ fabrication/ testing/ computer simulation/ case studies,etc. which commences in the VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:
 - Chairman of Department/HOD : Chairperson
 - Project coordinator : Member Secretary
 - Respective project supervisor : Member
- The student will be required to submit two copies of his / her project report to the department for record (one copy each for the department and one for participating teacher).
- Project coordinator will be assigned the project load of maximum of 2 hrs. per week including his/her own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students / groups under him / her.
- The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week		Credits	Internal Assessment	External Assessment (Examination)			
L	T		P	Max. Marks	Max. Marks	Exam Duration	
-	-	4	4	100	-	-	100



SYLLABUS: B Tech (EE)

Department: Electrical Engineering – 7th Semester

Subject: Professional Training – II

Subject Code: EE433B

1. At the end of 6th semester, each student would undergo four weeks Professional Training in an Industry / Institute / Professional / Organization / Research Laboratory etc. with the prior approval of the Training and Placement Officer of the University and submit in the department a typed report along with a certificate from the organization.
2. The typed report should be in a prescribed format.
3. The report will be evaluated in the VII Semester by a Committee consisting of two to three teachers from different specializations to be constituted by the Chairperson of the department. The basis of evaluation will primarily be the knowledge and exposure of the student towards different processes and the functioning of the organization.
4. The student will interact with the committee through presentation to demonstrate his / her learning.
5. Teachers associated with the evaluation work will each be assigned 2 periods per week load.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
-	-	2	2	50	00	-	50

