CURRICULUM
FOR
THIRD SEMESTER
OF
THREE-YEAR DIPLOMA COURSE
IN
INSTRUMENTATION
AND
CONTROL ENGINEERING

SUBJECT STUDY SCHEME
(3RD SEMESTER: INSTRUMENTATION AND CONTROL ENGINEERING)

Course code	Subjects	Time in Hours				CREDITS		
		Theory	Tutorial	Practical	Total	Theory	Practical	Total
ES301	Linear Integrated Circuits and Digital Electronics	3	--	--	3	3	--	3
ICPC301	Linear Integrated Circuits and Digital Electronics Lab	--	--	2	2	--	1	1
ICPC302	Transducer and Signal Conditioning	3	--	--	3	3	--	3
ICPC303	Transducer and Signal Conditioning Lab	--	--	2	2	--	1	1
ICPC304	Instrumentation Drawing	--	--	4	4	--	2	2
ICPC305	Measurement And Instrumentation	2	1	--	3	3	--	3
ICPC306	Measurement And Instrumentation Lab	--	--	2	2	--	1	1
ICPC307	Control System Engineering	3	1	--	4	4	--	4
ICPC308	Control System Engineering Lab	--	--	2	2	--	1	1
OE301	Open elective	2	--	--	2	2	--	2
SI301	Internship in CIIIT/Industry during summer break	--	--	2	2	--	1	1
	Total	**13**	**2**	**14**	**29***	**15**	**7**	**22**

***Note:** The remaining one hour in a week shall be utilized for sports and other activities like debates, seminar etc.

PROGRAM: THREE YEAR DIPLOMA PROGRAM IN INSTRUMENTATION AND CONTROL ENGINEERING	
COURSE CODE: ES301	**COURSE TITLE: ANALOG AND DIGITAL ELECTRONICS**
SEMESTER: 3RD	**CREDITS: 3**
PERIODS PER WEEK: 3(L: 3,T: 0, P: 0)	

COURSE OBJECTIVE

Digital electronics replaces the analog circuits in many fields. Using digital circuits is easier. Diploma holders must have knowledge about the fundamental laws used in digital electronics and the working principle of digital circuits. Operational amplifiers find application in timer circuits. This subject deals with both analog and digital electronic circuits.

COURSE CONTENTS

1. **Linear ICs: Op-amps, Timers and their Applications**
   - 1.1 Operational amplifier–Ideal Op.Amp – Block diagram and characteristics –Op-amp parameters – CMRR
   - 1.2 Slew rate – Applications of op-amp – Inverting amplifier – Virtual ground-Summing amplifier – Non inverting amplifier – Voltage follower – Comparator – Zero crossing detector
   - 1.3 Differential Amplifier – Instrumentation Amplifier - Integrator – Differentiator – V to I converter – I to V converter.
   - 1.4 Circuit diagram and working of ramp, triangular, square wave Generators, low pass and high pass filters using op. amps.

2. **555 Timer**
   - 2.1 555 Timer - Functional Block diagram
   - 2.2 Astable, Monostable and Bistable multi-vibrators using 555 timer.

3. **Digital Electronics**
   - 3.1 Distinction between analog and digital signal.
   - 3.2 Number system Decimal, Binary, octal and hexa-decimal number system
   - 3.3 Conversion from decimal and hexa-decimal to binary and vice-versa.
   - 3.4 Binary addition and subtraction.
   - 3.5 Logic gates-Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates, NAND and NOR as universal gates.

4. **Sequential and Combinational Circuit**
   - 4.1 Sequential Circuits: Half adder, Full adder, Mux, De-Mux, and Decoder
   - 4.2 Combinational Circuits: Concept of latch, Flip Flops(S-R, D, J-K, T types)
   - 4.3 Basic concept of shift registers and counters
   - 4.4 A/D and D/A Converters: Basic concept of A/D and D/A converters
   - 4.5 R-2R Ladder D/A Convertor, Successive aproximation method converter

COURSE OUTCOMES

After completing this subject, student will be able to:

- Explain the characteristics and applications of operational amp.
- Learn the concepts of Astable and Monostable Multivibrator using555.
- Familiarize the Truth Table and symbol of Logic gates
- Learn the operation of Adders.

- Distinguish between Combinational Logic and Sequential Logic
- Familiarize the concept of multiplexer, Demultiplexer and decoder
- Explain various Flip flops, registers and counters
- Study the different types of A/D and D/A converters

RECOMMENDED BOOKS

1. AnandKumar "Fundamentals of Digital Circuits" PHI publication.
2. Anil K. Maini "Digital Electronics: Principles And Integrated Circuit", Wiley Publications.
3. Linear Integrated circuits by D. Roy Choudhury.
4. Modern Digital Electronics by R.P. Jain.
5. Digital Electronics by Godse, 3rd Edition.

UNIT WISE TIME AND MARKS DISTRIBUTION

Unit No.	**Time Allotted (Hours)**	**Marks Allotted (%)**
1	16	35
2	08	15
4	10	20
5	14	30
Total	**48**	**100**

PROGRAM: THREE YEAR DIPLOMA PROGRAM IN INSTRUMENTATION AND CONTROL ENGINEERING	
COURSE TITLE **ICPC301**	COURSE TITLE**: LINEAR INTEGRATED CIRCUITS AND DIGITAL ELECTRONICS LAB**
SEMESTER: **3RD**	CREDITS: **1**
PERIODS PER WEEK: **2(L: 00,T: 00, P: 02)**	

COURSE OBJECTIVE:

This subject is a lab course to be supplemented by theory subject and aims to develop proficiency and understanding of practical outcomes of the subject taught in theory.

LIST OF PRACTICAL TO BE PERFORMED:

1. Construct Astable multivibrator using IC 555 timer and observe the output Waveform using CRO.
2. Construct monostable multivibrator using IC 555 timer and observe the output Waveform using CRO.
3. Construct bistable multivibrator using IC 555 timer and observe the output Waveform using CRO.
4. Verification of truth tables for NAND, NOR and Exclusive OR(EX-OR) and Exclusive NOR gates
5. Realization of logic functions with the help of NAND or NOR gates.
6. To design a half adder using XOR and NAND gates and verification of its operations.
7. Construction of a full adder circuit using XOR and NAND gates and verify its operation
8. Verification of truth table for IC flip-flops.
9. Verification of truth table for Mux and De-Mux.

PROGRAM: THREE YEAR DIPLOMA PROGRAM IN INSTRUMENTATION AND CONTROL ENGINEERING	
COURSE TITLE **ICPC302**	COURSE TITLE**: TRANSDUCER AND SIGNAL CONDITIONING**
SEMESTER: **3RD**	CREDITS: **3**
PERIODS PER WEEK: **3(L: 03,T: 00, P: 00)**	

COURSE OBJECTIVE:

Signal conditioning is an integral part of any instrumentation system. This subject gives an introduction to various methods of processing a signal available from a transducer to make it worth displaying or computer compatible. After studying the course the students will be able to identify different types of sensors and transducers and their applications in the field of instrumentation and control. The students will be able to select appropriate transducers relating to a process and will also get the relevant technical know how about the conditioning of a signal from a transducer for the purpose of control. Subject teachers are advised to show the students different types of sensors and transducers while teaching the various topics of this course.

COURSE CONTENT

1. Resistive Transducer

1.1. Construction, working Principle, Advantage and Disadvantage, Application of following Transducer
1.2 Potentiometer
1.3 Strain Gauge
1.4 Hot Wire anemometer
1.5 Resistive Temperature Transducer (RTD, Thermistor)
1.6 Load cell

2. Inductive Transducer

2.1. Construction, working Principle, Advantage and Disadvantage, Application of following Transducer.
2.2 LVDT
2.3 RVDT
2.4 Electromagnetic Pick-up
2.5 Inductive Microphone

3. Capacitive Transducer

3.1. Construction, working Principle, Advantage and Disadvantage, Application of following Transducer.
3.2 Capacitive Pick –Up
3.3 Condenser/Capacitor microphone
3.4 Differential Capacitor Pick-up

4. Other Types of Transducers

4.1 Working Principle, Application of following Transducer
4.2. Piezoelectric Transducer
4.3 Seismic Pick-up
4.4 Digital Transducer –Shaft Encoders
4.5 LDR
4.6 Humidity Sensor
4.7 Air Quality Sensor

5. Principle of Analog Signal Conditioning

5.1 Linearization

5.2 Conversion
5.3 Voltage to Frequency
5.4 Frequency to Voltage
5.5 Voltage to Current
5.6 Current to Voltage
5.7 Filtering and Impedance Matching

Note: Visits may be arranged to concerned industries

COURSE OUTCOME
By the end of the course, students should be able to:

- Identify different types of sensors and transducers and their applications in the field of Instrumentation and Control.
- Select appropriate transducers relating to a process.
- Acquire technical know how about the conditioning of a signal from a transducer for the purpose of control.
- Acquire and convert a signal available from a transducer to make it worth displaying or computer compatible.
- Understand working principle and pros & cons of different transducers.

RECOMMENDED BOOKS

1. Mechanical and industrial measurements by RK Jain, Khanna Publishers, New Delhi
2. Modern Control Engineering by OGATA
3. Fundamentals of Instrumentation by AE Fribance
4. Transducers by Peter Norton
5. Mechatronics by Bolton, Prentice Hall of India, New Delhi
6. Electronics Measurement and Instrumentation by AK Sawhney, DhanpatRai and Co, New Delhi
7. E-books/e-tools/relevant software to be used as recommended by AICTE /HSBTE / NITTTR.

UNIT WISE TIME AND MARKS DISTRIBUTION

Unit No.	**Time Allotted (Hours)**	**Marks Allotted (%)**
1.	12	30
2.	12	25
3.	08	15
4.	10	20
5.	06	10
Total	**48**	**100**

PROGRAM: THREE YEAR DIPLOMA PROGRAM IN INSTRUMENTATION AND CONTROL ENGINEERING	
COURSE TITLE **ICPC303**	COURSE TITLE**: TRANSDUCER AND SIGNAL CONDITIONINGLAB**
SEMESTER: **3RD**	CREDITS: **1**
PERIODS PER WEEK: **2(L: 0,T: 0, P: 2)**	

COURSE OBJECTIVE: This subject is a lab course to be supplemented by theory subject and aims to develop proficiency and understanding of practical outcomes of the subject taught in theory.

LIST OF PRACTICALS

1. Measurement of strain / resistance using strain gauge transducer.
2. Measurement of temperature using RTD (Resistance Temperature detector)
3. Measurement of temperature using Thermistor.
4. Measurement of displacement using LVDT.
5. Measurement of angular displacement using capacitive transducer.
6. Measurement of temperature using thermocouple.
7. Measurement of Resistance using LDR.
8. To measure weight using load cell.

PROGRAM: THREE YEAR DIPLOMA PROGRAM IN INSTRUMENTATION AND CONTROL ENGINEERING	
COURSE TITLE **ICPC304**	COURSE TITLE**: INSTRUMENTATION DRAWING**
SEMESTER: **3RD**	CREDITS: **2**
PERIODS PER WEEK: **4(L: 00,T: 00, P: 04)**	

COURSE OBJECTIVE:

Since drawing is the language of engineers through which they can express technical ideas in this subject, students will be able to draw component layouts and interpret the actual drawings used in the field of Instrumentation. Also student will be able to study various graphical symbols as per ANSI standards.

COURSE CONTENT

1. Study of Symbols

1.1 Electronic symbols.
1.2 Process instrumentation symbols.
1.3 Graphical symbols for pipe fittings (Valves and Piping), Graphical symbols and codes for pressure, temperature, flow, level measuring instruments as per ANSI standards.
1.4 Colour coding of lines (Electric lines and fluid lines).

2. Instrumentation Diagrams

2.1 Study of block diagram.
2.2 Study of schematic diagram.
2.3 Study of wiring diagram.
2.4 Study of graphical panel diagram.
2.5 Study of P& I diagram.

3. Instrument Installation System

3.1 Instrument Identification.
3.2 Study of instrument installation procedure.
3.3 Check list of good installation system

4. Plant Instrumentation (Power and Refinery Plant)

4.1 Instrumentation drawing of power and refinery plant.
4.2 Block diagram of power and refinery plant.
4.3 Flow diagram of power and refinery plant.

5. Plant Instrumentation (Steel and Cement Plant)

5.1 Instrumentation drawing of steel and cement plant.
5.2 Block diagram of steel and cement plant.
5.3 Flow diagram of steel and cement plant.

6. Schematic Diagrams

6.1 Schematic diagram of single acting cylinder.
6.2 Schematic diagram of double acting cylinder.
6.3 Schematic diagram of spring return cylinder.
6.4 Schematic diagram of tandem valve and shuttle valve.
6.5 Schematic diagram of SOL-Valve.

COURSE OUTCOME

After undergoing this course, the student will be able to:

- Identify the different types of symbols as per ANSI standards.
- Read different types of instrument diagrams.
- Identify instruments and go through installation procedure.
- Understand the drawing of power plant, steel plant & cement plant.

Industrial safety:

Fire prevention and control, handling of fire accidents, electrical safety, environmental safety, various safety equipment and their constructional features, maintenance and repair of safety equipment, safety in high pressure operations, safety management, safety provisions in the factory act, laws related to the industrial safety, measurement of safety performance, safety audit.

INSTRUCTIONAL STRATEGY

The teacher should lay emphasis on identification of symbols, draw sketches, wiring diagrams. Demonstrate different views, working drawings for interpretation. Make students aware of handbooks, data books and manuals for reference.

RECOMMENDED BOOKS

1. Applied Instrumentation by WG Andrews.
2. Instrumentation Engineers Hand Book by BG Liptic Vol.2.
3. Handbook of Applied Instrumentation by DM Considine.
4. Mechanical and Industrial Measurements by RK Jain, Khanna Publishers, New Delhi.
5. E-books/e-tools/relevant software to be used as recommended by AICTE / HSBTE / NITTTR.

UNIT WISE TIME AND MARKS DISTRIBUTION

Unit No.	Time Allotted (Hours)	Marks Allotted (%)
1	14	20
2	08	15
3	06	10
4	10	15
5	10	15
6	16	25
Total	**64**	**100**

PROGRAM: THREE YEAR DIPLOMA PROGRAM IN INSTRUMENTATION AND CONTROL ENGINEERING	
COURSE TITLE **ICPC305**	COURSE TITLE**: MEASUREMENT AND INSTRUMENTATION**
SEMESTER: **3RD**	CREDITS: **3**
PERIODS PER WEEK: **3(L: 02,T: 01, P: 00)**	

COURSE OBJECTIVE:

Instrumentation and control engineering diploma holders are normally placed in process and manufacturing industries and service sector. They are required to operate and maintain various electrical and electronic systems. This course provides a starting background to the students of diploma program in Instrumentation and Control acquainting him/her with various electrical and electronic instruments for their principle, operation, testing, calibration and applications. The detailed content of this course has been tailored as per industrial needs. Proper understanding of the measuring techniques, construction and working principles of various instruments will help the students in proper handling, operation and maintenance of industrial plants, control circuits and panels etc. This course will help the diploma students to pursue higher studies as well.

COURSE CONTENT

1. Measurement of Resistance, Inductance and Capacitance

1.1 Measurement of Resistance:
- 1.1.1 Wheatstone Bridge
- 1.1.2 Potentiometer method

1.2 Measurement of Inductance
- 1.2.1 Hay's bridge
- 1.2.2 Maxwell Bridge

1.3 Measurement of capacitance
- 1.3.1 De Sauty's bridge

1.4 construction and working of meggar

2. Ammeter, Voltmeter and Multimeter

2.1 Construction and working principle, applications of Ammeter and voltmeter
- 2.1.1 Moving Iron
- 2.1.2 Permanent Magnet Moving Coil Meters
- 2.1.3 Thermocouple type
- 2.1.4 Electrostatic type
- 2.1.5 Rectifier type

2.2 Construction and working of analog and digital multimeter.

3. Power and Energy Measurement

3.1 Introduction to single-phase and three-phase system.
3.2 Comparison between three-phase and single-phase system.
3.3 Working principle of dynamometer type watt meter
3.4 Power measurement using 2 watt meter or 3 watt meter methods
3.5 Working principle, construction and applications of energy meter

4. Frequency Measurement

Working Principle and applications of
4.1 Stroboscopes
4.2 Digital frequency meters

5. Cathode Ray Oscilloscope

5.1 Construction and working of Cathode Ray Tube (CRT)
5.2 Block diagram and working principle of a basic CRO
5.3 Digital storage oscilloscope (DSO): block diagram and working principle.

COURSE OUTCOME
After undergoing the subject, student will be able to:

- Describe various Electrical and Electronic Instruments.
- Understand proper handling, operation and maintenance of instruments used in industries.
- Describe Indicating, Recording and Integrating Instruments.
- Measure Resistance, Capacitance and Inductance with the help of different instruments.
- Operate Ammeter, Voltmeter and Multimeter.
- Describe Power, Energy and Frequency measurement.
- Demonstrate C.R.O. and D.S.O.

INSTRUCTIONAL STRATEGIES

While teaching this course the teacher should give demonstration in working and calibration of the instruments pertaining to relevant topics in the class. A visit to power plant or industry can also be organized in order to reinforce the classroom teaching and substantiating the course fundamentals.

RECOMMENDED BOOKS

1. A Course in Electrical Measurement and Measuring Instruments by AK Sawhney; DhanpatRai and Sons, New Delhi
2. Electrical Measurements and Measuring Instruments by SK Sahdev, Unique International Publications, Jalandhar
3. Experiments in Basic Electrical Engineering by SK Bhattacharya and KM Rastogi, New Age International (P) Ltd., Publishers, New Delhi
4. Electronic, Instrumentation Fundamentals by Malvino
5. Electrical Measurement by DR Nagpal
6. Electric Instruments by D. Cooper, Prentice Hall of India, New Delhi
7. Electronics Instrumentation by JB Gupta, SatyaPrakashan, New Delhi
8. Modern Electronic Instrumentation and Measurement Techniques by Cooper,
9. E-books/e-tools/relevant software to be used as recommended by AICTE / HSBTE / NITTTR.

UNIT WISE TIME AND MARKS DISTRIBUTION

Unit No.	**Time Allotted (Hours)**	**Marks Allotted (%)**
1	06	25
2	06	25
3	06	25
4	02	10
5	04	15
Total	**24**	**100**

PROGRAM: THREE YEAR DIPLOMA PROGRAM IN INSTRUMENTATION AND CONTROL ENGINEERING	
COURSE TITLE **ICPC306**	COURSE TITLE**: MEASUREMENT AND INSTRUMENTATION LAB**
SEMESTER: **3RD**	CREDITS: **1**
PERIODS PER WEEK: **2(L: O0,T: O0, P: O2)**	

COURSE OBJECTIVE:

This subject is a lab course to be supplemented by theory subject and aims to develop proficiency and understanding of practical outcomes of the subject taught in theory.

LIST OF PRACTICALS

1. To identify and study of indicating, integrating and recording instruments.
2. Use of analog and digital multimeter for measurement of voltage, current(a.c/d.c) and resistance
3. Study the constructional details, working and calibration of an ammeter (moving Coil and moving iron type)
4. To measure power, power factor in a 1-phase circuit, using wattmeter and power factor meter and verify results with calculations.
5. Study the constructional details, working of a meggar and measurement of resistance using meggar.
6. To measure unknown resistance with wheat-stone bridge.
7. To measure frequency, power, power factor in a single-phase circuit, using digital frequency meter, wattmeter and power factor meter and to verify results with calculations.
8. Measurement of power and power factor of a three-phase balanced load by two Wattmeter methods.
9. Measurement of voltage, frequency, time period, phase using CRO

PROGRAM: THREE YEAR DIPLOMA PROGRAM IN INSTRUMENTATION AND CONTROL ENGINEERING	
COURSE TITLE **ICPC307**	COURSE TITLE**: CONTROL SYSTEM ENGINEERING**
SEMESTER: **3RD**	CREDITS: **4**
PERIODS PER WEEK: **4(L: 03,T: 01, P: 00)**	

COURSE OBJECTIVE

It is pre-requisite for the students to know the various total plant controls in the process industry. An automatic control system saves manpower, reduces cost of production, increases the accuracy of the finished product and helps in mass production. The knowledge of this subject is required to have deeper grasp of the control environment/techniques as need to be studied in the forthcoming subjects e.g. process control, process instrumentation.

COURSE CONTENT

1. Introduction

1.1 Basic elements of control system.
1.2 Open loop control system.
1.3 Closed loop control system.
1.4 Manually controlled closed loop systems.
1.5 Automatic controlled closed loop systems.
1.6 Basic elements of a servo mechanism.
1.7 Linear systems, non-linear systems.
1.8 Introduction to laplace transform.

2. Control System Representation

2.1 Transfer function.
2.2 Block diagram of closed loop system.
2.3 Block diagram reduction techniques, Problems on block diagram.
2.4 Signal flow graph, Mason's formula.

3. Time Response Analysis

3.1 Standard test signals
3.2 Time response of first order system subjected to step and impulse input.
3.3 Introduction to second order system (over damped, critically damped and under damped systems).
3.4 Time domain specifications (Delay time, rise time, peak time, peak overshoot, settling time, steady state error).

4. Stability

4.1 Routh Array Criterion, Problems of Routh Array.
4.2 Introduction to Root Locus Technique.
4.3 Introduction to Bode Plot.

5. Non-Linear Control System

5.1 Introduction to behaviour of non-linear control system.
5.2 Principle of superposition and homogeneity.
5.3 Different types of non-linearites
    5.3.1 Saturation.
    5.3.2 Backlash

5.3.3 Hysteresis.
5.3.4 Dead zone.
5.3.5 Relay.
5.3.6 Friction.
5.3.7 Limit cycles.
5.3.8 Jump resonance.
5.3.9 Jump phenomenon.

5.4 Difference between linear and non-linear control system.

COURSE OUTCOME

After undergoing the subject, student will be able to:

- Understand fundamentals of control system.
- Understand the concept of linear and non-linear control system.
- Analyze the response of first order system w.r.t. different I/P signals
- Analyze the stability/behaviour of closed loop systems using various tools Ro uth array, root locus and bode plot.
- Learn about the transfer function and analyze different methods to find the transfer function.

INSTRUCTIONAL STRATEGY

Since the knowledge of this subject is required to have deeper grasp of the control environment/techniques as need to be studied in the forthcoming subjects e.g. process control, process instrumentation, the subject teacher is required to make the subject interesting and provide information about practical applications. The students may be given exposure in process industry and shown various controls.

RECOMMENDED BOOKS

1. Control Systems by Nagrath and Gopal
2. Linear Control Systems by B. S. Manke, Khanna Publication
3. Control Systems: Theory and Applications by Ghosh, Pearson Education, Sector 62, Noida
4. Control Systems by R. C. Sukla, DhanpatRai and Sons.
5. Control Systems by Ogata
6. E-books/e-tools/relevant software to be used as recommended by AICTE / HSBTE/NITTTR.

UNIT WISE TIME AND MARKS DISTRIBUTION

Unit No.	**Time Allotted (Hours)**	**Marks Allotted (%)**
1	10	25
2	12	25
3	08	15
4	10	20
5	8	15
Total	**48**	**100**

PROGRAM: THREE YEAR DIPLOMA PROGRAM IN INSTRUMENTATION AND CONTROL ENGINEERING	
COURSE TITLE **ICPC308**	COURSE TITLE**: CONTROL SYSTEM ENGINEERING LAB**
SEMESTER: **3RD**	CREDITS: **1**
PERIODS PER WEEK: **2(L: 00,T: 00, P: 02)**	

COURSE OBJECTIVE:

This subject is a lab course to be supplemented by theory subject and aims to develop proficiency and understanding of practical outcomes of the subject taught in theory.

LIST OF PRACTICAL'S

1. To demonstrate the synchro characteristic and use a synchro pair as error detector.
2. To study Non linearity behaviour of relay.
3. To study/design an open loop control system.
4. To study/design closed loop control system.
5. To study the Time response of first order system subjected to step input.
6. To study the Time response of 2^{nd} order system subjected to step input.

PROGRAM: THREE YEAR DIPLOMA PROGRAM IN INSTRUMENTATION AND CONTROL ENGINEERING	
COURSE TITLE OE301	COURSE TITLE**: OPEN ELECTIVE (ONLINE MODE)**
SEMESTER: **3RD**	CREDITS: **2**
PERIODS PER WEEK: **2(L: 02,T: 00, P: 00)**	

Any one of the below:-

1. NCC
2. Basholi Painting
3. Introduction to NGO Management
4. Basics of Event Management and Planning
5. Administrative Law
6. Introduction to Advertising
7. Moodle learning management system

PROGRAM: THREE YEAR DIPLOMA PROGRAM IN INSTRUMENTATION AND CONTROL ENGINEERING	
COURSE TITLE SI301	COURSE TITLE**: INTERNSHIP IN CIIIT/INDUSTRY DURING SUMMER BREAK**
SEMESTER: **3RD**	CREDITS: **1**
PERIODS PER WEEK: **2(L: 02,T: 00, P: 02)**	

INDUSTRIAL TRAINING OF STUDENTS

It is needless to emphasize further the importance of Industrial Training of students during their 3 years of studies at Polytechnics. It is industrial training, which provides an opportunity to students to experience the environment and culture of industrial production units and commercial activities undertaken infield organizations. It prepares student for their future role as diploma engineers in the world of work and enables them to integrate theory with practice. Polytechnics have been arranging industrial training of students of various durations to meet the above objectives.

This document includes guided and supervised industrial training to be organized during the semester break starting after 3RD semester examinations. The concerned HOD along with other teachers will guide and help students in arranging appropriate training places relevant to their specific branch. It is suggested that a training schedule maybe drawn for each student be for starting of the training in consultation with the training providers. Students should also be briefed in advance about the organizational setup, product range, manufacturing process, important machines and materials used in the training organization.

Equally important with the guidance is supervision of students training in the industry/organization by the teachers .Students should been courage to write daily report in their diary to enable them to write final report and its presentation later on.

Evaluation of professional industrial training report through viva-voce/presentation aims at assessing students understanding of materials, industrial process, practices in industry/field organization and their ability to engage in activities related to problem solving in industrial setup as well as understanding of application of knowledge and skills learnt in real life situations.

The teacher along with field supervisors will conduct performance assessment of students. The components of evaluation will include the following:

Punctuality and regularity	15%
Initiative in learning new things	15%
Presentation and VIVA	15%
Industrial training report	55%