

**CURRICULAR STRUCTURE FOR PART- II (2ND YEAR) OF THE FULL TIME DIPLOMA COURSES IN
ENGINEERING AND TECHNOLOGY**

WEST BENGAL STATE COUNCIL OF TECHNICAL EDUCATION												
TEACHING AND EXAMINATION SCHEME FOR DIPLOMA IN ENGINEERING COURSES												
COURSE NAME: DIPLOMA (3 YEARS)												
DURATION OF COURES: 6 SEMESTERS												
SEMESTER: FOURTH												
BRANCH: ELECTRONICS AND INSTRUMENTATION ENGINEERING												
SR. NO.	SUBJECT	CREDIT	PERIODS			EVALUATION SCHEME						
			L	TU	PR	INTERNAL SCHEME			ESE	PR		TOTAL
						TA	CT	TOTAL		INT	EXT	
1	Analog Electronics	3+2	3		3	10	20	30	70	50	50	200
2	Digital Electronics	4+2	3	1	3	10	20	30	70	50	50	200
3	Process Instrumentation – I	4+2	3	1	3	10	20	30	70	50	50	200
4	Electronic Measuring Instruments	2	2			5	10	15	35	----		50
5	Process Control	4	3	1		10	20	30	70	----		100
6	Development of Life skill- II	1			2	--	--	--	--	25	25	50
7	Professional Practice - II	1			2	--	--	--	--	50	---	50
TOTAL		25	14	3	13	45	90	135	315	400		850
STUDENT CONTACT HOURS PER WEEK: 30 Theory and Practical Period of 60 Minutes each. L - Lecture, TU – Tutorial, PR- Practical, TA- Teachers Assessment, CT- Class Test, ESE – End Semester Exam, INT – Internal, EXT- External												

Syllabus for ANALOG ELECTRONICS

Name of the Course : Diploma in Electronics & Instrumentation Engineering	
Name of the subject : Analog Electronics	
Subject Code:	Semester: Third
Duration: 6 months	Maximum Marks: 100
Teaching Scheme: Theory : 3hrs/week Tutorial : Practical :	Examination Scheme: Internal Scheme : Teachers Assessment: 10 Class Test : 20 End Semester Exam : 70

Credit: 3

Aim:

Sl No.	
1	This subject intends to teach operating principle and application of electronic circuits and devices like different types of amplifiers, oscillators and their applications
2	The subject knowledge is required in Industrial Electronics, Instrumentation and communication system
3	Understanding of the subject will provide the student for assembling, trouble shooting & testing of circuits & devices

Objective:

Sl No.	The Student will able to
1	do proper biasing for transistor
2	classify and explain various amplifiers and Oscillator circuits based on their characteristics
3	understand the operation and application of differential amplifier and operational amplifier

Pre-requisite:

Sl No.	
1	Basic Electronic Engineering
2	Basics on different active and passive components

Contents

Group	Module	Name of the topic	Hrs / Module
A	1	Transistor Biasing 1.1 Idea on Faithful amplification, stabilisation, 1.2 Need for transistor biasing, stability factor, concept of dc load line, selection of Q point 1.3 Different methods of transistor biasing (base resistor/ fixed bias, emitter bias, collector feedback bias, self bias) with stability analysis. 1.4 Thermal run away & its prevention, heat sinks.	9
	2	Small Signal & Power Amplifier 2.1 Small Signal Amplifier 2.1.1 Graphical demonstration of Single stage amplifier, phase reversal, DC & AC equivalent circuit, Load line . 2.1.2 Analysis, Classification of amplifier. 2.1.3 Transistor amplifier circuit as two port network, hybrid parameter model for transistor amplifier, analysis of CE amplifier using hybrid parameter. 2.1.4 Operation of difference amplifier 2.1.5 Operation of darlington amplifier	11

		2.2 Power Amplifier 2.21 Idea of Class A, B, AB & C operation. Comparison of these. 2.22 Operation, merits & demerits of Class A, Class B push-pull Amplifier. 2.23 Concept of cross over distortion	
B	3	Feedback Amplifier and Oscillator 3.1 Concept of Positive & negative feedback. 3.2 Amplifier without & with feed back. 3.3 Advantage of negative feed back on voltage gain, bandwidth, input output impedance, stability, noise, distortion. 3.4 Classification of oscillators, principle of oscillation, damped & un-damped oscillation, use of positive feed back, Barkhausen criterion for oscillation 3.5 Different oscillator circuits: L-C tuned collector oscillator, R-C phase shift oscillator, Wien bridge oscillator. (operation, frequency of oscillation of those)	12
	4	Operational Amplifier 4.1 Op-amp configurations (building blocks), op-amp parameters, characteristics of an ideal op-amp. 4.2 Examples of IC op-amp 4.3 Application of op-amp as inverting amplifier, non-inverting amplifier, adder, subtractor, differentiator, integrator, unity gain buffer, V to I & I to V converter, comparator, Regenerative comparator (Schmitt trigger), Square wave generator (Astable multivibrator), sample & hold circuit, instrumentation amplifier, Charge Amplifier, High Pass & Low Pass filter.	13

Books:

Title	Author	Publisher
Electronic Devices & Circuit Theory	Boylestad & Nashelsky	PHI Pub. Co.
Electronic Principles	A.P. Malvino	Mc Graw Hill
Principle of Electronics	V K Mehta, Rohit Mehta	S Chand
Operational Amplifier and linear ICs	D. A. Bell	Oxford University Press
Electronic Devices & Circuits	D. A. Bell	Oxford University Press
Integrated Electronics	Millman & Halkias	Mc Graw Hill
Op-amps & linear integrated circuits	R. Gayakwad	PHI
Foundation of Electronics	Chattopadhyay, Rakshit, Saha, Purkait	New Age
Analog Integrated Circuit Design	Johns	Wiley India
Linear Integrated Circuit	Ganesh Babu, Suseela B.	Scitech Publication
Linear Integrated Circuit	D Roy Choudhury	New Age
Electronic Device & Circuit	Mottershed	PHI

End Semester Examination Scheme

Maximum Marks: 70						Time: 3 Hrs			
Group	Module	Objective 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	10	Any 20	1	1 x 20 = 20	3	Any 5 taking at least 2 from each group	10	10 x 5 = 50
	2								
B	3	15	Any 20	1	1 x 20 = 20	4	Any 5 taking at least 2 from each group	10	10 x 5 = 50
	4								

Syllabus for DIGITAL ELECTRONICS

Name of the Course : Diploma in Electronics & Instrumentation Engineering			
Name of the Subject : Digital Electronics			
Subject Code:		Semester: Third	
Duration: 6 months		Maximum Marks: 100	
Teaching Scheme: Theory : 3hrs/week Tutorial : 1hrs/week Practical :		Examination Scheme: Internal Scheme : Teachers Assessment : 10 Class Test : 20 End Semester Exam : 70	
Credit: 4			
Aim:			
Sl No.			
1	To study different logic families		
2	To introduce different logic gates, Boolean algebra & combinational logic design using those gates		
3	To learn how to design sequential logic using flip flop		
Objective:			
Sl No.	The Student will able to		
1	Design simple logic circuits		
2	Assemble logic circuits		
3	Observe outputs of logic circuits		
4	Troubleshoot digital circuits		
Pre-requisite:			
1	Basic Physics		
2	Electronics Engineering		
Contents			
Group	Module	Name of the topic	Hrs / Module
A	01	Number Systems & Code: 1.1 Binary, octal, decimal & hexadecimal number systems, conversion from one system to another system. 1.2 Binary arithmetic, signed numbers, subtraction using 1's & 2's complement representation, concept of over flow. 1.3 Code- BCD, alphanumeric, ASCII. 1.4 Concept of parity & error correction.	6
	02	Boolean Algebra & Logic Gates: 2.1 Logical symbol, logical expression and truth table of AND, OR, NOT, NOR, NAND, XOR, XNOR, 2.2 Use of NAND & NOR gates as universal gates, implementation of Boolean functions using logic gates, circuit of logic gates using discrete components. 2.3 Digital logic families- RTL, TTL & CMOS, characteristics & circuit configurations, open collector & tri state gates 2.4 Boolean algebra law postulates, Duality Theorem, De Morgan's Theorem.	9

B	03	Combinational Logic Circuits: <p>3.1 Boolean functions & standard canonical forms, simplification using Boolean algebra & K- map, Minimization of logical expression using K-map (2, 3, 4 variables), POS & SOP</p> <p>3.2 Truth Table, K –map, simplified logical expression and logical circuit of Half Adder & Full Adder, Half Subtractor & Full Subtractor.</p> <p>3.3 Block diagram and Truth Table of Encoders, priority Encoder ICs and Decoder, Decoder-Driver</p> <p>3.4 Block diagram, Truth Table, working principle, Application, PIN functions of Decimal to BCD Encoder (IC 74147) and BCD to & Segment Decoder</p>	11
	04	Multiplexers & Demultiplexers: <p>4.1 Block Diagram, Truth Table, Logical Expression and Logic Diagram of Multiplexer (4:1 and 8:1), Design of 8:1 using 2 4: 1 Mux, Multiplexer ICs</p> <p>4.2 Block Diagram, Truth Table, Logical Expression and Logic Diagram of Demultiplexer (1:4, 1:8, 1:16), Demultiplex ICs</p>	7
	05	Flip Flops & Sequential Logic Design: <p>5.1 Symbol, logic diagram using NAND/NOR gates , working and Truth Table of S R flip flop</p> <p>5.2 Symbol, logic diagram using NAND gates , working, Truth Table and timing diagram of clocked S R flip flop</p> <p>5.3 Concept of edge triggering, level triggering</p> <p>5.4 Symbol, logic diagram using NAND gates , working, Truth Table and timing diagram of clocked J K flip flop</p> <p>5.5 Block diagram and Truth Table of Master-slave J K flip flop</p> <p>5.6 Symbol, working and Truth Table of D & T flip flop</p> <p>5.7 Application of flip flops</p> <p>5.8 Working, truth table,& timing diagram of Synchronous Counters (3 bit), Asynchronous Counter (3 bit, 4 bit), Mod N Counter, synchronous, up, down, up down, binary, decade, divide by N, ring counter.</p> <p>5.9 Block diagram, Working, Truth Table and waveform of Shift registers- SISO, SIPO, PISO, PIPO (4 bit) and universal Shift register.</p> <p>5.10 Application of Counter & Register</p>	13
	06	A/D & D/A Converters: <p>6.1 Block diagram and working of Ramp type, dual slope type, SAR type Flash type A/D converter,</p> <p>6.2 Specifications of A/D converter.</p> <p>6.3 Circuit diagram and working of R-2R ladder DAC & Weighted resistor D/A converter, Their comparison.</p> <p>6.4 Specifications of D/A converter</p>	9
	07	Timing Circuits: <p>7.1 Block diagram & Pin diagram of 555 IC Timer</p> <p>7.2 Working of 555 timer as astable multivibrator</p> <p>7.3 Working of 555 times as monostable multivibrator</p>	5

Books:		
Title	Author	Publisher
Digital Principles	R.P. Jain	Mc Graw Hill
Fundamentals of Digital Circuits	A Anand Kumar	PHI
Digital Electronics	A.K. Maini	Wiley India
Digital Electronics	G K Kharate	Oxford University Press
Digital Circuits & Systems	Hall	Mc Graw Hill Pub. Co
Digital Principles & Applications	Malvino & Leach	Mc Graw Hill Pub. Co
Digital System Design	Morris Mano	PHI
Switching Theory & Logic Design	C. V. S. Rao	Pearson
Digital Electronics	S. P. Bali	Mc Graw Hill
Digital Circuit -Vol I	D. Ray Chaudhury	Platinum Publisher
Digital Circuit -Vol II	D. Ray Chaudhury	Platinum Publisher
Digital Integrated Electronics	H. Taub, D. Shilling	Mc Graw Hill
Digital Fundamentals	Floyed, Jain	Pearson
Digital Electronics	P. Raja	Scitech
Digital Circuit & Design	S. Aligahanan, S. Aribazhagan	Bikash Publishing
A Text Book of digital Electronics	R S Shedda	S Chand & Company Ltd

End Semester Examination Scheme

Maximum Marks: 70						Time: 3 Hrs			
Group	Module	Objective 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	12	Any 20	1	1 x 20 =20	3	Any 5 taking at least 2 from each group	10	10 x 5 =50
	2								
	3								
B	4	13	Any 20	1	1 x 20 =20	5	Any 5 taking at least 2 from each group	10	10 x 5 =50
	5								
	6								
	7								

Syllabus for PROCESS INSTRUMENTATION - I

Name of the Course : Diploma in Electronics & Instrumentation Engineering	
Name of the Subject : Process Instrumentation I	
Subject Code:	Semester: Third
Duration: 6 months	Maximum Marks: 100
Teaching Scheme: Theory : 3hrs/week Tutorial : 1hrs/week Practical :	Examination Scheme: Internal Scheme : Teachers Assessment: 10 Class Test : 20 End Semester Exam : 70
Credit: 4	
Aim:	
Sl No.	
1	To control process parameters, precise measurement of those is the most important part.. The subject deals with measurement principles and techniques of process parameters like force, pressure etc

	To study signal conditioning, signal transmission, and storage for analysis & control		
Objective:			
Sl No.	The Student will able to		
1	Know the principle of operation, advantages, disadvantages of different process parameter like force, pressure, strain etc		
2	Choose the proper measuring sensor/ instrument for specific measurement		
3	Compare the different instruments used for a specific operation		
4	Know the specification of different measuring instruments		
5	Identify signal conditioning circuit for Instrumentation system in Industrial process, measurement & control		
6	Know basic idea on signal transmission in Instrumentation system		
7	Know the principle and application of different proximity sensors		
Pre-requisite:			
Sl No.			
1	Fundamental idea of Instrumentation system		
2	Basics of electronics		
3	Basics of physics		
Contents			
Module	Chapter	Name of the topics	Hrs / Module
A	1	Proximity Sensors: 1.1 Definition and importance of proximity sensors in instrumentation field 1.2 Description & application of different types of proximity sensors such as Inductive, optical, magnetic, capacitive, ultrasonic types	7
	2	Strain Gauge & Load Cell: 2.1 Material of construction of strain gauge, classification, gauge factor, strain measuring circuit, dummy strain gauge, advantage, disadvantage and application of various types of strain gauge, advantage of semiconductor strain gauge over metallic strain gauge. 2.2 Load cell- column type, shear type, application of load cells in industries.	9
	3	Pressure Measurement: 3.1 Definition, classification & units of pressure. Relation between different units 3.2 Manometer : U tube, well type & micrometer 3.3 Elastic pressure sensor: bourdon tube, bellow, diaphragm, capsule. 3.4 Vacuum measurement using Mc Loed gauge, Thermal conductivity gauge, Ionization gauge, Pirani gauge 3.5 Dead Weight Tester 3.6 Calibration of pressure measuring instruments by manometer & dead weight tester 3.7 Flapper- Nozzle system for pressure measurement	12
B	4	Signal Conditioning 4.1 Relevance of signal conditioning in process instrumentations. 4.2 Principles of analog signal conditioning. Brief idea on signal level & bias changing, linearization, conversions, filtering & impedance matching. Concept of loading 4.3 Passive signal conditioner: voltage divider, Wheatstone bridge circuit, RC filter 4.4 Active signal conditioner: Idea on op amp based circuit 4.5 I/P, P/I, I/V, V/I, F/V, V/F converters. 4.6 Instrumentation Amplifier, Charge amplifier, & their importance,	11
	5	Data Processing	11

		5.1 Necessity of data processing in Instrumentation 5.2 Block diagram and explanation of a generalised Data Acquisition System 5.3 Objective of DAS 5.4 Signal Conditioning in DAS, Radiometric conversion, Logarithmic conversion 5.5 Single channel and multichannel DAS 5.6 Block diagram explanation, characteristics of Data Logger 5.7 Comparison between DAS and Data Logger	
	6	Data Transmission & Telemetry 6.1 Idea on pneumatic & electric transmission 6.2 General Telemetry system 6.3 Voltage, current, & position telemetry system 6.4 4-20 mA current transmission, live and dead zero. 6.5 Need for modulation & demodulation in signal transmission 6.6 Basic idea on amplitude & frequency modulation (no deduction) 6.7 Need of Multiplexer in data transmission, Explanation of TDM & FDM 6.8 Idea on analog and digital data transmission 6.9 Advantage and disadvantage of digital data transmission over analog data transmission	10

Books:

Title	Author	Publisher
Introduction to Measurement & Instrumentation	Ghosh	PHI
Principles of Industrial Instrumentation	D.Patranabis	TMH
Measurement System Application & Design	E.O.Doeblin	Mc Graw Hill
Instrument Engineers' Handbook, Vol I: Process Measurement & Analysis	Bela G. Liptak	CRC Press, Taylor & Francis
Instrument Transducer	H K P Neubert	Oxford University Press
Mechanical Measurements	Beckwith, Buck & Marangoni	Narosa Pub. House
The Essence of Measurement	Allan Morris	PHI
A Course in Electrical & Electronics Measurement & Instrumentation	J.B. Gupta	S. K. Kataria Pub. Co.
Industrial Instrumentation & Control	S K Singh	TMH
Sensors & Transducers	D. V. S. Murty	PHI
Instrumentation & Control	Reddy, P S R Krishnudu	Scitech
Handbook of Modern Sensors	Fraden, Jacob	Springer

End Semester Examination Scheme

Maximum Marks: 70						Time: 3 Hrs			
Group	Module	Objective 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	12	Any 20	1	1 x 20 =20	4	Any 5 taking at least 2 from each group	10	10 x 5 =50
	2								
	3								
B	4	13	Any 20	1	1 x 20 =20	4	Any 5 taking at least 2 from each group	10	10 x 5 =50
	5								
	6								

Syllabus for ELECTRONIC MEASURING INSTRUMENTS

Name of the Course : Diploma in Electronics & Instrumentation Engineering			
Name of the Subject : Electronic Measuring Instruments			
Course Code:		Semester: Third	
Duration: 6 months		Maximum Marks: 50	
Teaching Scheme: Theory : 2 hrs/week Tutorial : Practical :		Examination Scheme: Internal Scheme : Teachers Assessment : 05 Class Test : 10 End Semester Exam : 35	
Credit: 2			
Aim:			
Sl No.			
1	The subject knowledge is required to provide detail knowledge for proper handling of electronic instruments which are widely used in electronics laboratory & electronics workshops.		
2	Understanding the subject will provide skill to the students for trouble shooting & testing of circuits using instruments		
Objective:			
Sl No.	The Student will able to		
1	Know different analog and digital measuring instruments		
2	Know about the digital frequency meter		
3	Explain the operation of CRO and Function Generator		
4	get an idea regarding the maintenance & service of these instruments		
Pre-requisite:			
Sl No.			
1	Idea on basic analog and digital electronics		
2	Idea on active and passive components		
Contents			
Group	Module	Name of the topic	Hrs/Module
A	1	Different Measuring Instrument 1.1 Comparison between analog & digital measuring instrument 1.2 Rectifier type, True RMS type analog voltmeter. 1.3 Ramp type and dual slope integrating type DVM 1.4 Q Meter- application & error.	10
	2	Frequency & Power Measurement 2.1 Name of different frequency meter 2.2 Operation of Electronic frequency counter for the measurement of frequency and time period. 2.3 Power Measurement by bolometer & calorimetric method	5

B	3	CRO and its Application: 3.1 Block diagram of CRO 3.2 Cathode Ray Tube, Deflection Amplifier, Time base generator, Delay line. 3.3 Electrostatic deflection technique. Automatic synchronization of time base. 3.4 Basic control of CRO 3.5 Different types of probes. 3.6 Dual trace, dual beam CRO. 3.7 Measurement of time period, phase, delay time, frequency by CRO.	10
	4	Signal Generators: 4.1 AF sine and square wave generator 4.2 Function generator 4.3 Pulse generator. 4.4 Sweep Generator	5

Books:

Title	Author	Publisher
Electronic Measurements	D.A.Bell	PHI
A course in Electrical & Electronics Measurement & Instrumentation	A.K. Sawhney	Dhanpat Rai Pub. Co
Electronic Instrumentation	Kalsi	Mc Graw Hill
Elements of Electronic Instrumentation & Measurement	J. J. Car	Pearson
Modern Electronic Instrumentation & Measurement Techniques	Helfrick & Cooper	PHI
A Course in Electrical & Electronics Measurement & Instrumentation	J.B. Gupta	S. K. Kataria Pub. Co.
Electronic Measurement & Instrumentation	Bell	Oxford
A course in Electrical & Electronics Measurement & Instrumentation		

End Semester Examination Scheme

Maximum Marks: 35

Time: 2 Hrs

Group	Module	Objective 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	7	Any 10	1	1 x 10 = 10	4	Any 5 taking at least 2 from each group	5	5 x 5 = 25
	2								
B	3	6	Any 10	1	1 x 10 = 10	4	Any 5 taking at least 2 from each group	5	5 x 5 = 25
	4								

Syllabus for PROCESS CONTROL

Name of the Course : Diploma in Electronics & Instrumentation Engineering			
Name of the Subject : Process Control			
Subject Code:		Semester: Third	
Duration: 6 months		Maximum Marks: 100	
Teaching Scheme: Theory : 3 hrs/week Tutorial : 1 hrs/week Practical:		Examination Scheme: Internal Scheme : Teachers Assessment: 10 Class Test : 20 End Semester Exam : 70	
Credit: 4			
Aim:			
Sl No.			
1	Monitoring and control of process is the most important part of in industry. With knowledge of this subject students will be able to control the process parameter as per the desired value for the optimization of the process.		
Objective:			
Sl No.	The Student will able to		
1	Know basics of process and control system		
2	Define the mathematical equation from physical system for further analysis		
3	Analyze the stability of the system		
4	Perform time response analysis of different system		
5	Know the control loop with different pneumatic & electronic controller		
6	Test , calibrate, maintain process control elements		
7	To know use of controllers and control valves		
Pre-requisite:			
Sl No.			
1	Fundamental idea on instrumentation		
2	Knowledge of mathematical calculation		
3	Knowledge of basic Electronics		
Contents			
Module	Chapter	Name of the topic	Hrs / Module
A	01	Introduction to Process & Control System: 1.1 Concept of process 1.2 Classification of process variables 1.3 Concept of open loop and closed loop control system. 1.4 Different elements in automatic close loop control systems. 1.5 Mathematical representation of simple mechanical & electrical system 1.6 Block diagram representation of control system, block diagram algebra. Simple problem	12

	02	Stability Analysis: 2.1 Concept of transfer function. 2.2 Different techniques of stability analysis (only Name) 2.3 Stability analysis using Routh Hurwitz criteria. Simple Problem. 2.4 Name of other techniques for stability analysis	9
	03	Time Response Analysis: 3.1 Introduction, standard test signals, performance indices. 3.2 First and second order system 3.3 Time response of first order system. 3.4 Time response of 2nd order system, definition of rise time, Peak overshoot, Settling time etc	9
B	04	Basic Control Schemes and Controllers: 4.1 A basic close loop control system and its working 4.2 Function and explanation of following control actions: On-Off, P, PI,PD, PID, Their relative merits and demerits. 4.3 Explanation & transfer function of On-Off, P, PI, PD, & PID type pneumatic controller (only motion balance type). 4.4 Explanation & transfer function of On-Off, P, PI, PD, & PID type electronic controller	15
	05	Final Control Element: 5.1 Different types of On Off and regulating Control Valve 5.2 Different parts of a Globe valve 5.3 Valve actuator 5.4 Explanation and use of I/P converter, positioned, Air Filter Regulator, Purge Regulator (constatnt DP regulator) 5.5 Idea on Control valve Characteristics, Cv, value selection & sizing , cavitation, flashing, rangeability 5.6 Specification of Control Valve 5.7 Installation of Control valve with manifolds. 5.8 Operation of SDV, ESDV, solenoid valve, MOV, Safety valve (pressure, temperature), self actuated Pressure Control Valve. 5.9 Basics of valve signature. 5.10 Construction, working principle and application of Servo Motor & Stepper motor	15

Books:

Title	Author	Publisher
Process Control Principle & Application	S Bhanot	Oxford University Press
Process Control; Concept Dynamics & Application	S. K. Singh	PHI
Principles of Process Control	D.Patranabis	Mc Graw Hill
Instrument Engineers' Handbook: Process Control & Optimization, Vol-II	Bela G Liptak	CRC Press, Taylor & Fraancis Group
Chemical Process Control: An Introduction to Theory & Practice	Stephanopoulos	Pearson
Instrumentation Fundamental for Process Control	D.O.J.Desai	Taylor & Francis
Modern Control Engineering:	K.Ogata	PHI
Principles of Industrial Process Control	D.P.Eckman	J. Wiley & Sons
Automatic Process Control	D.P.Eckman	J. Wiley & Sons
Nice's Control System Engineering	Gupta	Wiley India
Process Control Instrumentation Technology	Curtis Johnson	PHI
Automatic Control System	Kuo	Wiley India

Modern Control System					Ogata	PHI			
Control System Theory					S Dasgupta	Khanna			
Process System Analysis & Control					Coughanowr	Mc Graw Hill International			
End Semester Examination Scheme									
Maximum Marks: 70					Time: 3 Hrs				
Group	Module	Objective 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	13	Any 20	1	1 x 20 =20	4	Any 5 taking at least 2 from each group	10	10 x 5 =50
	2								
	3								
B	4	12				4			
	5								

Syllabus for ANALOG ELECTRONICS LAB

Name of the Course : Diploma in Electronics & Instrumentation Engineering	
Name of the subject : Analog Electronics Lab	
Subject Code:	Semester: Third
Duration: 6 months	Maximum Marks: 100
Teaching Scheme: Theory : Tutorial : Practical: 3 hrs/week	Examination Scheme: Continuous Internal Assessment Performance of job : 30 Notebook / Viva : 20 External Assessment On spot Job : 30 Viva Voce : 20
Credit: 2	
Skill to be developed:	
Intellectual Skill	
1	To locate fault in circuit
2	Interpret the waveform
Motor Skill	
1	Ability to sketch circuits
2	Ability to interpret circuit
3	
List of Practical	
SI No.	Experiments
1	Experiment for input /output characteristics of BJT
2	Experiment for input & transfer characteristics of FET.
3	Design of RC phase shift oscillator for a given cut off frequency.
4	Design of Wien bridge oscillator for a given cut off frequency.

5	Study of parameters of practical op-amp.
6	Use of op-amp as – <ul style="list-style-type: none"> • Noninverting amplifier. • Inverting amplifier. • Buffer. • Adder. • Differentiator. • Integrator. • Schmitt trigger. • Triangular wave generator.
7	Design of Low pass & High pass active filter & plotting of frequency response
	Note: Connect the circuit on bread board and see the response on CRO. Prepare the Labsheet.

Syllabus for DIGITAL ELECTRONICS LAB

Name of the Course : Diploma in Electronics & Instrumentation Engineering	
Name of the subject : Digital Electronics Lab	
Subject Code:	Semester: Third
Duration: 6 months	Maximum Marks: 100
Teaching Scheme: Theory : Tutorial : Practical: 3 hrs/week	Examination Scheme: Continuous Internal Assessment Performance of job : 30 Notebook /Viva : 20 External Assessment On spot Job : 30 Viva Voce : 20
Credit: 2	
Skill to be developed:	
Intellectual Skill;	
1	Interpret the result
2	Verify the result
Motor Skill:	
1	Accuracy of measurement
2	Proper connection
List of Practical:	
Sl No.	Experiment
01	Study of Digital IC data sheet and noting down the characteristics for TTL & CMOS logic families
02	Familiarization of 7400, 7402, 7404, 7408, 7432 & 7486 ICs
03	Verification of truth tables of AND, OR, NOT, NOR, NAND, XOR, XNOR gates.
04	Implementation of various logic gates using NAND & NOR gates (Truth table verification).

05	Verification of DeMorgan's theorem.
06	Implementation of Adder & Subtractor using minimum number of gates.
07	Operation & verification of truth table of S-R & J-K, D, T flip-flop.
08	Design of Ripple counter (4 bit)
09	Design of a universal shift register
10	Design and application of A/D & D/A converter
11	Design of decimal to seven segment display
12	Square wave generation with particular frequency using 555 timer & analysis of output using CRO

Syllabus for PROCESS INSTRUMENTATION - I LAB

Name of the Course : Diploma in Electronics & Instrumentation Engineering	
Name of the subject : Process Instrumentation -I Lab	
Subject Code:	Semester: Fourth
Duration: 6 months	Maximum Marks: 100
Teaching Scheme: Theory : Tutorial : Practical : 3 hrs/week	Examination Scheme: Continuous Internal Assessment Performance of job : 30 Notebook / viva : 20 External Assessment On spot Job : 30 Viva Voce : 20
Credit: 2	
Skill to be developed:	
Intellectual Skill;	
1	Identification & selection of equipments
2	Selection of transducers
Motor Skill:	
1	Accuracy of measurement
2	Proper connection
List of Practical:	
Sl No.	Experiment
1	To plot characteristics of potentiometer and observe the loading effect on output of potentiometer (translation potentiometer and rotational potentiometer)
2	Study of different parts of C type Bourdon Tube pressure gauge

3	Calibration of Bourdon Tube Pressure gauge using dead weight tester.
4	Calibration of Pressure switch using dead weight tester.
5	Measurement of strain/force using strain gauge/Load cell
6	Characteristics and calibration of strain gauge/Load cell
7	Measurement of Linear displacement by LVDT & plotting of characteristics curve
8	Characteristics and calibration of Hall effect sensor
9	Characteristic and calibration of Piezoelectric sensor
10	Speed measurement by contacting Tachometer
11	Speed measurement by Stroboscope
12	Study of Pneumatic Relay, AFR

Syllabus for DEVELOPMENT OF LIFE SKILL II

Name of the Course : Diploma in Electronics & Instrumentation Engineering	
Name of the Subject : Development of Life Skill II	
Subject Code:	Semester: forth
Duration: 6 months	Maximum Marks: 50
Teaching Scheme: Theory : Tutorial : Practical: 2 hrs/week	Examination Scheme: Internal Assessment : 25 External Assessment : 25
Credit: 1	
Aim:	
Sl No.	
1	In today's competitive world, the nature of organization is changing with very rapid speed. In this situation the responsibility of diploma holder is not unique. He will be a part of a team and will have to work as a team with others in the organization. As such the individual skills are not sufficient there to work at his best
2	This subject will develop a student's mind to be a part 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 Student will able to
1	Develop the status of mind to work as a team
2	Apply problem solving skills for a given situation.
3	Use effective presentation techniques.
4	Apply techniques for effective time management.

5	Apply task management techniques for given project.	
	Enhance leadership traits.	
	Resolve conflict by appropriate method	
	Face interview without fear.	
	Follow moral and ethics.	
	Convince people to avoid frustration	
Pre-requisite:		
Sl No.		
1	Team work and presentation skill	
2	Positive attitude and thirst of learning	
Contents		
Module	Name of the topic	Hrs / module
1	Social Skill Societies, Social Structure, Develop Sympathy and Empathy	
2	SWOT Analysis Concept, How to make use of SWOT	
3	Interpersonal Relation 3.1 Source of conflict, Resolution of conflict, 3.2 Ways to enhance interpersonal relation	
4	Problem Solving 4.1 Steps in Problem Solving 4.1.1 Identify and clarify the problem 4.1.2 Information gathering related to problem 4.1.3 Evaluate the evidence 4.1.4 Consider alternative solutions and their implications 4.1.5 Choose and implement the best alternatives 4.1.6 Review 4.2 Problem solving techniques 4.2.1 Trial and error 4.2.2 Brain Storming 4.2.3 Lateral Thinking	
5	Presentation Skills 5.1 Body language 5.2 Dress 5.3 Posture, Gesture, Eye contact and facial expression 5.4 Voice and language- Volume, Pitch, Inflection, Speed, Pause, Pronunciation, Articulation, Language, Practice of speech 5.5 Use of Aids- OHP, LCD projector, white board	
6	Group Discussion & Interview Techniques 6.1 Group Discussion 6.1.1 Introduction to group discussion 6.1.2 Ways to carry out group discussion 6.1.3 Parameters- Contact, body language, analytical and logical thinking, decision making 6.2 Interview Techniques 6.2.1 Appearance at interview board 6.2.2 Tips for handling common questions	
7	Working in Teams 7.1 Understanding the utility to work as a team	

	<p>7.2 Tips to work effectively in team</p> <p>7.3 Establish good rapport</p> <p>7.4 Interest toward others and work effectively with them to meet common objectives</p> <p>7.5 Tips to provide and accept feedback in a constructive and considerate way</p> <p>7.6 Leadership in team</p> <p>7.7 Handling frustration in team</p>	
8	<p>Task management</p> <p>8.1 Introduction</p> <p>8.2 Task identification</p> <p>8.3 Task planning, Organizing and Execution</p> <p>8.4 Closing the task</p>	
	<p>Student may perform the following task as practical / hands on practice</p> <ol style="list-style-type: none"> 1 SWOT Analysis- - Analysis yourself with respect to your strength and weakness, opportunities and threats. Following points may be useful for doing SWOT- <ol style="list-style-type: none"> 1.1 Past experience 1.2 Achievements 1.3 Failures 1.4 Feedback from others 2 Undergo a test on reading skill/ memory skill administered by the teacher 3 Solve the puzzles 4 Group wise social activity like Tree Plantation, Blood donation, environment protection, distribution of cloths to poor, awareness camp like cleanliness in slump area etc. 5 Deliver seminar on given topic. 6 Watch/ listen an informative session on social activities. Make report on topic of your interest using audio / visual aids. Make a report on the programme 7 Conduct an interview of a personality and write a report on it 8 Discuss a topic in a group and prepare minutes of discussion . Write through description of the topic discussed. 9 Arrange an exhibition, displaying flow-charts, posters, paper cutting, photographs etc on the topic given by teacher <p>Note: please note that these are the suggested assignments on the given contents/ topics. These assignments are the guide lines to the subject teachers. However the subject teachers are free to design any assignment relevant to the topic.</p>	

Books:		
Title	Author	Publisher
Adams Time Management	Marshal Cooks	Viva Books
Basic Management Skills for All	E.H. Mc Grath, S.J.	PHI
Body Language	Allen Pease	Sudha Publications Pvt Ltd
Creativity and Problem Solving	Lowe and Phil	Kogan Page (I) Pvt Ltd
Decision making & Problem Solvong	Adair, J	Orient Longman
Develop your Assertiveness	Bishop, Sue	Kogan Page (I) Pvt Ltd
Make Every Minute Count	Marion E Haynes	Kogan Page (I) Pvt Ltd
Organizational Behaviour	Steven L mcShane and Mary Ann Glinow	Tata McGraw Hill
Organizational Behaviour	Stephen P. Robbins	PHI
Presentation Skill	Micheal Hatton	ISTE N Delhi
Stress Management Through Yoga and meditation		Sterling Publisher Pvt Ltd
Target Setting and goal Achievement	Richard Hale, Peter Whilom	Kogan Page (I) Pvt Ltd
Time Management	Chakravarty, Ajanta	Rupa & Company
Working in Team	Harding ham, A	Orient Longman

INTERNET ASSISTANCE

1. <http://www.mindtools.com>
2. <http://www.stress.org>
3. <http://www.ethics.com>
4. <http://www.coopcomm.org/workbook.htm>
5. <http://www.mapforprofits.org/>
6. <http://www.learningmeditation.com> <http://bbc.co.uk/learning/courses/>
7. <http://eqi.org/>
8. <http://www.abacon.com/commstudies/interpersonal/indisclosure.html>
9. <http://www.mapnp.org/library/ethics/ethxgde.htm>
10. http://www.mapnp.org/library/grp_cnfl/grp_cnfl.htm
11. <http://members.aol.com/nonverbal2/diction1.htm>
12. http://www.thomasarmstron.com/multiple_intelligences.htm
13. <http://snow.utoronto.ca/Learn2/modules.html>
14. <http://www.quickmba.com/strategy>

Note: Syllabus of Development of Life Skill II will be revised to make it common for all dept. & It will be circulated separately.

Syllabus for PROFESSIONAL PRACTICE II

Name of the Course : Diploma in Electronics & Instrumentation Engineering	
Name of the Subject : Professional Practice II	
Subject Code:	Semester: Third
Duration: 6 months	Maximum Marks: 50
Teaching Scheme: Theory : Tutorial : Practical: 2 hrs/week	Examination Scheme: (Only Internal Assessment) Continuous Internal Assessment : 30 Viva / report / notebook etc : 20
Credit: 1	
Aim:	
1	After passing most of the diploma holders join industries. Due to globalization and competition in the industrial and service sector the selection for job is based on campus interview and competitive tests
2	While selecting candidates a normal practice adopted is to see general confidence, attitude, ability to communicate, in addition with basic technical concept.
3	Professional practice will provide opportunity to students to undergo activities which will enable them to develop confidence, attitude etc. Industrial visits, expert lectures, seminars on technical topics and group discussions are planned here so that there will be increased participation of students in learning process.
Objective:	
Sl No.	The Student will able to
1	Answer aptitude and reasoning test successfully
2	Acquire information from different sources
3	Prepare notes for given topics
4	Present given topic in a seminar
5	Interact with peers to share thought
	Prepare a report on industrial visit, expert lecture

Pre-requisite:		
1	Knowledge on basic electrical & electronic engineering	
2	Knowledge on Instrumentation engineering	
3	Knowledge of computer	
4	Knowledge of internet access	
Contents		
Module	Name of the Topic / activity	Hrs / Module
1	Aptitude and Reasoning Practice 1.1 General Aptitude 1.1.1 Arithmetic Aptitude 1.1.2 Data Interpretation 1.2 Verbal & Reasoning 1.2.1 Verbal Ability 1.2.2 Logical Reasoning 1.2.3 Verbal Reasoning 1.2.4 Non Verbal Reasoning	
2	Lecture by Professional / Industrial experts / Student Seminar based on following areas (at least two) a) Fire Fighting / safety Precaution and First Aids b) Yoga Meditation c) Problems of drinking water in rural areas d) Interview techniques e) Various petroleum product and its application f) Advancement of modern and new energy source g) Green Energy Concept h) Temperature reading and controlling through fiber Cable i) Electrical and pneumatic transmission j) Smart and Intelligent Instruments k) Any other suitable topic	
3	Group Discussion The student should discuss in a group of six to eight students. Two topics (at least) for group discussions may be selected by the faculty members. Some of the suggested topics are- a) Road safety rules awareness b) CNG vs LPG as fuel c) Load shading and remedial measure d) Safety in day to day life e) Energy saving in institute f) Tuitions should be banned g) Computers have resulted in unemployment h) Effects of cinema/media on youth i) Criticism is good or bad j) Advantage of co- education k) Any other suitable topic	
4	Field Visit	

	<p>Structured field visit (at least 1) be arranged and report of the same should be submitted by the student, as part of term work. The field visit may be arranged in the following areas / Industries</p> <p>a) Dairy plant b) Soft drink plant c) Instrument calibration laboratory d) Captive power Plant (Thermal) e) Power Generation Station f) Jute Industry g) Water treatment plant h) Paper printing plant i) Any other plant / laboratory</p>	
5	<p>Free & Open Source Software 5.1 Introduction to LibreOffice Calc 5.1.1 Getting started with LibreOffice Calc 5.1.1.1 Working with Cells 5.1.1.2 Working with Sheets 5.1.1.3 Formatting data 5.1.1.4 Basic data manipulation 5.1.1.5 Working with data 5.1.2 Different operations in LibreOffice Calc 5.1.2.1 Using Charts & graphs 5.1.2.2 Images and graphics 5.1.2.3 Advanced formatting and protection 5.1.2.4 Formulas and functions 5.1.2.5 5.2 Introduction to LibreOffice Impress 5.2.1 Getting Started with LibreOffice Impress 5.2.1.1 Creating a presentation document 5.2.1.2 Viewing a presentation document 5.2.1.3 Inserting Picture and objects 5.2.1.4 Printing a presentation document 5.2.2 Presentation in Impress 5.2.2.1 Slide Master Slide Design 5.2.2.2 Custom Animation 5.2.2.3 Slide Creation 5.2.2.4 Presentation Notes</p>	

Books:

Title	Author	Publisher
Quantitative Aptitude	Mohon Rao	Scitech
Quantitative Aptitude and Reasoning	Praveen	PHI
A modern Approach to Verbal and Nonverbal Reasoning	R S Aggrawal	S Chand
Quantitative Aptitude for Competitive Exam	R S Aggrawal	S Chand
A New Approach to Reasoning Verbal & Non-verbal	B.S. Sijwali,Indu Sijwali	Arihant
First Track Objective Arithematic	Rajesh Verma	Arihant
Reasoning (verbal/ Non-Verbal/ Logical)	J K Sharma	Unique Publisher
How to Crack Test of Reasoning	Jaikishan, Premkishan	Arihant
General Aptitude: Quantitative Aptitude & Reasoning for Competitive Examinations	GKP	G K Publisher

