STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA

TEACHING AND EVALUATION SCHEME FOR 4th Semester (Electronics & Communication)(wef 2019-20)

Subject Number	Subject Code	Subject	Periods/week			Evaluation Scheme			
			L	T	P	Internal Assessment / Sessional	End Sem Exams	Exams (Hours)	Total
		Theory							
Th.1		ELECTRICAL MACHINE *	4	-	-	20	80	03	100
Th.2		Data Communication and Computer Network *	4	-	-	20	80	03	100
Th.3		MICROPROCESSOR & MICROCONTROLLER*	5	-	-	20	80	03	100
Th.4		ANALOG ELECTRONICS & LINEAR IC	5	-	-	20	80	03	100
		Total	*18*	-	-	*80*	*320*	-	*400*
		Practical							
Pr.1		ELECTRICAL MACHINE LAB	-	-	4	25	50	03	75
Pr.2		Networking Lab	-	-	4	25	50	03	75
Pr.3		MICROPROCESSOR & MICROCONTROLLER LAB	-	-	4	25	25	03	50
Pr.4		ANALOG ELECTRONICS & Linear IC LAB	-	-	4	50	50	03	100
Pr.5		Technical Seminar	-	-	2	50	-	-	50
		Student Centred Activities(SCA)	-	-	3	-	-	-	-
		Total	-	-	*21*	*175*	*175*	-	*350*
		Grand Total	**18**	**-**	**21**	**255**	**495**	**-**	**750**

Abbreviations: L-Lecturer, T-Tutorial, P-Practical. Each class is of minimum 55 minutes duration

Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50% and in Aggregate is 40%

SCA shall comprise of Extension Lectures/ Personality Development/ Environmental issues /Quiz /Hobbies/ Field visits/ cultural activities/Library studies/Classes on MOOCS/SWAYAMetc. , Seminar and SCA shall be conducted in a section.

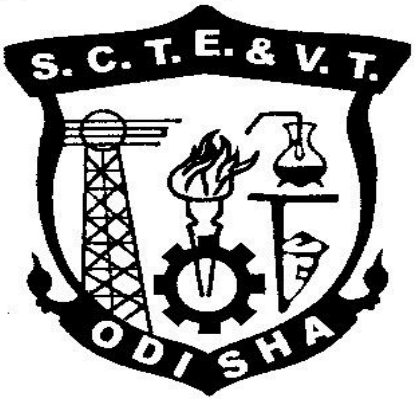
There shall be 1 Internal Assessment done for each of the Theory Subject. Sessional Marks shall be total of the performance of individual different jobs/ experiments in a subject throughout the semester

CURRICULLUM OF 4th SEMESTER

For

DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING

(Effective FROM 2019-20 Sessions)



STATE COUNCIL FOR TECHNICAL EDUCATION & VOCATIONAL TRAINING, ODISHA, BHUBANESWAR

Th.1 **ELECTRICAL MACHINE**

(Common to **ETC, AEI,EEE,E&M**)

Theory Marks	: 4 Periods per week	I.A.	:20
Total Periods Marks	:60 Periods	Term End Exam	: 80
Examination Marks	: 3 Hours	TOTAL MARKS	: 100

Chapter wise Distribution of periods with Total periods

Sl.No.	Topics	Periods
1.	ELECTRICAL MATERIAL	03
2.	DC GENERATOR	07
3.	DC MOTOR	10
4.	AC CIRCUITS	08
5.	TRANSFORMER	10
6.	INDUCTION MOTOR	07
7.	SINGLE PHASE INDUCTION MOTOR	06
	TOTAL	60

Rationale:

The application of Rotatory and Static Electrical machines find extensive use in modem industries is still in practice. The Electrical machine subject is intended to provide insight of different materials and in Electrical Engineering and the concept of different Electrical Machines with their operation and control. This subject also deals with the fundamental concept of single phase and three phase AC machines.

Objective:

After completion of this course the student will be able to:

1. Understand property & use of Electrical conducting & insulating materials.
2. Explain working principle & construction of DC generator.
3. Explain construction & working principle of motor & speed control of DC motor.
4. Discuss AC fundamentals.
5. Explain Construction & principle of transformer.
6. Describe principle of working of three-phase Induction motor.
7. Describe principle of single-phase motor.

Detailed Contents:

Unit-1. ELECTRICAL MATERIAL

1.1 Properties & uses of different conducting material.
1.2 Properties & use of various insulating materials used electrical engineering.
1.3 Various magnetic materials & their uses.

Unit-2. **DC GENERATOR**

2.1 Construction, Principle & application of DC Generator.
2.2 Classify DC generator including voltage equation.
2.3 Derive EMF equation & simple problems.
2.4 Parallel operation of DC generators.

Unit-3. **DC MOTOR**

3.1 Principle of working of a DC motor.
3.2 Concept of development of torque & back EMF in DC motor including simple problems.
3.3 Derive equation relating to back EMF, Current, Speed and Torque equation
3.4 Classify DC motors & explain characteristics, application.
3.5 Three point & four point stator/static of DC motor by solid State converter.
3.6 Speed of DC motor by field control and armature control method.
3.7 Power stages of DC motor & derive Efficiency of a DC motor.

Unit-4. **AC CIRCUITS**

4.1 Mathematical representation of phasors, significant of operator "J"
4.2 Addition, Subtraction, Multiplication and Division of phasor quantities.
4.3 AC series circuits containing resistance, capacitances, Conception of active, Reactive and apparent power and Q-factor of series circuits & solve related problems.
4.4 Find the relation of AC Parallel circuits containing Resistances, Inductance and Capacitances Q-factor of parallel circuits.

Unit-5.**TRANSFORMER**

5.1 Ideal transformer.
5.2 Construction & working principle of transformer
5.3 Derive of EMF equation of transformer, voltage transformation ratio.
5.4 Discuss Flux, Current, EMF components of transformer and their phasor diagram under no load Condition.
5.5 Phasor representation of transformer flux, current EMF primary and secondary Voltages under loadedcondition.
5.6 Types of losses in Single Phase (1-ø) Transformer.
5.7 Open circuit & short-circuit test (simple problems)
5.8 Parallel operation of Transformer.
5.9 Auto Transformer

Unit-6. INDUCTION MOTOR

6.1 Construction feature, types of three-phase induction motor.
6.2 Principle of development of rotating magnetic field in the stator.
6.3 Establish relationship between synchronous speed, actual speed and slip of induction motor.
6.4 Establish relation between torque, rotor current and power factor.
6.5 Explain starting of an induction motor by using DOL and Star-Delta stator. State industrial use of induction motor.

Unit-7. SINGLE PHASE INDUCTION MOTOR

7.1 Construction features and principle of operation of capacitor type and shaded pole type of single-phase induction motor.
7.2 Explain construction & operation of AC series motor.
7.3 Concept of alternator & its application.

Coverage of Syllabus upto Internal Exams(I.A.)

Chapter 1,2,3,4

Books Recommended

1. Fundamental of Electrical Engg by B.L.Theraja,- S Chand
2. Electrical MachinesBy Dr.S.K.Bhattachary, TMH
3. Electrical TechnologyBy H.Cotton, Pitman
4. Principle of Electrical MachineBy V K Mehta & R Mehtam, S Chand
5. General Electrical energy by Dr. B.R. Gupta, S Chand
6. Electrical Machinery Fundamental by Stephen J. Chapman, MGH

TH-2 DATA COMMUNICATION & COMPUTER NETWORK

(Common to CSE/IT/ETC/AEI**)**

Theory	: 4 Periods per week	I.A.	:20 Marks
Total Periods	:60 Periods	Term End Exam	: 80 Marks
Examination	: 3 Hours	TOTAL MARKS	: 100 Marks

Chapter wise Distribution of periods with Total periods

Sl. No.	Topics	Periods
1	NETWORK& PROTOCOL	08
2	DATA TRANSMISSION & MEDIA	08
3	DATA ENCODING	08
4	DATA COMMUNICATION & DATA LINK CONTROL	08
5	SWITCHING & ROUTING	10
6	LAN TECHNOLOGY	10
7	TCP/IP	08
	TOTAL	**60**

RATIONALE:

Now a days the growth of data communication technology has become very fast in development of various application areas. This subject will expose the learner to have an idea about the architecture computer network and different protocols to be followed to communicate. Further they will have an idea about different mode of communication.

Objective:

After completion of this course the student will be able to:

- Know the concepts of Data Communication, networking, protocols, and networking models
- Know the various transmission Medias
- Understand the concepts of switching
- Understand various Error detection and correction methods
- Know about data flow and error control
- Know about data link control
- Understand multiple access
- Learn the concepts of wired LANs and Ethernet
- Compare various connecting devices
- Know the concepts of network layer, logical addressing, IP, Forwarding and routing
- Understand brief concept on TCP/IP

Detailed Contents:

Unit-1. Network& Protocol

1.1 Data Communication

1.2 Networks

1.3 Protocol & Architecture, Standards, OSI, TCP/IP

Unit-2. Data Transmission & Media

2.1 Data transmission Concepts and Terminology

2.2 Analog and Digital Data transmission

2.3 Transmission impairments, Channel capacity

2.4 Transmission media, Guided Transmission, Wireless Transmission

Unit-3. Data Encoding

3.1 Data encoding,

3.2 Digital data digital signals,

3.3 Digital data analog signals

3.4 Analog data digital signals

3.5 Analog data analog signals

Unit-4. Data Communication & Data link control

4.1 Asynchronous and Synchronous Transmission

4.1 Error Detection

4.3 Line configuration

4.4 Flow Control,

4.5 Error Control

4.6 Multiplexing

4.7 FDM synchronous TDM

4.8 Statistical TDM

Unit-5. Switching & Routing

5.1 Circuit Switching networks

5.2 Packet Switching principles

5.3 X.25

5.4 Routing in Packet switching

5.5 Congestion

5.6 Effects of congestion, congestion control

5.7 Traffic Management

5.8 Congestion Control in Packet Switching Network.

Unit-6. LAN Technology

6.1. Topology and Transmission Media

6.2 LAN protocol architecture

6.3. Medium Access control

6.4 Bridges, Hub, Switch

6.5 Ethernet (CSMA/CD), Fiber Channel

6.6 Wireless LAN Technology..

Unit-7. TCP/IP

7.1 TCP/IP Protocol Suite

7.2 Basic Protocol functions

7.3 Principles of Internetworking

7.3 Internet Protocol operations

7.4 Internet Protocol

Coverage of Syllabus upto Internal Exams(I.A.)

Chapter 1,2,3,4

Books Recommended:

Sl.No	Name of Authors	Title of the Book	Name of the publisher
01	W.Stallings	Data Communication &Computer Networks	PHI
02	M.Bhatia	Introduction to Comp. Network	Unv. S. Press
03	Forouzen	Data Communication & Network	TMH

Th.3 MICROPROCESSOR & MICROCONTROLLER

(Common to ETC,AE&I,CSE &IT)

Theory	: 5 Periods per week	I.A.	:20 Marks
Total Periods	: 75 Periods	Term End Exam	: 80 Marks
Examination	: 3 Hours	TOTAL MARKS	: 100 Marks

Chapter wise Distribution of periods with Total periods

Sl.No.	Topics	Periods
1.	Microprocessor(Architecture and Programming-8085(8-bit))	15
2.	Instruction Set and Assembly Language Programming(8 bit)	15
3.	TIMING DIAGRAMS	08
4.	Microprocessor Based System Development Aids	10
5.	Microprocessor (Architecture and Programming-8086-16 bit)	12
6.	Microcontroller (Architecture and Programming-8 bit)	15
	TOTAL	75

Rationale:

The Microprocessor control has taken predominance over other types of control quite some time past. Starting from Electrical Power plant to consumer electronics this tiny chip finds extensive uses. As such Microprocessors have made pervading influence on our lives. This field is developing so rapid that it is difficult to keep track with the changes. Under this subjects Architecture and instruction sets of 8 bit and 16 bit processor have been discussed. Some applications have been included through the interfacing chips. Microcontroller (MC) may be called computer on the chip since it has basic features of a microprocessor with internal ROM, RAM, Parallel and serial ports within a single chip. Or we can say microprocessor with memory and ports is called as a microcontroller.Microcontroller is a programmable digital processor with necessary peripherals. Both microcontrollers and microprocessors are complex sequential digital circuits meant to carry out job according to the program / instructions. Sometimes analog input/output interface makes a part of microcontroller circuit of mixed mode(both analog and digital nature).

Objective:

After completion of this course the student will be able to:

1. Know differential between 8085 microprocessor &types of Bus.
2. Describe the Architecture & pin diagram of 8085 microprocessor.
3. Comprehend different instructions of 8085 microprocessor &addressing modes.
4. Write instructions under different addressing modes.
5. Discuss assembler & basic assembler directives.
6. Describe types of assembly language programs and write programs.
7. Explain the timing diagrams of different instructions.
8. State the functions of the interfacing chips like 8255, etc.
9. Explain the delay subroutine &calculate the delay by using one, two or three registers.
10. Explain ADC & DAC?&use of ADC & DAC modules
11. Write a program for traffic light control &stepper motor control.
12. Know about 16-bit microprocessor.

Detailed Contents:

Unit-1:Microprocessor (Architecture and Programming-8085-8-bit)

1.1 Introduction to Microprocessor and Microcomputer & distinguish between them.
1.2 Concept of Address bus, Data bus, Control bus & System Bus
1.3 General Bus structure Block diagram.
1.4 Basic Architecture of 8085 (8 bit) Microprocessor
1.5 Signal Description (Pin diagram) of 8085 Microprocessor
1.6 Register Organizations,Distinguish between SPR & GPR, Timing & Control Module,
1.7 Stack, Stack pointer &Stack top.

1.8 Interrupts:-8085 Interrupts, Masking of Interrupt(SIM,RIM)

Unit-2: Instruction Set and Assembly Language Programming

2.1 Addressing data & Differentiate between one-byte, two-byte &three-byte instructions with examples.
2.2 Addressing modes in instructions with suitable examples.
2.3 Instruction Set of 8085(Data Transfer, Arithmetic, Logical, Branching, Stack& I/O , Machine Control)
2.4 Simple Assembly Language Programming of 8085
- 2.4.1 Simple Addition & Subtraction
- 2.4.2 Logic Operations (AND, OR, Complement 1's & 2's) & Masking of bits
- 2.4.3 Counters & Time delay (Single Register, Register Pair, More than Two Register)
- 2.4.4 Looping, Counting & Indexing (Call/JMP etc).
- 2.4.5 Stack & Subroutine programes.
- 2.4.6 Code conversion, BCD Arithmetic & 16 Bit data Operation, Block Transfer.
- 2.4.7 Compare between two numbers
- 2.4.8 Array Handling (Largest number & smallest number in the array)

2.5 Memory & I/O Addressing,

Unit-3: TIMING DIAGRAMS.

3.1 Define opcode, operand, T-State, Fetch cycle, Machine Cycle, Instruction cycle & discuss the concept of timing diagram.
3.2 Draw timing diagram for memory read, memory write, I/O read, I/O write machine cycle.
3.3 Draw a neat sketch for the timing diagram for 8085 instruction (MOV, MVI, LDA instruction).

Unit-4 Microprocessor Based System Development Aids

4.1 Concept of interfacing
4.2 Define Mapping &Data transfer mechanisms - Memory mapping & I/O Mapping
4.3 Concept of Memory Interfacing:- Interfacing EPROM & RAM Memories
4.4 Concept of Address decoding for I/O devices
4.5 Programmable Peripheral Interface: 8255
4.6 ADC & DAC with Interfacing.
4.7 Interfacing Seven Segment Displays
4.8 Generate square waves on all lines of 8255
4.9 Design Interface a traffic light control system using 8255.
4.10 Design interface for stepper motor control using 8255.
4.11 Basic concept of other Interfacing DMA controller,USART

Unit-5 Microprocessor (Architecture and Programming-8086-16 bit)

5.1 Register Organisation of 8086
5.2 Internal architecture of 8086
5.3 Signal Descriptionof 8086
5.4 General Bus Operation& Physical Memory Organisation
5.5 MinimumMode&Timings,
5.6 Maximum Mode&Timings,
5.7 Interrupts and Interrupt Service Routines, Interrupt Cycle, Non-Maskable Interrupt, Maskable Interrupt
5.8 8086 Instruction Set & Programming: Addressing Modes, Instruction Set, Assembler Directives and Operators,

5.9 Simple Assembly language programmingusing 8086 instructions.

Unit-6 Microcontroller (Architecture and Programming-8 bit):-

6.1 Distinguish between Microprocessor & Microcontroller
6.2 8 bit & 16 bit microcontroller
6.3 CISC & RISC processor
6.4 Architectureof8051Microcontroller
6.5 Signal Descriptionof8051Microcontrollers
6.6 Memory Organisation-RAM structure, SFR
6.7 Registers,timers,interruptsof8051Microcontrollers
6.8 Addressing Modes of 8051
6.9 Simple 8051 Assembly Language ProgrammingArithmetic & Logic Instructions , JUMP, LOOP, CALL Instructions, I/O Port Programming
6.10 Interrupts, Timer & Counters
6.11 Serial Communication
6.12 Microcontroller Interrupts and Interfacing to 8255

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

Books Recommended

1. *Microprocessor architecture, programming & application with 8085 by R.S. Gaonkar, PenramInternational Publishing. (India) Pvt. Ltd.*
2. *The 8051 Microcontroller & Embedded Systems by Mazidi&Mazidi, - Pearson publication*
3. *Advanced Microprocessor and Peripherals (Architecture, Programming & Interfacing) by A.K. Roy & K.M. Bhurchandi, - TMH Publication*
4. *Microprocessor & Microcontroller by N.SenthliKumar,M.Sarvanan,S.Jeevananthan,S K Shah- OXFORD*
5. *Microprocessor & Microcontroller by R.S. Kaler, IKI Publishing*
6. *Microprocessor & its application by B.Ram,Dhanpat rai*
7. *Microcontroller, Theory and application by Ajaya V. Deshmukh. TMH*

Th.4. ANALOG ELECTRONICS & LINEAR IC

Theory	: 5 Periods per week	I.A.	:20 Marks
Total Periods	:75 Periods	Term End Exam	: 80 Marks
Examination	: 3 Hours	TOTAL MARKS	:100 Marks

Chapter wise Distribution of periods with Total periods

SL NO.	TOPIC	PERIODS
1.	DIODE, TRANSISTORS AND CIRCUITS	10
2.	AUDIO POWER AMPLIFIERS.	08
3.	FIELD EFFECT TRANSISTOR (FET).	10
4.	FEED BACK AMPLIFIER & OSCILLATOR	08
5.	TUNED AMPLIFIER & WAVE SHAPING CIRCUIT	12
6.	OPERATIONAL AMPLIFIER CIRCUITS & FEEDBACK CONFIGURATIONS	14
7.	APPLICATION OF OPERATIONAL AMPLIFIER, TIMER CIRCUITS & IC voltage regulator	13
		75

Rationale:

Analog Electronics has played an developmental role in the field of Electronics. In each and every field, electronics systems are used. Analogelectronics is one of the subjects which is the base of all advance electronics .It starts with PN junction which makes the student to follow the functioning of all semiconductor based electronics. This is a core group subject and it develops cognitive and psychomotor skills. This Subject deals the fundamental analysis & design of Electronics and systems. The concept of Semiconductor, different electronics circuits and their applications will required in the subject Analog Electronics. This subject also which deals with Analog Integrated Circuits and wave shaping Circuits for various applications in Electronics Engineering. The operational Amplifier will play vital role in day to day life of most of the Electronics equipment. The concept of operational Amplifier, IC voltage regulator has also been incorporated in this subject.

Objective:

After completion of this course the student will be able to:

1. Know the concept of Diode& its applications
2. Know about transistor & its parameters
3. Know the different types of Audio & Power Amplifiers.
4. Know about the Field Effect Transistors & its classification.
5. Know about the concept of Feedback Amplifier.
6. Concept of Barkhausen Criterion of Oscillation & the different types of oscillators & its applications.
7. Know about the concept of Tuned Amplifier.
8. Know the concept of Clipping & Clamping circuits& wave shaping circuits
9. Concept of Operational Amplifier
10. Different Characteristics Op-Amp.
11. Concept of IC Voltage Regulator.

Detailed Contents:

Unit-1: DIODE, TRANSISTORS AND CIRCUITS.

1.1 Working principle, of Diode & its current equation, Specification anduse of p-n junction diode.

1.2 Breakdown of diode (Avlance&Zener Breakdown) and Construction, working, Characteristics

1.3 Classification of Rectifiers and working of different types of Rectifiers- Half-Wave Rectifier, Full-Wave Rectifier (CT & BRIDGE type)

1.4 Working principle of p-n-p and n-p-n transistor, different types of transistor connection (CB, CE and CC)& input and output characteristics of transistor in different connections.

1.5 Define ALPHA, BETA and GAMMA of transistors in various modes. Establish the Mathematical relationship between them.

1.6 Basic concept of Biasing, Types of Biasing,h-parameter model of BJT,load line (AC &DC) and determine the Q-point.

1.7 Types of Coupling, working principle and use of R-C Coupled Amplifier & Frequency Responses of R-C coupled Amplifier & draw the curve.

Unit-2: AUDIO POWER AMPLIFIERS.

1.1 Classify Power Amplifier &Differentiate between Voltage and Power Amplifier.

1.2 Working principle of different types of Power Amplifier (Class-A, Class-AB, Class-B and Class-C & Class D amplifier).

1.3 Construction and working principle and advantages of Push Pull (Class-B) Amplifiers

Unit-3: FIELD EFFECT TRANSISTOR (FET).

3.1 FET & its classifications &Differentiate between JFET & BJT.

3.2 Construction, working principle & characteristics of JEFT &Explain JEFT as an amplifier, parameters of JFET & Establish relation among JFET parameters.

3.3 Construction & working principle MOSFET & its classification & characteristics (Drain & Transfer)

3.4 Explain the operation of CMOS, VMOS & LDMOS.

Unit-4: FEED BACK AMPLIFIER & OSCILLATOR

4.1 Define & classify Feedback Amplifier, principle of negative feedback with the help of block diagram, Types of feedback – negative &positive feedback.

4.2 Types of negative feedback – voltage shunt, voltage series, current shunt& current series and characteristics voltage gain, bandwidth , input Impedance output impedance, stability, noise , distortion in amplifiers.

4.3 Oscillator -block diagram of sine wave oscillator ,Types Requirement of oscillation-Barkhausen criterion

4.4 RC oscillators – RC phase shift ,Crystal, LC oscillators – Colpitts , Hartley & Wien Bridge Oscillators :Circuit operation, circuit diagram, equation for frequency of oscillation & frequency stability

Unit-5: TUNED AMPLIFIER & WAVE SHAPING CIRCUIT

5.1 Defined and classify Tuned amplifier, Explain parallel Resonant circuit, Resonance Curve & sharpness of Resonance.

5.2 working principle of Single tuned Voltage& Double tuned Amplifier & its limitation

5.3 Different type of Non-linear circuits - Clipper, diode series &shunt, positive& negative biased & unbiased and combinational clipper clippers circuit & its application.

5.4 Different type of Clamper circuit (positive & negative clampers) & its application.

5.5 Working of Astable, Monostable & BistableMultivibrator with circuit diagram.

5.6 Working& use of Integrator and Differentiator circuit using R- C circuit(Linear), input / output waveforms & frequency response.

Unit-6: OPERATIONAL AMPLIFIER CIRCUITS & FEEDBACK CONFIGURATIONS

6.1 Differential amplifier & explain its configuration &significance.
6.2 Block diagram representation of a typical Op- Amp, its equivalent circuits and draw the schematic symbol
6.3 Discuss the types of integrated circuits manufacturer's designations of ICs, Package types, pin identification and temperature and ordering information.
6.4 Define the following electrical characteristics input offset voltage, input offset current, CMMR, Large signal voltage gain, Slew rate .
6.5 Draw and explain the Open Loop configuration (inverting, non-inverting Amplifier)
6.6 Draw the circuit diagram of the voltage series feedback amplifier and derive the close loop Voltage gain, gain of feedback circuits input resistance, and output resistance, bandwidth and total output offset voltage with feedback.
6.7 Draw the circuit diagram of the voltage shunt feedback amplifier and derive the close loop, Voltage gain, gain of feedback circuits and input resistance, and output resistance, bandwidth and total output offset voltage with feedback.

Unit-7. APPLICATION OF OPERATIONAL AMPLIFIER, TIMER CIRCUITS& IC voltage regulator

7.1 Discuss the summing scaling and averaging of inverting and non-inverting amplifiers
7.2 DC & AC Amplifies using OP-AMP.
7.3 Integrator and differentiator using op-amp.
7.4 Active filter and describe the filter design of fast order low Pass Butterworth
7.5 Concept of Zero-Crossing Detector using Op-Amp
7.6 Block diagram and operation of IC 555 timer &IC 565 PLL& its applications.
7.7 Working of Current to voltage Convertor using Operational Amplifier
7.8 Working of the Voltage to Frequency Convertor using Operational Amplifier.
7.9 Working of the Frequency to Voltage Conversion using Operational Amplifier.
7.10 Operation of power supply using 78XX and 79XX,LM 317 Series with their PIN configuration
7.11 Functional block diagram & Working of IC regulator LM 723 & LM 317.

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4,5

Books Recommended

1. *A Textbook of Electronic Circuit by Dr. R.S. Sedha,-S.Chand Publication*
2. *Micro Electronic Circuits By Adel S. Sedra,Kenneth C. Smith, -Oxford publication,*
3. *Electronic Devices and Circuit Theory, Robert L. Boylestad, Louis Nashelsky, -Pearson Education*
4. *Operational Amplifier & Linear Integrated Circuit by R.K. Geakward,PHI*
5. *Millman's Electronic Devices and Circuits, Millman,Halkias, SatyabrataJit, -McGraw-Hill*
6. *Basic Electronics & linear Circuits by N.N.Bhargaya,D.C. Kulshreshtha&S C Gupta- McGraw Hill*
7. *Electronics principle by Sahdev-DhanpatRai&Co.Pub*
8. *Micro Electronics Circuits by Adel S. Sedra, Kenneth,C.Smith,Oxford Publication*

Pr1. ELECTRICAL MACHINE LAB

(Common to ETC / AEI)

Practical	: 4 Periods per week	Sessional	: 25 Marks
Total Periods	:60 Periods	Term End Exam	: 50 Marks
Examination	: 3 Hours	TOTAL MARKS	: 75 Marks

RATIONALE:

This Lab gives understanding of different Electrical Machine i.e. DC Generator, DC Motor, Transformer, etc. The students will able to identify different parts and connections and test the equipment. Different types of Motors are discussed.

OBJECTIVS:

On completing of this Lab. Course the students will able to

1. Run the DC Generator & DC Motor.
2. Connection of above Machine.
3. Find the losses of Transformer
4. Determine voltage Regulation

Skills to be developed:

Intellectual Skills:

1. Identification and selection of components.
2. Interpretation of circuits.
3. Understand working of Regulated dc power supply.

Motor skills:

1. Ability to draw the circuits.
2. Ability to measure various parameters.
3. Ability to test the components using multimeter.

List of Practicals:

1. Study different parts of DC Generator.
2. Run a DC shunt Generator
3. Connect and run DC Motor (series, shunt and compound motor with suitable stators connections & measure speed.).
4. Study 3 point & 4 point starter.
5. Study speed Control of DC shunt motor(field and armature control method)
6. Parallel operation of DC generators.
7. Connect & run a 3- I.M. with the help of DOL & star-delta stator.
8. Determine voltage regulation of transformer by direct loading.
9. Identify the terminals of a transformer perform short circuit & open circuit test & find the losses & efficiency.
10. Parallel operation of Transformers(only single Phase)
11. Construct switch board& Series Board using cut-out, switches, plugs, holder and two ways Switch.

Pr.2- NETWORKING LAB

(Common to CSE,IT ETC , AE&I)

Practical	: 4 Periods per week	Sessional	:25Marks
Total Periods	:60 Periods	Term End Exam	:50 Marks
Examination	: 3 Hours	TOTAL MARKS	:75 Marks

LIST OF PRACTICALS:-

1. Recognize the physical topology and cabling (coaxial, OFC, UTP, STP) of a network.
2. Recognition and use of various types of connectors RJ-45, RJ-11,BNC and SCST
3. Making of cross cable and straight cable
4. Install and configure a network interface card in a workstation.
5. Identify the IP address of a workstation and the class of the address and configure the IP Address on a workstation
6. Managing user accounts in windows and LINUX
7. Sharing of Hardware resources in the network.
8. Use of Netstat and its options.
9. Connectivity troubleshooting using PING, IPCONFIG
10. Installation of Network Operating System(NOS)
11. Create a network of at least 6 computers.
12. Study of Layers of Network and Configuring Network Operating System
13. Study of Routing and Switching, configuring of Switch and Routers, troubleshooting of networks
14. Study of Scaling of Networks, Design verities of LAN and forward of Traffic
15. Study WAN concepts and Configure and forward Traffic in WAN
16. Configure IPv4 and IPv6 and learn Quality, security and other services
17. Learn Network programming
18. Troubles shoot Networks.

Pr.3 - MICROPROCESSOR & MICROCONTROLLER LAB

(Common to ETC, AE&I, CSE & IT)

Practical	: 4 Periods per week	Sessional	:25 Marks
Total Periods	:60 Periods	Term End Exam	:25 Marks
Examination	: 3 Hours	TOTAL MARKS	:50 Marks

Rationale:

The Microprocessor control has taken predominance over other types of control quite some time past. Starting from Electrical Power plant to consumer electronics this tiny chip finds extensive uses. As such Microprocessors have made pervading influence on our lives. This field is developing so rapid that it is difficult to keep track with the changes. Under this subjects Architecture and instruction sets of 8 bit and 16 bit processor have been discussed. Some applications have been included through the interfacing chips.

Objective:

After completion of this course the student will be able to:

1. The concept of Microprocessor 8085 (8-Bit)
2. Concept of 16 Bit Processor 8086 (16 –Bit)
3. Programming & Interfacing Concept
4. Develop software for microcontroller systems using a high-level programming language
5. Demonstrate familiarity with common microcontroller subsystems, such as timer modules
6. Demonstrate an ability to use both polling and interrupt-driven approaches for interfacing a microcontroller(8-bit) with peripheral devices
7. Develop and analyze software to interface a microcontroller with common peripheral devices, such as switches, visual displays, digital-to-analog converters, analog-to-digital converters, and flash memory to produce a system to accomplish a specified task
8. Design interfaces to external devices connected to the microcontroller using a standard bus

List of Practicals:

NOTE: Total 14 Experiments Have To Be Completed.

(4 from Gr - A ,3 from Gr - B , 4 from Gr - C, 3 from Gr - D)

Gr A) 8085(Compulsory)

1. Addition, Subtraction, Multiplication, Division of two 8 bit numbers resulting 8/16 bit numbers.

Optional (Any three)

2. 1''s and 2's Complements
3. Binary to Gray Code / Hexadecimal to decimal conversion.
4. Logic Operations (AND, OR,) & Masking of bits
5. Time delay (Single Register, Register Pair, More than Two Register)
6. Compare between two numbers
7. Smallest /Largest number among n numbers in a given data array
8. Block Transfer of data

Gr B) 8086(Compulsory)

1. Addition, subtraction, Multiplication, Division of 16 bit nos + 2's complement of a 16 bit no.

Optional (Any two)

2. Marking of specific bit of a number using look-up table.
3. Largest /Smallest number of a given data array.
4. To separate the Odd and Even numbers from a given data array.
5. Sorting an array of numbers in ascending/descending order
6. Finding a particular data element in a given data array.

Gr-C) INTERFACING (Compulsory-any one)

1. Operation of 8255 using 8085 & 8051 microcontroller

2. Generate square waves on all lines of 8255 with different frequencies (concept of delay program)

OPTIONAL (Any Three) based on self-study

1. Study of stepper Motor and its operations (Clockwise, anticlockwise, angular movement, rotate in various speeds)
2. Study of Elevator Simulator
3. Generation of Square, triangular and saw tooth wave using Digital to Analog Converter
4. Study of 8253 and its operation (Mode 0, Mode 2, Mode 3)
5. Study of Mode 0, Mode 1, BSR Mode operation of 8255.
6. Study of 8279 (keyboard & Display interface)
7. Study of 8259 Programmable Interrupt controller.
8. Study of Traffic Light controller
9. Steeper Motor Controller.

Gr-D) 8051 MICROCONTROLLER (Compulsory) by self-study

1. Initialize data to registers and memory using immediate, register, direct and indirect addressing mode

OPTIONAL (any two)

2. Write a Program for
   - 2.1 Bit Digital Output-LED Interface
   - 2.2 8 Bit Digital Inputs (Switch Interface)
3. Write a Programs for(Any one)
   - 3.1 4 x 4 Matrix Keypad Interface
   - 3.2 Buzzer Interface
   - 3.3 Relay Interface
4. Write a Program for character based LCD Interface.
5. Write a Program for Analog to Digital Conversion (On chip ADC& DAC)
6. Interfacing With Temperature Sensor.
7. Write a program Stepper Motor Interface
8. Write a program to Generate Delay Subroutine
9. 805 Timer & Counter programming –Generate Square wave

Pr.4 ANALOG ELECTRONICS & Linear IC LAB

Practical	: 4 Periods per week	Sessional	: 50 Marks
Total Periods	: 60 Periods	Term End Exam	: 50 Marks
Examination	: 3 Hours	TOTAL MARKS	: 100 Marks

Rationale:

Analog Electronics lab is an introductory experimental laboratory that explores the design, construction, and debugging of analog electronic circuits. This laboratory projects investigate the performance characteristics of diodes, transistors, JFETs etc including the construction of a small audio amplifier and preamplifier. The course provides opportunity to simulate real-world problems and solutions that involve tradeoffs and the use of engineering judgment.Design of amplifiers and other electronic systems have to satisfy specifications. Bipolar and field-effect transistors, diodes integrated circuits and passive components are part of the hardware needed. Gain, bandwidth, feedback, stability are some of the design concepts needed.This Lab. Based on the application of Operational Amplifier, IC Voltage Regulated & PCB Design. The students will use software & Circuit maker software at the end of the section is an introductory experimental laboratory that explores the design, construction, and debugging of analog electronic circuits. This subject covers diodes, transistors, JFETs, op-amps, and basic analog circuit design as applied to audio and radio frequency circuits. Students spend for some periods term designing their own projects. Projects vary in scope and breadth, depending on students' level of prior background and interest. Students will learn to understand and use a wide variety of analog circuits.

Objective:

After completion of this course the student will be able to:

1. Perform various experiments Analog Electronic
2. Understand the behavior of different semiconductor devices
3. Understand the concept of Rectifiers,Amplifiers,Oscillatos,feedback amplifiers
4. Know the specifications of Electronics components
5. The Characteristics of operational Amplifier.
6. Construction of Timer Circuit.
7. Construction of Power Supply IC based

Skills to be developed:

Intellectual Skills:

1. Interpret results

2. Calculate values of various components for given circuits

3. Select instruments

Motor Skills:

1. Connect the instruments properly.

2. Take accurate readings

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List of Practicals: (**Perform Any 10 Experiments + Any 04 (using Software) have to be Completed) (Total=14 Expt)**

1. Determine the Forward & reverse characteristics of any two types Diode.
2. Construct Bridge Rectifier using different filter circuit and to determine Ripple factor & Analyse wave form with filter & without filter of above circuit.
3. Determine the input and output characteristics of CE & CB transistor configurations.
4. Construct & test the Transistor regulator using Zener diode.
5. Study the two stage CE amplifier , find Gain & draw the frequency response curve
6. Construct & Find the gain simple (i) Class A Amplifier. (ii) Class B Amplifier (iii) Class C Tuned Amplifier
7. Construct & test Class B -Push Pull amplifier & observe the wave form

8. Determine Drain & Transfer characteristics of JFET & MOSFET
9. Construct & calculate the frequency & Draw the wave formof
   (i) Hartly Oscillator
   (ii) Collpit's Oscillator
   (iii) Wein Bridge Oscillator
   (iv) R-C phase shift Oscillator
10. Construct & test Astable, Monostable & Bistable Multivibrator using OPAMP or IC 555.
11. Construct & test timer circuit using IC 555 timer
12. Observe the waveform of Clipper,Clamper circuits
13. Construct and test voltage power supply using 78xx ,79xx, LM 317 ICs (+5V, -5V,+9V,-9V)
14. Construct and test voltage power supply using LM723.
15. Study of Operational Amplifier 741 & draw its pin diagram
16. Construct and study inverting and non-inverting amplifier using OPAMP.
17. Construct and study the Integrator and differentiator using op-amp.
18. Construct and study Active filter and describe the filter design of fast order low Pass Butterworth
19. PCB Design (Visit to Industry/ Local Industry)
20. (Any Four from above) using p-spice / or **–Wiring X/MULTISIM** SOFTWARE, With this software you can create simple wiring layouts with the most common discreet electronic components or **TINA Design Suite-** A very nice and friendly circuit design and simulation program with 10,000+ built in components. Available in many languages)
21. Mini project: After PCB design place the component and test the Electronics Circuit and prepare a report at the end of session. At the end of Semester the Drafting, Simulation & design of PCB can be carried out using the following suitable software under Inovation Projects.

Required Software:

1. B2-Spice + Eagle : Simulation & PCB design software.
2. Supper CAD.
3. Electronics work bench: Simulation.
4. CADSTAR/TINA : PCB Design.
5. P Spice/TINA /MULTISIM : Simulation
6. Edwin : Simulation + PCB design.
7. ORCAD
8. Circuit Maker & etc.

Books Recommended

1. Handbook of Experiments in Electronics & Communication Engg by S P Rao&B.Sasikala-VIKAS
2. Advanced practical Electronics by KAR -Books & Allied Pvt

Pr.5 -TECHNICAL SEMINAR

Practical : 2 Periods per week Sessional : 50 Marks
Total Periods : 30 Periods TOTAL MARKS : 50 Marks

RATIONALE:

The Technical Seminar will provide Motivation among the students to develop new Technology Based on Advances in Electronics & Provide Guidance for Carrier Growth. The student will enhance their skills through Group Discussion & Presentation. They are communication skills with Managerial capability will be enhanced.

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 under go 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:

After Completing the Technical Seminars the students will able to:

1. Develop reading skills
2. Use techniques of acquisition of information from various sources
3. Draw the notes from the text for better learning.
4. Apply the techniques of enhancing the memory power.
5. Develop assertive skills.
6. Prepare report on industrial visit.
7. Apply techniques of effective time management.
8. Set the goal for personal development
9. Enhance creativity skills.
10. Develop good habits to overcome stress
11. Face problems with confidence
12. To motivation the students in developing life skills for successful career growth.

Each student has to select a recent topic of latest technology in the area of Electronics & Telecommunication Engg. and present a seminar in front of all students of the class. He/She has to prepare a PowerPoint presentation of the selected topic of minimum 10 slides are the total presentation will be approximately 10 minutes duration .There will be interactive session between the presenter and rest of the students including the faculty members of the dept at the end of presentation .A student has to present at least 2 nos.of seminar during a semester and to submit the report for evaluation.