MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ELECTRONIC CIRCUITS II LAB

Equipments Available in the Lab

Sl.No	Hardware	Specification	Quantity
Major Equipments			
1	CRO (Min)	30MHz	12
2	DSO	25MHz	3
3	Signal Generator /Function Generators	3 MHz	15
4	Regulated Dual Fixed Power Supplies	(0 – 30V)	7
5	Regulated Dual variable Power Supplies	(0 – 30V)	21
6	LCR meter		1
7	Standalone desktops PC	Dell Desktop Motherboard 1GB RAM, CRT Monitor Zebronics Keyboard and Optical Mouse	
8	Digital Multimeter		15
9	Wires Single strand		25
10	IC Trainer 10 bit		15
11	Seven segment display		40
12	Assembled LED board/LEDs		40
Minor Equipments			
13	Transistor/FET (BJT-NPN-PNP and NMOS/PMOS)		
14	Transistors, Resistors, Capacitors, diodes, Bread Boards, Transformers		
15	IC7400, IC7402, IC7404, IC7486, IC7408, IC7432, IC7483, IC74150, IC74151, IC74147, IC7445, IC7476, IC7491, IC555, IC7494, IC7447, IC74180, IC7485, IC7473, IC74138, IC7411, IC7474		
Software			
16	SPICE Circuit Simulation Software		
17	MATLAB 5-user		

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COURSES OFFERED

Sl.No	Odd Sem (Course code & Name)	Class	Even Sem (Course code & Name)	Class
1	EC 3361 - Electronic Devices and Circuits Lab	II ECE	EC 3462 - Linear Integrated Circuits Lab	II ECE
2	CS 3351 - Digital Principles and Computer Organization	II CSE/IT	EE 3412 - Linear and Digital Circuits Lab	II EEE
3	EC 3352 - Digital System Design	II ECE		

EC 3361- ELECTRONIC DEVICES AND CIRCUITS LABORATORY

OBJECTIVES:

- To learn the characteristics of PN Junction diode and Zener diode.
- To understand the operation of rectifiers and filters.
- To study the characteristics of amplifier.

OUTCOMES:

- Characteristics of PN Junction Diode and Zener diode.
- Design and Testing of BJT and MOSFET amplifiers.
- Operation of power amplifiers.

LIST OF EXPERIMENTS

1. Characteristics of PN Junction Diode and Zener diode.
2. Full Wave Rectifier with Filters.
3. Design of Zener diode Regulator.
4. Common Emitter input-output Characteristics.
5. MOSFET Drain current and Transfer Characteristics.
6. Frequency response of CE and CS amplifiers.
7. Frequency response of CB and CC amplifiers.
8. Frequency response of Cascode Amplifier
9. CMRR measurement of Differential Amplifier
10. Class A Transformer Coupled Power Amplifier

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EC 3352 - DIGITAL SYSTEM DESIGN

OBJECTIVES:

- To present the fundamentals of digital circuits and simplification methods
- To practice the design of various combinational digital circuits using logic gates
- To bring out the analysis and design procedures for synchronous and asynchronous Sequential circuits
- To learn integrated circuit families.
- To introduce semiconductor memories and related technology

OUTCOMES:

At the end of the course the students will be able to

- Use Boolean algebra and simplification procedures relevant to digital logic.
- Design various combinational digital circuits using logic gates.
- Analyse and design synchronous sequential circuits.
- Analyse and design asynchronous sequential circuits.
- Build logic gates and use programmable devices

LIST OF EXPERIMENTS

1. Design of adders and subtractors & code converters.
2. Design of Multiplexers & Demultiplexers.
3. Design of Encoders and Decoders.
4. Design of Magnitude Comparators
5. Design and implementation of counters using flip-flops
6. Design and implementation of shift registers.

CS 3351 - DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION

OBJECTIVES:

- To analyze and design combinational circuits.
- To analyze and design sequential circuits
- To understand the basic structure and operation of a digital computer.
- To study the design of data path unit, control unit for processor and to familiarize with the hazards.
- To understand the concept of various memories and I/O interfacing.

OUTCOMES:

At the end of this course, the students will be able to:

- Design various combinational digital circuits using logic gates

- Design sequential circuits and analyze the design procedures
- State the fundamentals of computer systems and analyze the execution of an instruction
- Analyze different types of control design and identify hazards
- Identify the characteristics of various memory systems and I/O communication

LIST OF EXPERIMENTS

1. Verification of Boolean theorems using logic gates.
2. Design and implementation of combinational circuits using gates for arbitrary functions.
3. Implementation of 4-bit binary adder/subtractor circuits.
4. Implementation of code converters.
5. Implementation of BCD adder, encoder and decoder circuits
6. Implementation of functions using Multiplexers.
7. Implementation of the synchronous counters
8. Implementation of a Universal Shift register.
9. Simulator based study of Computer Architecture

EC 3462 - LINEAR INTEGRATED CIRCUITS LABORATORY

OBJECTIVES:

- To gain hands on experience in designing electronic circuits
- To learn simulation software used in circuit design
- To learn the fundamental principles of amplifier circuits
- To differentiate feedback amplifiers and oscillators.
- To differentiate the operation of various multivibrators

OUTCOMES:

At the end of the course the students will be able to

- Analyze various types of feedback amplifiers
- Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators
- Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave- shaping circuits and multivibrators, filters using SPICE Tool.
- Design amplifiers, oscillators, D-A converters using operational amplifiers.
- Design filters using op-amp and perform an experiment on frequency response

LIST OF EXPERIMENTS:

DESIGN AND ANALYSIS OF THE FOLLOWING CIRCUITS

1. Series and Shunt feedback amplifiers-Frequency response, Input and output impedance
2. RC Phase shift oscillator and Wien Bridge Oscillator

3. Hartley Oscillator and Colpitts Oscillator
4. RC Integrator and Differentiator circuits using Op-Amp
5. Clippers and Clampers
6. Instrumentation amplifier
7. Active low-pass, High pass & Band pass filters
8. PLL Characteristics and its use as frequency multiplier, clock synchronization
9. R-2R ladder type D-A converter using Op-Amp

EE 3412 - LINEAR AND DIGITAL CIRCUITS LABORATORY

OBJECTIVES:

- To learn design, testing and characterizing of circuit behavior with combinational logic gate ICs.
- To learn design, testing and characterizing of circuit behavior with register/ counter an sequential logic ICs.
- To learn design, testing and characterizing of circuit behavior with OPAMP ICs.
- To learn design, testing and characterizing of circuit behavior with analog Ics like 555 timer VCO and regulators.
- To learn design, testing and characterizing of circuit behavior with digital Ics like decoders, multiplexers

OUTCOMES:

At the end of the course the students will be able to

- Ability to understand and implement Boolean Functions.
- Ability to understand the importance of code conversion
- Ability to Design and implement circuits with digital ICs like decoders, multiplexers, register.
- Ability to acquire knowledge on Application of Op-Amp
- Ability to Design and implement counters using analog ICs like timers, VCOs and digital ICs like Flip-flops and counters.

LIST OF EXPERIMENTS:

1. Implementation of Boolean Functions, Adder and Subtractor circuits.
2. Code converters: Excess-3 to BCD and Binary to Gray code converter and vice-versa.
3. Parity generator and parity checking.
4. Encoders and Decoders.
5. Counters: Design and implementation of 3-bit modulo counters as synchronous and Asynchronous types using FF IC’s and specific counter IC.
6. Shift Registers: Design and implementation of 4-bit shift registers in SISO, SIPO, PISO, PIPO modes using suitability IC’s.
7. Study of multiplexer and de multiplexer
8. Timer IC application: Study of NE/SE 555 timer in Astability, Monostability operation.

9. Application of Op-Amp: inverting and non-inverting amplifier, Adder, comparator, Integrator and
Differentiator.
10. Voltage to frequency characteristics of NE/ SE 566 IC.
11. Variability Voltage Regulator using IC LM317