SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA – 520010

AnAutonomous college in jurisdiction of Krishna University, A.P., India

S

Sub: ELECTRONICS	Course Code: ELE T11B	Year:2021– 22	Group: B.Sc	Credits 4

emester – I **PAPER – I**

CIRCUIT THEORY AND ELECTRONIC DEVICES

Syllabus

Unit	Learning Units	Lecture Hours
I	**Passive Networks: (D.C) AND Networks Theorems: (D.C)** 1. Branch current method, Nodal Analysis, star to delta and delta to star conversions, Superposition Theorem, Thevenin's Theorem, Norton'sTheorem, Maximum Power, Milliman and Reciprocity theorems.**(Problems)**	**16**
II	**RC & RL Circuits and the Sine Wave:** Transient response of RC and RL circuits with step input, The sine wave, average value, effective (R.M.S) values, Phase relations, Basic Response and frequency response of R, L & C elements. Differences between A.C and D.C. low pass and high pass filters, passive differentiating and integrating circuits.	**12**
III	**Series and Parallel Resonance Circuits:** Series resonance and parallel resonance circuits, Q - Factor, Selectivity and band width, Tank circuit-LC oscillations.	**5**
IV	**Power Supplies and Photo Electronic Devices:** **Rectifiers:** Half wave, full wave and bridge rectifiers-Efficiency-ripple Factor-Regulation, **Filters:** L-section & π-section filters. Three terminal fixed voltage I.C. regulators (78XX and &79XX) LED, IR-LED, Photo diode, Opto-Isolators, LDR, and solar cell;	**13**
V	**Transistors:** **BJT:** Construction, and characteristics of CE Configurations, Complete hybrid equivalent model, and Transistor as a switch. **BJT Biasing:** Fixed-Bias, Emitter-Stabilized Bias, Voltage-Divider Bias.	**14**

	FET: Construction, and Characteristics of FET/JFET, and MOSFETs, Advantages of FET over BJT **UJT:** UJT construction-working, and V-I characteristics, UJT as a Relaxation oscillator.	

TEXT BOOKS:

1. Introductory circuit Analysis (UBS Publications) ---- Robert L. Boylestad.
2. Electronic Devices and Circuit Theory --- Robert L. Boylestad & Louisashelsky.
3. Circuit Analysis by P.Gnanasivam --- Pearson Education
4. Electronic Devices and Circuits I – T.L.Floyd- PHI Fifth Edition

REFERENCE BOOKS:

1. Engineering Circuit Analysis By: Hayt & Kemmerly - MG.
2. Networks and Systems – D. Roy Chowdary.
3. Electric Circuit Analysis- S.R. Paranjothi- New Age International.
4. Integrated Electronics – Millmam & Halkias.
5. Electronic Devices & Circuits – Bogart.

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA – 520010

An Autonomous college in jurisdiction of Krishna University, A.P., India

Sub: ELECTRONICS	Course Code: ELE P11B	Year:2021– 22	Group: B.Sc	Credits 2

Semester – I **PAPER – I**

CIRCUIT THEORY AND ELECTRONIC DEVICES

List of Experiments

1. Thevenin's Theorem-verification
2. Norton's Theorem-verification
3. Maximum power Transfer Theorem-verification
4. RC circuit-Frequency response (low and high pass)
5. RL circuit-Frequency response (low and high pass)
6. Series Resonance
7. Full wave Bridge Rectifier
8. 78xx IC Voltage Regulator
9. BJT input characteristics CE configuration.
10. UJT characteristics.

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA – 520010

An Autonomous college in jurisdiction of Krishna University, A.P., India

Sub: ELECTRONICS	Course Code:		Group: B.Sc	Credits 4

Semester – II **PAPER – II**

DIGITAL ELECTRONICS

Syllabus

Unit	Learning Units	Lecture Hours
I	**NUMBER SYSTEM AND CODES:** Decimal, Binary, Hexadecimal, Octal, BCD, Conversions, Complements (1's, 2's, 9's and 10's), Addition, Subtraction, Gray, Excess-3 Code conversion from one to another.	9
II	**BOOLEAN ALGEBRA AND THEOREMS:** Boolean Theorems, De-Morgan's laws. Digital logic gates, Multi level NAND & NOR gates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 4,5 variables),don't care condition	12
III	**COMBINATIONAL DIGITAL CIRCUITS**: (Adders-Half & full adder, Sub-tractor-Half and full sub-tractors,Parallel binary adder, Magnitude Comparator, Multiplexers (2:1,4:1)) and Demultiplexers (1:2,4:1), Encoder (8-line-to-3-line) and Decoder (3-line-to-8-line). IC-LOGIC FAMILIES: TTL logic, DTL logic, RTL Logic, CMOS Logic families (NAND&NOR Gates), Bi-CMOS inverter	12
IV	**SEQUENTIAL DIGITAL CIRCUITS**: **OFFLINE: (07 hours)** Flip Flops: S-R FF, J-K FF, T and D type FFs, Master-Slave FFs, Excitation tables, Registers:-shift left register, shift right register, Counters -Asynchronous-Mod16, Mod-10,Mod-8,Down counter. Synchronous-4-bit &Ring counter.	10
V	**MEMORY DEVICES:** General Memory Operations, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM, EAROM, PLA (Programmable logic Array), PAL (Programmable Array Logic).	10

Textbook:

1. M.Morris Mano, " Digital Design " 3rd Edition, PHI, New Delhi.
2. Ronald J. Tocci. "Digital Systems-Principles and Applications" 6/e. PHI. New Delhi. 1999.(UNITS I to IV)
3. G.K.Kharate-Digital electronics-oxford university press

4. S.Salivahana&S.Arivazhagan-Digital circuits and design
5. Fundamentals of Digital Circuits by Anand Kumar

Reference Books:

1. Herbert Taub and Donald Schilling. “Digital Integrated Electronics” . McGraw Hill. 1985.
2. S.K. Bose. “Digital Systems”. 2/e. New Age International. 1992.
3. D.K. Anvekar and B.S. Sonade. “Electronic Data Converters : Fundamentals & Applications”. TMH. 1994.
4. Malvino and Leach. “ Digital Principles and Applications”. TMG Hill Edition.

Semester – II **PAPER – II**

DIGITAL ELECTRONICS LAB

LAB LIST:

1. Verification of IC-logic gates

2.Verification of De-Morgan's laws

3. Realization of basic gates using discrete components (resistor, diodes & transistor)

4 .Realization of basic gates using Universal gates (NAND & NOR gates)
5. Verify Half adder and full adder using gates

6. Verify Half subtractor and full subtractor using gates.

7. Verify the truth table of RS , JK, T-F/F using NAND gates

8. 4-bit binary parallel adder and subtractor using IC 7483

9. BCD to Seven Segment Decoder using IC -7447/7448

Semester – III **PAPER – IV**

ANALOG CIRCUITS & COMMUNICATIONS

Unit	Learning Units	Lecture Hours
I	**OPERATIONAL AMPLIFIERS**: Definition, Characteristics of Op-Amp, Block diagram of opamp, inverting, non-inverting, virtual ground, summing amplifier, subtractor, voltage follower, opamp parameters, voltage to current convertor, integrator, differentiator, differential amplifier, Logarithmic amplifier	12
II	**OP-AMP CIRCUITS**: Voltage regulator, Comparator, Instrumentation amplifier, Schmitt trigger, Sine wave generator, Square wave generator - Astable Multivibrator, Triangular wave generator, Active filters (Basics) - Low pass, High pass, Band pass filters. IC - 555 –functional block diagram.	10
III	**MODULATION:** Need for modulation, Types of Modulation, **Amplitude modulation** – frequency spectrum of AM, representation of AM, power relations in the AM wave. **Generation of AM** – Transistor modulators, **Detection of AM** – Diode detector.	12
IV	**FREQUENCY MODULATION:** Theory of FM, Frequency deviation and carrier swing, modulation index, deviation ratio, percent modulation, Mathematical representation of FM, frequency spectrum and bandwidth of FM wave. **Generation of FM** – Reactance modulator. **Detection of FM** – FM demodulation. Phase Locked Loop (PLL).	14
V	**RADIO BROADCASTING AND RECEPTION:** Spectrum of electromagnetic waves, Radio broadcasting and reception – Block Diagram, AM Transmitter & Super heterodyne AM receiver, FM Transmitter & Super heterodyne FM receiver. Differences between AM and FM.	12

Text Books:

1. Op Amp and Linear Integrated Circuits By Ramakant Gaykwad
2. Linear Integrated Circuits By Roy Choudary
3. Unified Electronics Vol II – J.P. Agarwal and Amit Agarwal.
4. Electronic Communications - George Kennedy
5. Antennas and Wave Propagation – G.S.N.Raju – PHI

6. Principles of communication system –Herbert Taub & D.L.Schilling

Reference Books:

1. Jacob Millan ,Micro Electronics,McGraw Hill.
2. Mithal G K, Electronic Devices and Circuits Thana Publishers.
3. Allan Motter shead ,Electronic Devices and Circuits – An Introduction- Prentice Hall
4. Electronic Communications – Roody & Colen
5. Communication Systems – Hayken --- 4th Edition
6. Modern digital and analog communication system –B.P. Lathi

Semester – III PAPER – IV

ANALOG CIRCUITS AND COMMUNICATIONS LAB

1. Op-Amp as inverting and non-inverting
2. Op-Amp Voltage follower and current follower.
3. Op-Amp as integrator and differentiator
4. Op-Amp as adder & subtractor
5. Op-Amp as voltage to current converter
6. Op-Amp as square wave generator
7. AM Modulation and Demodulation.
8. FM Modulation and Demodulation
9. Pre-emphasis and De-emphasis.
10. PM Modulation and Demodulation.

MICROCONTROLLERS AND INTERFACING

UNIT-I: **(10Hrs)**

Introduction: Comparison of Microprocessor and Micro controller, Evolution of microcontrollers from 4-bit to 32 bit, Overview and block diagram of 8051, Architecture of 8051, Development tools for micro controllers, Assembler – Compiler - Simulator / Debugger.

UNIT -II: **(10Hrs)**

Microcontroller organization: program counter and memory organization, Data types and directives, PSW register, Register banks and stack, pin diagram of 8051, Port organization, Interrupts and timers

UNIT-III: **(10Hrs)**

Addressing modes, instruction set of 8051: Addressing modes and accessing memory using various addressing modes, instruction set: Arithmetic, Logical, Simple bit, jump, loop and call instructions and their usage.

Unit -IV: **(15Hrs)**

Assemble language programming Examples: Addition, Multiplication, Subtraction, division, arranging a given set of numbers in largest / smallest order. Time delay generation and calculation, Timer/Counter Programming.

UNIT-V : **(15Hrs)**

Interfacing and Application of Microcontroller: Interfacing of – PPI 8255, DAC (0804), Temperature measurement (LM35), interfacing seven segment displays, displaying information on a LCD, control of a stepper Motor (Uni-Polar).

TEXT BOOKS:

1.The 8051 microcontroller and embedded systems using assembly and c-kennet j. Ayalam, Dhananjay V. gadre, cengage publishers

2.The 8051 microcontrollers and Embedded systems - By Muhammad Ali Mazidi and Janice Gillispie Mazidi – Pearson Education Asia, 4th Reprint, 2002.

REFERENCE BOOKS:

1.Microcontrollers Architecture Programming, Interfacing and System Design – Raj Kamal.

2.The 8051 Microcontroller Architecture, Programming and Application - Kenneth J. Ajala , west publishing company (ST PAUL, NEW YORK, LOS ANGELES, SAN FRANCISCO).

3.Microcontroller theory and application-Ajay V. Deshmukh

MICROCONTROLLERS AND INTERFACING LAB

1. Addition and Subtraction of Two 8-Bit Numbers.

2. Multiplication and Division of Two 8-Bit Numbers.

3. Largest number /smallest in an array.

4. Addition Of Two 8-Bit Numbers (Keil Software).

5. Addition Of Two 16-Bt Numbers (Keil Software).

6. Subtraction Of Two 8-Bit Numbers (Keil Software).

7. Subtraction Of Two 16-Bit Numbers (Keil Software).

8. Multiplication Of Two 8-Bit Numbers (Keil Software).

9. Interfacing Led To 8051 Microcontroller (Keil Software).

10. Interfacing Seven Segments To 8051 Microcontroller (Keil Software).

Semester - V **Paper- V** **No of Credits:3**

ANALOG AND DIGITAL COMMUNICATIONS

UNIT –I **10Hrs**

AMPLITUDE MODULATION: Need for modulation, amplitude modulation-frequency spectrum of AM wave, representation of AM, power relations in the AM wave. Generation of AM- Transistor modulators. Suppression of carrier, balanced modulator, suppression of one side band- the filter method,phase shift method.

UNIT –II **10Hrs**

FREQUENCY MODULATION:

Theory of FM, mathematical representation of FM, frequency spectrum of FM wave, narrow band FM, wide band FM, power contents of the carrier and sidebands, Generation of FM signals – Reactance modulator.

UNIT –III **10Hrs**

BASIC RECEIVER CIRCUITS:

Noise – Thermal, Shot, Noise figure, Super heterodyne Receiver block diagram, FM receiver, discriminators-slope, balanced slope, phase discriminator & Ratio detector

UNIT –IV **12Hrs**

RADIO WAVE PROPAGATION:

Communication bands, Electromagnetic waves, propagation of waves - ground waves, Ionosphere & Space waves. **PULSE MODULATION:** Introduction, Sampling Theorem, TDM, FDM, PAM- Generation & Detection PWM- Generation & Detection, PPM- Generation & Detection

UNIT –V **18Hrs**

DIGITAL COMMUNICATIONS:

PCM – PCM encoders, Quantization noise, S/N ratio of PCM system, relation between S/N ratio & BW, Compounding, Advantages of digital over analog communications. Advantages of shift keying over digital communication, Types of shift keying, ASK – Generation & Detection, FSK – Generation& Detection, PSK – Generation & Detection.

TEXT BOOKS:

1. Electronic Communications - George Kennedy
2. Antennas and Wave Propagation – G.S.N.Raju – PHI
3. Principles of communication system –Herbert Taub & D.L.Schilling

REFERENCES:

1. Electronic Communications – Roody & Colen
2. Communication Systems – Hayken --- 4th Edition
3. Advance Electronic communication system ---Tomasi Wayne
4. Modern digital and analog communication system –B.P.lathi

Semester - V **Paper- V** **No of Credits:2**

ANALOG AND DIGITAL COMMUNICATION LAB--PRACTICAL

30Hrs

LAB LIST:

1. AMPLITUDE MODULATION
2. AMPLITUDE DE-MODULATION
3. FREQUENCY MODULATION
4. FREQUENCY DE-MODULATION
5. PRE-EMPHASIS CIRCUIT
6. DE-EMPHASIS CIRCUIT
7. PULSE AMPLITUDE MODULATION
8. PULSE WIDTH MODULATION.
9. PULSE POSITION MODULATION
10. PULSE CODE MODULATION

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA-10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	**ELET 52**	**2017-18**	**B.Sc. (MECS)**
		2018-19	

Semester-V **Paper- VI** **No of Credits:3**

MICROPROCESSOR SYSTEMS

UNIT -I: 15**Hrs**

CPU ARCHITECTURE

Introduction to Microprocessor, INTEL -8085(μ P) Architecture, CPU, ALU unit, Register Organization, Address, data and control Buses. Pin configuration of 8085, 8086 Architecture, Evaluation of Microprocessor, Internal operation, Pin description. Instruction format, Machine Language instructions, Instruction Execution timing, Addressing modes

UNIT -II: 10 Hrs

INSTRUCTION SET:

Data transfer Instruction, Logical Instructions, Arithmetic Instructions, Branch Instructions, Flag Manipulation , Shift and rotate Instruction, Loop Instruction

UNIT -III: 15Hrs

Assembly Language Programming, Programmes for Addition, Subtraction, Multiplication , Find the largest and smallest number in an array. **Modular programming**:–Linking and Relocation, Stacks, Procedures, Interrupts And Interrupt Routines.

UNIT -IV: **10Hrs**

Basic 8086 Configurations – Minimum mode and Maximum Mode, Interrupt Priority Management I/O Interfaces: Serial Communication interfaces, Parallel Communication, Programmable Timers, Keyboard and display, DMA controller

UNIT -V: 10Hrs

ARM PROCESSOR

Introduction to 16/32 bit processors, Arm architecture & organization, Arm based mcus, Programming model, Instruction

TEXT BOOKS:

1. Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and Glenn SA Gibson
2. Microcontrollers Architecture Programming, Interfacing and System Design – **Raj Kamal Chapter: 15.1, 15.2, 15.3, 15.4.1**
3. 8086 and 8088 Microprocessor by Tribel and avatar singh

REFERENCES:

1. Microprocessors and Interfacing – Douglas V.Hall
2. Microprocessor and Digital Systems – Douglas V. Hall
3. Advanced Microprocessors & Microcontrollers - B.P.Singh & Renu Singh – New Age
4. The Intel Microprocessors – Architecture, Programming and Interfacing – Bary B. Brey.
5. Arm Architecture reference manual –Arm ltd.

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA-10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	**ELEP 52**	**2017-18**	**B.Sc. (MECS)**
		2018-19	

Semester-V **Paper- VI** **No of Credits:2**

MICROPROCESSOR LAB **30Hrs**

LAB LIST:

1. Program Toadd To Decimal Numbers
2. Subtraction Of Two Decimal Numbers
3. Add Two Words In Memory Location And Store The Result In Subsequent Memory Location
4. To Interchange Two Words From 4100 And 4102 Location
5. Program To Compute Logical Ones In A Word And Store The Result In Memory
6. Program To Convert Two Bcd Numbers In To Hex
7. Program To Convert Hex Number In To Bcd Number.
8. Program To Find The Square Root Of A Given Number.

9. Interfacing Experiments using 8086 microprocessor (DEMO):

1. Traffic Light Controller
2. Elevator,
3. 7-segment display

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA-10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	**ELE TCL61**	**2017-18** **2018-19**	**B.Sc. (MECS)**

Semester-VI **Paper- VIII** **No of Credits:3**

Embedded System Design

UNIT 1: **10Hrs**

Introduction to Embedded Systems:

Embedded systems overview, Design Challenge, Processor Technology, IC Technology, and DesignTechnology.

UNIT 2: 15Hrs

Custom Single Purpose Processor – Hardware Development:

Introduction, Combinational logic, Sequential logic, Custom Single Purpose Processor Design, RT-LevelCustom Single-Purpose Processor.

UNIT 3: 15Hrs

General Purpose Processor – Software Development:

Introduction, Basic Architecture, Operation, Programmer's View, asips, and Development Environment: Host and Target Machines, Linker / Locators for Embedded Software, Getting Embedded Software into the target system. Debugging Techniques: Testing on your Host Machine, and Instruction Set Simulators.

UNIT 4: 10Hrs

RTWA for Embedded Systems:

Introduction, Timers, Counters and Watchdog Timers, UART, Pulse Width Modulators, LCD Controllers,Keypad Controllers, Stepper Motor Controllers, Analog – to – Digital Converters, and Real Time Clocks. **UNIT 5: 10Hrs**

Advanced Communication Principles:

Parallel Communication, Serial Communication, Wireless Communication, **Serial Protocols:** I^2C, CAN, firewire, and USB. **Parallel Protocols:** PCI BUS and ARM BUS. **Wireless Protocols:** irda, Bluetooth, and IEEE 802.11.

TEXT BOOKS:

1. Embedded System Design – A Unified Hardware / Software Introduction By **Frank Vahid / Tony Givargis** – WILEY EDITION.
2. Embedded Systems Architecture, Programming and Design – 2nd Edition By **Raj Kamal** – Tata mcgraw-Hill Education.

REFERENCES:

3. An Embedded Software Premier - **David E- Siman**, PEARSON Education
4. Embedded / real - time systems - **DR. K.V.K.K. Prasad**, dreamtech
5. The art of programming Embedded systems, **Jack G. Ganssle**, academic press
6. Intelligent Embedded systems, **Louis L. Odette, Adison Wesly**, 1991

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA-10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	**ELE PCL61**	**2017-18** **2018-19**	**B.Sc. (MECS)**

Semester-VI **Paper- VIII** **No of Credits:2**

EMBEDDED SYSTEMS

COURSE CODE: (ELEPCL61)LAB

LIST

Peripherals Interfacing to 89s51/52

1. Interfacing led to 8051 microcontroller (keil software).
2. Interfacing buzzer to 8051 microcontroller (keil software).
3. Interfacing relay to 8051 microcontroller (keil software).
4. Interfacing seven segments to 8051 microcontroller (keil software
5. Interfacing lcd to 8051 microcontroller (keil software).
6. Interfacing dc motor to 8051 microcontroller (keil software).
7. Interfacing stepper motor to 8051 microcontroller (keil software).
8. Interfacing matrix keypad to 8051 microcontroller (keil software).
9. Interfacing computer's serial port to 8051 microcontroller (keil software).
10. Interfacing adc0804 to 8051 microcontroller (keil software).

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA-10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	**ELE TCL 62**	**2017-18** **2018-19**	**B.Sc (M.E.Cs)**

Semester-VI **Paper- IX** **No of Credits:3**

ELECTRONIC INSTRUMENTATION

UNIT-I **10Hrs**

Measurements:

Basic block diagram of measurement system, Accuracy and precision, resolution, sensitivity, linearity, Errors, systematic and random errors, standards &calibrations of an instrument.
Applications of instrument

UNIT –II 10Hrs

Basic Measurement Instruments: DC measurement-ammeter, voltmeter, ohm meter, AC measurement, Digital voltmeter systems (integrating and non-integrating). Digital Multimeter; Block diagram principle of measurement of I, V, C. Accuracy and resolution of measurement. **Measurement of Impedance-**
A.C. bridges, Measurement of Self Inductance (Anderson's bridge), Measurement of Capacitance (De Sauty bridge), Measurement of frequency (Wien's bridge).

UNIT-III 15Hrs

Lock-in-amplifier: Basic Principles of phase locked loop (PLL), Phase detector (XOR& edge triggered), Voltage Controlled Oscillator (Basics, varactor), lock and capture. Basic idea of PLL IC (565 or 4046). Lock-in-amplifier , Idea of techniques for sum and averaging of signals.
Signal Generators: Function generator, Pulse Generator, (Qualitative only).

UNIT-IV 15Hrs

Analytical instruments

Spectrophotometer, working with block diagram, features of spectrophotometer,
P_H meter - principle working with block diagram, features of **P_H** meter.
TEMPERATURE TRANSDUCERS
Standards and calibration, Fluid expansion and metal expansion type transducers, like bimetallic strip, Thermometer, RTD, Thermo couple and their characteristics.

UNIT-V : 10Hrs

Direct digital control (DDC), Distributed control system (DCS),
PLC'S: Block diagram, hardware, PLC operation, basic logic program (ladder logic),
Applications of PLC'S

TEXT BOOKS

1. Introduction to instrumentation and control By A.K.Ghosh
2. Sensors and transducers PHI 2Ed By D.Patranabis.
3. Industrial instrumentation –Eckman.P.
4. Instrument measurement analysis By Nakra and chaudhry.

Reference Books:

1. W.D. Cooper and A. D. Helfrick, Electronic Instrumentation and Measurement Techniques, Prentice Hall (2005).
2. E.O. Doebelin, Measurement Systems: Application and Design, mcgraw Hill Book - fifth Edition (2003).
3. David A. Bell, Electronic Devices and Circuits, Oxford University Press (2015).
4. Alan S. Morris, "Measurement and Instrumentation Principles", Elsevier (Butterworth Heinmann-2008).

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA-10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	**ELE PCL 62**	**2017-18** **2018-19**	**B.Sc (MECS)**

Semester-VI **Paper- IX** **No of Credits:2**

ELECTRONICS LAB

ELECTRONIC INSTRUMENTATION LAB

LAB LIST: **30Hrs**

1. Design of multi range ammeter and voltmeter using galvanometer.
2. Measurement of resistance by Wheatstone bridge and measurement of bridge sensitivity.
3. Measurement of Capacitance by De'Sautys.
4. Measure of low resistance by Kelvin's double bridge.
5. To determine the Characteristics of resistance transducer - Strain Gauge (Measurement of StrainUsing half and full bridge.)
6. To determine the Characteristics of LVDT.
7. To determine the Characteristics of Thermistors and RTD.
8. Measurement of temperature by Thermocouples and study of transducers like AD590 (twoTerminal temperature sensor), PT-100, J- type, K-type.
9. To study the Characteristics of LDR, Photodiode, and Phototransistor.

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA-10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	**ELET EL61**	**2017 – 18** **2018-19**	**B.Sc** **(MECS)**

Semester-VI **Paper- VII** **No of Credits:3**

MICRO CONTROLLER AND INTERFACES

UNIT-I: 10Hrs

Introduction, comparison of Microprocessor and micro controller, Evolution of microcontrollers from 4- bit to 32 bit , Development tools for micro controllers, Assembler-Compiler-Simulator/Debugger.

UNIT –II 10Hrs

Microcontroller Architecture:

Overview and block diagram of 8051, Architecture of 8051, program counter and memory organization, Data types and directives, PSW register, Register banks and stack, pin diagram of 8051, Port organization, Interrupts and timers.

UNIT-III: 10Hrs

Addressing modes, instruction set of 8051: Addressing modes and accessing memory using various addressing modes, instruction set: Arithmetic, Logical, Simple bit, jump, loop and call instructions and their usage. Time delay generation and calculation, Timer/Counter Programming,

Unit -IV: 15Hrs

Assemble language programming Examples: Addition, Multiplication, Subtraction, division, arranging a given set of numbers in largest/smallest order.

UNIT-V : 15Hrs

Interfacing and Application of Microcontroller:

Interfacing of – PPI 8255, DAC (0804), Temperature measurement (LM35), interfacing seven segment displays, displaying information on a LCD, control of a stepper Motor (Uni-Polar), Interfacing a 4*3 matrix keypad. Generation of different types of waveforms using DAC.

TEXT BOOKS:

1. The 8051 microcontroller and embedded systems using assembly and c-kennet j.Ayalam, DhananjayV.gadre, cengage publishers

2.The 8051 microcontrollers and Embedded systems - By Muhammad Ali Mazidi and Janice Gillispie Mazidi – Pearson Education Asia, 4th Reprint, 2002.

REFERENCE BOOKS:

1. Microcontrollers Architecture Programming, Interfacing and System Design – **Raj kamal.**
2. The 8051 Microcontroller Architecture, Programming and Application - **Kenneth J.Ajala ,** west publishing company (ST PAUL, NEW YORK, LOS ANGELES, SAN FRANCISCO).
3. Microcontroller theory and application-Ajay V.Deshmukh

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA-10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	**ELEP EL61**	**2017 – 18** **2018-19**	**B.Sc** **(MECS)**

Semester-VI **Paper- VII** **No of Credits:2**

MICROCONTROLLER LAB

Lab list: **30Hrs**

1. Addition and subtraction of two 8-bit numbers.
2. Multiplication and division of two 8-bit numbers.
3. Exchange of higher and lower nibbles in accumulator.
4. Bcd operation and reverse and x-or of given numbers.
5. Addition of two 8-bit numbers (keil software).
6. Addition of two 16-bt numbers (keil software)
7. Subtraction of two 8-bit numbers (keil software).
8. Subtraction of two 16-bit numbers (keil software).
9. Multiplication of two 8-bit numbers (keil software).
11. Program for swapping and compliment of 8-bit numbers (keil software).
12. Program to find the largest number in given array (keil software).
13. Program to find the smallest number in given array (keil software).
14. Interfacing led to 8051 microcontroller (keil software).
15. Interfacing buzzer to 8051 microcontroller (keil software).
16. Interfacing relay to 8051 microcontroller (keil software).
17. Interfacing seven segments to 8051 microcontroller (keil software).

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASAL, VIJAYAWADA -10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	ELETCLS63	2017-18 2018-19	B.Sc(M.E.Cs)	Credits

OPTICAL FIBER COMMUNICATION AND APPLICATIONSOBJECTIVES:

- To study about the concept of fiber optic communication.
- To study light source and detectors
- To study the different types of fiber measurements.
- To study the concept of link design
- Introduction to fiber optic communication Receiver
- To study about fiber optic measurement
- To study about Optic Fiber Sensors and applications.

UNIT I: (10Hrs)

Fiber optic communication:

The basic communications systems, Nature of light, Advantages of fiber, Applications of fiber optic communications, Light wave fundamentals- Electromagnetic waves, Dispersion, Pulse distortion and information rate, polarization, Resonant cavities, Reflection at a plane boundary, Critical – angle Reflections
; Optic fiber waveguides: - Step-index fiber, Graded-index fiber, Attenuation. (Elementary Treatment only) .

UNIT II:(10Hrs)

Light source and detectors:

Light emitting diodes Operating characteristics, Laser diodes, Laser diode operating characteristics, Distributed feedback laser diode, Optical amplifiers, Light detectors: Principles of photo detection, Photo multiplier, Semi conductor photo diode, PIN photo diode, Avalanche photo diode.

UNIT III: (15Hrs)

MODULATION :

Light Emitting Diode Modulation and circuits, Laser diode modulation and circuits, Analog Modulation Format, Digital modulations formats. **SYSTEM LINK DESIGN:** Analog system design, Digital system design, power budget analysis.

UNIT IV: (15Hrs)

Optical Fiber Communication Receiver:

Introduction : Signal Path through Optical Data link, Receiver configuration with noise, Receiver noises, Noise at the input to the Amplifier, Receiver Capacitance and Bandwidth , Block diagram of Optical Receiver, Automatic Gain Control (AGC) circuit **Fiber Optical Measurement:** Introduction: Attenuation Measurement, Optical Time Domain Reflecto-meter (OTDR), Time Domain Dispersion Measurement, Frequency Domain Dispersion Measurements, Numerical Aperture Measurement using Scanning photo detector, measurement of losses in Splice and Connectors.

UNIT V:(10Hrs)

Fiber Optical Sensors and Applications:

Fiber Optic Sensor: Generalised Optical Fiber sensors, Phase and Polarization Fiber sensor, Optical Fluid Level Detector, Optical Fiber Flow Sensors, Optical Displacement sensors, Long haul communications , Local Area Networks.

TEXT BOOKS:

1. Fiber Optic Communications by Joseph C.Palais (4th Edition, Pearson Education)
2. Opto-electronics and Fiber Optic communications by C.K.Sarkar and D.C.Samkar
3. Fiber Optic Communications by S.Sankar. (New age international)

REFERENCE BOOKS:

1. Fiber Optic communication by senior-PHI
2. Fiber Optic communications Technology – Djafar k.Mynbaev, Lowell L. Scheiner.
3. Otical fiber communication-Gerd Kaiser
4. Optical communication system-John Gowar.

OUTCOMES:

- This course provides the students with the basic understanding of the concepts and principles ofoptical fibre communications.
- Line transmission systems,- analog and digital transmission system standards.
- On completion of the course, the students will be able to apply the knowledge and principles leant toanalyze, design, install and manage typical wired and wireless communication systems and networks

ELECTRONICS	**ELEPCLS63**	**2017-18** **2018-19**	**B.Sc (M.E.Cs)**	**Credits 3**

ELECTRONICS LAB-VI

OPTICAL FIBER COMMUNICATION LAB

LAB LIST:

ABOUT FIBER OPTICS.

1: SETTING FIBER OPTIC ANALOG LINK

2: SETTING FIBER OPTIC DIGITAL LINK

3: STUDY OF LOSSES IN OPTICAL FIBER

4: BENDING LOSSES IN FIBER

5: STUDY OF NUMERICAL APERTURE OF OPTICAL FIBER

6: STUDY OF CHARACTERISTICS OF FIBER OPTIC LED.

7: STUDY OF TIME DIVISION MUTIPLEXING (DIGITAL)

ELECTRONICS	**ELETCLS64**	**2017-18** **2018-19**	**B.Sc (M.E.Cs)**	**Credits - 3**

COMPUTER NETWORK

UNIT-I : **12Hrs**

INTRODUCTION to OSI,TCP/IP and other Network models, Examples of Networks, Novel Networks ,Arpanet, Internet, Network topologies, WAN,LAN,MAN.

PHYSICAL LAYER :Transmitted media copper, Twisted pair wireless, switching and Encodingasynchronous communications ,Narrowband ,Broadband, ISDN& ATM.

UNIT-II: 12Hrs

DATA LINK LAYER: Design issues, framing, error detection &correction, CRC, elementary protocol-Stopand wait, Sliding window, slip, data link layer in HDLC, Internet, ATM

UNIT-III: 12Hrs

MEDIUM ACCESS SUB LAYER: ALOHA, MAC, Address, Carrier sense multiple access, IEEE 802.Xstandard Ethernet, Wireless LAN, Bridges.

UNIT-IV: 12Hrs

NETWORK LAYER: Virtual circuits and data gram sub nets-routing algorithm, shortest path routing,fooding, Hierarchicalrouting, broadcast, multicast, distance vector routing

UNIT-V : 12Hrs

TRANSPORT LAYER : Transport services, Connection management ,TCP & UDP protocols, ATM AALlayers protocol

APPLICATION LAYER- Network security, domain name system, SNMP, Electronic mail, The world web, multimedia

TEXT BOOKS:

Computer Networks - Andrew S. Tanenbaum,4th Edition,Pearson educationData

communications & Networking -Behrouz A.Forouzan.3rd EditionTMH

References

An engineering approach to Computer Networks - S. Kesav 2nd Edition,Pearson education

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA- 10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	**ELEPCLS64**	**2017-18** **2018-19**	**B.Sc (M.E.Cs)**	**Credits - 3**

COMPUTER NETWORK

Practical Training in Networking

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA- 10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	ELETCLS65	2017-18 2018-19	B. Sc (M.E.Cs)	Credits - 3

CONSUMER ELECTRONICS

Unit – I: **(12hrs)**

MICROWAVE OVENS – Microwaves (Range used in Microwave ovens) – Microwave oven blockdiagram – LCD timer with alarm – Single-Chip Controllers – types of Microwave oven – Wiring and Safety instructions – care and Cleaning.

Unit – II: **(12hrs)**

WASHING MACHINES – Electronic controller for washing machines – Washing machine hardware and software – Types of washing machines – Fuzzy logic washing machines Features of washingmachines.

Unit – III: **(12hrs)**

AIR CONDITIONERS AND REFRIGERATORS -Air Conditioning – Components of air conditioning systems – All water air conditioning systems – All air conditioning systems – Unitary and central air conditioning systems – Split air conditioners.

Unit – IV: **(12hrs)**

HOME/OFFICE DIGITAL DEVICES – Fascimile machine – Xerographic copier – calculators – Structure of a calculator – Internal organization of a calculator – Servicing electronic calculators – Digital clocks – Block diagram of a digital clock.

Unit – V: **(12hrs)**

DIGITAL ACCESS DEVICES – Digital computer – Internet access – online ticket reservation – functions and networks – barcode scanner and decoder – Electronic Fund Transfer – Automated Teller Machines(ATMs) – Set-Top boxes – Digital cable TV – Video on demand.

TEXTBOKS:

1. S.P. Bali, Consumer Electronics – Pearson Education , New Delhi,2005.
2. R.G. Gupta Audio and Video systems Tata McGraw Hill(2004)

ELECTRONICS	ELEPCLS65	2017-18 2018-19	B. Sc (M.E.Cs)	Credits - 2

ELECTRONICS LAB

CONSUMER ELECTRONICS LAB

(At least two Activities should be done)

1. Study of PA systems for various situations – Public gathering , closed theatre / Auditorium, Conference room, Prepare Bill of Material(Costing)
2. Installation of Audio/Video systems – site preparation , electrical requirements , cables and connectors
3. Market Survey of products (at least one from each module)
4. Identification of block and tracing the system. Assembly and Disassembly of system using Toolkit
5. Assembly and Disassembly of system and printer.

NOTE: one activity as directed in practical course is equivalent to 4 experiments.

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA- 10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	ELETCLS66	2017-18 2018-19	B. Sc (M.E.Cs)	Credits -3

TITLE: CONTROL SYSTEMS

Objectives

- To understand the concepts of digital control systems and assemble various components associated with it.Advantages compared to the analog type.
- The theory of z–transformations and application for the mathematical analysis of digital control systems.
- To represent the discrete–time systems in state–space model and evaluation of state transition matrix.
- To examine the stability of the system using different tests.
- To study the conventional method of analyzing digital control systems in the w–plane.
- To study the design of state feedback control by "the pole placement method."

UNIT – I: **12Hrs**

Introduction and signal processing : Introduction to analog and digital control systems – Advantages of digital systems – Typical examples – Signals and processing – Sample and hold devices – Sampling theorem and data reconstruction – Frequency domain characteristics of zero order hold.

UNIT–II: **12Hrs**

Z–transformations : Z–Transforms – Theorems – Finding inverse z–transforms – Formulation of difference equations and solving – Block diagram representation – Pulse transfer functions and finding open loop and closed loop responses.

UNIT–III: **12Hrs**

State space analysis and the concepts of Controllability and observability State Space Representation of discrete time systems – State transition matrix and methods of evaluation – Discretization of continuous – Time state equations – Concepts of controllability and observability – Tests (without proof).

UNIT – IV: **12Hrs**

Stability analysis : Mapping between the S–Plane and the Z–Plane – Primary strips and Complementary Strips – Stability criterion – Modified routh's stability criterion and jury's stability test.

UNIT – V: **12Hrs**

Design of discrete–time control systems by conventional methods : Transient and steady state specifications – Design using frequency response in the w–plane for lag and led compensators – Root locus technique in the z– plane.
Outcomes:

- ✓ The students learn the advantages of discrete time control systems and the "know how" of various associatedaccessories.

- ✓ The learner understand z–transformations and their role in the mathematical analysis of different systems(likelaplace transforms in analog systems).
- ✓ The stability criterion for digital systems and methods adopted for testing the same are explained.
- ✓ Finally, the conventional and state–space methods of design are also introduced.

Text Book

1.Discrete–Time Control systems – K. Ogata, Pearson Education/PHI, 2nd Edition

Reference Books

1. Digital Control Systems, Kuo, Oxford University Press, 2nd Edition, 2003.

2. Digital Control and State Variable Methods by M.Gopal, TMH

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA-520 010

An Autonomous College in the jurisdiction of Krishna University, Machilipatnam, A.P

ELECTRONICS	**ELEPCLS66**	**2017-18** **2018-19**	**B. Sc (M.E.Cs)**	**Credits -2**

ELECTRONICS LAB-VI

CONTROL SYSTEM LAB

MAT LAB:

1. TRANSFER FUNCTION FROM ZEROS AND POLES
2. STEP RESPONSE OF A TRANSFER FUNCTION
3. MPULSE RESPONSE OF A TRANSFER FUNCTION
4. RAMP RESPONSE OF A TRANSFER FUNCTION
5. TIME RESPONSE OF A SECOND ORDER SYSTEM
6. TRANSFER FUNCTION OF A D.C MOTOR
7. BODE PLOT FROM A TRANSFER FUNCTION

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA- 10

An Autonomous college in jurisdiction of Krishna University, A.P., India

ELECTRONICS	ELETCLS67	2017-18	B.Sc (M.E.Cs)	Credits - 3
		2018-19		

TITLE: PC MAINTENANCE AND TROUBLE SHOOTING

UNIT – I : **12Hrs**

INTRODUCTION TO COMPUTERS:
Block diagram & types of computers. Mother Board Characteristics, choosing a Motherboard, Installinga Mother board, Upgrading system BIOS. Bus Slots – ISA, MCA, EISA, PCI, USB and firmware (IEEE1394). Features and comparison of 80286, 80386 and 80486, Characteristics of Pentium MMX, Comparison of Pentium-2 with all other processors. Dual core, core 2 duo, quad, P4, P4HT, I3, I5, I7 processors.

UNIT – II : **12Hrs**

BASIC TROUBLE SHOOTING: Introduction about proper tools in system maintenance, various test equipment for PC servicing, Reasons for failure of resistor, Reasons for failure of capacitor, Reasons for failure of other components, Safety precautions during trouble shooting.

Keyboard: Types of keyboards block diagram of keyboard, keyboard connectors. reasons for failure of keyboard.
Mouse: Working and components of mouse and different connectors.
Add on cards: MDA, CGA, VGA, Sound card, NIC card, SCSI Controller and FDC and HDC.

UNIT – III : **12Hrs**

STORAGE DEVICES: Introduction about disk drives, Characteristics of different disk drivesFDD:- Different types, working and components of drives.
HDD:-Different types, working and components of HDD drives partitioning & Formatting HDD
CDROM:- Different types working and components of CDROM drives.
DVD:- Different types, working and components of DVD.
Reasons for failure of disk drives

UNIT –IV : **12Hrs**

SMPS: linear, AT, ATX,
Block of SMPS and description of each block.
INTRODUCTION to UPS& SPS:
Reasons for power supply failure, Impact of power supply failure on PC
MONITOR: Introduction about display units, Different display technologies, block diagram, Reasons for display failure.

UNIT – V : **12Hrs**

PRINTERS:- Different types of printers, dot matrix, INKJET & LASER PRINTER – components and working.
PREVENTIVE MAINTANCE – Effect of heat and noise, Effect of corrosion on PC, Effect of power fluctuations, Effect of magnetic fields on system performance, EMI effect, Virus protection, Tools and techniques of S/W trouble shooting.

TEXT BOOKS:

1. UPGRADING AND REPAIRING PC – SCOTT MULLER.
2. IBM PC and Clones: Hardware, Troubleshooting and Maintenance - GOVINDARAJALU. B

REFERNCE BOOKS:

1. I.T. HARDWARE - NATSHELL.
2. PRINTER MANUALS.

ELECTRONICS	**ELEPCLS67**	**2017-18**	**B.Sc (M.E.Cs)**	**Credits - 2**
		2018-19		

ELECTRONICS LAB

PC MAINTENANCE AND TROUBLE SHOOTING LAB

LAB LIST:

1. Identification of different peripherals and components in a PC.
2. Identification of different types of motherboards.
3. Identification of different expansion slots and add-on cards.
4. Assembling a PC
5. Study of CMOS ROM BIOS setup utilities.
6. . Change of CMOS password and boot sequence
7. Connecting hard drives, floppy drives and DVD writer
8. Creating partitions and formatting a hard drive.
9. Installation of windows 2000 Professional and windows XP
10. Installation of application software's and antivirus software
11. Installation of windows server 2003
12. Installation and configuring display sound and LAN cards.