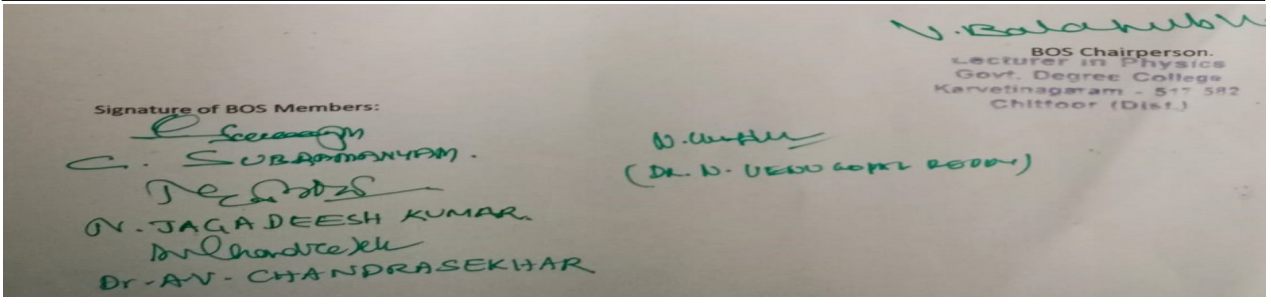
SRI VENKATESWARA UNIVERSITY: TIRUPATI

Programme: B.Sc. Honours in Electronics (Major)

w.e.f. AY 2023-24

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	I	1	Essentials and Applications of Mathematical, Physical and Chemical Sciences	3+2	4
	I	2	Advances in Mathematical, Physical and Chemical Sciences	3+2	4
	II	3	Fundamental of Electricity and Electronics	3	3
			Fundamental of Electricity and Electronics Practical Course	2	1
	II	4	Circuit theory and electronic devices	3	3
			Circuit theory and electronic devices Practical Course	2	1
II	III	5	Semiconductor devices and Materials	3	3
			Semiconductor devices and Materials Practical Course	2	1
		6	Digital Electronics	3	3
			Digital Electronics Practical Course	2	1
		7	Analog Electronics	3	3
			Analog Electronics Practical Course	2	1
		8	Electronic communication system	3	
			Electronic communication system Practical Course	2	
	IV	9	Electrical and electronics instrumentation	3	
			Electrical and electronics instrumentation Practical Course	2	1
		10	Microcontrol system	3	
			Microcontrol system Practical Course	2	
		11	Microprocessor system	3	
			Microprocessor system Practical Course	2	



SRI VENKATESWARA UNIVERSITY: TIRUPATI

SEMESTER-IV

COURSE 9: ELECTRICAL AND ELECTRONIC INSTRUMENTATION

Theory Credits: 4 5 hrs/week

The students will learn :

a. Basic concepts of indicating instruments.
b. Various electronic instruments such as CRO, storage oscilloscopes, function generators, spectrum analyzer etc.,
c. transducers, sensors and display devices.

UNIT-I

DC and AC indicating Instruments: Accuracy and precision - Types of errors - PMMC galvanometer, sensitivity, Loading effect - Conversion of Galvanometer into ammeter, Voltmeter and Shunt type ohmmeter - Multimeter.

Electrodynamometer - Thermocouple instrument - Electrostatic voltmeter - Watt- hour meter.

UNIT-II

DC and AC bridges: Wheatstone bridge - Kelvin's bridge - Balancing condition for AC bridge - Maxwell's bridge - Schering's bridge - Wein's bridge - Determination of frequency.

UNIT-III

Oscilloscopes: Block diagram - Deflection Sensitivity - Electrostatic Deflection - Electrostatic Focusing - CRT Screen - Measurement of Waveform frequency, phase difference and Time intervals - Sampling Oscilloscope - Analog and Digital Storage Oscilloscopes.

UNIT-IV

Instrumentation Amplifiers and Signal Analysers: Instrumentation amplifier - Electronic Voltmeter and Multimeter - Digital Voltmeter - Function Generator - Wave Analyser - Fundamentals of Spectrum Analyser.

UNIT-V

Transducer and Display Devices: Strain Gauge - Unbounded Strain Gauge - LVDT - Resistance Thermometer - Photoelectric Transducer - Pen Recorder - Audio Tape Recorder - Seven Segment Display - LCD.

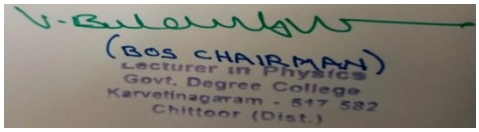
Text Books

Electronic Instrumentation and Measurement Techniques - *W.D. Cooper & A.D. Helfrick*, Prentice Hall of India.

Electronic Instrumentation and Measurement - *Kalasi*.

Reference Books

1. A Course in Electrical and Electronic Measurement and Instrumentation - *A.K. Sawhney*, Dhanpat Rai and Sons.
2. Electronic Instrumentation and Measurements-*P.B. Zbar*,McGraw Hill
3. International.
4. Measurement Systems Application and Design - *Ernest O. Doebelin*, 4/e, TataMcGraw Hill Publishing Co. LTD



SEMESTER-IV

COURSE 10: MICRO CONTROLLER SYSTEM

Theory Credits: 3 3 hrs/week

OBJECTIVES:

- To understand the concepts of microcontroller based system.
- To enable design and programming of microcontroller based system.
- To know about the interfacing Circuits.

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).

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

3. Mazidi and JaniceGillispie Mazidi – Pearson Education Asia, 4th Reprint, 2002.

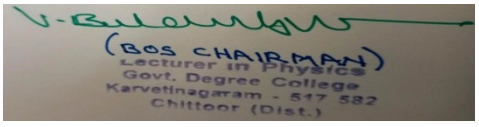
REFERENCE BOOKS:

1. Microcontrollers Architecture Programming, Interfacing and System Design – Rajkamal.

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 OUTCOMES:

- The student can gain good knowledge on microcontrollers and implement in practical applications
- learn Interfacing of Microcontroller
- get familiar with real time operating system



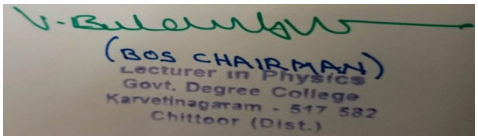
SEMESTER-IV

COURSE 10: MICRO CONTROLLER SYSTEM

Practical Credits: 1 2 hrs/week

LAB LIST:

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. Exchange Of Higher And Lower Nibbles In Accumulator.
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).



SEMESTER-IV

COURSE 11: MICROPROCESSOR SYSTEMS

Theory Credits: 3 3 hrs/week

OBJECTIVES:

- To understand basic architecture of 16 bit and 32 bit microprocessors.
- To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
- To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors
- To understand RISC based microprocessors.
- To understand concept of multi core processors.

UNIT -I: (12Hrs)

CPU ARCHITECTURE *Introduction to Microprocessor, INTEL -8085(P) Architecture, CPU, ALU unit, Register organization, Address, data and control Buses. Pin configuration of 8085. Addressing modes* 8086 Microprocessor: Architecture, Pin description. Instruction format, Instruction Execution timing, Addressing modes

UNIT -II: (12 Hrs)

8085 Instruction Set:

Data transfer Instruction, Logical Instructions, Arithmetic Instructions, Branch Instructions, Machine Control instructions.

UNIT -III: (12Hrs)

Assembly Language Programming using 8085, Programmes for Addition, Subtraction, Multiplication, Division, largest and smallest number in an array. BCD to ASCII and ASCII to BCD.

UNIT -IV: (12Hrs)

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: (12Hrs)

ARM PROCESSOR: Introduction to 16/32 bit processors, Arm architecture & organization, Arm based MCUs, Programming model, Instruction set.

TEXTBOOKS:

1. Microprocessor Architecture, Programming and Applications
2. with the 8085 – Penram International Publishing, Mumbai.- Ramesh S. Gaonakar
3. Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and Glenn SA Gibson
4. Microcontrollers Architecture Programming, Interfacing and System Design – Raj Kamal Chapter: 15.1, 15.2, 15.3, 15.4.1
5. 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.

OUTCOMES:

- The student can gain good knowledge on microprocessor and implement in practical applications
- Design system using memory chips and peripheral chips for 16 bit 8086 micro processor.
- Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
- Understand multi core processor and its advantages

SEMESTER-IV

COURSE 11: MICROPROCESSOR SYSTEMS

Practical Credits: 1 2 hrs/week

List of Experiment

Programs using Intel 8085 /8086

1. Addition and Subtraction (8 bit and 16-bit)
2. Multiplication and Divition (8-bit)
3. Largest number in an array.
4. Smallest number in an array.
5. BCD to ASCII and ASCII to BCD .
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