# Dr V S KRISHNA GOVERNMENT DEGREE COLLEGE(A)
# VISAKHAPATNAM

MAJOR Courses offered w.e.f. AY 2023-24

**SEMESTER-IV COURSE CODE: 23ELEM41**

**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

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

2. 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*, Mc Graw Hill International.

3. Measurement Systems Application and Design - *Ernest O. Doebelin*, 4/e, TataMcGraw Hill Publishing Co. LTD

# Dr. V. S. Krishna Govt. Degree College (Autonomous)

## Visakhapatnam-13

(Affiliated To Andhra University, Visakhapatnam)

## BLUE PRINT FOR SEMESTER END EXAMINATIONS PAPER SETTING

| Learning level wise Weightage | | | | |
|---|---|---|---|---|
| **Bloom's Taxonomy level** | **Weightage** | **marks** | **Essay type** | **Short answer type** |
| **Knowledge/ Remember** | 33% | 20 | 2 | 1(one out of two) |
| **Understanding/ Comprehension** | 27% | 16 | 2 | |
| **Application/** | 20% | 12 | 1 | 1(one out of two) |
| **Analysis** | 13% | 8 | | 2(two out of four) |
| **Synthesis/ Evaluate** | 7% | 4 | | 1(one out of two) |
| **Total** | 100 | 60 | | 5 out of 10 questions |

| Chapter wise Weightage | | | | |
|---|---|---|---|---|
| **Sl. No.** | **Module/ Chapter** | **Name of the chapter** | **8 Marks** | **4 Marks** |
| 1 | UNIT-I | | 2(one out of two) | 2 |
| 2 | UNIT-II | | 2(one out of two) | 2 |
| 3 | UNIT-III | | 2(one out of two) | 2 |
| 4 | UNIT-IV | | 2(one out of two) | 2 |
| 5 | UNIT-V | | 2(one out of two) | 2 |

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**SEMESTER END EXAMINATIONS MODEL PAPER**

SEMESTER- (__)

**(Programme)**_____ **Course title**_____. **Course code**_____

Time: 3 hours Maximum Marks: 60

**PART- A**

Answer any **five** of the following questions. Each question carries **Four** marks. 5 X 4 = 20 Marks

1. –
2. –
3. –
4. ---
5. –
6. –
7. ---
8. –
9. –
10. --

**PART- B**

Answer **all the following** questions. Each carries **Eight** marks 5 X 8 = 40 Marks

11. (A).

(Or)

(b)

12. (A)

(Or)

(b)

13. (A)

(Or)

(b)

14. (A)

(Or)

(b)

15. (a).

(Or)

(b)

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

w.e.f. AY 2023-24

# COURSE CODE 23ELEM42: MICRO CONTROLLER SYSTEM

Theory Credits: 3 3 hrs/week

## Objectives

The students will learn:

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

## Learning outcomes:

| On Completion of the course, the students will be able to | | Knowledge level (Bloom's Taxonomy) |
|---|---|---|
| CO 1 | The student can gain good knowledge on microcontrollers and implement in practical applications | Level 1 (knowledge) |
| CO 2 | learn Interfacing of Microcontroller | Level 2 (Understanding) |
| CO 3 | Get familiar with real time operating system | Level 2 (Understanding) |

## 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 ckennet 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

## CO-PO Mapping

1- Low, 2- Moderate, 3- High, '-' No Correlation

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 |
|---|---|---|---|---|---|---|---|---|---|
| CO 1 | | | | | | | | | |
| CO 2 | | | | | | | | | |
| CO 3 | | | | | | | | | |
| CO 4 | | | | | | | | | |
| CO 5 | | | | | | | | | |

## CO-PSO Mapping

1- Low, 2- Moderate, 3- High, '-' No Correlation

| | PSO 1 | PSO 2 | PSO 3 | PSO 4 | PSO 5 |
|---|---|---|---|---|---|
| CO 1 | | | | | |
| CO 2 | | | | | |
| CO 3 | | | | | |
| CO 4 | | | | | |
| CO 5 | | | | | |

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

w.e.f. AY 2023-24

## COURSE CODE 23ELEM42P: MICRO CONTROLLER SYSTEM

Practical | Credits: 1 | 2hrs/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).

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# COURSE CODE 23ELEM42: MICRO CONTROLLER SYSTEM

Theory | Credits: 3 | 3 hrs/week

## Blue Print for Semester End Theory Examinations

| S.No | Type of question | No of questions given | | | No of questions to be answered | | |
|---|---|---|---|---|---|---|---|
| | | No of questions | Marks allotted to each question | Total marks | No of questions | Marks allotted to each question | Total marks |
| 1 | Section A Short answer questions | 10 (Two questions from each unit) | 4 | 40 | 5 (Any five out of 10 questions) | 4 | 20 |
| 2 | Section B Long answer questions | 10 (Two questions from each unit with only internal choice) | 8 | 80 | 5 (Answer one question from each unit) | 8 | 40 |
| Total | | | | 120 | | | 60 |

**Percentage of choice given** $= \frac{(120-60)}{120} \times 100 = 50\%$

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**COURSE CODE 23(ELE)M42: MICRO CONTROLLER SYSTEM**

## BLUE PRINT FOR SEMESTER END EXAMINATIONS PAPER SETTING

| Learning level wise Weightage | | | | |
|---|---|---|---|---|
| Bloom's Taxonomy level | Weightage | Marks | Essay type | Short answer type |
| Knowledge/ Remember | 33% | 20 | 2(two out of four) | I (one out of two) |
| Understanding/ Comprehension | 27% | 16 | 2(two out of four) | |
| Application | 20% | 12 | I (one out of two) | I (one out of two) |
| Analysis | 13% | 8 | | 2(two out of four) |
| Synthesis/ Evaluate | 7% | 4 | | I (one out of two) |
| Total | IOO | 60 | 5(each question has internal choice) | 5 out of 10 questions |

| Chapter wise Weightage | | | | |
|---|---|---|---|---|
| Sl. No. | Module/ Chapter | Name of the chapter | 8 Marks | 4 Marks |
| 1 | **I** | | 2(one out of two) | 2 |
| 2 | **II** | | 2(one out of two) | 2 |
| 3 | **III** | | 2(one out of two) | 2 |
| 4 | **IV** | | 2(one out of two) | 2 |
| 5 | **V** | | 2(one out of two) | 2 |
| | | | 5(each question has internal choice) | 5 out of given 10 |

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**COURSE CODE 23ELEM42: MICRO CONTROLLER SYSTEM**

Theory | Credits: 3 | 3 hrs/week

**Max Marks: 60**

**Model Paper**

**Section A**

**Answer any five questions from the following ($4M \times 5 = 20M$)**

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

**Section B**

**Answer all the questions ($8M \times 5 = 40M$)**

11. (a)

**(OR)**

(b)

12.(a)

**(OR)**

(b)

13.(a)

**(OR)**

(b)

14.(a)

**(OR)**

(b)

15.a)

**(OR)**

(b)

Dr. V S KRISHNA GOVERNMENT DEGREE COLLEGE

VISAKHAPATNAM

B.Sc. PHYSICS SYLLABUS UNDER CBCS

[2023-24 Batch onwards]

Course Code: 23(ELE)M43

II Year B.Sc (Hons.)-ELECTRONICS

**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 peripheralchips 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:**

**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:**

**8085 INSTRUCTION SET:**

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

**UNIT -III:**

**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:**

**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: 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 with the 8085 – Penram International Publishing, Mumbai.- Ramesh S. Gaonakar

2. Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and Glenn SA Gibson
3. 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 microprocessor.
- 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

□

Course Code: 23(ELE)M43P

**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

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**Visakhapatnam 2023-2024**
**Course Code: 23(ELE)M43**

**BLUE PRINT (:MICROPROCESSOR SYSTEMS)**
**IIB.Sc. (Hons.) ELECTRONICS- SEM-IV/Course : 11**
**Max Marks-75 Time-3Hrs. Credits:3**

| | | TOPIC | SECTION-A | SECTION-B | |
|---|---|---|---|---|---|
| S.No. | UNIT | | ESSAY QUESTIONS 10 MARKS | SHORT QUESTIONS 5MARKS | TOTAL MARKS |
| 1. | I | CPU ARCHITECTURE | 2 | 2 | 30 |
| 2. | II | 8085 INSTRUCTION SET | 2 | 2 | 30 |
| 3. | III | ASSEMBLY LANGUAGE PROGRAMMING USING 8085 | 2 | 2 | 30 |
| 4. | IV | BASIC 8086 CONFIGURATIONS | 2 | 2 | 30 |
| 5. | V | ARM PROCESSOR | 2 | 2 | 30 |
| 6. | | TOTAL QUESTIONS | 10 | 10 | 150 |

[Note: Question Paper setters are instructed to add Numerical Problems (each of 4 marks) with a maximum weightage of 8 marks cither in Section-A or Section-B covering all the five units in the syllabus]

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VISAKHAPATNAM
B.Sc. PHYSICS SEMESTER END EXAMINATION
[2023-24 Batch onwards]
Course Code: 23(ELE)M43

II Year B.Sc (Hons.)- ELECTRONICS
**SEMESTER-IV COURSE 11: MICROPROCESSOR SYSTEMS**

Time: 3 hrs. Maxmarks:60

**SECTION – A**

**Answer all Questions of the following** **[5 X 8 = 40 ]**

1. a)

[OR]

b)

2. a)

[OR]

b)

3. a)

[OR]

b)

4. a)

[OR]

b)

5. a)

[OR]

b)

**SECTION – B**

**Answer any FIVE Questions of the following** **[5 X 4 = 20 ]**

6. a)
7. a)
8. a)
9. a)
10. a)
11. a)
12. a)
13. a)
14. a)
15. a)