

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

B.Sc ELECTRONICS

REVISED SYLLABUS

2010-11

SEMESTER III & IV

SEMESTER- III

EC3B08 MICROPROCESSORS

Aim of the course:

This course aims to give a strong background in the field of Microprocessor 8085 and to expertise in assembly level programming


















































Contact hours: 72




















Credits                : 4                                             











Course outline

UNIT-1


















































MODULE-













1                                                 

8 hours
Microcomputer: Introduction-types of microcomputers, Memory: Types, Memory map and address, memory address lines, memory word size, Memory classification
Types of I/O:Peripheral Mapped I/O, Memory mapped I/O                   

Text Book: *Microprocessor architecture, programming, and Application with 8085*           


















































MODULE-








2                                                 












12 hours
Microprocessor: Introduction to 8085, Microprocessor initiated operations and bus organization, internal data operation, 8085 registers, externally initiated operations 8085 microprocessor pin out and details, microprocessor communication and Bus timings, demultiplexing the bus, generating control signals            

Text Book: *Microprocessor architecture, programming, and Application with 8085*           

MODULE-

3                                                 

16 hours
 8085 Functional block diagram, 8085 machine cycles and bus timings, 8085 Instruction classification, instruction set, addressing modes, data transfer   Operations, arithmetic operations, logic operations, branch operations. (Examples of each operation)    

Text Book: *Microprocessor architecture, programming, and Application with 8085*           

UNIT-2

EC4B14 PRACTICAL - MICROPROCESSORS

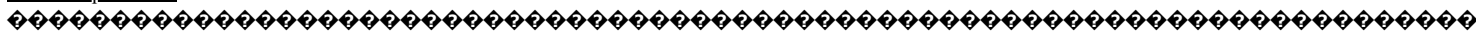
Aim of the course:

To equip the student with a practical knowledge of 8085 programming, its interfacing and applications

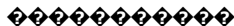
Contact hours : 72

Credits: 2

List of Experiments



UNIT I



- 1. Data transfer using direct and indirect addressing
- 2. Block data transfer
- 3. Addition and subtraction of two signed numbers.
- 4. Addition and subtraction of two unsigned numbers.
- 5. 16 bit addition.
- 6. Multiplication of two numbers.
- 7. Multiplication by shift rotate and add method.
- 8. Division of two numbers.
- 9. Checking specific bits.
- 10. Finding largest number in a data.
- 11. Finding smallest number in a data.
- 12. Sorting in ascending order.
- 13. Sorting in descending order.
- 14. BCD addition and subtraction

UNIT II

- 1. Waveform generation.
- 2. Lighting LED with a delay.
- 3. Traffic control.
- 4. Stepper motor interface.
- 5. Counter to count from 0-99 with a delay.
- 6. Simple assembly level 8086 programming using DEBUG or MASM

All the experiments of Unit I are to be carried out compulsorily and from Unit II at least 3 experiments are to be carried out compulsorily.

EC4B15 MICROWAVE ELECTRONICS

Aim of the course:

To equip the student with the theory of wave guides, transmission lines, microwave components, microwave tubes and devices

Prerequisite:

Knowledge on Maxwell's equation, Electromagnetic radiation

Contact hours: 72 hours

Credits : 4

Course Outline

Unit I

Module I 8 hours

Introduction- Frequency spectrum- microwave bands applications of Microwaves different fields.
Guided waves Introduction rectangular wave guides TE, TM and TEM waves
Text book (1) pages 311-331

Module II 14 hours

Transmission media
Review of transmission lines Transmission line equation (derivation required) Impedance matching input impedance, standing wave ratio, power applications-strip transmission lines-cavity resonators- Coaxial cable, twisted pair cable
Text book (2) pages 501-517, 533-536, 552-554. Text book (1) pages 353-357, 569-571,

Module III 8 hours

Microwave Components
Introduction-wave guide corners, twists, and bends- wave guide coupling, E-H tuner- wave guide tees- directional couplers- isolators and circulators
Text book (1) pages 340-347, 357-364

Unit II

Module IV 15 hours

Microwave Tubes
Introduction Multicavity Klystron Velocity modulation and beam bunching reflex Klystron- magnetrons working of magnetrons Traveling wave tube- other microwave tubes
Text book (1) pages 377-411

Module V 15 hours

Microwave Semiconductor Devices
Schottky diodes, Point Contact diodes, Varactor diodes- applications- concept of parametric amplifiers microwave transistors and integrated circuits- IMPATT, TRAPATT and GUNN devices Applications.
Text book (1) pages 417-424, 427-436, 440-444, 448-451, 454-465

- Text Books:*
- 1 Electronic communication- Fourth Edition-Kennedy
 - 2 Elements of Electromagnetics- Fourth Edition- Matthew N O Sadiku
 - 3 Electromagnetic Waves and Radiating Systems Jordan and Balmain

EC4B16 OPTOELECTRONICS



Aim of the course:

This course aims to give an in-depth knowledge in the field of lasers, optical semiconductor devices, optical display devices and optical wave guides








Contact hours: 72 hours

Credits         : 4




Course Outline**UNIT I****MODULE I**

Nature of light, wave nature of light, elliptical polarization, birefringence, optical activity, electro-optic effect, Kerr modulators, magneto-optic devices, Acousto-optic effect  (Text book 2 pp 1-11,  76-87, & 94-104)




MODULE II

      Lasers- emission and absorption of radiation, population inversion, attainment, optical feedback, threshold condition, Doped insulator lasers, gas lasers, Q switching (Text book 2 pp 155-157, 161-168, 181-187, 201-209  & 226-230)




MODULE III

 Semiconductor optical sources- optical emission from semiconductors, heterojunctions, semiconductor injection laser, single frequency injection lasers, distributed feedback lasers, LED power and efficiency, double heterojunction LED, LED structures, LED characteristics (text book 3  pp 296-336,  394-410)


UNIT II**MODULE IV**

Photodetectors- Thermal detectors, junction photodiodes, APD, phototransistor, Solar cells- I-V characteristics and spectral response. Materials and design considerations of solar cells (text book 2  pp 254-261, text book 3  pp 430-453, 455-458, text book 1  pp 430-432, 435-438, 442-445)















































MODULE V

Display devices  PL, EL and CL displays, displays based on LED, Plasma panel and LCD  (text book 2  pp 113-153)

MODULE VI

Optical fibre waveguides, step index and graded index fibres, attenuation, modes in step index fibre, modes in graded index fibre, pulse Distortion and information rate in optic fibres, construction of optic fibres, optic fibre cables(text book 4  pp 102-138)

TEXT BOOKS

- 1                                              

EC4B17 INSTRUMENTATION ELECTRONICS

Aim of the course:

This course aims to impart an in-depth knowledge in the field of transducers, bridges, and electronic instruments.

Contact hours: 72 hours

Credits : 4

Unit- I

Module I- Introduction 6 Hours
 Generalized Measurement systems - Static and dynamic characteristics - units and standards of measurements - error analysis.

Module II- Transducers 18 Hours
 Classification of transducers - Selecting a transducer- Resistive, inductive and capacitive transducers - strain gauge and gauge factor, Temperature transducers - Thermistor, Thermo couples, LVDT, Displacement Transducers, Piezo-Electric transducers

Module III- Signal Conditioning 12 Hours
 Bridge measurements Wheatstone Bridge, Maxwell, Hay, Schering, and Wien bridge, Amplifiers - Chopper amplifiers.

Module IV- Data Acquisition and conversion 12 Hours
 Principle of operation of DAC- Weighted resistor network- Binary Ladder resolution- linearity offset-principle of operation of ADC- counter method, successive approximation, single slope and dual slope integration

Module V Electronic Measurements and Display Instruments 12 Hours
 DC Voltmeter-DC Ammeter, Analog Multimeter, Digital Multimeter Block representation- Simple frequency Counter, Q meter Basic Q meter circuit Cathode ray Oscilloscopes - block schematic - special oscilloscopes - Storage oscilloscope, Graphic recorder and X-Y recorders.

Module VI Signal Generators and Analyzers 12 Hours
 Signal generators, RF signal generators, Sweep Frequency generators, Pulse generators, Simple frequency counter, Wave analyzer, Harmonic distortion analyzer, Spectrum analyzer.

Text Books:

1. Albert D.Helfrick and William D.Cooper - Modern Electronic Instrumentation and Measurement Techniques, Prentice Hall of India, 2003.
2. Electronic Instrumentation H S Kalsi - TMH

Reference Text Books:

1. Alan. S. Morris, Principles of Measurements and Instrumentation, Prentice Hall of India, 2nd edn., 2003.

