ACHARYA NAGARJUNA UNIVERSITY

B.Sc. Electronics CBCS SYLLABUS

B. Sc ELECTRONICS SYLLABUS (2017-18)

3rd YEAR
V SEMESTER
PAPER-V ANALOG AND DIGITAL COMMUNICATIONS
PAPER-VI MICROPROCESSOR SYSTEMS
ACHARYA NAGARJUNA UNIVERSITY
B.Sc. Electronics CBCS Syllabus
3RD YEAR

Semester - V

Paper- V

Only for the year 2017-18

TITLE: ANALOG AND DIGITAL COMMUNICATIONS

OBJECTIVES:
- This course provides a thorough introduction to the basic principles and techniques used in analog and digital communications.
- The course will introduce analog and digital modulation techniques.
- Communication receiver and transmitter design, baseband and band pass communication techniques, line coding techniques, noise analysis, and multiplexing techniques.
- The course also introduces analytical techniques to evaluate the performance of communication systems.

UNIT – I (12Hrs)

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.

UNIT – II (12Hrs)

FREQUENCY MODULATION:

UNIT – III (12Hrs)

BASIC RECEIVER CIRCUITS:

UNIT – IV (12Hrs)

PULSE MODULATION:
- Introduction, Sampling Theorem, TDM, FDM, PAM- Generation & Detection PWM- Generation & Detection

UNIT – V (12Hrs)

DIGITAL COMMUNICATIONS:
- PCM – PCM encoders, Quantization noise, S/N ratio of PCM system, relation between S/N ratio & BW, Composting, Advantages of digital over analog communications.
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
3. Advance Electronic communication system — Tomasi wayne
4. Modern digital and analog communication system — B.P. Lathi

OUTCOMES:
On successful completion of the course students will be able to:
• The student can gain good knowledge on analog and digital communication
• Understand basic elements of a communication system
• Conduct analysis of baseband signals in time domain and in frequency domain
• Demonstrate understanding of various analog and digital modulation and demodulation techniques techniques.
• Analyse the performance of modulation and demodulation techniques in various transmission environments

ELECTRONICS LAB-V
COMMUNICATION LAB

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
MODEL PAPER

ANALOG AND DIGITAL COMMUNICATIONS

SECTION-A

Answer any FIVE of the following: 5x5=25M

1. Explain about need for modulation.
2. Write short note on wide band FM.
3. Define the following terms.
   (i) Thermal (ii) shot noise
4. State and prove sampling theorem
5. Write a short note on TDM.
6. Write a short note on PWM.
7. What are the advantages of Digital over Analog Communication?
8. Explain about power relations of AM.

SECTION-B

Answer the following: 5x10=50M

1. a) Define amplitude modulation and explain about frequency spectrum of AM wave.
   (or)
   b) Explain about Suppression of Carrier using balanced modulator.
2. a) Explain about the generation and de-modulation of FM
   (or)
   b) Explain how FM signals are generated using reactance modulator.
3. a) Explain about the principle and working of super heterodyne receiver-AM
   (or)
   b) Discuss about the construction and working of Ratio detector.
4. a) Explain the block diagram of PAM and briefly explain each block.
   (or)
   b) Describe the generation and detection of PPM.
5. a) Explain the block diagram of PCM in detail.
   (or)
   b) Discuss briefly about ASK.
ACHARYA NAGARJUNA UNIVERSITY
B.Sc. Electronics CBCS Syllabus

Only for the year 2017-18
3rd YEAR

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Semester-V
Paper- VI

TITLE: MICROPROCESSOR SYSTEMS

UNIT -I: (12Hrs)
CPU ARCHITECTURE
Introduction to Microprocessor, INTE-8085(μP) Architecture, CPU, ALU unit, Register organization, Address, data and control Buses. Pin configuration of 8085.

UNIT – II: (12Hrs)
8086 Architecture, Evaluation of Microprocessor, Internal operation, Pin description. Instruction format, Machine language instructions, Instruction Execution timing, Addressing modes

UNIT -III: (12 Hrs)
INSTRUCTION SET: Data transfer instruction, Logical instructions, Arithmetic Instructions, Branch Instructions, Flag Manipulation, Shift and rotate Instruction, Loop Instruction

UNIT -IV: (12Hrs)
Assembly Language Programming, Programmes for Addition, Subtraction, Multiplication. Find the largest and smallest number in an array.

UNIT -V: (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

R. Siva Mohanty 20/1/2017
Bos., Chairperson, Electronics

S. Elamanchili
Member of BOS

P. Srinivasa Rao
member, B.Sc Electronics

A. Suresh Babu
Member, BOS
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.

ELECTRONICS LAB-VI
MICROPROCESSOR LAB

LAB LIST:
1. PROGRAM TO ADD 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
Department of Electronics
Title: Microprocessor systems
MODEL PAPER
SECTION-A
Answer any FIVE of the following: 5x5=25M

1. Describe the flag register of 8086.
2. Explain the pipeline architecture.
3. What is an interrupt vector table? And explain.
4. Write short notes on DMA.
5. Write short notes on shift and rotate instructions.
6. Write short notes on minimum mode configuration.
7. Compare series communication and parallel communication systems
8. Write about instruction format.

SECTION-B
Answer the following: 5x10=50M

1. a) Explain the functional block diagram of 8085 microprocessor.
   (or)
   b) Draw the Pin diagram of 8085 microprocessor and explain each pin.

2. a) Define the following terms in brief (i) Data transfer (ii) Arithmetic instructions and with one example each
   (or)
   b) Explain Addressing Modes of 8086.

3. a) Explain Data Transfer and Arithmetic Instructions with two Examples.
   (or)
   b) Explain about Flag Manipulation and loop instructions.

4. a) Write an ALP program to find the largest number in an array.
   (or)
   b) Write an ALP Program for the Addition of 16 bit Hexadecimal numbers.
   (or)

5. a) Explain Interrupt Priority Management of I/O Interface.
   (or)
   b) Explain about programmable Timers.