## **MAHATMA GANDHI UNIVERSITY, KOTTAYAM**

# **B.Sc ELECTRONICS**

# REVISED SYLLABUS(COMPLEMENTARY)

# SEMESTER III & IV

### Semester III

EC3C03\_Operational amplifiers, Integrated circuits and Communication electronics

#### **Aims and Objectives**

The advent of integrated circuit technology is the cause of all modern developments in electronic industry. The objective of the course is to introduce the techniques of IC fabrication, discuss the basic principle of working of operational amplifier. The course also aims to provide rudimentary ideas of electronic communication.

No. of contact hours: 36 No. of Credits: 2

Module I
OP amp

Basic concepts Schematic diagram of 741-Ideal Operational amplifier- Practical inverting OP-AMP- Practical non-inverting OP-AMP - DC analysis- Ac Analysis- The differential amplifiers- OP- Amp Parameters- Input bias current- Input offset current-Input offset voltage-Input Common mode Range-Power Supply Voltage rejection Ratio-Output Voltage Swing(Range)- Slew rate- Full Power Band Width- - Applications of OPAMP-adder Circuit - Integrator Differentiator- voltage comparator.

Ref: Integrated Electronics Millman & Halkias

#### **Module II**

Integrated Circuits

IC classification- monolithic IC techniques- Planar process- Bipolar transistor fabrications- Monolithic diodes- Resistors-Capacitors- IC Packaging- Preparation of thin films.

Ref: Micro Electronics Millman & Grabel.

Module III

Communication

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Principles of A.M. Side band frequencies of A M wave-Power in AM wave-Transistor A.M modulator-Frequency modulation (Qualitative study only)-Essentials of demodulation of AM wave. A.M. Radio receiver-Super heterodyne receivers- Pulse modulation-PAM, PTM, PCM, PPM. (Basic ideas)
T.V. fundamentals-Block diagram of monochrome T.V.transmitter and receiver-Scanning-Aspect ratio-Basic ideas of LCDTV-Plasma TV HDTV

Practical III
List of Experiments

No. of contact hours: 36

Credits: 1

- 1. OP- AMP- inverting amplifier.
- 2. Non-inverting amplifier using OP- AMP

- 3. OP- AMP comparator, buffer.
- 4. OP- AMP- integrator.
- 5. OP- AMP- differentiator.
- 6. OP-AMP-Square Wave generator using OP-AMP
- 7. Amplitude Modulation
- 8. Demodulation
- 9. PCB Fabrication

#### Semester IV

Aims and Objectives

#### **EC3C03 Digital Electronics**

• Computers and many other sophisticated electronic devices are working on Digital electronic principles. The aim of the course is to impart sufficient knowledge of these principles. The course also aims to provide basic ideas of memory devices.

No. of contact hours: 36 No. of Credits: 2

Module I

Number Systems-Decimal-binary �l-Hexadecimal-BCD-conversion between different systems- Binary Arithmetic

Ref:Digital Circuits and Design & Salivahanan and S Arivazhagan [Ch I&2]

Logic

Review of AND, OR, NOT, XOR, NAND, NOR gates and their Truth Table. TTL and CMOS gates. Adders-Half Adder- Full Adder- 4 bit Adder- Subtraction circuits-Encoders- Decoders

• Ref: Integrated Electronics Millman & Halkias

Module II

Flip

Types of Flip Flops(FF)- S-R FF-[ NOR and NAND based ] Clocked S-R FF- D FF J-K FF T FF Master- Slave FF- Race around condition- Applications of FF-Shift registers-Serial in Serial out Parallel out- Serial-in-parallel out-parallel in serial out- Counters- Ripple counter- Ring counter- Synchronous Counters- Synchronous Up/down Counter Design of Mod-10(decade) counter. D/A Converters-Weighted resistor type D/A Converter- R-2R Converters- A/D Converter Counter type A/D Converter.

Ref: Integrated Circuits Millman & Hallkias

Module III��

**Memory Devices** 

Memory Devices-Magnetic tapes-Hard disc-Floppy disc-C.D. Rewritable C.D.-D.V.D. - Bubble memory-Memory card-Memory button - Pen drive

Ref: Microprocessor architecture, programming and applications with the 8085- & Ramesh Gaonkar

Practical IV
List of Experiments

No. of contact hours: 36

Credits: 1

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- 1. Verification of Truth table of Logic gates using IC.
- 2. Verification of De-Morgan s laws using IC.
- 3. Verification of truth table of JK flip-flop.
- 4. Shift register using IC.

- 5. Ripple counter using IC.
- 6. Ring counter using IC.
- 7. Decade counter using IC.
- 8. A/D Converter
- 9. D/A Converter