

2000-2001

SSP-S 304

SYLLABUS

ANDHRA UNIVERSITY
DEPARTMENT OF PHYSICS
M.Sc.(FINAL) PHYSICS & II M.Sc(TECH.) ELECTRONICS
III SEMESTER : P304: ELECTRONICS – II.
(Common for II M.Sc. Space Physics – SP.304)

1. Operational Amplifiers (OP Amp.):

The ideal Op Amp – Practical inverting and Non inverting Op Amp stages. Op Amp Architecture – differential stage, gain stage, DC level shifting, output stage, offset voltages and currents. (Chapter. 10.21, 14.1 to 14.6 of Text book.1) 5 Hrs.

Operational Amplifier parameters input-offset voltage (V_{io}), Input Bias current (I_b) – Common Mode Rejection Ratio (CMRR), Slew Rate, Open loop voltage gain. (Chapter 14.7 to 14.9 of Text book. 1) 3 Hrs.

2. Operational Amplifier Applications:

Summing amplifier (adder), Integrator, Differentiator, Voltage – Current converter Current – Voltage converter. Phase Shift oscillator, Wein bridge oscillator. 5 Hrs.

Active Filters – Butterworth and Chebyshev filter functions, Single amplifier, Bi – quad section, switched capacitor filters, Precision AC/DC converters. 5 Hrs.

Chapter. 10.22, 15.2, 15.3, 15.7, 15.9, 15.10, 16.6, 16.8 to 16.15 of Text Book. 1.

3. Digital Circuits:

The binary system, Boolean Algebra – AND, OR, NOT, NAND, NOR EX- OR and EX – NOR gates. Logic gate characteristics Applications of Boolean Algebra – Binary Adder (Half adder and Full adder). 4 Hrs.

Digital comparator. Decoder and Encoder. Seven segment Decoder / driver. Flip – Flops – RS, JK, T and D Flip Flops. Shift Register, Ripple counters, Synchronous Counters. Applications of Counters – Frequency counter. 7 Hrs.

Chapter: 6.1 to 6.4, 7.2, 7.4, 7.6, 7.8, 8.1 to 8.7 of Text book.1.

4. A/D and D/A Converter:

Signals and Signal processing, Sample and Hold Systems. D/A Converter (linear weighted and ladder type). A/D converter (Counting A/D Converter, Successive approximation, Dual slope). 8 Hrs.

Chapter: 16.1, 16.2, 16.4, 16.5 of Text Book.1.

5. Microwave Devices:

Multi cavity Klystron, Reflex Klystron, Magnetron, Travelling wave tube, Gunn Diode, IMPATT diode, TRAPATT diode. 5 Hrs.

Cavity Resonator, Directional couplers – isolator, attenuator, hybrid T junction (magic T), Parabolic reflector antenna, Horn antenna, Lens antenna. 8 Hrs.

Chapter: 11.2 to 11.5, 12.6, 12.7, 10.4, 10.5, 10.3.4 of Text book 1 and Chapter: 9.7 of Text Book.2.

TEXT BOOKS:

1. "Microelectronics" by Jacob Millman & Arvin Grabel, McGraw-Hill International editions.
2. "Electronic Communication Systems" – George Kennedy –Tata McGraw-Hill.
3. "Op.Amps and Linear Integrated Circuits" – Ramakant A. Gayakwad – Prentice Hall of India.
4. "Digital Systems – Principles and applications" –Ronald.J.Tocci, Prentice Hall of India.