

SCIENCE FACULTY

North Maharashtra University, Jalgaon.

Class:- S.Y.B.Sc. (Semester Pattern)

(wef. June 2008)

In the Joint meeting of Chairman of Board of studies in all subjects of science faculty chaired by Hon. Dean of Science faculty is held on 26th May 2008, the revised syllabus for S.Y.B.Sc. (Electronics) is accepted and finalised as per guidelines of Academic Council and with reference to the U.G.C. model curriculum. The nomenclature accepted is as follows.

ELE YSC [Y for year, S for semester and C for course number].

The Course Structure and title of the courses for S.Y.B.Sc. (Electronics) are as given below:

Course Title	Semester	Periods	Marks	
			Ext.	Int.
ELE-211-ANALOG CIRCUITS AND APPLICATIONS.	I	52	40	10
ELE-212-DIGITAL ELECTRONICS & APPLICATIONS	I	52	40	10
ELE-221- LINEAR INTEGRATED CIRCUITS & APPLICATIONS.	II	52	40	10
ELE-222- INSTRUMENTATION	II	52	40	10
ELE-203-PRACTICAL COURSE	Annual	104	80	20

Note:-

1. Instrumentation-I s compulsory for the students who offered Electronics as of the subject at F.Y.B.Sc.
2. A Study tour is compulsory for the S.Y.B.Sc students. The students should submit their tour reports at the time of practical examination.
3. Each period is of 48 mts. duration.
4. Each course is having weightage four periods per week.
5. Each practical course is having weightage four periods per week.
6. Examination of practical course shall be held at the end of the academic year.

Chairman B.O.S.

Dean Sci. Faculty

NORTH MAHARASHTRA UNIVERSITY, JALGAON.
Syllabus for S. Y. B. Sc. Electronics.
Paper - I

ELE-211: ANALOG CIRCUITS AND APPLICATIONS.

SEMESTER - I

- 1. Multistage Transistor Amplifiers :** (11P,08M)
Introduction, Block diagram of multistage transistor amplifier, Explanation of terms - gain, frequency response, decibel gain, Bandwidth. Two stage RC-coupled transistor amplifier, two stage transformer coupled transistor amplifier.
- 2. Transistor Audio Power Amplifier :** (11P,08M)
Difference between voltage and power amplifiers, Block diagram of a practical power amplifier, Class B Push Pull Power Amplifier-operation, cross over distortion, conversion efficiency, heat sinks.
- 3. Feedback:** (14P, 12M)
Concept of feedback, types of feedback, Principles of negative feedback in amplifiers, Gain of negative feedback amplifier, Advantage of negative feedback (derivations are not expected).
Emitter follower – operation, characteristics and applications,
Positive feedback amplifier (Oscillator), Bark Hausen criterion, transistorized phase shift oscillator.
- 4. Wave Shapping Circuits :** (06P, 04M)
Need of wave shaping circuits, Differentiator and Integrator circuits using R and C, Basic Clipping and clamping circuits.
- 5. Differential Amplifier :** (10P,08M)
Introduction, CMRR, differential amplifier configurations (mention types with circuit diagram only), Emitter coupled differential amplifier, differential amplifier with constant current source.

Reference :

- | | | |
|--|---|--------------------|
| 1. Principles of Electronics | - | V. K. Mehta |
| 2. Electronic Principles | - | A. P. Malvino |
| 3. Electronic Devices & Circuits | - | Milliman & Halkias |
| 4. Electronic Devices & Circuits | - | Allen Mottorshed |
| 5. Basic Electronics | - | D. C. Tayal |
| 6. Basic Electronics & Linear Circuits | - | N. N. Bhargava |
| 7. Integrated Circuit | - | K. R. Botkar |

**ELE-221: LINEAR INTEGRATED CIRCUITS & APPLICATIONS.
SEMESTER - II**

1. Operational Amplifier - (10P, 08M)

Block diagram, Schematic symbol, Pin diagram, parameters (definitions only) - Input impedance, output impedance, input offset voltage, open loop voltage gain, input bias current, slew rate. Ideal characteristics of an Op-Amp, practical characteristics of an Op-Amp, inverting amplifier, concept of virtual ground, non-inverting amplifier, voltage follower.

2. General applications - (08P, 06M)

Adder, Subtractor, Differentiator, integrator, Instrumentation amplifier with three Op-Amps, voltage to current converter with floating load and grounded load, Log amplifier using diode.

3. Active filters and Oscillators - (12P, 08M)

Classification of filter, Active filters – Advantages, limitations and types, first order low pass and high pass active filters (Derivation of gain and designing), phase shift oscillator, Wien bridge oscillator, basic triangular and square wave generator.

4. Comparators - (08P, 08M)

Basic comparator, Schmitt trigger, comparator characteristics, precision half wave and full wave rectifiers, basic peak detector.

5. Waveform generators using IC-555 (14P, 10M)

Timer IC-555 and its application - Pin diagram, Functional block diagram, Concept of multivibrator, Astable Multivibrator – Operation and its applications (Square wave generator, Free running ramp generator), Monostable Multivibrator – Operation and its applications (frequency divider, pulse stretcher), Bistable Multivibrator–Operation.

References –

1. Operational Amplifier - G. B. Clayton
2. Operational Amplifier and Linear Integrated Circuits - R. A. Gaikwad
3. Integrated Circuits - K. R. Botkar

NORTH MAHARASHTRA UNIVERSITY , JALGAON.

Syllabus for S. Y. B. Sc. Electronics.

Paper - II

ELE-212: DIGITAL ELECTRONICS & APPLICATIONS

SEMESTER - I

1. K- map :-

(16P, 14M)

Revision of Boolean laws and theorems, Sum of product method, Truth table to K-map up to 4 variables, properties of K-map (pairs, quads, octet), K-map Simplification, don't care condition, product of sum simplification. Design examples using K-map half adder, full adder, half subtractor and full subtractor.

2. Counter :-

(16P, 12M)

Asynchronous counter (4-bit), decade counter, Synchronous counter (4-bit), modulus of counter, mod-3 counter, mod-5 counter, shift counter, up-down counter (3-BIT).

3. Data Converters :-

(12P, 08M)

Digital to Analog converters - binary weighted resistors, binary ladder D/A Accuracy and resolution.

Analog to Digital converters - simultaneous, counter type, and successive approximation.

4. Digital Frequency Meter:-

(08P, 06M)

Block diagram and working of DFM, measurement modes such as frequency and period, Time base generator in DFM.

References –

1. Digital Principles and Applications - Leach, Malvino
2. Modern Digital Electronics - R. P. Jain
3. Digital Electronics - William Gothman
4. Digital Fundamentals - Thoman Floyd

**ELE-222: INSTRUMENTATION
SEMESTER - II**

1. Transducers - (11P, 08M)

Introduction, Parameters and advantages of electrical transducer, Active and passive transducers, resistance pressure transducer, semiconductor strain gauge transducer, LVDT transducers.

2. Power Supply - (12P, 10M)

Block diagram of unregulated and regulated power supply, load regulation, line regulation, basic regulator theory – voltage regulator, series regulator and shunt regulator (transistorized), Block diagram of three terminal voltage regulator, fixed voltage regulator using 78XX and 79XX.

3. Basic Analog Meters - (09P, 06M)

PMCC mechanism, DC ammeter, DC voltmeter, loading effect, sensitivity of voltmeter, Design of multirange ammeter and voltmeter, series type ohmmeter, idea of multimeter.

4. Cathode Ray Oscilloscope (CRO) - (14P, 12M)

Block diagram, CRT controls, Vertical deflection system – CRO probe, input selector, vertical amplifier, function of delay line. Horizontal deflection system – Time base generator, synchronization condition, triggered sweep generator, sync selector, triggered pulse circuit (trigger level and slope), modes of trigger.

5. Digital Multimeter (DMM) (06P,04M)

Block diagram of DMM, current to voltage conversion, resistance to voltage conversion, auto zeroing.

References –

1. Electronics Instrument & Measurement Techniques - W. D. Cooper
2. Electronics Instrumentation - H. S Kalsi
3. Electrical & Electronic Measurements & Instrumentation - A. K. Sawhney

NORTH MAHARASHTRA UNIVERSITY, JALGAON.

Syllabus for S. Y. B. Sc. Electronics.

Paper – III

ELE-203- Practical

A) ANY FOUR

1. Build and test clipping circuits (+ve, -ve and combination) using diodes, battery.
2. Build and test clamper circuits (+ve, -ve) using R and C.
3. Build and test dual power supply using 78XX and 79XX (Load and line regulation).
4. Build and test differential amplifier using transistor.
5. Build and study R – C Integrator and Differentiator circuits.
6. Design, Build and test phase shift oscillator using transistors / Op-amp.

B) ANY FOUR

7. Study of IC 7490 as scalar.
8. Design, build and test DAC using R-2R ladder / binary weighted resistors.
9. Build and test counter type ADC using DAC.
10. Study of IC tester (IC's 7400, 7404, 7408, 7432, 7447, 7490).
11. Build and test a decade counter using IC 7490, IC 7447 decoder and 7 - segment display.
12. To construct and simplify logic circuit using K-map of given truth tables (four variables) and verify truth table.

C) ANY FOUR

1. Study characteristics of Op-Amp (offset null, I/P and O/P impedance)
2. Build and test adder and subtractor using Op-Amp.
3. Design, build and test first order low pass / high pass active filter using Op-Amp.
4. Study of log amplifier using diode and Op-Amp.
5. Design, build and test Astable / Monostable multivibrator using IC 555.
6. Build and test two stage R-C coupled/ transformer coupled amplifier.

D) ANY FOUR

7. Design, build and test Wein-bridge oscillator using Op-Amp.
8. Design, build and test square wave and triangular wave generator using Op-Amp.
9. Design and verify multirange ammeter, voltmeter using PMMC.
10. Build and test precision half and full wave rectifier using Op- amp.
11. Design build and test V/I converter using op-amp.
12. Design build and test Schmitt trigger using op-amp.

**NORTH MAHARASHTRA UNIVERSITY,
JALGAON.**

**SYLLABUS
FOR**

**S. Y. B. Sc.
ELECTRONICS.**

W. E. From June - 2008