

Re-Accredited B+++ 2.86 CGPA by NAAC

VEER NARMAD SOUTH GUJARAT UNIVERSITY

University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.

વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી

યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.

Tel : +91 - 261 - 2227141 to 2227146, Toll Free : 1800 2333 011, Digital Helpline No. - 0261 2368888

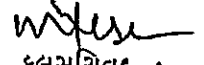
E-mail : info@vnsgu.ac.in, Website : www.vnsgu.ac.in

-: પરિપત્ર :-

યુનિવર્સિટી સંલગ્ન વિજ્ઞાન વિદ્યાશાખા હેઠળની તમામ કોલેજોનાં આચાર્યશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૫-૨૬ થી અમલમાં આવનાર T.Y.B.Sc.(Electronics) Sem.-5 & 6 નો પેટાસમિતિ દ્વારા તૈયાર કરવામાં આવેલ અભ્યાસક્રમ ઈલેક્ટ્રોનિક્સ વિષયની નિયુક્ત એડહોક અભ્યાસ સમિતિના કન્વીનરશ્રીએ અભ્યાસ સમિતિવતી અને વિજ્ઞાન વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખાવતી ડીનશ્રીએ મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલની તા.૨૪/૧૨/૨૦૨૪ ની સભા ના ઠરાવ ક્રમાંક:૩૫૩ અન્વયે માન.કુલપતિશ્રીને આપેલ સત્તા અંતર્ગત માનનીય કુલપતિશ્રી દ્વારા મંજૂર કરેલ છે. જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

(બિડાણ: ઉપર મુજબ)

ક્રમાંક:ઓથોરીટીઝ/પરિપત્ર/૧૯૯૩૮/૨૦૨૫
તા.૨૮/૦૭/૨૦૨૫


કુલસચિવ

પ્રતિ,

- ૧) યુનિવર્સિટી સંલગ્ન વિજ્ઞાન વિદ્યાશાખા હેઠળની તમામ કોલેજોનાં આચાર્યશ્રીઓ.
..... આપશ્રીની કોલેજના સંબંધિત શિક્ષકોને જાણ કરી અમલ કરવા સારૂ.
- ૨) અધ્યક્ષશ્રી, વિજ્ઞાન વિદ્યાશાખા.
- ૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.
.....તરફ જાણ તેમજ અમલ સારૂ.

[Subject code for Theory-2503000505019001]

[Subject code for Practical-2503000505019002]

Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for T Y B Sc (Electronics) Major Semester-5
(With Effect From June 2025)

PAPER - 1 : Operational Amplifier

(Total 4 Credit : 2 for Theory and 2 for Practical i.e. 4 Hours of Practical per week per batch)

Unit 1: Introduction to operational amplifier

Differential amplifier circuit configurations, Dual input balanced output Differential amplifier, Dual input unbalanced output Differential amplifier, Constant current bias, Current mirror, level translator.

Block diagram, equivalent circuit and schematic symbol of typical operational amplifier, ideal op amp, ideal voltage transfer curve, Open loop op-amp configurations, Voltage series feedback amplifier, voltage shunt feedback amplifier, Differential amplifier with one op-amp, two op-amp and three op-amps, examples of designing and analysis.

Unit 2 : Indian Views on Science

India- Past and Present, Views of the West and India towards Logic and Experiments, Western and Indian concept of Science, Scientific tradition, Electrical and Mechanical Science

Recommended List of Books:

- 1) R A Gayakwad, Op-Amps and Linear Integrated Circuits, 2012, PHI, New Delhi
- 2) P R Gray and R G Meyer, Analysis and Design of Integrated Circuits, 6th Ed John Wiley & Sons
- 3) R F Coughlin and A F F Driscoll, Operational Amplifiers and Linear Integrated Circuits, 2000, PHI, New Delhi
- 4) Suresh Soni, India's Glorious Scientific Tradition, Ocean Books Pvt. Ltd., New Delhi

Experiments/ Laboratory work :

There will be four hours of laboratory/practical per week per batch. There will be ten students per batch for laboratory/practical work.

List of Experiments/Practicals/Laboratory work for Paper Operational Amplifier

1. Study of BJT differential amplifier
2. Study of Non- inverting amplifier
3. Study of inverting amplifier
4. Study of CMRR
5. Measurement of Input and output off-set voltage.
6. Study of slew rate.
7. Study of Differential Amplifier with one, two and three Operational Amplifier

[Subject code for Theory-2503000505029001]

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Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for T Y B Sc (Electronics) Major Semester-5
(With Effect from June 2025)

PAPER - 2 : Analog Communication

(Total 4 Credit : 2 for Theory and 2 for Practical i.e. 4 Hours of Practical per week per batch)

Unit 1: Basics of Communication and Modulation Techniques

Communication system, Modulation, External Noise, Internal Noise, Signal to noise ratio, Analog and digital signals

Introduction of Antenna, Antenna parameters and their definitions.

Theory of AM, A M Generation, Doubled Sideband Suppressed Carrier Modulation, Description of SSB, carrier Suppression, Unwanted Sideband Suppression, Demodulation of AM, Frequency & Phase Modulation Theory, Frequency Modulation Bandwidth, Phase Modulation, Generation of Frequency Modulation, FM Demodulation: AM-Based Method,

Unit 2: Indian Approach to Applied Science

Metallurgy, Ion pillar in Delhi, Kerala's Dhatu Darpan, Aeronautics and Marine Science, Mathematics, measurement of Time, Astronomy, Architecture, Chemistry, Botany and Zoology, Science of Sound and Voice. Garment Industries.

Recommended List of Books :

- 1) Electronic Communication: Analog, Digital and Wireless - Sanjeev Gupta, 3rd Ed, Khanna Publication
- 2) Electronic Communication Systems - Kennedy, Davis 4th Ed., TMH
- 3) Electronic Communications -Dennis Roddy, John Coolen,6th Ed,
- 4) Electronics and communication technology - J S Katre , 2012 Ed, Tech -Max Publication
- 5) Electronics & Radio Engineering – Terman – 4th Ed, Mc Graw Hill
- 6) Communication Systems – Simon Haykin , 3rd Ed, John Willy & Sons Inc
- 7) Electronics & Radio Engineering – M. L . Gupta , 9th Edition, Dhanpat Rai publication
- 8) Suresh Soni, India's Glorious Scientific Tradition, Ocean Books Pvt. Ltd., New Delhi

List of Experiments/Practicals/Laboratory work for Paper VII

1. Study of AM
2. Study of Amplitude Demodulation
3. Study of FM
4. Study of Frequency Demodulation

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Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for S Y B Sc (Electronics) Major Semester-5
(With Effect From June 2025)

PAPER - 3 : Basic Measurement System

(Total 4 Credit : 2 for Theory and 2 for Practical i.e. 4 Hours of Practical per week)

Unit 1: Measurements Systems and its Characteristics

Functional element of instrumentation, examples, (pressure gauge, and Bourdon types thermometer), Input output configuration, schematics, examples, methods of corrections, high gain feed-back, opposing input and signal filtering, examples. Introduction to various bridges. Static characteristics (Accuracy and precision, Resolution, Threshold, Linearity, hysteresis, sensitivity, etc), Errors and its types, absolute and relative, Gross, systematic and random errors, Methods of correction, Statistical analysis, Gaussian error distribution curve, probable error.

Unit 2: Basic Vedic Mathematics

Arithmetic Techniques; Subtraction from 100/1000/00000 : Method and Vedic Method, Multiplication with a series of 9s numbers with same, greater, lesser number of 9s, Operations with 9 (Basic and enhancement Method), computational remainder (Navsesh) on division by 9, computation of quotient on division by 9

Recommended List of Books :

1. W D Cooper, Electronics Instrumentation and Measurement Techniques, 4th Ed, PHI, New Delhi.
2. B E Jones, Instrumentation, Measurements, and Magnitudes, 3rd Ed, THM, New Delhi.
3. D S Sonde, Monographs with Solid State Electronic Instrumentation Vol-I to IV, 4th Ed, THM, New Delhi.
4. E O Döbelin, Measurement Systems, 3rd Ed, McGraw Hill
5. Atul Gupta, The Power of Vedic Maths with trigonometry, Jayco Publishing House
6. William Q., Vedic Mathematics Secrets, Vedic Mathematics Secrets @ www.VedicMathematicsSecrets.com

List of Experiments/Practicals/Laboratory work for Paper

1. Study of Maxwell Bridge
2. Study of Schering Bridge
3. Study of Weins Bridge
4. Study of Gaussian Error distribution curve
5. Study of Kelvin's Bridge
6. Study of Owen's Bridge
7. Study of Anderson's Bridge

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Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for T Y B Sc (Electronics) Minor Semester - 5
(With Effect From June 2025)

Paper - 1 : Small Signal Amplifier

Total 4 Credit : 2 for Theory and 2 for Practical i.e. 4 Hours of Practical per week)

Unit-I: *Transistor Biasing*

Introduction; Need for biasing; Factors contributing to thermal instability; Effect of temperature increase; Stability factor; Operating point; Different methods for transistor biasing: Fixed –bias circuit; Collector-to-base bias; Disadvantages of collector-to-base bias; Voltage divider bias with emitter bias; Bias compensation; Design operations

Unit-II: *Small Signal Amplifier Analysis*

Introduction; Classification of amplifiers; General theory of amplifier; CE, CC, CB amplifier; RC coupled transistor amplifier; Lower cut-off frequency f_l ; Upper cut-off frequency f_2 ; Frequency response curve and band width;

Recommended Books:

- 1) A Mottershead, Electronics Devices and Circuits An Introduction, PHI, New Delhi.
- 2) R Boylestad and L Nashelsky, Electronics Devices and Circuits
- 3) I J Nagrath, Electronics Devices and Circuits, PHI, New Delhi (2007)
- 4) Millman, Halkias, Satyabrata, Electronics Devices and Circuits, TMH, New Delhi
- 5) Electron Device and Circuits. G K Mittal
- 5) Sanjeev Gupta, Electronics Devices and Circuits, Dhanpat Rai Publications

List of Experiments/Practicals/Laboratory work for Paper

- 1) Study of CE amplifier
- 2) Study of CC amplifier
- 3) Study of CB amplifier
- 4) Study of RC Coupled Amplifier
- 5) Study of basing circuit.

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Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for T Y B Sc (Electronics) Minor Semester-5
(With Effect From June 2025)

Title of the Paper Electronics (Minor Course) : Advance Electronics System
(Total Credits 04 : Theory-02, Practicals-02 i.e. 4 hours per week)

Unit-I: Flip-flops and Concept of Memory

Construction and working of RS Flip-flop, limitations, D flip-flop, construction and working of JK flip-flop, Master-slave JK Flip-flop, flip-flop as a memory element, types of semiconductor memory, RAM, ROM, EPROM, DRAM, SRAM etc., basic concept of memory chip and its organization, address data lines, chip select-enable and its functions

Unit-II: Registers and Counters

Use of flip-flop as register, introduction to shift register, types of shift registers (SISO, SIPO, PIPO, PISO), Left-shift register Universal Shift register, Application of Shift register, Introduction to Binary counter, basic ripple counter, working and waveforms of ripple counter, types of counters, Up/Down counters, modulus- 2^N counter, design of counters with various modulus values, synchronous and asynchronous counters,

Recommended Books:

- 1) Logic Design Theory, N N Biswas, PHI New Delhi
- 2) Computer System Architecture, M Mano, PHI, New Delhi
- 3) Digital Electronics and Logic Design, B Somnathan Nair, PHI
- 4) Digital Logic and Computer Design, M Mano, PHI, New Delhi
- 5) Fundamentals of Digital Circuits, A Anand Kumar, PHI, New Delhi
- 6) Digital Principles and Applications, Malvino & Leach, TMH
- 7) Digital Electronics An Introduction to Theory and Practice, W H Gothamann, PHI, New Delhi

List of Experiments/Practicals/Laboratory work for Paper:

- 1) Study of RS flip-flop
- 2) Study of clocked RS flip-flop
- 3) Study of D flip-flop
- 4) Study of JK flip-flop
- 5) Study of three/four bit counter
- 6) Study of Up/Down counter
- 7) Study of decade counter
- 8) Study of Shift Registers

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Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for T Y B Sc (Electronics) Minor Semester-5
(With Effect From June 2025)

Title of the Paper Electronics (Minor Course) : Industrial Instrumentation System
(Total Credits 04 : Theory-02, Practicals-02 i.e. 4 hours per week)

Unit 1: Temperature and Force Sensor

Temperature scales, International Practical temperature scale, Electrical, Non-electrical, and radiation methods, Balance, Hydraulic Cell, Pneumatic Cell, Elastic Force Devices, Separation of force Components and Calibration,

Unit 2: Transducers

Types, classifications and selection of transducers, Resistive transducers, strain gauge, theory, gauge factor, semiconductors strain gauge, application, capacitive transducers, types, variable area, distance and dielectric type, differential arrangement, inductive transducers, principle and working, temperature measurement, electrical methods, thermistor characteristics and application.

Recommended List of Books :

1. W D Cooper, Electronics Instrumentation and Measurement Techniques, 4th Ed, PHI, New Delhi.
2. B E Jones, Instrumentation, Measurements, and Magnitudes, 6th Ed, THM, New Delhi.
3. D S Sonde, Monographs with Solid State Electronic Instrumentation Vol-I to IV, 4th Ed, TMH New Delhi.
4. E O Dobelin, Measurement Systems, 3rd Ed, McGraw Hill

List of Experiments/Practicals/Laboratory work for Paper:

1. Study of Potentiometer as sensor.
2. Study of Strain gauge as pressure measuring device
3. Study of LVDT Characteristics
4. Study of Capacitive transducer
5. Study of Inductive transducer

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Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for T Y B Sc (Electronics) Minor Semester-5
(With Effect From June 2025)

Title of the Paper Electronics (Minor Course) : Introduction to Power Supplies
(Total Credits 04 : Theory-02, Practicals-02 i.e. 4 hours per week)

Unit-I: *Rectifiers and Regulators*

Introduction; half and full wave rectifier; capacitor filter: capacitor filter with full wave rectifier, ripple voltage; Inductor filter: Inductor filter with full wave rectifier, L section filter.

Introduction; Stabilization; Reference element, Zener shunt regulator: Designing of Zener shunt regulator; ripple, other features, limitation of basic Zener shunt regulator, Extending power and current range of basic Zener diode; Transistor shunt regulator, emitter follower regulator; Series pass regulators, Feedback regulators; Sample, reference, comparator and controller.

Unit-II: *Three terminal Regulators*

Three Terminal Regulators: Introduction, block diagram of three terminal regulator: applications of three terminal regulator; adjustable output voltage three terminal regulator; variable output power supply, dual power supply. (78xx series, 79xx series, LM317 & LM337)

Recommended Books:

- 1) N C Goyal & R K Khetan, Monograph on Electronics Design Principles, Khanna Publishers
- 2) M D Singh and K B Khanchandani, Power Electronics, TMH, New Delhi
- 3) A K Sawhney, Electricals and Electronics Measurement and Instrumentation,

List of Experiments

- 1) Study of Half wave rectifier
- 2) Study of full wave rectifier
- 3) Study of Bridge rectifier
- 4) Study of Bridge rectifier with L-filter
- 5) Study of Bridge rectifier with CLC-filter
- 6) Study of Zener regulator circuit
- 7) Study of three terminal regulator

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Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for T Y B Sc (Electronics) Semester-5 Skill Enhancement Course
(With Effect From June 2025)

Title of the Paper : Programming Language for Microcontroller
(Total Credits 02 : Theory-01, Practicals-01 i.e. 2 hours per week)

Unit 1: Loop and Control structures

Variables and constants in C, Rules for construction of variables and constants, C keywords, Data types in C, integers and chars; signed-unsigned, floats-doubles, storage of data types, Operators and its hierarchy, type conversion, Loop and decision Control structures like if, if-else, else-if, While, For, Do-while, Switch case structure

Recommended List of Books:

- 1) Let us C, Y. Kanetkar, 9th Ed, BPB Publication
- 2) Programing in ANSI C by E Balaguruswamy 6th Ed TMH
- 3) Programing in C S G Kochan, 5th Ed, Pearson

List of Experiments/Practicals/Laboratory work for Paper

1. Write a programme to find out given year is a leap year or not
2. Write a programme to find out largest digit in a given integer.
3. Write a programme to find out smallest digit in a given integer.
4. Write a programme to add digits of a five digit number.
5. Write a programme to check given number is prime or not.
6. Write a programme to add first n prime number.
7. Write a programme to find whether the given number is off or even number.
8. Write a programme to add first n even numbers.
9. Write a programme to add first n odd number.
10. Write a programme to find factorial of a number and print.
11. Write a programme to add first n odd/even numbers.

[Subject code-2503000505069003]

Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for T Y B Sc (Electronics) Semester-5 Skill Enhancement Course
(With Effect From June 2025)

Title of the Paper : Introduction to MATLAB (Practical Only)
(Total Credits 02 : Practicals-02 i.e. 4 hours per week)

List of Practical for MATLAB

1. Hands on with MATLAB (Data type operators writing of simple equations etc.)
2. Vectors and Matrices
3. Vectors and matrix operations
4. Simulation:
 - a. To create arrays and vectors and perform arithmetic and trigonometric operations on them.
 - b. To make simple 2-D plot in MATLAB
 - c. To make and plot Sine wave
 - d. To make and plot cosine wave
 - e. To create script files and execute them in MATLAB
 - f. To understand arithmetic operation in MATLAB.
 - g. To understand array and matrix simple computation and manipulation.
 - h. To define and use anonymous functions in command-line computation.
 - i. To learn and do simple symbolic algebra in MATLAB.
 - j. To read data from common data files into MATLAB workspace and save data into a MATLAB readable file.
 - k. Publish report.

[Subject code for Theory-2603000506019001]

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Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for T Y B Sc (Electronics) Major Semester-6
(With Effect From June 2025)

Paper – 1 : Application of Operational Amplifier

(Total 4 Credit : 2 for Theory and 2 for Practical i.e. 4 Hours of Practical per week)

Unit 1 : Linear applications of op-amp.

Peaking amplifier, summing, scaling and averaging amplifiers, instrumentation amplifier and its applications, voltage to current converter and its applications, current to voltage converter, Integrator, differentiator, examples of designing and analysis

Active filters, First order low-pass Butterworth filter, Second order low-pass Butterworth filter, First order high-pass Butterworth filter, Second order high-pass Butterworth filter, higher order filters, Band pass filters, Band reject filters, All pass filters,

Unit- 2 : Advance Vedic Mathematics

Verification of sum, difference, square, cube of two numbers (Method-1 Method-2), Operations with 11 & 111 (Multiplication and Division), Multiplication (Nikhilam and Urdhva Tiryak), Division (with remainder, without remainder), Square, Square root of nay numbers, Cube and cube roots of any numbers.

Recommended List of Books :

- 1) R A Gayakwad, Op-Amps and Linear Integrated Circuits, 2012, PHI, New Delhi
- 2) P R Gray and R G Meyer, Analysis and Design of Integrated Circuits, 6th Ed, John Wiley & Sons
- 3) R F Coughlin and A F F Driscoll, Operational Amplifiers and Linear Integrated Circuits, 2000, PHI, New Delhi
- 4) Atul Gupta, The Power of Vedic Maths with trigonometry, Jayco Publishing House
- 5) William Q., Vedic Mathematics Secrete, Vedic Mathematics Secrets @
www.VedicMathematicsSecrets.com

Experiments/ Laboratory work :

There will be four hours of laboratory/practical per week per batch. There will be ten students per batch for laboratory/practical work.

List of Experiments/Practical/Laboratory work for Paper

- 1) Study of Integrator circuits
- 2) Study of active LPF filters
- 3) Study of active HPF filters
- 4) Study of active BPF filters.
- 5) Study of active 1st order Notch filter.
- 6) Study of active 2nd order Notch filter.
- 7) Study of differentiator circuits
- 8) Study of comparator and Zero crossing detector
- 9) Study of 741 as an astable multivibrator

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Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for T Y B Sc (Electronics) Major Semester-6
(With Effect From June 2025)

Paper – 2 : Digital Communication Systems

(Total 4 Credit : 2 for Theory and 2 for Practical i.e. 4 Hours of Practical per week)

Unit 1: Digital Communication

Introduction, Pulse modulation, PCM, PCM Sampling, Signal to Quantization Noise Ratio, Linear Versus Non Linear PCM Codes, Ideal Channel Noise, Coding methods, Companding

Unit 2: Fibre Optics

Introduction, Basic Fibre Optic System, Physical Description, Theory of optical fiber, dispersion, losses in fibre, optical transmitters, Receiver, Fibre Optic Cable: Splices, Connectors and couplers

Recommended List of Books :

- 1) Electronic Communication : Analog , Digital and Wireless - Sanjeev Gupta, 3rdEd, Khanna Publication .
- 2) Electronic Communication Systems - Kennedy, Davis 4th Ed TMG
- 3) Monochrome and Colour Television by R R Gulati,2nd Ed, New Age International
- 4) Electronic Communications -Dennis Roddy , John Coolen, 3rd Ed, McGraw Hill
- 5) Electronics and communication technology - J S Katre ,2012 ed Tech -Max Pub
- 6) Electronics & Radio Engineering – Terman – 4th Ed, Mc Graw Hill
- 7) Communication Systems – Simon Haykin , 3rd Ed, John Willy & Sons Inc
- 8) Electronics & Radio Engineering – M. L . Gupta , 9th Ed, Dhanpat Rai Pub
- 9) Advance Electronics communication System by WAYNE TOMASI
- 10) Wireless Communication by U.S. Shah

List of Experiments/Practicals/Laboratory work for Paper VII

1. Study of TDM
2. Study of Sample and Hold circuit
3. Study of SHR
4. Study of Fibre optics Voice transmission

5. Study of bending loss in Fibre Optics System

Veer Narmad South Gujarat University, Surat

NEP-2020 : Syllabus for T Y B Sc (Electronics) Major-3 Semester-6
(With Effect From June 2025)

Paper – 3 : Introduction to Microcontroller

(Total 4 Credit : 2 for Theory and 2 for Practical i.e. 4 Hours of Practical per week)

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Unit 1: Architecture

Block diagram of Microcontroller – Comparison with Microprocessor and Microcontroller – Pin details of 8051 – ALU – Special function registers – ROM – RAM – RAM Memory Map (including registers and register banks) – Program Counter – PSW register –Stack - I/O Ports – Timer Interrupt – Serial Port – External memory – Clock – Reset – Clock Cycle –Machine Cycle – Instruction cycle – Instruction fetching and execution -Overview of 8051 family.

Unit 2: Instruction Set

Assembling and running an 8051 program – Instruction set of 8051 – Data transfer instructions – Different addressing modes – Arithmetic Instructions – Signed number concepts and arithmetic operations – Logic and Compare instructions – Rotate instruction and data serialization – BCD, ASCII Loop and jump instructions – Call instructions – Time delay routines – Program control – Assembler directives – Sample programs.

Recommended List of Books:

1. 8051 Microcontroller by Kenneth J.Ayala, 4th Ed, PHI
2. Microprocessor and Microcontroller by R.Theagarajan, 6th Ed, Sci Tech Publication, Chennai
3. 8051 Microcontroller and Embedded Systems using Assembly and C by Mazidi, Mazidi and D.MacKinlay, 2006, Pearson Education Low Price Edition.
4. Programming customizing the 8051 Microcontroller by Myke Predko, 5th Ed, Tata McGraw Hill

List of Experiments/Practical:

1. Addition of two/three and series of 8-bits/16-bits numbers
2. Decimal addition and Decimal subtraction
3. One's and Two's complement of 8-bit/16-bit
4. Shifting and Mask-off certain bits
5. To find largest number from a three data.
6. To arrange data in 2 descending order with concept of subroutine

7. To arrange data in descending order with concept of subroutine
8. To find smallest number from a three data and data array

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NEP-2020 : Syllabus for T Y B Sc (Electronics) Minor Semester-6
(With Effect From June 2025)

Title of the Paper Electronics (Minor Course) : Amplifier & Oscillators
(Total Credits 04 : Theory-02, Practicals-02 i.e. 4 hours per week)

[Subject code for Theory-2603000506049001] [Subject code for Practical-2603000506049002]

Unit-I: *Feedback Amplifier*

Introduction; Feedback concepts; General theory of feedback; Reasons for negative feedback; Loop gain; Types of negative feedback in transistor circuits; Advantages of negative feedback; Change input impedance and output impedance in voltage series feedback, current shunt feedback, voltage shunt feedback, voltage series feedback, current shunt feedback, current series feedback; Increase in bandwidth; Stabilization; reduction in non-linear distortion; Reduction in noise; Emitter follower; Practical feedback circuits

Unit- II: *Oscillators*

Oscillators: Introduction; Effect of positive feedback; Oscillator operations; Types of oscillators; Requirement for oscillator; Phase Shift oscillator; Wein bridge oscillators; Resonant circuit oscillator; Colpitt's oscillator, Hartley oscillator; Unijunction oscillator; Schmitt trigger

Recommended Books:

- 1) A Mottershead, Electronics Devices and Circuits An Introduction, PHI, New Delhi.
- 2) Sanjeev Gupta, Electronics Devices and Circuits, Dhanpatrai Publications
- 3) R Boylestad and L Nashelsky, Electronics Devices and Circuits,
- 4) I J Nagrath, Electronics Devices and Circuits, PHI, New Delhi (2007)
- 5) Millman, Halkias, Satyabrata, Electronics Devices and Circuits, TMH, New Delhi

List of Experiments:

- 1) Study of Amplifier circuit without feedback.
- 2) Study of effect of negative feedback in an amplifier
- 3) Study of Phase shift oscillator
- 4) Study of Wein bridge oscillator
- 5) Study of Colpitt's oscillator,
- 6) Study of Hartley oscillator;
- 7) Study of Unijunction oscillator;
- 8) Study of Schmitt trigger

[Subject code for Theory-2603000506049003]

[Subject code for Practical-2603000506049004]

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NEP-2020 : Syllabus for T Y B Sc (Electronics) Minor Semester-6
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Title of the Paper Electronics (Minor Course) : Switching Power Supply
(Total Credits 04 : Theory-02, Practicals-02 i.e. 4 hours per week)

Unit-I: SMPS and Inverter-Choppers

SMPS: Introduction, comparison of SMPS, and linear type power supplies, principle, fly-back convertors, forward type convertors, selection of transformer, transistors, diodes and capacitors, control IC for SMPS, applications of SG 3524.

Inverter-Choppers: principle of inverter: Series, parallel and bridge inverter, McMurray inverter, McMurray Bedford inverter, Voltage controlled and current source inverter, Principles of choppers: single and two thyriator chopper, step up chopper, AC chopper.

Unit- II: Thyristors

Four layer devices, construction and working of an SCR, two transistor analogy, characteristics of SCR, construction working DIAC & DIAC characteristics, construction working TRIAC & TRIAC characteristics

Recommended Books:

- 1) N C Goyal & R K Khetan, Monograph on Electronics Design Principles, Khanna Publishers
- 2) M D Singh and K B Khanchandani, Power Electronics, TMH, New Delhi
- 3) A K Sawhney, Electricals and Electronics Measurement and Instrumentation

List of Laboratory Experiments

1. Design, built and test 3 terminal regulator.
2. Design build and test variable output 3 terminal regulator
3. Study of characteristics of thyriator.
4. Study of characteristics of SCR.
5. Study of characteristics of DIAC.
6. Study of characteristics of TRIAC.