



SRR & CVR GOVT. DEGREE COLLEGE
(Autonomous)

PHONE NO : 9848732916

NAAC : B+ (III Cycle with CGPA : 2.60) - Estd: 1937

WEBSITE : www.srrcvr.ac.in

ISO 9001 - 2015 Certified

EMAIL : srrandcvr@gmail.com

Institution is ranked by NIRF 101 -150 band at NIRF - 2020

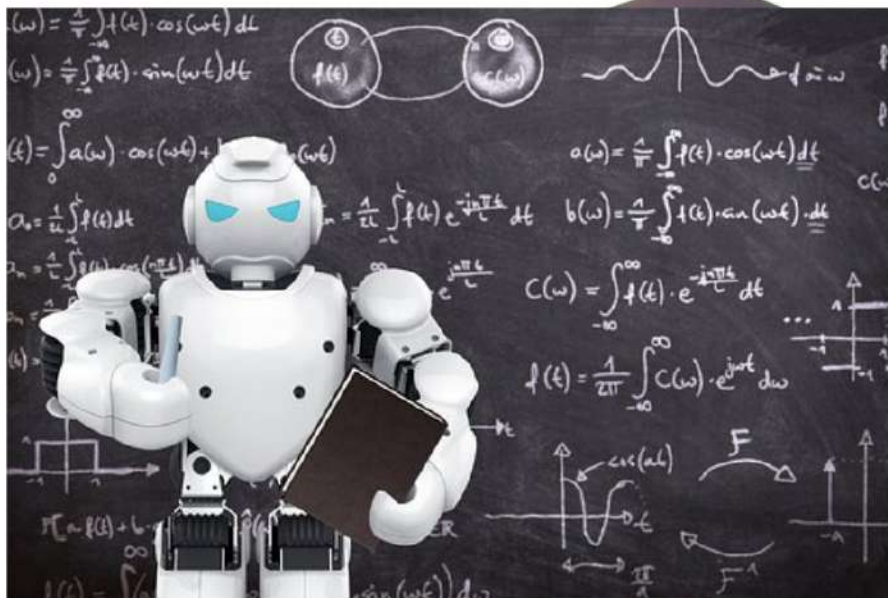


BOARD OF STUDIES

UNDERGRADUATE

Annual Year 2018-19

COURSE CODE : 301,302,303



Minutes of Meeting &
Curriculum

PHYSICS & ELECTRONICS

SRR&CVR GOVT DEGREE COLLEGE (A)
VIJAYAWADA-4



DEPT OF PHYSICS & ELECTRONICS
BOS RESOLUTIONS
IN
PHYSICS
2018-2019

**SRR & CVR GOVERNMENT DEGREE COLLEGE (AUTONOMOUS) Vijayawada
520004**

Minutes of the meeting of the Board of Studies in the subject of

PHYSICS

The meeting of the Board of Studies in the subject of Physics was held on 21st March 2018 in Dept. of Physics Laboratory, SRR & CVR Govt. Degree College (A), Vijayawada 520004.

The following members attended the meeting:

LIST OF BoS MEMBERS

S.No	Name	Qualification	Designation	Address
1.	Mrs. P. Sailaja	M.Sc, M.phil	Chairman	I/C Dept. of Physics and Electronics SRR&CVR GDC (A)
2.	Dr. J. Siva Ramakrishna	M.Sc, Ph.D	University Nominee	Dept. of Physics, Acharya Nagarjuna University Guntur
3.	Mrs. B. Naga Mani	M.Sc, , Ph.D	Subject Expert	I/C Dept. of Physics Govt Degree College, Mylavaram
4.	Dr. R. Kameswari	M.Sc, B.Ed, M.Phil, Ph.D	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
5.	K. Sujatha	M.Sc(tech), (Ph.d)	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
6.	Md. Iqbal Basha	M.Sc, M.Ed, M.Phil.	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
7.	T.V Ram Babu	M.Sc(tech),M.Ed.	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
8.	V.Uma Lakshmi	M.Sc, M.Phil, PGDHE, CSIR- NET, (Ph.D)	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).

f. gelain
J. S. R. K. 21-3-2018
B. Naga Mani

AGENDA FOR BOS MEETING

Type of meeting: Board Of Studies meeting in PHYSICS subject.

Facilitator: Mrs.P.Sailaja, I/c. Dept. of Physics & Electronics.

Note Taker : Mrs.K.Sujatha, Lecturer in physics

Attendees: BOS Members.

Time & Date: 9.30 AM ON 21th March 2018, Wednesday

Location: To be held at Dept. of Physics & Electronics, SRR&CVR GDC

Agenda Items:

Item 1: Approval of syllabus for Semester III and IV for the
Academic year 2018-19

Item 2: Approval of Question paper, blue print and model paper

Item 3: Approval for Internal assessment component, Minimum marks in internal assessment

P. Gerak
J. S. R. K. H. K.
21.3.2018

Bongamau

RESOLUTIONS

The Chairperson, Board of Studies welcomed the members and initiated discussion on the syllabus for III and IV semesters. He apprised the members of the guidelines of the UGC and the CCE regarding the framing of syllabus, and the recommended evaluation ratio for internal and external examinations. The members discussed in detail the various aspects presented before them and unanimously resolved the following:

Resolutions:

1. Resolved to adopt the present University CBCS syllabus for semester III and IV, with the suggested modifications(20%).
2. Resolved to approve the division of marks for internal and external examination along with the suggested blue print and model paper.
3. Resolved to approve the list of paper setters and examiners submitted by the department

S.No	Name	Designation	SIGNATURE
1.	Mrs.P. Sailaja	Chairman	P. Sailaja
2.	Dr. J. Siva Ramakrishna	University Nominee	J. S. R. K. 21.3.2017
3.	Mrs. B. Naga Mani	Subject Expert	B. Naga Mani
4.	Dr. R. Kameswari	Member	R. Kameswari
5.	K. Sujatha	Member	K. Sujatha
6.	Md. Iqbal Basha	Member	I. Basha
7.	T.V Ram Babu	Member	T. V. Ram Babu
8.	V.Uma Lakshmi	Member	V. Uma Lakshmi


Principal
SRR & CVR GOVT. DEGREE COLLEGE
(Autonomous)
Machavaram, VIJAYAWADA - 520 004.

S.R.R & C.V.R GOVT. DEGREE COLLEGE (AUTONOMOUS)

VIJAYAWADA – 520 004

B.Sc. 1st Semester Physics

(w.e.f 2017-2018)

Paper I: Mechanics & Properties of Matter

Work load:60 hrs per semester

4 hrs/week

UNIT-I (10 hrs)

1. Vector Analysis

Scalar and vector fields, gradient of a scalar field and its physical significance, Divergence and curl of a vector field with derivations and physical interpretation, Vector integration (line, surface and volume), Statement and proof of Gauss, Stokes & Greens theorems.

UNIT-II (10 hrs)

2. Mechanics of particles

Laws of motion, motion of variable mass system, Equation of motion of a rocket, Conservation of energy and momentum, Collisions in two and three dimensions, Concept of impact parameter, scattering cross-section, Rutherford scattering(qualitative treatment only)

UNIT-III (16 hrs)

3. Mechanics of Rigid bodies

Definition of rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum, Euler equations and its applications, precession of a top, Gyroscope, precession of the equinoxes.

4. Mechanics of continuous media

Elastic constants of isotropic solids and their relations, Poisson's ratio and expression for Poisson's ratio in terms of ν , n , k . Classification of beams, types of bending i.e uniform & non-uniform bending, point load, distributed load.

UNIT-IV (12Hrs)

5. Central forces

Central forces, definition and examples, , conservative nature of central forces, conservative force as a negative gradient of potential energy, equation of motion under a central force, Derivation of Kepler's laws, Coriolis force.

UNIT-V (12 hrs)

6. Special theory of relativity

Galilean relativity, absolute frames, Michelson-Morley experiment, negative result, Postulates of special theory of relativity, Lorentz transformation, time dilation, length contraction, mass-energy relation.

REFERENCE BOOKS:

1. B. Sc. Physics, Vol.1, Telugu Academy, Hyderabad
2. Fundamentals of Physics Vol. I - Resnick, Halliday, Krane ,Wiley India 2007
3. Unified Physics, Vol. 1, S.L. Gupta & S. Gupta, Jai Prakash Nath & Co, Meerut.
4. College Physics-I. T. Bhimasankaram and G. Prasad. Himalaya Publishing House.
5. University Physics-FW Sears, MW Zemansky& HD Young,Narosa Publications, Delhi
6. Mechanics, S.G.Venkatachalapathy, Margham Publication, 2003.

Practical paper 1: Mechanics & Properties of Matter (50M , Internal 25+External 25)

Work load: 30 hrs per semester

3 hrs/week

Minimum of 6 experiments to be done and recorded

1. Viscosity of liquid by the flow method (Poiseuille's method)
2. Young's modulus of the material of a bar (scale) by uniform bending
3. Young's modulus of the material a bar (scale) by non- uniform bending
4. Surface tension of a liquid by capillary rise method
5. Bifilar suspension –moment of inertia of a regular rectangular body.
6. Determination of moment of inertia using Fly-wheel
7. Determination of the height of a building using a sextant.
8. Rigidity modulus of material of a wire-dynamic method (torsional pendulum)

Signatures:

K. S. Rao

J. S. R. K.

P. S. Rao

B. Nagammai

S.R.R & C.V.R GOVT. DEGREE COLLEGE (AUTONOMOUS)
VIJAYAWADA – 520 004

B.Sc. 2nd Semester Physics
(w.e.f 2017-2018)
Paper II: Waves & Oscillations

Work load: 60 hrs per semester

4 hrs/week

UNIT-I (12 hrs)

1. Simple Harmonic oscillations

Simple harmonic oscillator and solution of the differential equation-Physical characteristics of SHM, torsion pendulum-measurements of rigidity modulus, compound pendulum- measurement of 'g', Principle of superposition, beats, combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures.

UNIT-II (12 hrs)

2. Damped and forced oscillations

Damped harmonic oscillator, solution of the differential equation of damped oscillator, Energy considerations, logarithmic decrement, relaxation time, quality factor, forced oscillator-equation of motion and its solution, amplitude resonance and velocity resonance.

UNIT-III (10 hrs)

3. Complex vibrations

Fourier theorem and evaluation of the Fourier coefficients, analysis of periodic wave functions-square wave, saw tooth wave, simple problems on evolution of Fourier coefficients.

UNIT-IV (16hrs)

4. Vibrating strings & Bars 16 hrs

Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at ends, overtones and harmonics, Longitudinal vibrations in bars-wave equation and its general solution, Tuning fork.

UNIT-V (10 hrs)

5. Ultrasonics: 10hrs

Ultrasonics, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics, determination of wavelength of ultrasonic waves, Applications of ultrasonic waves.

REFERENCE BOOKS:

1. BSc Physics Vol.1, Telugu Academy, Hyderabad.
2. Waves and Oscillations. N. Subramanyam and Brijlal, Vikas Pulications.
3. Unified Physics Vol., Mechanics, Waves and Oscillations, Jai Prakash Nath&Co.Ltd.
4. Fundamentals of Physics.
5. Halliday/Resnick/Walker ,Wiley India Edition 2007.
6. Waves & Oscillations. S.Badami, V. Balasubramanian and K.R. Reddy,Orient Longman.
7. College Physics-I. T. Bhimasankaram and G. Prasad. Himalaya Publishing House.
8. Science and Technology of Ultrasonics- Baldevraj, Narosa, New Delhi,2004
9. Introduction to Physics for Scientists and Engineers. F.J. Buche. McGraw Hill.

Practical Paper II: Waves & Oscillations (50M , Internal 25+External 25)

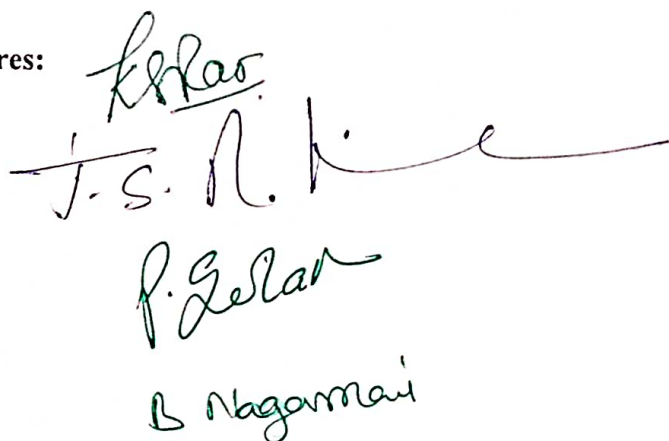
Work load: 30 hrs per semester

3 hrs/week

Minimum of 6 experiments to be done and recorded

1. Volume resonator experiment
2. Determination of 'g' by compound/bar pendulum
3. Simple Pendulum- estimation of errors.
4. Velocity of transverse wave along stretched string using sonometer
5. Verification of laws of vibrations of stretched string –sonometer
6. Determination of frequency of a bar –Melde's experiment.
7. Formation of Lissajous figures using CRO.
8. Study of oscillations of a mass under different combinations of springs.

Signatures:


K. R. Rao
J. S. R. K.
P. S. R. K.

B. Nagammai

SRR&CVR Government Degree College (A), Vijayawada
Physics Paper III: Wave Optics
III SEMESTER

Work load:60 hrs per semester

4 hrs/week

UNIT-I (8 hrs)

1. Aberrations:

Introduction – monochromatic aberrations. spherical aberration, methods of minimizing spherical aberration, coma, astigmatism and curvature of field, distortion. Chromatic aberration-the achromatic doublet. Achromatism for two lenses (i)in contact and (ii) separated by a distance.

UNIT-II (14hrs)

2. Interference

Principle of superposition – coherence-temporal coherence and spatial coherence-conditions for interference of light.Fresnel's biprism-determination of wavelength of light –change of phase on reflection.Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (cosine law) –colors of thin films-

Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film). Determination of diameter of wire, Newton's rings in reflected light. Michelson interferometer-working and construction, Determination of wavelength of monochromatic light using Newton's rings

UNIT-III (14hrs)

3. Diffraction

Introduction.distinction between Fresnel and Fraunhofer diffraction, Fraunhofer diffraction –Diffraction due to single slit-Fraunhofer diffraction due to double slit-Fraunhofer diffraction pattern with N slits (diffraction grating).Resolving power of grating
Fresnel's half period zones-area of the half period zones-zone plate-comparison of zone plate with convex lens-

UNIT-IV(10 hrs)

4.Polarisation:

Polarized light: methods of polarization polarization by reflection, refraction, double refraction, scattering of light-Brewster's law-Mauls law-Nicol prism polarizer and analyzer- Quarter wave plate, Half wave plate-optical activity, Babinet's compensator

UNIT-V (14hrs)

5. Lasers and Holography

Lasers: introduction, spontaneous emission, stimulated emission. Population Inversion, Laser principle Einstein coefficients (Qualitative treatment only) , Types of lasers-He-Ne laser, Ruby laser- Applications of lasers. Holography: Basic principle of holography-Gabor hologram and its limitations, Applications of holography.

6. Fiber Optics Introduction- different types of fibers, rays and modes in an optical fiber, fiber material, principles of fiber communication (qualitative treatment only), advantages of fiber optic communication.

REFERENCE BOOKS:

1. BSc Physics, Vol.2, Telugu Akademy, Hyderabad
2. A Text Book of Optics-N Subramanyam, L Brijlal, S.Chand& Co.
3. Unified Physics Vol.II Optics & Thermodynamics – Jai Prakash Nath&Co.Ltd., Meerut
4. Optics,F..A. Jenkins and H.G. White, Mc Graw-Hill
5. Optics, AjoyGhatak,Tata Mc Graw-Hill.
6. Introduction of Lasers – Avadhanulu, S.Chand& Co.
7. Principles of Optics- BK Mathur, Gopala Printing Press, 1995

Practical Paper III: Wave Optics

Work load:30 hrs

2 hrs/week

Minimum of 6 experiments to be done and recorded

1. Determination of radius of curvature of a given convex lens-Newton's rings.
2. Resolving power of grating.
3. Dispersive power of a prism.
4. Determination of wavelength of light using diffraction grating-minimum deviation method.
5. Determination of wavelength of light using diffraction grating-normal incidence method.
6. Resolving power of a telescope.
7. Determination of thickness of a thin wire by wedge method
8. Determination of refractive index of liquid-Boy's method.

P. Gopal
S. S. Narayana
21.3.2018

B Nagammai

SRR&CVR Government Degree College (A), Vijayawada
Physics Paper IV: Thermodynamics & Radiation Physics
IV SEMESTER

Work load: 60 hrs per semester

4 hrs/week

UNIT-I (10 hrs)

1. Kinetic theory of gases

Introduction – Deduction of Maxwell's law of distribution of molecular speeds, Transport phenomena – Mean free path - Viscosity of gases-thermal conductivity-diffusion of gases.

UNIT-II(12 hrs)

2. Thermodynamics

Introduction- Isothermal and adiabatic process- Reversible and irreversible processes- Carnot's engine and its efficiency-Carnot's theorem-Second law of thermodynamics. Kelvin's and Clausius statements- Entropy, physical significance – Change in entropy in reversible and irreversible processes-Entropy and disorder-Entropy of Universe– Temperature-Entropy (T-S) diagram and its uses –

UNIT-III(12 hrs)

3. Thermodynamic potentials and Maxwell's equations

Thermodynamic potentials-Derivation of Maxwell's thermodynamic relations-Clausius- Clapeyron's equation-Derivation for ratio of specific heats-Derivation for difference of two specific heats for perfect gas. Joule Kelvin effect-expression for Joule Kelvin coefficient for perfect

UNIT-IV(12 hrs)

4. Low temperature Physics

Introduction-Joule Kelvin effect-Porous plug experiment - Joule expansion-Distinction between adiabatic and Joule Thomson expansion-Expression for Joule Thomson cooling- Liquefaction of helium, Kapitza's method-Adiabatic demagnetization, -applications of substances at low temperature-effects of chloro and fluoro carbons on ozone layer.

UNIT-V(14 hrs)

5. Quantum theory of radiation

Blackbody-Ferry's black body-distribution of energy in the spectrum of black body-Wein's displacement law, Wein's law, Rayleigh-Jean's law(Qualitative treatment)-Quantum theory of radiation-Planck's law-Measurement of radiation-Types of pyrometers-Disappearing filament optical pyrometer-experimental determination – Angstrompyrheliometer-determination of solar constant, Temperature of Sun.

REFERENCE BOOKS:

1. BSc Physics, Vol.2, Telugu Akademy, Hyderabad

F. J. S. N. V. 21.3.2018
B. Nagarajan

P. S. S. R. A.

2. Thermodynamics, R.C.Srivastava, S.K.Saha & Abhay K.Jain, Eastern Economy Edition
3. Unified Physics Vol.2, Optics & Thermodynamics, Jai Prakash Nath & Co.Ltd., Meerut
4. Fundamentals of Physics. Halliday/Resnick/Walker.C. Wiley India Edition 2007
5. Heat, Thermodynamics and Statistical Physics-N Brij Lal, P Subrahmanyam, PS Hemne, S.Chand & Co., 2012
6. Heat and Thermodynamics- MS Yadav, Anmol Publications Pvt. Ltd. 2000
7. University Physics, HD Young, MW Zemansky, FW Sears, Narosa Publishers, New Delhi

Practical Paper IV: Thermodynamics & Radiation Physics

Work load: 30 hrs

2 hrs/week

Minimum of 6 experiments to be done and recorded

1. Thermal conductivity of bad conductor-Lee's method
2. Measurement of Stefan's constant.
3. Verify Newton's law of cooling
4. Heating efficiency of electrical kettle with varying voltages.
5. Thermoemf- thermo couple
6. Thermal behavior of an electric bulb (filament/torch light bulb)
7. Study of variation of resistance with temperature - thermistor.
8. Determination of wavelength of laser light using diffraction grating.

P. G. G. G.

J. S. R. S. 2018

B. N. G. G.

BASIC CIRCUIT THEORY

UNIT- 1: (12Hrs)

SINUSOIDAL ALTERNATING WAVEFORMS:

Definition of current and voltage. The sine wave, general format of sine wave for voltage or current, phase relations, average value, effective (R.M.S) values. Differences between A.C and D.C. J-Operator-phasor notation, Complex impedance and admittance (problems)

UNIT-II: (12hrs)

PASSIVE NETWORKS: (D.C)

Kirchhoff's current and Voltage Law's ,Resistor, Capacitor, and Inductor, series and parallel networks.R-L and R-L-C Circuits with DC inputs. Branch current method, Mesh Analysis, Nodal Analysis(Problems on mesh & nodal analysis).

UNIT-III: (14hrs)

NETWORKS THEOREMS: (D.C)

Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power, Milliman and Reciprocity theorems(problems).

UNIT-IV: (12hrs)

RC AND RL CIRCUITS:

Transient response of RC and RL circuits with dc source, Time constants, Frequency response of RC and RL circuits, their action as low pass, high pass & band pass filters. Passive differentiating and integrating circuits. (problems)

UNIT-V: (10hrs)

SERIES AND PARALLEL RESONANCE CIRCUITS:

Series resonance and parallel resonance circuits, Q - Factor, Selectivity and band width, Comparison of series and parallel resonance.
Cathode Ray Oscilloscope – CRT and its working-electrostatic deflection-fluorescent screen-measurement of voltage, frequency and phase by using CRO.

TEXT BOOKS:

1. Introductory circuit Analysis (UBS Publications) ---- **Robert L. Boylestad.**
2. Principles of Electronics by V.K. Mehtha
3. Electronic Devices and Circuit Theory --- **Robert L. Boylestad & Louis Nashelsky.**
4. Circuit Analysis by P.Gnanasivam- Pearson Education

REFERENCE BOOKS:

1. Engineering Circuit Analysis **By: Hayt & Kemmerly - MG.**
2. Networks and Systems – **D.Roy Chowdary.**
3. Unified Electronics (Circuit Analysis and Electronic Devices) **by Agarwal-Arora**
4. Electric Circuit Analysis- **S.R. Paranjothi- New Age International.**

ELECTRONICS LAB-1(50M, Internal 25+ External 25)

(CIRCUIT LAB)

Demonstration of C.R.O: Demonstration using CRO Kit - Block diagram concepts etc., in lab session (Using slides.)

(Assignments are to be given-Marks shall be allotted to this work as internal part.)

LAB LIST:

1. Measurements of D.C & A.C voltage, frequency using CRO
2. Verification of Kirchoff's laws
3. Network theorems verification
4. RC circuit-Frequency response (low, high pass & band pass)
5. RL circuit-Frequency response (low, high pass & band pass)
6. LCR series resonance circuits-Frequency response-Determination of Q and Band Width.
7. LCR parallel resonance circuits-Frequency response-Determination of Q and Band Width.

Lab experiments are to be done on breadboard and simulation software (using Multi sim) and output values are to be compared and justified for variation.

K. S. Rao
J. S. R. K.
P. Zilal
B. Nagammai

.Electronic Devices and Circuits

UNIT 1: (12Hrs)

PN JUNCTION DIODES:

P-N junction Diode, Depletion region, Barrier Potential, Working in Forward and Reverse bias condition – Junction capacitance, Diode current equation – Effect of temperature on reverse saturation current – construction, working, V-I characteristics and simple applications of Junction Diode, varactor diode, Zener diode. Zener Diode as voltage regulator, varactor diode, and Tunnel diode.

UNIT –II:(12hrs)

BIPOLAR JUNCTION TRANSISTOR AND ITS BIASING: (D.C)

Introduction, Transistor Construction, Operation, and characteristics of CB, CE, and CC – Configurations. Complete hybrid equivalent model, DC load line analysis.

BJT Biasing: Fixed-Bias Circuit, Emitter-Stabilized Bias Circuit, Voltage-Divider Bias, Bias Stabilization.

UNIT-III:(16hrs)

FIELD EFFECT TRANSISTORS , UJT & SCR:

Introduction, Construction, Operation and Characteristics of FET/JFET, Drain and Transfer characteristics, Depletion-type, and Enhancement-Type MOSFETs.

FET Biasing: Fixed-Bias Configuration, Self-Bias Configuration, Voltage-Divider Biasing.

UNIT IV: (08hrs)

Uni-Junction Transistor (UJT)

UJT construction-working, V-I characteristics, UJT as a Relaxation oscillator.

Silicon Controlled Rectifier (SCR):

Structure and working of SCR. Two transistor representation, Characteristics of SCR. Experimental set up to study the SCR characteristics, simple applications of SCR.

UNIT-V:(12hrs)

PHOTO ELECTRIC DEVICES:

Light-Emitting Diodes (LEDs), IR Emitters, Photo diode, Photo transistors, Structure and operation of LDR, and Opto-Isolators.

TEXT BOOKS:

1. Electronic Devices and Circuit Theory --- Robert L. Boylestad & Louis Nashelsky.
2. Electronic Devices and Circuits I – T.L.Floyd- PHI Fifth Edition
3. Principles of Electronics, V.K. Mehata

REFERENCE BOOKS:

1. Integrated Electronics – Millman & Halkias.
2. Electronic Devices & Circuits – Bogart.
3. Sedha R.S., A Text Book Of Applied Electronics, S.Chand & Company Ltd

ELECTRONICS LAB-2 (50M, Internal 25+ External 25)
(ELECTRONIC DEVICES AND CIRCUITS LAB)

LAB LIST:

1. V-I Characteristics of junction diode
2. V-I Characteristics of zener diode
3. Zener Diode as a Voltage Regulator
4. BJT input and output characteristics
5. FET input and output characteristics
6. UJT characteristics
7. LDR characteristics
8. V-I characteristics of SCR
9. LED Characteristics

Lab experiments are to be done on breadboard and simulation software (using multisim) and output values are to be compared and justified for variation.

K. S. Rao
J. S. R. K.
P. S. Rao
B. Nagammai

Digital Electronics

Unit – I (9hrs)

NUMBER SYSTEM AND CODES: Decimal, Binary, Hexadecimal, Octal, BCD. Conversions, Complements (1's, 2's, 9's and 10's), Addition, Subtraction, Gray, Excess-3 Code conversion from one to another.

Unit- II (12hrs)

BOOLEAN ALGEBRA AND THEOREMS: Boolean Theorems, De-Morgan's laws. Digital logic gates, Universal NAND & NOR gates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 4,5 variables), don't care condition.

Unit-III (15hrs)

COMBINATIONAL DIGITAL CIRCUITS:

Adders-Half & full adder, Subtractor-Half and full subtractors, Parallel binary adder, Magnitude Comparator, Multiplexers (2:1, 4:1) and Demultiplexers (1:2, 4:1), Encoder (8-line-to-3-line) and Decoder (3-line-to-8-line). IC-LOGIC FAMILIES: TTL logic, DTL logic, RTL Logic, CMOS inverter.

UNIT-IV (14hrs)

SEQUENTIAL DIGITAL CIRCUITS:

Flip Flops: S-R FF, J-K FF, T and D type FFs, Master-Slave FFs, Excitation tables. Registers:-shift left register, shift right register, Counters - Asynchronous-Mod16 up & down counter, Mod-10, Synchronous-4-bit up counter.

UNIT-V (10hrs)

MEMORY DEVICES:

General Memory Operations, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM, EAROM, PLA (Programmable logic Array), PAL(Programmable Array Logic)

J. S. N. K. 21-3-2018

P. Geetha

B Nagammai

TEXT BOOKS:

1. M.Morris Mano, " Digital Design " 3rd Edition, PHI, New Delhi.
2. Ronald J. Tocci. "Digital Systems-Principles and Applications" 6/e. PHI, New Delhi, 1999.(UNITS I to IV)
3. G.K.Kharate-Digital electronics-oxford university press
4. S.Salivahana&S.Arivazhagan-Digital circuits and design
5. Fundamentals of Digital Circuits by Anand Kumar

Reference Books :

1. Herbert Taub and Donald Schilling. "Digital Integrated Electronics" . McGraw Hill, 1985.
2. S.K. Bose. "Digital Systems", 2/e, New Age International, 1992.
3. D.K. Anvekar and B.S. Sonade. "Electronic Data Converters : Fundamentals & Applications". TMH, 1994.
4. *Malvino and Leach. " Digital Principles and Applications ". TMG Hill Edititon.*

ELECTRONICS LAB-3 (50M, Internal 25+ External 25)

(DIGITAL ELECTRONICS LAB)

LAB LIST:

1. Verification of IC-logic gates
2. Realization of basic gates using discrete components (resistor, diodes & transistor)
3. Realization of basic gates using Universal gates (NAND & NOR gates)
4. Verify Half adder and full adder using gates
5. Verify Half subtractor and full subtractor using gates.
6. Verify the truth table of RS , JK, T-F/F using NAND gates
7. 4-bit binary Counter using Flip-Flops.
8. BCD to Seven Segment Decoder using IC -7447/7448

Lab experiments are to be done on breadboard and simulation software (using multisim) and output values are to be compared and justified for variation.

J. Gelat
J. S. N. K. e
21.3.2018
B. Bhagawan

S.R.R & C.V.R GOVERNMENT DEGREE COLLEGE(AUTONOMOUS), VIJAYAWADA
B.Sc. Electronics Syllabus, Semester-4
w.e.f. 2018-19

SEMESTER 4

PAPER 4

Analog and Digital IC-Applications

Unit – I (10hrs)

OPERATIONAL AMPLIFIERS: Definition, Basic op-amp Ideal op-amp, Block diagram of op-amp, inverting, noninverting, virtualground, Adders, subtractors, summing amplifier, voltage follower, op-amp parameters, voltage to current convertor ,integrator, differentiator, differential amplifier, Logarithmic amplifier.

Unit- II (15 hrs)

OP-AMP CIRCUITS: voltage regulator, comparator, multivibrators-astable, monostable, Bi-stable, Schmitt trigger, sine wave generator, square wave generator, triangular wave generator, Active filters(Basics)-low pass, high pass, band pass filters

IC-555 –functional block diagram and mention its applications

Unit-III (15hrs):

COMBINATIONAL & SEQUENTIAL LOGIC CIRCUITS (IC-Applications):

Design of Code convertor: BCD to Seven Segment, BCD to Grey, Grey to Binary.

Design of Counters using State Machine: Mod N counter, Preset Table, Binary Up/Down Counter, Design of Universal Shift Register

UNIT-IV (10hrs)

DATA CONVERTERS:

A/D converter:- Successive Approximation ADC,-Single slope and dual slope converter, Sigma-delta ADC. D/A converter: R-2R Ladder network, Binary Weighted .

UNIT-V (10hrs)

DIGITAL SYSTEM INTERFACING AND APPLICATIONS: interfacing of LED's

Applications of Counters: Digital Clock

Applications of Shift Registers: Parallel to Serial ,Serial to Parallel, UART

J. S. N. K. 21.3.2018
R. Abraham

P. S. S. S.

TEXT BOOKS:

6. G.K.Kharate-Digital electronics-oxford university press
7. M.Morris Mano. " Digital Design " 3rd Edition, PHI, New Delhi.
8. Op Amp and Linear Integrated Circuits By Ramakant Gaykwad
9. Linear Integrated Circuits By Roy Choudary

Reference Books :

5. Jacob Millman, Micro Electronics, McGraw Hill.
6. Mithal G K. Electronic Devices and Circuits Thana Publishers.
7. Allan Motter shead .Electronic Devices and Circuits – An Introduction- Prentice Hall

ELECTRONICS LAB-3 (50M, Internal 25+ External 25)

(Analog and digital IC-Applications)

LAB LIST:

1. Op-Amp as inverting and non-inverting
2. Op-Amp as integrator and differentiator
3. Op-Amp as adder & subtractor
4. Op-Amp as voltage to current converter
5. Op-Amp as sine wave generator (Wien bridge oscillator)
6. Op-Amp as sine wave generator
7. Astable multivibrator determination of frequency (using IC 555)
8. Voltage Regulator Circuit Using OP-AMP.

Lab experiments are to be done on breadboard and simulation software (using Multisim) and output values are to be compared and justified for variation.

P. S. R. K. K.
21.3.2018

B. Nigaman



SRR & CVR GOVT. DEGREE COLLEGE (Autonomous)

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NAAC : B+ (III Cycle with CGPA : 2.60) - Estd: 1997

ISO 9001 - 2015 Certified
Institution is ranked by NIRF 101 - 150 band at NIRF - 2020

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Department of Physics & Electronics

Syllabus Modified and approved in BOS

2018-19

S.No.	Course Code	Course Name	Content Modifications	Justification
1	ELE-3303	Sem-3, paper- 3 Digital Electronics	Additions -Universal logic gates- Implementation of all logic gates using NAND and NOR gates, CMOS inverter Deletions: Multilevel NAND and NOR gates	To give comprehensive knowledge on gates.
2	ELE-4303	Sem- 4, PAPER-4 Analog and Digital IC Applications	Deletions—Instrumentation amplifier Additions-Multivibrators Lab: Voltage regulator using OP- AMP.	To give a detail understanding of applications of OPAMP.
3	PHY-3302	paper III: Wave Optics	Deletion: difference between interference and diffraction, Laurent half shape polarimeter	Already covered in intermediate
4	PHY-3302P	paper IIIp: Wave Optics lab	Deletion: Study of optical rotation - polarimeter, refractive index of liquid - hallow prism	Already covered in intermediate
5	PHY-4302	paper IV: thermodynamics & Radiation Physics	Deletion: Change of entropy of a perfect gas, Rayleigh jeans law (derivation)	Already covered in intermediate
6	PHY-4302P	Practical paper IVp: thermodynamics & Radiation Physics lab	Deletion: Specific heat of liquid - Barton's radiation correction, thermal conductivity of rubber	Similar experiment was already included in the syllabus

Percentage of Overall Revision in the Syllabus: 20%

Signature of the In-charge
with Dept. Lecturer in charge
Dept. of Physics & Electronics,
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Signature of the Principal
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