SRR & CVR GDC (A), VIJAYAWADA, KRISHNA DT.

AFFILIATED TO KRISHNA UNIVERSITY, MACHILIPATNAM

Report on 2nd Board of Studies Meeting for UG Programme of the Department of PHYSICS & ELECTRONICS AY-2021-22
Composition of the BoS of PHYSICS as Per UGC Guidelines

Members of Board of studies

Members of the Board of Studies of Department of Physics met on 30 -11-2021 at 2.00 PM in the Department of Physics & Electronics staff room.

s.no	Name of the faculty	Designation
1	Smt.P.Sailaja ,Assoc.Prof.in Electronics SRR & CVR GDC (A),Vijayawada	**Board of studies chairperson**
2	Dr. M.Rami Reddy, Registrar, Krishna University, Machilipatnam	**University Nominee**
3	K.Ajay Kumar ,Assist.Prof.in Physics GDC,Eluru,W.G.Dt. Mob:9493474612	**Subject Expert**
4	Dr.P.GopiKrishna,Asst.Prof.in Dept of ECM K.L.Education Foundation,Vaddeswaram, Guntur	**Subject Expert**
5	N. Vara Prasad, CEO, ARETE IT Services Pvt. Ltd Mob:8885591199	**Industrialist**
6	6 V.Raja Naik, Assit .Prof in Physics, PPDCET, Nunna Mob:9133029432 :	**Alumni**
7.	Dr.R.Kameswari,Assoc.Prof.in Physics Dr.K.Sujatha, Assoc.Prof.in Physics Smt.B.Nagamani ,Asst.Prof.in Physics Smt. T.V.Vakula Priya ,Asst.Prof.in in Physics Sri T.V.Ram Babu, Asst.Prof.in Physics Sri. J.Nageswara Rao,Asst.Prof.in Physics Smt. V.Uma Lakshmi,Asst.Prof.in Physics.	**Members of the Department**

SRR & CVR GDC (A), VIJAYAWADA, KRISHNA DT.

AFFILIATED TO KRISHNA UNIVERSITY, MACHILIPATNAM Department of PHYSICS & ELECTRONICS AY-2021-22

Composition of the BoS of PHYSICS as Per UGC Guidelines

Members of the Board of Studies of Department of Physics met on 30 -11-2021 at 2.00 PM in the Department of Physics & Electronics staff room Under chairmanship of Smt P.sailaja, Incharge of the Department, with the following agenda.

AGENDA:

1. Review of minutes of BOS .

2. To apprise and approve Departmental Vision and mission.

3. To discuss and approve curriculum structure suggested by APSHE and from feedback of students and different stakeholders with modifications not exceeding 20% on demand of local needs and to be implemented from the year 2021-.

4. To approve blue print and Model Question paper for theory and practical examinations.

5. Review of evaluation of Internal and External Examinations.

6. To Suggest Methodologies and innovative teaching practices.

7. To discuss and approve panel of Examiners.

8. To suggest and approve student study projects, Extension activities curricular, co-curricular activities and to discuss about certificate course - Hardware and Networking.

9. Any other with the permission of the chairman.

Course structure for I,II,III,IV& V

Semester	Paper	SUBJECT	Hrs/Week	Credits		Internal Marks	External Marks	Total
I	I	Mechanics,Waves & Oscillations	4	3	2	40	60	100
II	II	Optics	4	3	2	40	60	100
III	III	Heat & Thermodynamics	4	3	2	40	60	100
IV	IV	Electricity Magnetism and Electronics	4	3	2	40	60	100
	V	Modern physics	4	3	2	40	60	100

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AFFILIATED TO KRISHNA UNIVERSITY, MACHILIPATNAM

BOARD OF STUDIES PHYSICS (2021-2022)

I Year B.Sc.-Physics: Semester I

Course-I: (Mechanics, Waves and Oscillations)

Work load: 60hrs per semester **4 hrs/week**

Course outcomes:

On successful completion of this course, the students will be able to:

CO1:Understand Newton's laws of motion and motion of variable mass system and its application to rocket motion and the concepts of impact parameter, scattering cross section.

CO2:Apply the rotational kinematic relations, the principle and working of gyroscope and it applications and the precessional motion of a freely rotating symmetric top.

CO3:Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation.

CO4:Understand postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.

CO5:Examine phenomena of simple harmonic motion and the distinction between un damped, damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator.

CO6: Fourier analysis is essentially for wave analysis after completion of this subunit they will able to analyze the different wave forms.

CO7:Appreciate the formulation of the problem of coupled oscillations and solve them to obtain normal modes of oscillation and their frequencies in simple mechanical systems.

CO8:Figure out the formation of harmonics and overtones in a stretched string and acquire the knowledge on Ultrasonic waves, their production and detection and their applications in different fields.

Mechanics, Waves and Oscillations

Work load : 60 hrs per semester **4 hrs/week**

Unit- 1

Mechanics of particle and Rigid bodies

Mechanics of Particles

Review of Newton's Laws of Motion, Motion of variable mass system, Motion of a rocket, Multistage rocket, Concept of impact parameter, scattering cross-section, Rutherford scattering (concept only)

Mechanics of Rigid bodies

Rigid body, rotational kinematic relations, Equation of motion for a rotating body, Angular momentum and Moment of inertia tensor, Euler equations, Precession of a spinning top, Precession of the equinoxes

UNIT -2

Motion in a Central Force Field

Central forces, definition and examples, characteristics of central forces, conservative nature of central forces, Equation of motion under a central force, Kepler's laws of planetary motion -Proofs, Motion of satellites.

Unit -3

Relativistic Mechanics

Introduction to relativity, Frames of reference, Galilean transformations, absolute frames, Michelson-Morley experiment, negative result, Postulates of Special theory of relativity, Lorentz transformation, time dilation, length contraction, variation of mass with velocity, Einstein's mass-energy relation (concept only)

Unit-4

Oscillators

Un damped, Damped and Forced oscillations

Simple harmonic oscillator and solution of the differential equation, Damped harmonic

oscillator, Forced harmonic oscillator (no derivation) – Their differential equations and solutions, Resonance, Logarithmic decrement, Relaxation time and Quality factor.(concept only)

Fourier analysis

Fourier theorem and evaluation of the Fourier coefficients, analysis of periodic wave functions-square wave, triangular wave.

Unit-5

Strings and their behaviour

Vibrating Strings

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.

Ultrasonics

Ultrasonics, General Properties of ultra sonic waves, Production of ultrasonics by piezoelectric and magnetostriction methods, Detection of ultrasonics, Applications of ultrasonic waves, SONAR

ADD ON UNIT

Principles Behind Covid Protection Equipment

Fog Sanitizer Machine, Germicidal Uvdis Infectent Lamp. Uv Sterilizer Box

Reference books:

1. B. Sc. Physics, Vol.1, Telugu Academy, Hyderabad
2. Fundamentals of Physics Vol. I - Resnick, Halliday, Krane ,Wiley India 2007
3. College Physics-I. T. Bhimasankaram and G. Prasad. Himalaya Publishing House.
4. University Physics-FW Sears, MW Zemansky & HD Young,Narosa Publications, Delhi
5. Mechanics, S.G.Venkatachalapathy, Margham Publication, 2003.
6. Waves and Oscillations. N. Subramanyam and Brijlal, VikasPulications.
7. Unified Physics - Waves and Oscillations, Jai PrakashNath&Co.Ltd.
8. Waves & Oscillations. S.Badami, V. Balasubramanian and K.R. Reddy, Orient Longman.
9. The Physics of Waves and Oscillations, N.K.Bajaj, Tata McGraw Hill

10. Science and Technology of Ultrasonics- Baldevraj, Narosa, New DelhiB.,2004
11. "Geometrical and physical optics" by P.K.Chakrabarty
12. B. Sc Practical physics by C.L ,Arora, S.Chand & Co
13. B.Sc Practical physics 3year degree course by K. Hanumantha Rao, Guntur, Maruthi series Publications.

Practical Course 1: Mechanics, Waves and Oscillations

Work load: 30 hrs per semester **2 hrs/week**

Course outcomes (Practicals):

On successful completion of this practical course, the student will be able to;

CO1: Perform experiments on Properties of matter such as the determination of module of elasticity *viz.*, Young's modulus, Rigidity modulus of certain materials; Surface tension of water , Coefficient of viscosity of a liquid , Moment of inertia of some regular bodies by different methods and compare the experimental values with the standard values.

CO2: Know how to determine the acceleration due to gravity at a place using Compound pendulum and Simple pendulum.

CO3: Notice the difference between flat resonance and sharp resonance in case of volume resonator and sono meter experiments respectively.

CO4: Verify the laws of transverse vibrations in a stretched string using sonometer and comment on the relation between frequency, length and tension of a stretched string under vibration.

CO5: Demonstrate the formation of stationary waves on a string in Melde's string experiment.

CO6: Observe the motion of coupled oscillators and normal modes.

Minimum of 6 experiments to be done and recorded:

1. Young's modulus of the material of a bar (scale) by uniform bending
2. Young's modulus of the material a bar (scale) by non- uniform bending
3. Surface tension of a liquid by capillary rise method

4. Viscosity of liquid by the flow method (Poiseuille's method)
5. Bifilar suspension –Moment of inertia of a regular rectangular body.
6. Fly-wheel -Determination of moment of inertia
7. Rigidity modulus of material of a wire-Dynamic method (Torsional pendulum)
8. Volume resonator experiment
9. Determination of 'g' by compound/bar pendulum
10. Simple pendulum- normal distribution of errors-estimation of time period and the error of the mean by statistical analysis
11. Determination of the force constant of a spring by static and dynamic method.
12. Coupled oscillators
13. Verification of laws of vibrations of stretched string – Sonometer
14. Determination of frequency of a bar –Melde's experiment.
15. Study of a damped oscillation using the torsion pendulum immersed in liquid decay

COURSE I: Mechanics & Waves and Oscillations
BLUE PRINT

Unit	**Essay answer questions**	**Short answer questions**	**Numerical problem**
Unit I	2 (with internal choice)	1	1
Unit II	2 (with internal choice)	2	0
Unit III	2 (with internal choice)	1	1
Unit IV	2 (with internal choice)	1	1
Unit V	2 (with internal choice)	2	0

Percentage of choice :50 %.

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BOARD OF STUDIES PHYSICS (2021-2022)

I Year B.Sc.-Physics: Semester II

COURSE II: Wave Optics

Course outcomes:

On successful completion of this course, the students will be able to:

CO1: Understand Newton's laws of motion and motion of variable mass system and its application to rocket motion and the concepts of impact parameter, scattering cross section.

CO2: Apply the rotational kinematic relations, the principle and working of gyroscope and it applications and the processional motion of a freely rotating symmetric top.

CO3: Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation.

CO4: Understand postulates of Special theory of relativity and its consequences.

CO5: Examine phenomena of simple harmonic motion and the distinction between un damped, damped and forced oscillations.

CO6: Appreciate the formulation of the problem of coupled oscillations and solve them to obtain normal modes of oscillation and their frequencies in simple mechanical systems.

CO7: Figure out the formation of harmonics and overtones in a stretched string and acquire the knowledge on Ultrasonic waves, their production and detection and their applications in different fields.

UNIT-1

Interference of light: Introduction, Conditions for interference of light, Interference of light by division of wave front and amplitude,Phase change on reflection- Stokes' treatment, Lloyd's single mirror,Interference in thin films: Plane parallel and wedge- shaped films, colours in thin films, Newton's rings in reflected light-Theory and experiment, Determination of wavelength of monochromatic light, Michelson interferometer and determination of wavelength.

UNIT-2

Diffraction of light: Introduction, Types of diffraction: Fresnel and Fraunhoffer diffractions, Distinction between Fresnel and Fraunhoffer diffraction,Fraunhoffer diffraction at a single slit, Plane diffraction grating, Determination of wavelength of light using diffraction grating,

Resolving power of grating, Fresnel's half period zones, Explanation of rectilinear propagation of light, Zone plate, comparison of zone plate with convexlens.

UNIT-3

Polarisation of light

Polarized light: Methods of production of plane polarized light, Double refraction, Brewster's law, Malus law, Nicol prism, Nicol prism as polarizer and analyzer, Quarter wave plate, Half wave plate, Plane, Circularly and Elliptically polarized light(concept only)-Production and detection, Optical activity, determination of specific rotation, Basic principle of LCDs

UNIT-4

Aberrations and Fiber Optics

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 adistance.

Fibre optics: Introduction to Fibers, different types of fibers, rays and modes in an optical fiber, Principles of fiber communication (qualitative treatment only), Advantages of fiber opticcommunication.

UNIT-5

Lasers and it`s Applications

Introduction, Spontaneous emission, stimulated emission, Population Inversion, Laser principle, Einstein coefficients(concept only), Types of lasers-He-Ne laser, Ruby laser, Applications of lasers;

Reference books:

1. B. Sc Physics, Vol.2, Telugu Akademy, Hyderabad
2. A Text Book of Optics-N Subramanyam, L Brijlal, S.Chand&Co.
3. Optics-Murugeshan,S.Chand&Co.
4. Unified Physics Vol.IIOptics, Jai PrakashNath&Co.Ltd.,Meerut
5. Optics,F.A. Jenkins and H.G.White,McGraw-Hill
6. Optics,AjoyGhatak,TataMcGraw-Hill.
7. Introduction of Lasers – Avadhanulu, S.Chand&Co.
8. Principles of Optics- BK Mathur, Gopala Printing Press,1995

COURSE II: BLUE PRINT WAVE OPTICS

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	1	1
Unit II	2 (with internal choice)	2	0
Unit III	2 (with internal choice)	1	1
Unit IV	2 (with internal choice)	1	1
Unit V	2 (with internal choice)	2	0

Percentage of choice :50 %.

Practical Course II: Wave Optics

Workload:30hrs **2 hrs/week**

Course outcomes (Practicals):

Co1: On successful completion of this practical course the student will be able to,

Co2: Gain hands-on experience of using various optical instruments like spectrometer, polarimeter and making finer measurements of wavelength of light using Newton Rings experiment, diffraction grating etc.

Co3:Understand the principle of working of polarimeter and the measurement of specific rotatory power of sugar solution

Co4: Know the techniques involved in measuring the resolving power of telescope and dispersive power of the material of the prism.

Co5:Be familiar with the determination of refractive index of liquid by Boy's method and the determination of thickness of a thin wire by wedge method.

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. Study of optical rotation–polarimeter.
4. Dispersive power of a prism.
5. Determination of wavelength of light using diffraction grating-minimum deviation method.
6. Determination of wavelength of light using diffraction grating-normal incidence method.
7. Resolving power of a telescope.
8. Refractive index of a liquid-hallow prism
9. Determination of thickness of a thin wire by wedge method
10. Determination of refractive index of liquid-Boy's method.

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BOARD OF STUDIES PHYSICS(2021-2022)

II Year B.Sc.-Physics: III Semester

Course-III: HEAT AND THERMODYNAMICS

Work load: 60hrs per semester **4 hrs/week**

Course Outcomes

On successful completion of this course, the student will be able to Understand,

CO1: The concept of distribution of velocities of molecules and the applications of concept of Transport phenomena in gases .

CO2 : The main concept of thermodynamic laws is decrease in available form of energy (work) in the universe which leads to more disorder and information in the system.

CO3 : Students can derive Any thermodynamic expressions easily from Maxwell's thermodynamic relations.

CO4 : The molecular concept in joule Thomson effect and it's applications in refrigeration systems.

CO5 : Understanding Quantum concept which solved Ultraviolet catastrophe of black body radiation spectrum and the principles in design of pyrometers.

UNIT-I:

Kinetic Theory of gases: (12 hrs): Kinetic Theory of gases-Introduction, Maxwell's law of distribution of molecular velocities (qualitative treatment only) Mean free path, Degrees of freedom, Principle of equipartition of energy (Qualitative ideas only), Transport phenomenon in ideal gases: viscosity, Thermal conductivity and diffusion of gases. : Average speed, RMS speed, Probable Speed of molecules in a gas.

UNIT-II:

Thermodynamics: (12hrs): Introduction- Isothermal and Adiabatic processes, Reversible and irreversible processes, Carnot's engine and its efficiency, Carnot's theorem, Second law of thermodynamics: Kelvin and Clausius statements, Principle of refrigeration, 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 ; change of entropy when ice changes into steam. Third law of thermodynamics, Work done in an Isothermal and Adiabatic Process"

UNIT-III:

Thermodynamic Potentials and Maxwell's equations: (12hrs) Thermodynamic potentials-Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy and their significance, Derivation of Maxwell's thermodynamic relations from thermodynamic potentials, Applications to (i) Clausius-Clayperon's equation (ii) Value of CPCV (iii) Value of CP/CV.Thermodynamic square(Wheel) or Born square

UNIT-IV:

Low temperature Physics: (12hrs) : Methods for producing very low temperatures, Joule Kelvin effect, Porous plug experiment , Joule expansion, Distinction between adiabatic and Joule Thomson expansion, Expression for Joule Thomson cooling, Production of low temperatures by adiabatic demagnetization (qualitative), Practical applications of substances at low temperatures. Adiabatic demagnetization.

UNIT-V:

Quantum theory of radiation: (12 hrs) Blackbody and its spectral energy distribution of black body radiation, Wein's displacement law, Stefan-Boltzmann's law and Rayleigh-Jeans law (No derivations), Planck's law of black body radiation-Derivation, Deduction of Wein's law and RayleighJeans law from Planck's law, Solar constant and its determination using Angstrom Pyrheliometer, Estimation of surface temperature of Sun. Ultraviolet catastrophe ,Rayleigh-jean's law derivation(Quantitative**)**

TEXT BOOKS:

1. BSc Physics, Vol.2, Telugu Akademy, Hyderabad
2 BSc Unified physics, Vol.2 Optics & Thermodynamics, Jai PrakashNath&Co.Ltd., Meerut

REFERENCE BOOKS :

1. Thermodynamics, R.C.Srivastava, S.K.Saha&AbhayK.Jain, Eastern Economy Edition.
2. Heat and Thermodynamics -N BrijLal, P Subrahmanyam, S.Chand& Co.,2012
3. Heat and Thermodynamics- MS Yadav, Anmol Publications Pvt. Ltd, 2000 University Physics
4. HD Young, MW Zemansky,FW Sears, Narosa Publishers, New Delhi

COURSE III: BLUE PRINT
Heat & Thermodynamics

Unit no	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	2	0
Unit II	2 (with internal choice)	1	1
Unit III	2 (with internal choice)	1	1
Unit IV	2 (with internal choice)	2	0
Unit V	2 (with internal choice)	1	1

Percentage of choice :50 %.

Practical Lab Course-III: Heat and Thermodynamics

Work load: 30 hrs **2 hrs/week**

Course outcomes of lab III

On successful completion of this practical course, the student will be able to;

CO1.Perform some basic experiments in thermal Physics, viz., determinations of Stefan's constant, coefficient of thermal conductivity.

CO2: Understand variation of thermo- emf of thermocouple with temperature difference at its two junctions, calibration of a thermocouple and Specific heat of a liquid.

Minimum of 6 experiments to be done and recorded

1. Specific heat of a liquid –Joule's calorimeter –Barton's radiation correction
2. Thermal conductivity of bad conductor-Lee's method
3. Thermal conductivity of rubber. 4. Measurement of Stefan's constant.
5. Specific heat of a liquid by applying Newton's law of cooling correction.
6. Heating efficiency of electrical kettle with varying voltages.
7. Thermoemf- thermocouple - Potentiometer
8. Thermal behavior of an electric bulb (filament/torch light bulb)
9. Measurement of Stefan's constant- emissive method
10. Study of variation of resistance with temperature - Thermistor.
11. Simulation Black body radiation spectrum
12. Calculator for wien's displacement law, stefan - Boltzmann law, Rayleigh - jean's law.

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BOARD OF STUDIES PHYSICS(2021-2022)

II Year – IV SEMESTER For Mathematics Combinations
Course-IV: ELECTRICITY, MAGNETISM AND ELECTRONICS

Course outcomes:
On successful completion of this course, the students will be able to:

CO1: Understand the Gauss law and its application to obtain electric field in different cases.

CO2:Understand the difference between the magnetic effect of electric current and electromagnetic induction and apply the related laws.

CO3: Develop Knowledge and understanding on the unification of electric and magnetic fields and Maxwell's equations governingelectromagnetic waves andUnderstand Biot and Savart's law and Ampere's circuital law.

CO4:.Phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Q- factor, Power factor and the comparative study of series and parallel resonant circuits.

CO5. Describe the operation of p-n junction diodes, zener diodes, light emitting diodes and transistors.

CO6. Understand the operation of basic logic gates, universal gates and their truth tables and also Understand of Digital number systems and their applications.

Course-IV: ELECTRICITY, MAGNETISM AND ELECTRONICS
Work load : 60 hrs per semester 4 hrs/week

UNIT-I

1. Electrostatics: (6hrs)
Gauss's law-Statement and its proof, Differential Form Of Gauss Law .Electric field intensity due to (i) uniformly charged solid sphere and (ii) an infinite conducting sheet of charge, Electrical potential–Equipotential surfaces, Potential due to a (i) dipole (ii)uniformly charged sphere.

2. Dielectrics: (6 hrs)
Dielectrics-Polar and Non-polar dielectrics- Effect of electric field on dielectrics, Dielectric strength, Capacitance of a parallel plate condenser with dielectric slab between the plates, Electric displacement D, electric polarization P,Relation between D, E and P, Dielectric constant and electric susceptibility. Electric Fields In Cavities of Dielectrics.

UNIT-II
3.Magnetostatics: (6 hrs)
Biot-Savart's law and its applications: (i) circular loop and (ii) solenoid, Divergence and curl of magnetic field, Ampere's Circuital Law and its application to Solenoid, Hall effect and applications. Ballistic Galvanometer (Theory Only)

4. Electromagnetic Induction: (6 hrs)
Faraday's laws of electromagnetic induction, Lenz's law, Self-induction and Mutual induction, Self-inductance of a long solenoid, Mutual inductance of two coils, Energy stored in magnetic field, Eddy currents and Electromagnetic damping .Skin Depth.

UNIT-III
5. Alternating currents: (6 hrs)
Alternating current - Relation between current and voltage in LR and CR circuits, Phasor and Vector diagrams, LCR series and parallel resonant circuit, Q –factor, Power in ac circuits, Power factor. Single Phase A.C &D.C Motors(Qualitative Treatment only).

6. Electromagnetic waves-Maxwell's equations: (6hrs) Idea of displacement current, Maxwell's Equations-Derivation, Maxwell's wave equation (with derivation,Poyinting theorem (Statement and proof) .Electromagnetic Waves in conducting Media.
UNIT-IV

7. Basic Electronic devices: (12 hrs)
PN junction diode, Zener diode and Light Emitting Diode (LED) and their I-V characteristics, Zener diode as a regulator- Transistors and its operation, CB,CE and CC configurations, Input and output characteristics of a transistor in CE mode, Relation between alpha, beta and gamma; Hybrid parameters, Determination of hybrid parameters from transistor characteristics; Transistor as an amplifier.

UNIT-V:

8. Digital Electronics: (12 hrs)

Number systems, Conversion of binary to decimal system and vice versa, Binary addition & Binary subtraction (1's and 2's complement methods), Laws of Boolean algebra, DE Morgan'slaws-Statements and Proofs, Basic logic gates, NAND and NOR as universal gates, Exclusive-OR gate, Half adder and Full adder circuits.

Note :Numerical problems should be done after completion of each chapter each having a weightage of 4 marks should be asked in the semester End examination.The minimum passing marks in each theory & Lab course is 40%.

TEXT BOOKS

1. B.Sc Physics, Vol.3, Telugu Academy, Hyderabad.
2. B.SC Physics VOL.3, Unified physics

REFERENCE BOOKS

1. Electricity and Magnetism, D.N. Vasudeva. S. Chand & Co.
2. Electricity and Magnetism, B.D.Duggal and C.L.Chhabra. Shobanlal& Co.
3. Electricity, Magnetism with Electronics, K.K.Tewari, R.Chand& Co.,
4. Electricity and Magnetism, R.Murugeshan, S. Chand & Co.
5. Principles of Electronics, V.K. Mehta, S.Chand& Co.

BLUE PRINT FOR COURSE IV: Electricity ,Magnetism & Electronics

unit no	Essay Answer Questions	Short Answer Questions	Numerical problems
Unit -I	2(with internal choice)	1	1
Unit- II	2(with internal choice)	2	0
Unit -III	2(with internal choice)	1	1
Unit -IV	2(with internal choice)	2	0
Unit -V	2(with internal choice)	1	1

Percentage of choice :50 %.

Practical Course IV: Electricity, Magnetism and Electronics

Work load: 30 hrs 2 hrs/week

Course outcomes (Practical):

On successful completion of this practical course the student will be able to;

CO1:Measure the current sensitivity and figure of merit of a moving coil galvanometer.

CO2: Observe the resonance condition in LCR series and parallel circuit

CO3: Learn how a sonometer can be used to determine the frequency of AC-supply.

CO4: Observe the variation of magnetic field along the axis of a circular coil carrying current using Stewart and Gee's apparatus.

CO5: Understand the operation of PN junction diode, Zener diode and a transistor and their V-I characteristics.

CO6: Construct the basic logic gates, half adder and full adder and verify their truth tables. Further, the student will understand how NAND and NOR gates can be used as universal building blocks.

Minimum of 6 experiments to be done and recorded

1. LCR circuit series/parallel resonance, Q factor.

2. Determination of ac-frequency –Sonometer.

3. Verification of Kirchhoff's laws.

4. Field along the axis of a circular coil carrying current-Stewart & Gee's apparatus.

5. PN Junction Diode Characteristics

6. Zener Diode –V-I Characteristics

7. Zener Diode as a voltage regulator

8. Transistor CE Characteristics- Determination of hybrid parameters

9. Logic Gates- OR,AND,NOT and NAND gates. Verification of Truth Tables.

10. Verification of De Morgan's Theorems.

11. Construction of Half adder and Full Adders-Verification of truth tables.

12. Maximum Power Transfer theorem

Note :from all the above experiments 30 % will be conducted through virtual labs, 70 % will be conducted through offline.

B.Sc. PHYSICS SYLLABUS UNDER CBCS

II Year B.Sc.-Physics: IV Semester
Course V: MODERN PHYSICS
For Mathematics Combinations
Work load:60hrs per semester 4 hrs/week

COURSE OUTCOMES:

On successful completion of this course, the students will be able to:

CO1: Develop an understanding on the concepts of Atomic and Modern Physics, basic elementary quantum mechanics and nuclear physics.
CO2: Develop critical understanding of concept of Matter waves and Uncertainty principle.
CO3: Get familiarized with the principles of quantum mechanics and the formulation of Schrodinger wave equation and its applications.
CO4: Examine the basic properties of nuclei, characteristics of Nuclear forces, salient Features of nuclear models
CO5: Classify Elementary particles based on their mass, charge, spin, half life and Interaction.
CO6: Get familiarized with the nano materials, their unique properties and applications.
CO7: Increase the awareness and appreciation of superconductors and their practical Applications.

UNIT-I :
1. Atomic and Molecular Physics :(12 hrs)

Spectrum of Hydrogen Atoms ,Vector atom model and Stern-Gerlach experiment, Quantum numbers associated with it, Angular momentum of the atom, Coupling schemes, Spectral terms and spectral notations, Selection rules, Intensity rules, , Zeeman effect (concept only), Raman effect, Characteristics of Raman effect, Experimental arrangement to study Raman effect, Quantum theory of Raman effect, Applications of Raman effect.

UNIT-II:
2. Matter waves & Uncertainty Principle: (12 hrs)

Matter waves, de Broglie's hypothesis, Wave length of matter waves, Properties of matter waves, Davisson and Germer's experiment, Phase and group velocities, Heisenberg's uncertainty principle for position and momentum& energy and time, Illustration of uncertainty principle using diffraction of beam of electrons (Diffraction by a single slit)and photons(Gamma ray microscope),Bohr's principle of complementary
UNIT-III:

3. Quantum (Wave) Mechanics:(12 hrs)

Basic postulates of quantum mechanics, Schrodinger time independent and time dependent wave equations-Derivations, Physical interpretation of wave function, Eigen functions, Eigen values, Application of Schrodinger wave equation to (i) one dimensional potential box of infinite height(Infinite Potential Well) and (ii) one dimensional harmonic oscillator

UNIT-IV:

4. Nuclear Physics :(12 hrs)

Nuclear Structure: General Properties of Nuclei, Mass defect, Binding energy; *Nuclear forces*: Characteristics of nuclear forces- Yukawa's meson theory; *Nuclear Models*: Liquid drop model, The Shell model, Magic numbers; *Nuclear Elementary Particles*: Elementary Particles and their classification

UNIT-V:

5. Nano materials :(7hrs)

Nano materials – Introduction, Electron confinement, Size effect, Surface to volume ratio, Classification of nano materials– (0D, 1D, 2D); Quantum dots, Nano wires, Fullerene, CNT, Graphene (Mention of structures and properties),Distinct properties of nano materials (Mention-*mechanical, optical, electrical, and magnetic properties*); Mention of applications of Nano materials

6. Superconductivity: (5 hrs)

Introduction to Superconductivity, Experimental results-critical temperature, critical magnetic field, Meissner effect , Isotope effect, Type I and Type II superconductors, BCS theory (elementary ideas only),Applications of superconductors

REFERENCE BOOKS

1. BSc Physics, Vol.4, Telugu Akademy, Hyderabad
2. Atomic Physics by J.B. Rajam; S.Chand& Co.,
3. Modern Physics by R. Murugeshan and Kiruthiga Siva Prasath. S. Chand & Co.
4. Concepts of Modern Physics by Arthur Beiser. Tata McGraw-Hill Edition.
5. Nuclear Physics, D.C.Tayal, Himalaya Publishing House.
6. S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publ.Co.)
7. K.K.Chattopadhyay&A.N.Banerjee, Introd.to Nanoscience and Technology(PHI LearningPriv.Limited).
8. Nano materials, A K Bandopadhyay. New Age International Pvt Ltd (2007)
9. Textbook of Nanoscience and Nanotechnology, BS Murthy, P Shankar, Baldev Raj,BB Rath and J Murday-Universities Press-IIM

BLUE PRINT FOR COURSE V: Modern Physics

UNIT NO	Essay Answer Questions	Short Answer Questions	Numerical problems
Unit -I	2(with internal choice)	1	1
Unit- II	2(with internal choice)	1	1
Unit -III	2(with internal choice)	1	1
Unit -IV	2(with internal choice)	2	0
Unit -V	2(with internal choice)	2	0

Percentage of choice :50 %.

Practical Course V: Modern Physics

Work load: 30 hrs **2 hrs/week**

On successful completion of this practical course, the student will be able to;

CO1:Measure charge of an electron and e/m value of an electron by Thomson method.

CO2:Understand how the Planck's constant can be determined using Photocell and LEDs.

C03:Understand the energy levels of a particle in one dimentional potential box

CO4:Determine the Energy gap of a semiconductor using thermistor and junction diode.

Minimum of 6 experiments to be done and recorded

1. e/m of an electron by Thomson method.
2. Determination of Planck's constant (photocell).
3. Verification of inverse square law of light using photovoltaic cell.
4. Determination of the Planck's constant using LEDs of at least 4 different colours (virtual lab).
5. Determination of work function of material of filament of directly heated vacuum diode.
6. Millikan oil drop model virtual lab
7. One dimensional potential box virtual lab
8. Determination of M & H.
9. Analysis of powder X-ray diffraction pattern to determine properties of crystals.
10. Energy gap of a semiconductor using junction diode.
11. Energy gap of a semiconductor using thermistor.
12. GM counters characteristics (virtual lab).

RECOMMENDED CO-CURRICULAR ACTIVITIES FOR ALL COURSES:
MEASURABLE

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content).

2. Student seminars (on topics of the syllabus and related aspects (individual activity))

3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams)

4. Field studies (individual observations and recordings as per syllabus content and related areas (Individual or team activity)

5. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

GENERAL

1. Group Discussion

2. Visit to Research Stations/laboratories and related industries.

RECOMMENDED ASSESSMENT METHODS

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests).

2. Practical assignments and laboratory reports.

3. Observation of practical skills.

4. Efficient delivery using seminar presentations, viva voce interviews.

MODEL QUESTION PAPER FOR ALL COURSES

Time:3 hours Max marks: 60M

Section-A

(Short answer type)

Answer any five out of 10 questions from all units (I to V)

Marks: 5 x 4M = 20 M

At least two questions should be set from each unit.

(At least three problems should be given.)

1.
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Section-B

(Essay type)

Answer All questions with internal choice from all units (I to V).

Marks : 5 X 8 M = 40 M

(Two questions are to be set from each unit with internal choice)

11. a) OR b)
12.a) OR b)
13.a) OR b)
14.a) OR b)
15 .a) OR b)

SRR & CVR GDC (A), VIJAYAWADA, KRISHNA DT.

AFFILIATED TO KRISHNA UNIVERSITY, MACHILIPATNAM

DEPARTMENT OF PHYSICS & ELECTRONICS
BOARD OF STUDIES PHYSICS (2021-2022)

After thorough Discussion the following Resolutions are made:

1. It resolved to follow the same syllabus prescribed by the APSCHE, Andhra Pradesh for UG students of Physics in all semesters from the Academic Year 2021-22 with some additional inputs and some deletions.

2. It is resolved to continue the syllabus of Course I (Semester I), Course II (Semester II) without modifications as approved by BOS 2020-21.

3. It is resolve to follow the Course III (Semester III) syllabus modified above with modification proposed by BOS members that in Practical- 9 was replaced by "Verification of Newton's law of cooling by drawing cooling curve".

4. It is resolved that regarding Semester IV (Course IV), above without modifications are accepted for the academic year 2021-22.

5. Regarding Course V, as suggested by the BOS members it is resolved to delete "Quantum dots, Nano wires, Fullerene, CNT" from Unit-V.

6. It is resolved to approve the syllabus of skill developed courses without modifications (i.e., Electrical appliances for first semester and Solar Energy for second semester).

7. It is resolved and approved the Syllabus for Certificate Courses of

    1. Certificate course on "Hardware and Networking"

    2. Certificate course on "Exp EYES".

8. Resolved and approved the model question paper pattern for all semester examinations.

9. It is resolved to take 40 % marks are eligible to treat as pass both in internal and external examinations.

10. It is resolved to take 60% of marks for external examinations and 40% for internal examinations as same as the BOS of last academic year 2020-21.

11. It is approved blue print for theory and practical examinations without modifications.

12. It is resolved to consider 25 Marks for External evaluation and 25 Marks for internal evaluation in Practical examination in all semesters.

12. It is resolved to suggested student study projects, Extension activities, Field trips, curricular and co-curricular activities.

Signatures of the BOS members:

1 Smt. P. Sailaja , Assoc.Prof of Physics**(Board of studies chairperson)**

2. Dr. M. Rami Reddy, (**University Nominee)**
Registrar, Krishna University, Machilipatnam

3. Sri K. Ajay Kumar, Assist.Prof. of Physics (**Subject Expert)**

4. Dr. P.Gopi Krishna, Asst.Prof. of Dept of ECM(**Subject Expert)**

5. Sri N. Vara Prasad (**Industrialist)**

6 Sri V. Raja Naik, Asst .Prof of Physics (**Alumni)**

Members of the Department:

7. Dr.R.Kameswari,Assoc.Prof.of Physics

8. Dr.K.Sujatha,Assoc.Prof.of Physics

9. Smt.B.Nagamani Asst .Prof of Physics

10. Smt. T.V.Vakula Priya , Asst .Prof of Physics

11. Sri T.V.Ram Babu, Asst .Prof of Physics

12. Sri. J.Nageswara Rao, Asst .Prof of Physics

13. Smt. V.Uma Lakshmi , Asst .Prof of Physics

DEPARTMENT OF PHYSICS & ELECTRONICS

BOARD OF STUDIES (2021-2022)

Smt P.Sailaja , Incharge of the Department of Physics & Electronics request the Academic Council to Consider and approve the changes in the syllabi recommended by the Board of Studies for the academic year 2021-22 & -23.
The BOS meeting held on 30-11-2021.

The resolutions were seconded by Dr.M.Rami Reddy,University Nominee, Member of the Board of studies.

The Academic councilis also requested to accord permission to appoint Examiners for theory and Practical for the academic year 2021-22.

Chairman BOS

Members present

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DEPARTMENT OF PHYSICS& ELECTRONICS
BOARD OF STUDIES PHYSICS AND ELECTRONICS (2021-2023)

List of Examiners and Paper Setters:

S.NO	Name of the Lecturer	Address
1.	Sri.K.Ajay Kumar ,Assist.Prof.in Physics Mob:9493474612	GDC,Eluru,W.G.Dt
1	Sri M.Aruna , Lecturer in physics, Mob.no-9490881096	GDC, Kanchikacherla, Krishna Dt
2	Smt.Ch.Komala Lakshmi, Lecturer in Physics, Mob.no-9440151266	GDC(A), Rajamahendravaram, E.G.Dt
3	Kum.G.Sirisha, Lecturer in Physics Mob.no-8121925246	GDC(W),Guntur, Guntur Dt.
4	Sri.G.V.Gangadhar Rao,Lecturer in physics Mob.no-9182665253	GDC,Jangareddy Gudem, W.G.Dt
5	Dr.P. Gopi Krishna ,Asst.Prof.in Dept of ECM	K.L.Education Foundation,Vaddeswaram, Guntur.
6	Sri. T. Devender Reddy	GDC, Movva
7	Sri.SK.Basha, Lec.in Physics Mob no.9705964213	GDC,Rajahmundry,E.G.Dt

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ELECTRICAL APPLIANCES

(SKILL DEVELOPMENT COURSE)

(UNDER CBCS FRAMEWORK FROM 2020-21)

B.Sc. Semester – 1

COURSE OUTCOMES :

By successful completion of the course, students will be able to:

CO1. Acquire necessary skills/hand on experience/ working knowledge on multimeters, galvanometers, ammeters, voltmeters, ac/dc generators, motors, transformers, single phase and three phase connections, basics of electrical wiring with electrical protection devices.

CO2. Understand the working principles of different household domestic appliances.

CO3. Check the electrical connections at house-hold but will also learn the skill to repair the electrical appliances for the general troubleshoots and wiring faults.

UNIT-I (6 hrs)

Voltage, Current, Resistance, Capacitance, Inductance, Electrical conductors and Insulators, Ohm's law, Series and parallel combinations of resistors, Galvanometer, Ammeter, Voltmeter, Multimeter, Transformers, Electrical energy, Power, Kilowatt hour (kWh), consumption of electrical power

UNIT-II (10 hrs)

Direct current and alternating current,RMS and peak values, Power factor, Single phase and three phase connections , Basics of House wiring , Star and delta connection , Electric shock, First aid for electric shock, Overloading , Earthing and its necessity, Short circuiting , Fuses , MCB , ELCB, Insulation, Inverter, UPS

UNIT-III (10 hrs)

Principles of working, parts and servicing of Electric fan, Electric Iron box, Water heater; Induction heater, Microwave oven; Refrigerator, Concept of illumination, Electric bulbs, CFL, LED lights, Energy efficiency in electrical appliances, IS codes & IE codes.

Co-curricular Activities (Hands on Exercises): (04 hrs)

[Any four of the following may be taken up]

1. Studying the electrical performance and power consumption of a given number of bulbs connected in series and parallel circuits.

2. Measuring parameters in combinational DC circuits by applying Ohm's Law for different resistor values and voltage sources

3. Awareness of electrical safety tools and rescue of person in contact with live wire.

4. Checking the specific gravity of lead acid batteries in home UPS and topping-up with distilled water.

5. Identifying Phase, Neutral and Earth on power sockets.

6. Identifying primary and secondary windings and measuring primary and secondary voltages in various types of transformers.

7. Observing the working of transformer under no-load and full load conditions.

8. Observing the response of inductor and capacitor with DC and AC sources.

9. Observing the connections of elements and identify current flow and voltage drops.

10. Studying electrical circuit protection using MCBs, ELCBs

11. Assignments, Model exam etc.

ADDITIONS:

1. LCD projectors

SRR&CVR GOVT DEGREE COLLEGE (A),VIJAYAWADA

MODEL QUESTION PAPER FOR ELECTRICAL APPLIANCES

Max. Marks: 50 Time: 1½ hrs (90 Minutes)

SECTION- A

Answer any FIVE questions.

Each answer carries 10 marks (5x10M=50 Marks)

(At least 1 question should be given from each Unit)

1. Explain the parts and working of a microwave oven.
2. Explain in detail about ELCB.
3. Explain about transformers.
4. Define resistance. Derive the equation for total resistance when the resistances are connected in series.
5. Explain the parts and working of an electric fan.
6. Explain about overloading of an electrical circuit.
7. Explain the parts and working of an induction heater.
8. Explain about multimeter.
9. Explain in detail about MCB.
10. Explain the concept of earthing and its necessity.

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SKILL DEVELOPMENT COURSES

Revised CBCS w.e.f. 2020-21

Science Stream

SOLAR ENERGY

Total 30 hrs (02h/wk), 02 Credits & Max Marks: 50

COURSE OUTCOMES:

After successful completion of the course, students will be able to:

CO1. Acquire knowledge on solarradiation principles with respect to solar energy estimation.

CO2. Get familiarized with various collecting techniques of solar energy and its storage

CO3. Learn the solar photovoltaic technology principles and different types of solar cells for energy conversion and different photovoltaic applications.

CO4. Understand the working principles of several solar appliances like Solar cookers, Solar hot water systems, Solar dryers, Solar Distillation, Solar greenhouses.

SYLLABUS:

UNIT-I – Solar Radiation: (6 hrs)

Sun as a source of energy, Solar radiation, Solar radiation at the Earth's surface, Measurement of Solar radiation-Pyroheliometer, Pyranometer, Sunshine recorder, Prediction of available solar radiation, Solar energy-Importance, Storage of solar energy, Solar pond

UNIT-II – Solar Thermal Systems: (10 hrs)

Principle of conversion of solar radiation into heat, Collectors used for solar thermal conversion: Flat plate collectors and Concentrating collectors, Solar Thermal Power Plant, Solar cookers, Solar hot water systems, Solar dryers, Solar Distillation, Solar greenhouses.

UNIT-III – Solar Photovoltaic Systems: (10 hrs)

Conversion of Solar energy into Electricity - Photovoltaic Effect, Solar photovoltaic cell and its working principle, Different types of Solar cells, Series and parallel connections, Photovoltaic applications: Battery chargers, domestic lighting, street lighting and water pumping.

Reference Books:

1. Solar Energy Utilization, G. D. Rai, Khanna Publishers
1. Solar Energy- Fundamentals, design, modeling & applications, G.N. Tiwari, Narosa Pub., 2005.
2. Solar Energy-Principles of thermal energy collection & storage, S.P. Sukhatme, Tata Mc-Graw Hill Publishers, 1999.
3. Solar Photovoltaics- Fundamentals, technologies and applications, Chetan Singh Solanki, PHI Learning Pvt. Ltd.,
4. Science and Technology of Photovoltaics, P. Jayarama Reddy, BS Publications, 2004.

Co-curricular Activities (Hands on Exercises): (04 hrs)

[Any four of the following may be taken up]

1. Plot sun chart and locate the sun at your location for a given time of the day.

2. Analyse shadow effect on incident solar radiation and find out contributors.

3. Connect solar panels in series & parallel and measure voltage and current.

4. Measure intensity of solar radiation using Pyranometer and radiometers.

5. Construct a solar lantern using Solar PV panel (15W)

6. Assemble solar cooker

7. Designing and constructing photovoltaic system for a domestic house requiring 5kVA power

8. Assignments/Model Exam.

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AFFILIATED TO KRISHNA UNIVERSITY, MACHILIPATNAM

MODEL QUESTION PAPER FOR SOLAR ENERGY

Max. Marks: 50 *Time: 1½ hrs (90 Minutes)*

SECTION- A (4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks (At least 1 question should be given from each Unit)

Questions

1.

2.

3.

4.

5.

6.

7.

8.

SECTION B (3x10M = 30 Marks)

Answer any three questions. Each answer carries 10 marks

1.

2.

3.

4.

5

SRR&CVR GOVT DEGREE COLLEGE (A)

VIJAYAWADA-4

DEPT OF PHYSICS & ELECTRONICS

BOS RESOLUTIONS

IN

ELECTRONICS

2020-2021

SRR & CVR GOVT. DEGREE COLLEGE (Autonomous)

Machavaram, VIJAYAWADA – 4, Krishna Dist, A. P.

Minutes of the meeting of the Upgradation of Syllabus U. G. (B.O.S.) in the Subject of Electronics

A. Y.: 2020- 2021

The meeting of the Upgradation of Syllabus (B O S) in the subject of Physics , Electronics, solar energy and electrical appliances was held on 26 - 11 - 2020 , SRR & CVR Govt. Degree College (Autonomous), Vijayawada- 520004.

The following members attended the meeting: (Offline / Online / Blended)

1. Smt.P.Sailaja	(In-charge of the Dept& Chairperson, BOS)
2. Dr. Sandhya Cole	(University Nominee)
3. B.Nagamani	(Subject Expert)
4. Dr. R.kameswari	(Faculty Member)
5. Dr.K.Sujatha	(Faculty Member)
6 .Md.I.Pasha	(Faculty Member)
7. T.V.Rambabu	(Faculty Member)
8. T.V..V.Priya	(Faculty Member)

Agenda :

1. Approval of the i. Syllabus, ii. Model Question paper, iii. Blue Print and iv. Question Bank of the Semesters I and II of Electronics
2. Approval of the duration of the Examination for 3 hours.
3. Approval of the stipulated Credits, Work Load, Internal Marks breakup etc...
4. Approval of Online Examination pattern in case COVID 19 doesn't subside at the time of Examinations (MCQs Pattern).

The Chairperson welcomed the members and had discussion on the Agenda. He / She apprised the members of the guidelines of the UGC, APSCHE, Krishna University and the CCE regarding the framing of Syllabus, etc., 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:

The members of BOS Meeting Resolved:

1. To approve the syllabus for Semesters I, II, (APSCHE's Syllabus, for the announced Subjects and the modified Syllabus for Other Subjects) Electronics for the academic year 2020- 2021.

   Sem III Details: .Syllabus approved in BOS 2019-2020 will be followed.
   Sem V Details: Syllabus approved in BOS 2019-2020 will be followed.
   (Due to COVID - 19 consequences, as per the Staff Council Resolutions, II Sem is also included along with the I Semester. Please include the details of BOS of III and V Semesters above, if any).

2. To approve the i. Syllabus, ii. Model Question paper, iii. Blue Print and iv. Question Bank of the Semesters I &II
3. To approve the validity of this Syllabus for next 2 years.
4. : To follow Autonomous pattern of Total 100 marks as: i. Theory of 60 Marks, and ii. Internal Assessment of 40 marks.
5. To follow the Practicals components' Structure as resolved by the Science groups and other groups.
6. To follow Internal Assessment of 40 Marks Uniform pattern breakup resolved by the Autonomous Body / Committee.
7. ***meet.google.com/wtu-wywi-wtk date : 26-11-2020, time: 3-5 pm***

I. Details of Members attended:

S No	Name, Designation	Status of the Expert	Offline / Online/ Blended
1	P.Sailaja	In-charge of the Dept& Chairperson, BOS	offline
2	Dr. Sandhya cole	University Nominee	online
3	B.Nagamani	Subject Expert	offline
4	Dr. R. Kameswari	Faculty Member	offline
5	Dr. K.Sujatha	Faculty Member	offline
6	Md. I. Pasha	Faculty Member	offline
7	T.V.Rambabu	Faculty Member	offline
8	T.V.V. Priya	Faculty Member	offline

9 : To approve the stipulated Credits, Work Load, Internal Marks breakup etc.,.

10: To approve Online Examination pattern in case COVID 19 doesn't subside at the time of Examinations (MCQs Pattern).

11. Any other Resolutions, with the approval of the Chair:

i. BOS members resolved to make changes in electronics syllabus Sem I & Sem II according to affiliating university.

ii. Resolved to conduct at least 2 experiments be performed through virtual labs .

iii. Resolved to conduct certificate course in computer Hardware and Networking and in Electrical appliances.

12. To approve any other valid inclusion in B O S, with the permission of the Principal and Controller of Examinations (C O E).

Note:

1. Copies of i. Syllabus, ii. Model Question paper, iii. Blue Print and iv. Question Bank of the Semesters are enclosed.

2. Above Resolutions have to be Recorded / Documented in the Individual Departments B O S Meetings Register, with the counter signature of the Principal.

3. If the B O S Meeting is conducted online, the Recording of the Meeting is to be preserved in C D and has to be submitted to the College.

Signatures of the members of the BOS Meeting:

S No	Name & Designation	Status	Signature
1	P. Sailaja	In-charge of the Dept& Chairman, BOS	P. Sailaja
2	Dr. Sandhya cole	University Nominee	
3	B.Nagamani	Subject Expert	B Nagamani
4	Dr. R. Kameswari	Faculty Member	R Kameswari
5	Dr. K.Sujatha	Faculty Member	K. Sujatha
6	Md. I. Pasha	Faculty Member	
7	T.V.Rambabu	Faculty Member	
8	T.V.V. Priya	Faculty Member	

Counter signed by:

Principal

SRR & CVR Govt Degree College (A)

Vijayawada

PHINCIPAL (FAC)
SRR & CVR GOVT. DEGREE COLLEGE
(Autonomus)
Machavaram, VIJAYAWADA-520 004.

Vision:

To produce ethical, professional and employable individuals in the field of Electrical Engineering and also to make them ready for industries and higher learning

Mission

To impart the principles, concepts, latest trends in Electrical Engineering and develop the students as a good Electrical Engineering Technician.

To produce the Technicians with multidisciplinary skills, professional attitude, ethics, communication skills, teamwork skills for employment and higher learning

Creating infrastructure and teaching learning practices for enhancement of Knowledge, Understanding, Application, Skills, and behaviour of students towards employment and higher studies

Learning Outcomes:

By successful completion of the course, students will be able to:

1. Acquire necessary skills/hand on experience/ working knowledge on multimeters, galvanometers, ammeters, voltmeters, ac/dc generators, motors, transformers, single phase and three phase connections, basics of electrical wiring with electrical protection devices.

2. Understand the working principles of different household domestic appliances.

3. Check the electrical connections at house-hold but will also learn the skill to repair the electrical appliances for the general troubleshoots and wiring faults.

SYLLABUS FOR BRIDGE COURSE IN SEM-I

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)**

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.

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 , zener diode , construction , and working.

MODEL PATTERN FOR SYLLABUS : SEM-1 (CURCUIT THEORY AND ELECTRIC DEVICES)

S.NO	Title of Unit	Title of Topic /Sub Topic, etc	Reference
UNIT-1	**NETWORKS ANALYSIS & THEOREMS(DC)**	Mesh Analysis, Nodal Analysis(Problems on mesh & nodal analysis). Superposition Theorem, Thevenin's Theorem,Norton's Theorem, Maximum Power Transfer theorem ,Millman and Reciprocity theorems **(problems).**	1.Passive Integrator and Differentiator Circuits Worksheet - AC ... www.allaboutcircuits.com › ... › AC Electric Circuits
UNIT-2	**RC AND RL CIRCUIT**	Frequency response of RC and RL circuits, their action as low pass, high pass fliters Passive differentiating and integrating circuits. (problems)	
	SERIES AND PARALLEL RESONANCE CIRCUITS	Series resonance and parallel resonance circuits, Q - Factor, Selectivity and band width, Comparison of series and parallel resonance.	
UNIT-3	**DIODES**	V-I characteristics varactor diode, and Tunnel diode , Zener Diode as voltage regulator.	
	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 analys **BJT Biasing:** Fixed-Bias Circuit, Voltage-Divider Bias, Bias Stabilization.	
UNIT-4	**FIELD EFFECT TRANSISTORS**	Introduction, Construction, Operation and Characteris FET/JFET, Drain and Transfer characteristics, Depletion-type, and Enhancement-Type MOSFETs. **FET Biasing:** Fixed-Bias Configuration, Voltage-Divider Biasing.	Field-Effect Transistor Biosensors for Biomedical Applications ... www.mdpi.com ›
UNIT-5	**Uni-Junction Transistor (UJT)**	UJT construction-working, V-I characteristics, UJT as a Relaxation oscillator	1.Applications of UJT -

	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.	Semiconductor for You www.semiconductorforu.com › Articles 2.What is SCR (Silicon Controlled Rectifier), How it works ... components101.com › articles › scr-introduction-worki... 3 Silicon-Controlled Rectifier - an overview | ScienceDirect Topics www.sciencedirect.com › topics › engineering › silicon-c.. 4.Silicon Controlled Rectifiers - New Applications in the Home ... www.rfcafe.com › references › electronics-world › silic .

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.**
4. Electronic Devices and Circuits I – **T.L.Floyd- PHI Fifth Edition**

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.
5. Integrated Electronics – **Millmam & Halkias.**
6. Electronic Devices & Circuits – **Bogart.**
7. Sedha R.S., A Text Book Of Applied Electronics, S.Chand & Company Ltd

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

(ELECTRONIC DEVICES AND CIRCUITS 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. Network theorems verification.
3. RC circuit-Frequency response (low, high pass)
4. RL circuit-Frequency response (low, high pass)
5. LCR series resonance circuits-Frequency response-Determination of Q and Band Width.
6. LCR parallel resonance circuits-Frequency response-Determination of Q and Band Width.
7. Zener Diode as a Voltage Regulator
8. BJT input and output characteristics
9. FET input and output characteristics
10. UJT characteristics
11. LDR characteristics
12. V-I characteristics of SCR

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

w.e.f. 2020-21 (Revised in May 2020)

MODEL QUESTION PAPER COMMON FOR ALL FIVE THEORY COURSES

Time : 3 hrs Max marks : 60M

SECTION-A

(Short Answer Type Questions) Marks : 5x4M = 20M

Answer any five out of the following ten questions

1. *Short answer type question from Unit*-I
2. Short answer type question from Unit-I
3. Short answer type question from Unit-II
4. Short answer type question from Unit-II
5. Short answer type question from Unit-III
6. Short answer type question from Unit-III
7. Short answer type question from Unit-IV
8. Short answer type question from Unit-IV
9. Short answer type question from Unit-V
10. Short answer type question from Unit-V

SECTION-B

(Essay Type Questions) Marks: 5x8M =40M

Answer <u>All</u> questions with internal choice from each Unit

1. Essay type question from Unit-I

   Or

   Essay type question from Unit-I

2. Essay type question from Unit-II

   Or

   Essay type question from Unit-II

3. Essay type question from Unit-III

   Or

   Essay type question from Unit-III

4. Essay type question from Unit-IV

   Or

   Essay type question from Unit-IV

5. Essay type question from Unit-V

   Or

   Essay type question from Unit-V

SRR & CVR GOVT. DEGREE COLLEGE (A)

VIJAYAWADA – 520 004

B.Sc. 1ST Semester Electronics

(w.e.f 2020-2021)

Paper I: CURCUIT THEORY AND ELECTRONIC DEVICES

BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	1	1
Unit II	2 (with internal choice)	1	1
Unit III	2 (with internal choice)	2	0
Unit IV	2 (with internal choice)	2	0
Unit V	2 (with internal choice)	2	0

MODEL PATTERN FOR SYLLABUS : SEM – 2 (DIGITAL ELECTRONICS)

S.NO	Title of Unit	Title of Topic /Sub Topic, etc	Reference
UNIT -1	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.	The simple math behind decimal-binary conversion algorithms ... indepth.dev › the-simple-math-behind-decimal-binary-...
UNIT-II	BOOLEAN ALGEBRA AND THEOREMS	Boolean Theorems, De-Morgan's laws. Digital logic gates, Universal logic gates-NAND & NOR gates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 4,5 variables), don't care condition.	Binary to Decimal Conversion – x-engineer.org x-engineer.org › ... › Mathematics › Arithmetics
UNIT-III	COMBINATIONAL DIGITAL CIRCUITS	Adders-Half & full adder, Subtractor-Half and full subtractors, Parallel binary adder, Magnitude Comparator, Multiplexers (2:1,4:1)) and De multiplexers (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	Half Adder and Full Adder Circuit-Truth Table,Full Adder using ... www.circuitstoday.com › half-adder-and-full-adder
UNIT- IV	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& Ring counter.	(PDF) Incorporation of Reduced Full Adder and Half Adder ... www.researchgate.net › publication › 305623785_Incorp...
UNIT-V	MEMORY DEVICES	General Memory Operations, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM, PLA (Programmable logic Array),PAL (Programmable Array Logic)	

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 Edition.

SYLLABUS UP GRADATION

ELECTRONICS

2020-2021

Paper	Syllabus revision	justification
sem-1 paper -1 Network theorem and electronics devices and circuits	Additions— CB,CC configurations, BJT biasing ,FET biasing and SCR Deletions—power supplies and photo electric devices.	Deleted topics were replaced with additional topics to give clear knowledge of working of electronic devices.
Sem-2,paper -2 Digital Electronics	Additions— Shift left and Right registers ,Down counters	Will develop deep understanding of working of registers

B.Sc. Electronics

w.e.f. 2020-21 (Revised in May 2020)

MODEL QUESTION PAPER COMMON FOR ALL FIVE THEORY COURSES

Time : 3 hrs Max marks : 60M

SECTION-A

(Short Answer Type Questions) Marks : 5x4M = 20M

Answer any five out of the following ten questions

1. *Short answer type question from Unit-*I
2. Short answer type question from Unit-I
3. Short answer type question from Unit-II
4. Short answer type question from Unit-II
5. Short answer type question from Unit-III
6. Short answer type question from Unit-III
7. Short answer type question from Unit-IV
8. Short answer type question from Unit-IV
9. Short answer type question from Unit-V
10. Short answer type question from Unit-V

SECTION-B

(Essay Type Questions) Marks: 5x8M = 40M

Answer <u>All</u> questions with internal choice from each Unit

1. Essay type question from Unit-I

   Or

   Essay type question from Unit-I

2. Essay type question from Unit-II

   Or

   Essay type question from Unit-II

3. Essay type question from Unit-III

   Or

   Essay type question from Unit-III

4. Essay type question from Unit-IV

   Or

   Essay type question from Unit-IV

5. Essay type question from Unit-V

   Or

   Essay type question from Unit-V

ELECTRONICS LAB-2

(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 parallel adder and subtractor using IC 7483
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.

SRR & CVR GOVT. DEGREE COLLEGE (A)

VIJAYAWADA – 520 004

B.Sc. 2nd Semester Electronics

(w.e.f 2020-2021)

Paper II: DIGITAL ELECTRONICS

BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	0	2
Unit II	2 (with internal choice)	1	1
Unit III	2 (with internal choice)	2	0
Unit IV	2 (with internal choice)	2	0
Unit V	2 (with internal choice)	2	0

Bridge course of electronics sem – II STUDENTS

1. Basic idea about types of signals (Analog & Digital),
2. Basic idea about circuits
3. Basic logic operations like bit wise operations, Shift operations, ASCII codes
4. Idea on types of Memories
5. Knowledge on circuit analysis or analog electronics.

S No	Name & Designation	Status	Signature
1	P. Sailaja	In-charge of the Dept& Chairman, BOS	P. Sailaja
2	Dr. Sandhya cole	University Nominee	
3	B.Nagamani	Subject Expert	B Nagamani

Counter signed by:

Principal

SRR & CVR Govt Degree College (A)

Vijayawada

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