



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 2017-18

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

2017-2018

2017-18

SRR & CVR GOVERNMENT DEGREE COLLEGE (AUTONOMOUS)

Vijayawada 520004

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

PHYSICS AND ELECTRONICS

The meeting of the Board of Studies in the subject of PHYSICS AND ELECTRONICS was held on **18 April 2017** in III YEAR PHYSICS LAB , SRR & CVR Govt Degree College (Autonomous), Vijayawada 520004.

The following members attended the meeting:

- | | |
|---------------------------|---|
| 1. Sri.K.Srinivasa Rao | (In-charge of the Department & Chairman, BoS) |
| 2. Dr.J.Siva Rama Krishna | (University Nominee) |
| 3. Smt.P.Sailaja | (Subject Expert) |
| 4. Smt.B.Nagamani | (Subject Expert) |
| 5. Dr.R.Kameswari | (Faculty Member) |
| 6. Sri. Md.Iqbal Pasha | (Faculty Member) |
| 7. Sri.T.V.Rambabu | (Faculty Member) |
| 8. Smt.V.Uma Lakshmi | (Faculty Member) |

Agenda:

Item 1: Approval of syllabus for Semester I and II for the academic year 2017-18

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

The Chairperson, Board of Studies welcomed the members and initiated discussion on the syllabus for I and II year 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 I and II with the suggested modifications (20% of changes).
2. Resolved to approve the division of marks for internal and external examination along with the suggested blue print and model paper.

Syllabus for CBCS Semester I-Attached

Question Paper Blue Print-Attached








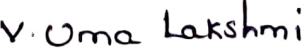
Model Question Paper-Attached

Syllabus for CBCS Semester II-Attached

Question Paper Blue Print-Attached

Model Question Paper-Attached

Signature of the members of the BoS:

	Name	Position	Signature
1	Sri.K.Srinivasa Rao	Chairperson	
2	Dr.J.Siva Rama Krishna	University Nominee	
3	Smt.P.Sailaja	External Expert	
4	Smt.B.Naga Mani	External Expert	
5	Dr.R.Kameswari	Faculty Member	
6	Sri.Md.Iqbal Pasha	Faculty Member	
7	Sri.T.V.Rambabu	Faculty Member	
8	Smt.V.UmaLakshmi	Faculty Member	

3. Resolved to approve workshop cum Training in Disaster management and first Aid.
4. Resolved to approve Certificate course - Android Mobile mechanism.
Resolved to approve MOU with Siri Energy & Carbon advisory.
5. Resolved to conduct of e-waste management workshop & Field visits.
6. Resolved to conduct of Guest lectures, student seminars and other co-curricular activities.
7. Resolve to conduct a Survey program on LED usage in Krishna Dt.
8. Any other suggestions with the permission of the chairman.

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



DEPT OF PHYSICS & ELECTRONICS
BOS RESOLUTIONS
IN
ELECTRONICS
2017-2018

SRR & CVR GOVERNMENT DEGREE COLLEGE (AUTONOMOUS)

Vijayawada 520004

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Syllabus for CBCS Semester I-Attached

Question Paper Blue Print-Attached





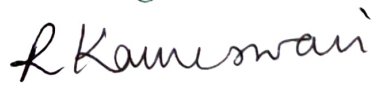


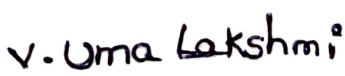
Model Question Paper-Attached

Syllabus for CBCS Semester II-Attached

Question Paper Blue Print-Attached

Model Question Paper-Attached

Signature of the members of the BoS:

	Name	Position	Signature
1	Sri.K.Srinivasa Rao	Chairperson	
2	Dr.J.Siva Rama Krishna	University Nominee	
3	Smt.P.Sailaja	External Expert	
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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. A. 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)

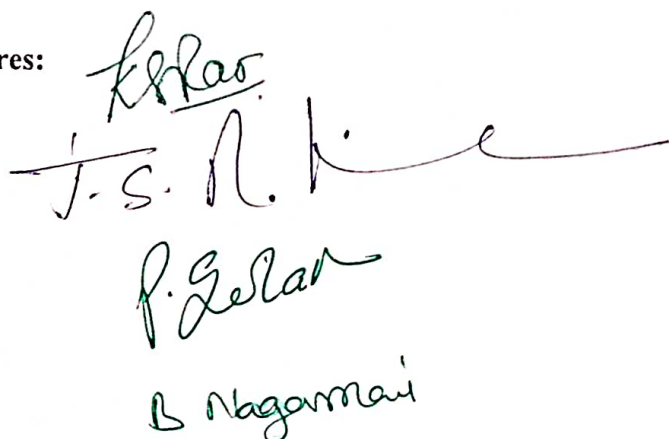
Work load: 30 hrs per semester

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:



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



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Department of Physics & Electronics Syllabus Modifications 2017-18

S.No.	Course Code	Course Name	Content Modifications	Justification
1	ELE-1303	sem-1 paper -1 Basic circuit theory	Deletions:-- -Star to delta and delta to star conversions Additions :-- Cathode Ray Oscilloscope -CRT and its working-Electrostatic deflections-fluorescent screen-measurement of voltage ,frequency and phase by using CRO.	outdated To develop operational knowledge of CRO .
2	ELE-2303	sem-2,PAPER -2 Electronic devices and circuits	Deletions— power supplies	Included in Electronic Instrumentation paper.
3	PHY -1302	paper I: Mechanics & Properties of matter	Deletions: Rutherford scattering derivation, shearing force, motion of satellite, GPS, addition of velocities four vector formalism Additions:Green theorem, Coriolis force	More focus was given to the qualitative treatment rather than quantitative. Will give deeper knowledge
4	PHY -1302P	practical paper I p: Mechanics & Properties of matter lab	Deletion: Determination of radius of capillary tube Hg thread method, Viscosity of liquid by Searls viscometer method	All ready covered in intermediate
5	PHY -2302	paper II: waves & Oscillations	Deletions: Energy tranport and transverse impedence	Since applications of vibration of strings is more relevant topics, related to vibrations in rods are deleted.
6	PHY -2302P	Practical paper II p: waves & Oscillations lab	Deletions: Elastic constant of spring, Study of damped oscillations in liquid immersed torsional pendulum.	All ready covered in intermediate

Percentage of Overall Revision in the Syllabus: 23%

P. Gilain
Lecturer in Charge
Signature of the In-charge
Dept. of Physics & Electronics
SRR & CVR Govt. Degree College
(Autonomous)
VIJAYAWADA-4

[Signature]
Signature of the PRINCIPAL
SRR & CVR GOVT. DEGREE COLLEGE
(Autonomous)
Mahavaram, VIJAYAWADA-520 004