DEPARTMENT OF PHYSICS PROFILE DOCUMENT

Vision:

- To be a competent physics department, which addresses global challenges.

Mission:

- Providing student centered learning environment.
- Infusing "we can do it" & "let us do it" culture in students.
- Sms , e-mail and net surfing by all students.
- Including innovative/creative attitudes in students.
- The department of physics encourages the students to understand the physics principles in nature and use them in daily activities to lead comfortable life.
- To develop research attitude in students by involving them in study projects
- The curriculum of B.Sc Physics offers students the opportunity to acquire a deep insight into conceptual knowledge of fundamental physics.
- The department consists of highly qualified and devoted faculty members who contribute towards academic growth and holistic development of the students.
- The department provides a platform to the students to go beyond academics and explore new horizons. We also conduct talks by eminent physicists from diverse fields which inspire and motivate young minds.

Brief history of the department:

In the year 1973 this college has emerged with B.A and B.Sc undergraduate course. After 25 years i.e., in 1998 B.Sc MPC and MPCs courses were started with the appointment of only one lecturer in Physics Sri. A. Ramabramhachary with an initial strength of 100 students. Another four lecturers were appointed later on. Students were taken to nearby S.R.R Govt. Degree College for physics practicals as labs were not established. In 1999 the physics lab was established and inaugurated by the vice-chancellor, Kakatiya University. After that UGC sanctioned three lakh rupees for the

development of physics labs. In 2004, the college administration has changed the location of the established physics laboratories first from Chaitanya Bharathi Auditorium to Room no.20 and 21 in the main building in 2004 just before the first NAAC visit. Later third lab was constructed beside lab1 and lab2 with UGC funding. Again in 2010 the three labs were well established in new building. In 2011 and 2017 there was NAAC visit. Now the total strength has gone up to 344.

Inputs from the departments:

1. Name and address of the department :Physics, Govt. Degree College for Women-Karimnagar
2. Telephone number:0878-2268274, mobile of in-charge:9392006005
3. Date of establishment of the department:xx-xx-1998
4. Built-up area of the department:1500 SFT
5. List of the different programmes offered by the department together with details:

programme	Level of study	Cut of marks at entry level	Sanctioned seats
B.Sc MPC E/M	UG	35%	60
B.Sc MPCs E/M	UG	35%	180
B.Sc MPSt E/M	UG	35%	60
		Total no of physical sciences sanctioned seats	300

6. Have any of the teaching programmes have been dropped because it lost its immediate relevance or because it was not viable? NO

7. What are sanctioned teaching staff strength and the present positions?
   Sanctioned=02 filled=02 vacant=0
8. Number of teaching and non-teaching staff of the department:

Details of staff	Male	Female	Total
Total No. of teachers	1	1	2
Teachers with NET/SET	1	1	2
Non –teaching staff	0	1	1

9. Faculty profile: adequacy and Competency of faculty

   Teaching:

S.NO	NAME OF THE FACULTY	DESIGNATION	EXPERIENCE AS DEGREE LECTURER	QUALIFICATION	ADDITIONAL CHARGES
1	N. SATYANARAYANA REDDY	LECTURER	5	M.Sc,B.Ed,SET	1.MANA TV COORDINATOR, 2.ELECTRICAL AND AUDIO VISUAL INCHARGE 3.INCHARGE OF PHYSICS DEPARTMENT

2	Dr. P. ARUNA	Asst.Professor	2	M.Sc,B.Ed,SET, Ph.D.	1. CONVENER: STUDENT GRIVENCES CELL 2. MENTOR FOR YOUTH FOR SOCIAL IMPACT 3. INCHARGE OF MATHEMATICS DEPARTMENT

Non-teaching staff:

1	R. Laxmi	Office sub-ordinate	16	Nil	Lab assistant

10. Does the department have academic, administrative and financial autonomy?

Academic matters YES at university & commissionarate level.
Administration YES at college level through principal & HOD
Finance NO UGC/STATE GOVT/ student spl fee

11. **Students Profile**:

Programme	Students strength			
B.Sc (PHYSICAL SCIENCE)	I	II	III	Total
M.P.Cs	108	104	99	311
M.P.C	06	14	10	30
M.P.St	01	02	NIL	03
	Total number of students			344

12. Changes made in the program during the past two years and the contribution of the faculty to those change.

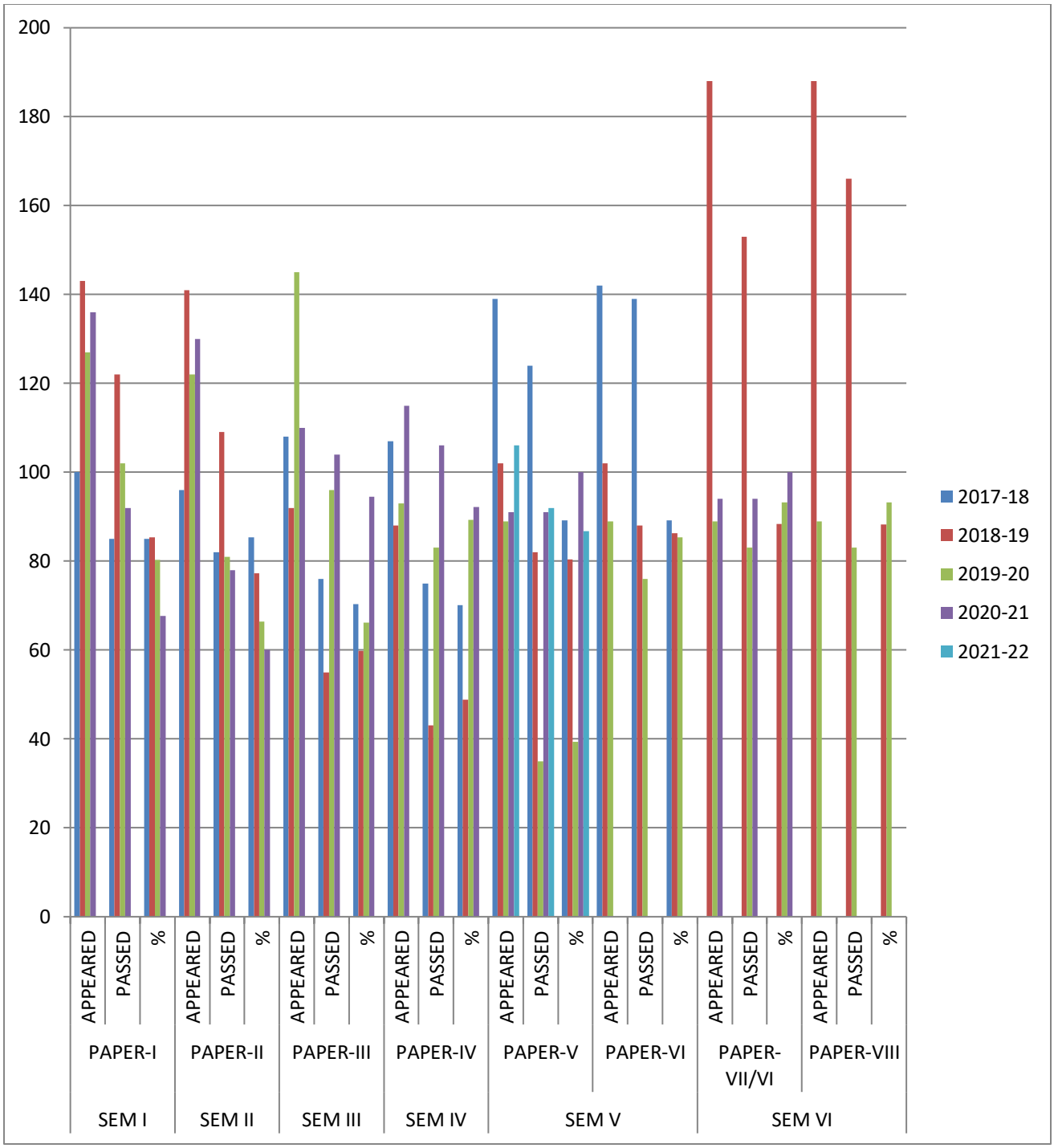
As S.U has started the semester pattern based on choice based credit system (CBSC) introduced by CCE. As S.U syllabus has changed during the academic year 2019-2020 Physics syllabus has changed during the three

academic years consisting of 6 semesters with 6 papers (I, II, III, IV, V, VI) in VI SEM there is a choice for project works as 1 paper and there are 4 SEC (skill enhancement courses) and in V semester 1 GE (Generic elective) VI semester NANO Science course in live projects syllabus was introduced in S.U and intimated to faculty members in the Physics department.

13. Trends in the success and dropout rate of students during the past five years:

SEM/YR			2017-18	2018-19	2019-20	2020-21	2021-22
SEM I	PAPER-I	APPEARED	100	143	127	136	
		PASSED	85	122	102	92	
		%	85	85.31	80.31	67.64	
SEM II	PAPER-II	APPEARED	96	141	122	130	
		PASSED	82	109	81	78	
		%	85.41	77.3	66.39	60	
SEM III	PAPER-III	APPEARED	108	92	145	110	
		PASSED	76	55	96	104	
		%	70.37	59.78	66.2	94.54	
SEM IV	PAPER-IV	APPEARED	107	88	93	115	
		PASSED	75	43	83	106	
		%	70.09	48.86	89.24	92.17	
SEM V		APPEARED	139	102	89	91	106

	PAPER-V	PASSED	124	82	35	91	92
		%	89.2	80.39	39.32	100	86.79
	PAPER-VI	APPEARED	142	102	89		
		PASSED	139	88	76		
		%	89.2	86.27	85.39		
SEM VI	PAPER-VII/VI	APPEARED		188	89	94	
		PASSED		153	83	94	
		%		88.38	93.25	100	
	PAPER-VIII	APPEARED		188	89		
		PASSED		166	83		
		%		88.29	93.25		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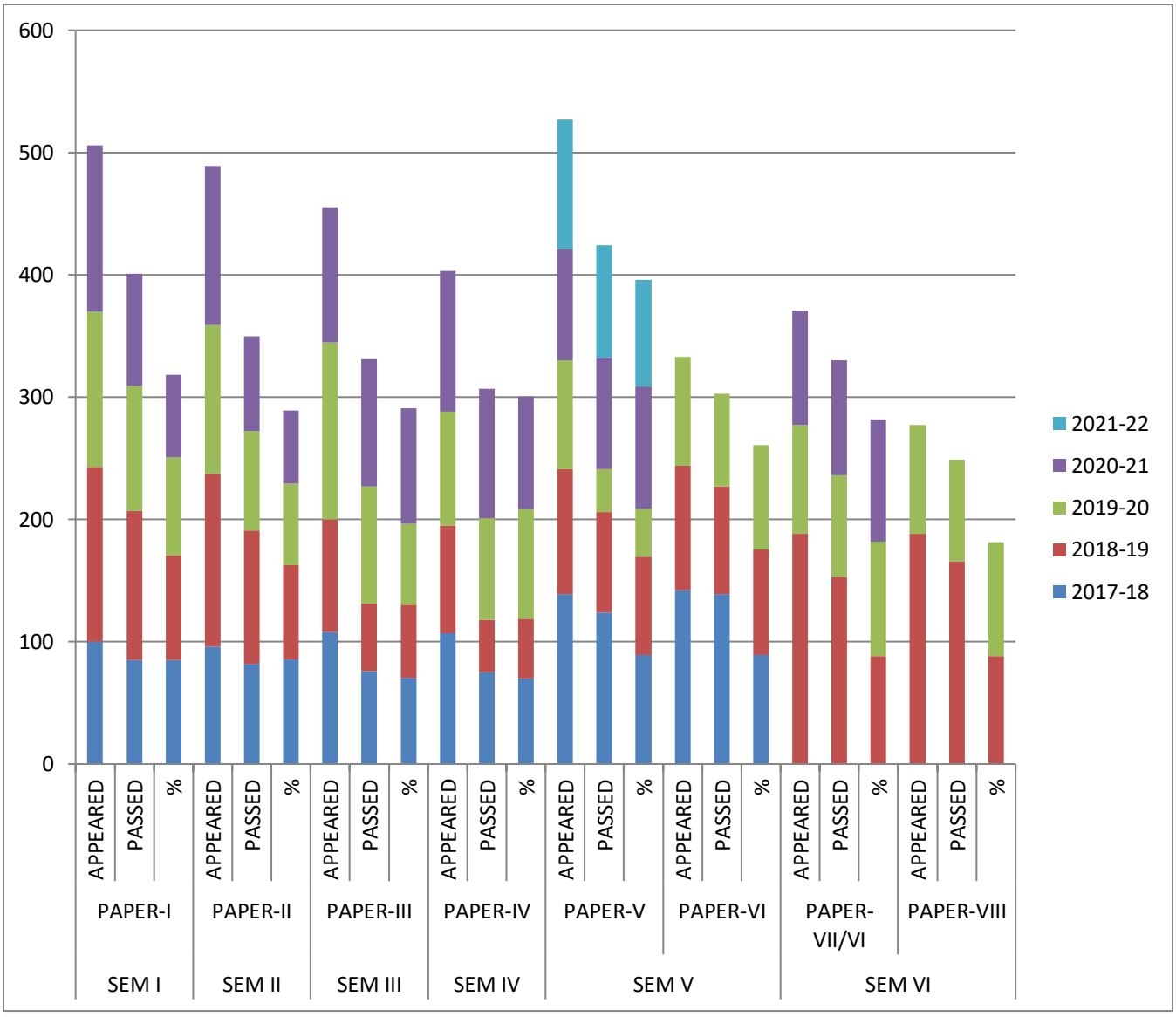
SEM VI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SEM II
SEM III
SEM IV
SEM V
SEM VI

14. Detail of faculty development programmes and teacher who have been benefited during the past five years:

Name of the Lecturer	Title of the course attended	Organized by	Date
N.Satyanarayana Reddy	01.Refresh Course 101 Experimental Physics	Osmania University	25-09-2018 to 10-10-2018
	02.U.G Physics practical exam workshop	SRR Govt. Arts and Science College , Karimnagar	27-08-2018
	03. Workshop on Physics creativity innovation	SRR Govt. Arts and Science College , KNR	02-03-2019
	04. Inner Engineering for teachers	ISHA Institute of Inner Sciences	23-07-2019 to 27-07-2019
	05. Faculty Development Programme	INFOSYS	25-11-2019 TO 06-12-2019
	06. ICT tools in higher education	Osmania University, UGC HRDC RUSA	20-08-2020 to 26-08-2020
	07. E-Workshop on virtual lab	IIT Guwahati & Bhavan's Vivekananda College	14-05-2020
	08. Physics Webinar series	Justice Busheer Ahmed Sayeed College For Women, Chennai	26-05-2020 to 28-05-2020
	09. National Webinar on material science and software tools	Stella Maris college (Autonomous) Chennai	01-06-2020 to 03-06-2020

	10. Role of Science and technology the diagnosis of novel corona vairus covid-19	Dr. B R Ambedkar college,HYD	09-06-2020
	11. Technology for the exploration for the inner space	SRM Institute of science and Technology, Chennai	11-07-2020
	12.Future generation solar cells	Nehru Intitute Of technology	14-07-2020
	13. Constitutional rights and duties	Department of Political Science, GDCW,KNR	07-04-2021

EMPLOYEE PROFILE

1	Name	N. Satyanarayana Reddy
2	Father Name	Thirupathi Reddy
3	Aadhar Number	604183460706
4.a	PAN Number	AVIPN1049F
4.b	Employee ID	1507065
4.c	Date of Birth	13/07/1972
4.d	Department	PHYSICS
6	Designation	Lecturer in Physics
7	Qualification	M.Sc B.Ed, SET

S.No.	Class	Year of Study	Name of the board (or) University	% Marks/Class/ Grade obtained
1	SSC	1988	BOARD OF SECONDARY EDUCATION	69%
2	10+2	1991	BOARD OF INTERMEDIATE	41.50%
3	Degree	1994	KAKATIYA UNIVERSITY	67%
4	PG	1996	KAKATIYA UNIVERSITY	65.53%
5	PHD			

	6	NET/SET	2012	TS SET		
8	Date of Joining in Government Service			19/01/2002		
9	Date of joining As a Lecturer in Government Degree college			31/07/2016		
10	Date of Joining in this Institute			30/06/2018		
11	No. of OC's Attended			1		
	S.No.	**Name of the course**	**From**	**To**	**University/HRDC**	
	1	Induction Training Programme	27/11/2017	24/12/2017	NIT Warangal	
12	No. of Rc's Completed			1		
	S.No.	**Name of the course**	**From**	**To**	**University/HRDC**	
	1	101 Exprimental physics	25/9/2018	10/10/2018	Osmania University	
13	No. of STC's Completed			1		
	S.No.	**Name of the course**	**From**	**To**	**University/HRDC**	
	1	ICT Tools in higher education	20/08/2020	26/08/2020	Osmania University	

14	No. & Additional Resonsibilities Performing in college			1. I/C MANA TV Coordinator 2. I/C of Physics and Mathematics 3. I/C of Audio Visual and Electrical	
15. a	5 Major Achievements in perfomed career				
15. b	No. of Books Published				
	S.No.	**Title of the Book**	**ISBN No.**	**Remarks**	
16	Mobile Number	9392006005			
17	Email-id	nsphysics72@gmail.com			
18	Research Area	0			
19	Publications				

EMPLOYEE PROFILE

1	Name	Dr.P. Aruna
2	Father Name	P. Venkata Ratnam
3	Aadhar Number	369505903801
4.a	PAN Number	AIVPA0387R
4.b	Employee ID	2125780
4.c	Date of Birth	07/10/1973
4.d	Department	PHYSICS
6	Designation	Lecturer in Physics
7	Qualification	M.Sc; B.Ed, SET , Ph.D

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	S.No.	**Class**	**Year of Study**	**Name of the board (or) University**	**% Marks/Class / Grade obtained**	
	1	SSC	1989	BOARD OF SECONDARY EDUCATION	73%	

	2	10+2	1992	BOARD OF INTERMEDIATE	56.00%	
	3	Degree	1995	OSMANIA UNIVERSITY	65%	
	4	PG	1997	OSMANIA UNIVERSITY	69.43%	
	5	Ph.D	2022	OSMANIA UNIVERSITY		
	6	NET/SET	2018	TS SET		
8	Date of Joining in Government Service			6/1/2005		
9	Date of joining As a Lecturer in Government Degree college			3/9/2020		
10	Date of Joining in this Institute		3/9/2020			
11	No. of OC's Attended		1			
	S.No.	**Name of the course**	**From**	**To**	**University/HRDC**	
	1	Induction Training Programme	1/12/2021	31/12/2021	OSMANIA UNIVERSITY	
12	No. of Rc's Completed	NIL				
	S.No.	**Name of the course**	**From**	**To**	**University/HRDC**	

13	No. of STC's Completed	NIL			
	S.No.	**Name of the course**	**From**	**To**	**University/HRDC**
14	No. & Additional Responsibilities Performing in college			Convener Grievance Redressal Cell	
15.a	5 Major Achievements in performed career		1. Best Teacher Award 2. Ph.D.		
15. b	No. of Books Published				
	S.No.	**Title of the Book**	**ISBN No.**	**Remarks**	
16	Mobile Number	9849922868			
17	Email-id	aruna1.physics@gmail.com			
18	Research Area	NANOCOMPOSITES			
19	Publications	1. Structural and magnetic properties of $ZnFe_2O_4$-Co_3O_4 nanocomposites 2. Structural and magnetic properties of microwave-hydrothermally synthesised $ZnFe_2O_4$-CuO nanocomposites			

Name of the Lecturer	Title of the course attended	Organized by	Date
P. ARUNA	01. FED on soft skills	HRD & TSCHE	05/10/2022 10/10/2020
	02. Advanced material for energy and environment application	Yogi Vemana University, Kadapa	21/12/2022 23/12/2022
	03. FDP	BHAVANS Vivekananda College, Secundrabad	2/3/2021 06/03/2021
	04. FDP	Lendi institute of engineering and technology	21/06/2021 25/06/2021
	05.FDP	GDC , Khairatabaad, HYD	05/07/2021 12/07/2021
	06. Induction program	Osmania University, UGC HRDC	01/12/2021 31/12/2021
	07. Blended learning in higher education	Dr. B.R.Ambedkar Open University , HYD	14/03/2022 25/03/2022
	08. FDP in Global Business Foundation Skills	Infosys BPM Ltd. Hyderabad	06/09/2022 14/09/2022

15. Participation of lecturer in the academic activities including teaching consultancy and research

Name of the lecturer	Title of the course attended	Organized by	Date
N. Sathyanarayana Reddy	Opportunities in physics after B.Sc	TSWRDC(WOMEN) KNR	24/03/2021
P. Aruna	Opportunities after graduation	GDC, ALIAR	07/06/2021

16. Does the department mentor overall performance of the students through regular assessments?

Ans: YES

17. Is there a method of assessing the students' academic standing in order to provide enrichment and remedial courses?

The department assesses the students by analyzing the entry level of performance. The department conducts slip tests after giving the assignments of each unit. Their performance is again assessed by getting marks.

Remedial couching is given to those who need by providing study material, previous question papers for preparing final exams.

Those who performed "O" for them have given the students study projects.

Those who scored less than 40 %(failed students) according syllabus is taught by planning to need the academic requirements.

The syllabus is sub-divided into topics theory and applications and study material is prepared by staff to suit the needs of all the three categories of the students. Additional curriculum is given for top categories students like student study projects, Jignasa study projects, P.G couching, study material is given to two other categories for their further improvements in the performance at final exams.

The college conducts internal exams twice for every semester; the marks are recorded in the marks register.

18. How do the teachers update themselves for discharging their teaching /research responsibilities give details?

Updating teaching and learning through computer facility surfing the net based text books reference books material prepared by teachers through interaction discussion, attending the workshops seminars and webinars.

Academic Calendar

B.Sc. (Physics) Syllabus, Satavahana University (w.e.f 2019-2020)

SCHEME FOR CHOICE BASED CREDIT SYSTEM (YEAR & SEMESTER - WISE SCHEME OF HPW)

YEAR	SEM	COURSE/PAPER	COURSE TYPE
FIRST	I	Mechanics & Oscillations	DSC-1, Lab (Practicals) DSC-1(Pr)
	II	Thermal Physics	DSC-2, Lab (Practicals) DSC-2(Pr)
SECOND	III	Electromagnetic Theory	DSC-3, Lab (Practicals) DSC-3(Pr)
		1) Experimental methods & Error analysis	SEC-1
		2) Electrical circuits & Networking	SEC-2
	IV	Waves & Optics	DSC-4, Lab (Practicals) DSC-4(Pr)

		1) Basic Instrumentation 2) Digital Electronics	SEC-3,4
THIRD	V	Modern Physics	DSC-5, Lab (Practicals) DSC-5(Pr)
		Renewable energy & Energy harvesting	GE
	VI	Electronics	DSC-6, Lab (Practicals) DSC-6(Pr)
		Nanoscience Project / Course in lieu of project	DSE

*__DSC__: Discipline Specific Course (Core); __DSE__: Discipline Specific Elective (Elective); __Pr__: Practical SEC: Skill Enhancement Course; __GE__: Generic Elective

B.Sc. (Physics)- I Year Semester – I

Paper – I: Mechanics and Oscillations (DSC-1: Compulsory)

Unit – I 1. Vector Analysis (14) Scalar and Vector fields, Gradient of a Scalar field and its physical significance. Divergence and Curl of a Vector field and related problems. Vector integration - line, surface and volume integrals. Stokes, Gauss's and Green's theorems - simple applications.

Unit – II 2. Mechanics of Particles (7) Laws of motion, motion of variable mass system, motion of a rocket, multi-stage rocket, conservation of energy and momentum. Collisions in two and three dimensions, concept of impact parameter, scattering cross-section. 3. Mechanics of Rigid Bodies (7) Definition of Rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertial tensor. Euler's equations, precession of a top, Gyroscope.

Unit – III 4. Central Forces (8) 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, gravitational potential and gravitational field, motion under inverse square law, derivation of Kepler's laws. 5. Special theory of Relativity (8) Galilean relativity, absolute frames, Michelson-Morley experiment, Postulates of special theory of relativity. Lorentz transformation, time dilation, length

contraction, addition of velocities, mass-energy relation. Concept of four vector formalism.

Unit – IV 6. Oscillations (12) Simple harmonic oscillator and solution of the differential equation – Physical characteristics of SHM, Torsion pendulum – Measurement of rigidity modulus, Compound pendulum - Measurement of 'g', combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures. Damped harmonic oscillator, Solution of the differential equation of damped oscillator. Energy considerations, Logarithmic decrement, relaxation time, quality factor, differential equation of forced oscillator and its solution, amplitude resonance, velocity resonance.

Paper – I: Mechanics and Oscillations Practicals (DSC-1: Compulsory)

1. Measurement of errors – Simple Pendulum.
2. Calculation of slope and intercept of Y= mX +C graph by theoretical method (simple pendulum experiment)
3. Study of a compound pendulum- determination of 'g' and 'k'. 4. Y' by uniform Bending
5. Y by Non-uniform Bending.
6. Moment of Inertia of a fly wheel.
7. Rigidity modulus by Torsion Pendulum.
8. Determination of surface tension of a liquid through capillary rise method.
9. Determination of Surface Tension of a liquid by any other method.
10. Determination of Viscosity of a fluid.
11. Observation of Lissajous figures from CRO- Frequency ratio. Amplitude and phase difference of two waves.
12. Study of oscillations of a mass under different combination of springs- Series and parallel
13. Study of Oscillations under Bifilar suspension- Verification of axis theorems

B.Sc. (Physics)- I Year Semester – II Paper – II: Thermal Physics (DSC-2: Compulsory)

Unit – I 1. Kinetic theory of gases: (6) Introduction – Deduction of Maxwell's law of distribution of molecular speeds, Transport Phenomena – Viscosity of gases – thermal conductivity – diffusion of gases. 2. Thermodynamics: (8) Basics of Thermodynamics - Carnot's engine (qualitative) - Carnot's theorem - Kelvin's and Clausius statements – Thermodynamic scale of temperature – Entropy, physical significance – Change in entropy in reversible and irreversible processes – Entropy and disorder – Entropy of universe – Temperature- Entropy (T-S) diagram – Change of entropy of a perfect gas-change of entropy when ice changes into steam.

Unit – II 3. Thermodynamic potentials and Maxwell's equations: (7) Thermodynamic potentials – Derivation of Maxwell's thermodynamic relations – Clausius-Clayperon'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 and Vanderwaal's gas. 4. Low temperature Physics: (7) Joule Kelvin effect – liquefaction of gas using 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 – Production of low temperatures – Principle of refrigeration, vapour compression type.

Unit – III 5. Quantum theory of radiation: (14) Black body-Ferry's black body – distribution of energy in the spectrum of Black body – Wein's displacement law, Wein's law, Rayleigh-Jean's law – Quantum theory of radiation - Planck's law – deduction of Wein's law, Rayleigh-Jeans law, Stefan's law from Planck's law. Measurement of radiation using pyrometers – Disappearing filament optical pyrometer – experimental determination – Angstrom pyroheliometer - determination of solar constant, effective temperature of sun.

Unit – IV 6. Statistical Mechanics: (14) Introduction, postulates of statistical mechanics. Phase space, concept of ensembles and some known ensembles, classical and quantum statistics and their differences, concept of probability, MaxwellBoltzmann's distribution law -Molecular energies in an ideal gas- Maxwell-Boltzmann's velocity distribution law, Bose-Einstein Distribution law, Fermi-Dirac Distribution law, comparison of three distribution laws.

Paper – II: Thermal Physics Practicals (DSC-2: Compulsory)

1. Co-efficient of thermal conductivity of a bad conductor by Lee's method.
2. Measurement of Stefan's constant.
3. Specific heat of a liquid by applying Newton's law of cooling correction.
4. Heating efficiency of electrical kettle with varying voltages.
5. Calibration of thermo couple
6. Cooling Curve of a metallic body
7. Resistance thermometer
8. Thermal expansion of solids
9. Study of conversion of mechanical energy to heat.
10. Determine the Specific of a solid (graphite rod)

B.Sc. (Physics)- II Year Semester – III Paper – III: Electromagnetic Theory (DSC-3: Compulsory)

Unit I : Electrostatics (14 Hrs) Electric Field:- Concept of electric field lines and electric flux, Gauss's law (Integral and differential forms), application to linear, plane and spherical charge distributions. Conservative nature of electric field 'E', Irrotational field. Electric potential:- Concept of electric potential, relation between electric potential and electric field, potential energy of a system of charges. Energy density in an electric field. Calculation of potential from electric field for a spherical charge distribution.

Unit II : Magnetostatics (14 Hrs) Concept of magnetic field 'B' and magnetic flux, Biot-Savart's law, B due to a straight current carrying conductor. Force on a point charge in a magnetic field. Properties of B, curl and divergence of B, solenoidal field. Integral form of Ampere's law, Applications of Ampere's law: field due to straight, circular and solenoidal currents. Energy stored in magnetic field. Magnetic energy in terms of current and inductance. Magnetic force between two current carrying conductors. Magnetic field intensity. Ballistic Galvanometer:- Torque on a current loop in a uniform magnetic field, working principle of B.G., current and charge sensitivity, electromagnetic damping, critical damping resistance. **Unit III**: Electromagnetic Induction and Electromagnetic waves (14) Faraday's laws of induction (differential and integral form), Lenz's law, self and mutual Induction. Continuity equation, modification of Ampere's law, displacement current, Maxwell equations. Maxwell's

equations in vacuum and dielectric medium, boundary conditions, plane wave equation: transverse nature of EM waves, velocity of light in vacuum and in medium. Poynting's theorem.

UNIT IV: Varying and alternating currents (7 Hrs) Growth and decay of currents in LR, CR and LCR circuits-Critical damping. Alternating current, relation between current and voltage in pure R, C and L-vector diagrams - Power in ac circuits. LCR series and parallel resonant circuit-Q-factor. AC & DC motors-single phase, three phase (basics only). Network Theorems (7 Hrs) Passive elements, Power sources, Active elements, Network models: T and π Transformations, Superposition theorem, Thevenin's theorem, Norton's theorem. Reciprocity theorem and Maximum power transfer theorem (Simple problems). Note: Problems should be solved at the end of every chapter of all units.

Paper – III: Electromagnetic Theory Practicals (DSC-3: Compulsory)

1. To verify the Thevenin Theorem
2. To verify Norton Theorem
3. To verify Superposition Theorem
4. To verify maximum power transfer theorem.
5. To determine a small resistance by Carey Foster's bridge.
6. To determine the (a) current sensitivity, (b) charge sensitivity, and (c) CDR of a B.G.
7. To determine high resistance by leakage method.
8. To determine the ratio of two capacitances by De Sauty's bridge.
9. To determine self-inductance of a coil by Anderson's bridge using AC.
10. To determine self-inductance of a coil by Rayleigh's method.
11. To determine coefficient of Mutual inductance by absolute method.
12. LR circuit
13. RC circuit
14. LCR series circuit
15. LCR parallel circuit

Paper – IV: Waves and Optics (DSC-4: Compulsory)

Unit-I: Waves (14 Hrs) Fundamentals of Waves -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, energy transport, transverse impedance. Longitudinal vibrations in bars- wave equation and its general solution. Special cases (i) bar fixed at both ends ii) bar fixed at the midpoint iii) bar free at both ends iv) bar fixed at one end. Transverse vibrations in a bar- wave equation and its general solution. Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, Tuning fork.

Unit II: Interference: (14 Hrs) Principle of superposition – coherence – temporal coherence and spatial coherence – conditions for Interference of light. Interference by division of wave front: Fresnel's biprism – determination of wave length of light. Determination of thickness of a transparent material using Biprism – change of phase on reflection – Lloyd's mirror experiment. Interference by division of amplitude: Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (Cosine law) – Colours of thin films – Non-reflecting films – interference by a plane parallel film illuminated by a point source – Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) – Determination of diameter of wire-Newton's rings in reflected light with and without contact between lens and glass plate, Newton's rings in transmitted light (Haidinger Fringes) – Determination of wave length of monochromatic light – Michelson Interferometer – types of fringes – Determination of wavelength of monochromatic light, Difference in wavelength of sodium D1,D2 lines and thickness of a thin transparent plate.

Unit III: Diffraction: (14 Hrs) Introduction – Distinction between Fresnel and Fraunhofer diffraction, Fraunhofer diffraction:- Diffraction due to single slit and circular aperture – Limit of resolution – Fraunhofer diffraction due to double slit – Fraunhofer diffraction pattern with N slits (diffraction grating). Resolving Power of grating – Determination of wave length of light in normal and oblique incidence methods using diffraction grating. Fresnel diffraction-Fresnel's half period zones – area of the half period zones –zone plate – Comparison of zone plate with convex lens – Phase reversal zone plate – diffraction at a straight edge – difference between interference and diffraction.

Unit IV: Polarization (14 Hrs) Polarized light : Methods of Polarization, Polarizatioin by reflection, refraction, Double refraction, selective absorption , scattering of light – Brewster's law – Malus law – Nicol prism polarizer and analyzer – Refraction of plane wave incident on negative and positive crystals (Huygen's explanation) – Quarter

wave plate, Half wave plate – Babinet's compensator – Optical activity, analysis of light by Laurent's half shade polarimeter.

Paper – IV: Waves and Optics Practicals (DSC-4: Compulsory)

1. Thickness of a wire using wedge method.
2. Determination of wavelength of light using Biprism.
3. Determination of Radius of curvature of a given convex lens by forming Newton's rings.
4. Resolving power of grating.
5. Study of optical rotation-polarimeter.
6. Dispersive power of a prism
7. Determination of wavelength of light using diffraction grating minimum deviation method.
8. Wavelength of light using diffraction grating – normal incidence method.
9. Resolving power of a telescope.
10. Refractive index of a liquid and glass (Boys Method).
11. Pulfrich refractometer – determination of refractive index of liquid.
12. Wavelength of Laser light using diffraction grating.
13. Verification of Laws of a stretched string (Three Laws).
14. Velocity of Transverse wave along a stretched string
15. Determination of frequency of a bar- Melde‟s experiment

B.Sc. (Physics)- III Year Semester – V Paper – V(A) : Modern Physics (DSE-1: Elective)

UNIT - 1 : SPECTROSCOPY (14 Hrs) Atomic Spectra:Introduction - Drawbacks of Bohr's atomic model - Sommerfeld's elliptical orbits - relativistic correction (no derivation). Stern & Gerlach experiment, Vector atom model and quantum numbers associated with it. L-S and j-j coupling schemes. Spectral terms, selection rules, intensity rules-spectra of alkali atoms, doublet fine structure, Zeeman Effect, Paschen-Back Effect and Stark Effect (basic idea). Molecular Spectroscopy:Types of molecular spectra, pure rotational energies and spectrum of diatomic molecule. Determination of inter nuclear distance.Vibrational energies and spectrum of diatomic molecule. Raman effect, classical theory of Raman effect. Experimental arrangement for Raman effect and its applications.

UNIT – II :Quantum Mechanics (14 Hrs) Inadequacy of classical Physics: Spectral radiation - Planck's law (only discussion). Photoelectric effect - Einstien's photoelectric equation. Compton's effect - experimental verification. Matter waves & Uncertainty principle: de Broglie's hypothesis - wavelength of matter waves, properties of matter waves. Phase and group velocities. Davisson and Germer experiment. Double slit experiment. Standing de Brogile waves of electron in Bohr orbits. Heisenberg's uncertainty principle for position and momentum (x and px), Energy and time (E and t). Gamma ray microscope. Diffraction by a single slit. Position of electron in a Bohr orbit. Complementary principle of Bohr. Schrodinger Wave Equation Schrodinger time independent and time dependent wave equations. Wave function properties - Significance. Basic postulates of quantum mechanics. Operators, eigen functions and eigen values, expectation values.

Unit - III : Nuclear Physics (14 Hrs) Nuclear Structure: Basic properties of nucleus - size, charge, mass, spin, magnetic dipole moment and electric quadrupole moment. Binding energy of nucleus, deuteron binding energy, p-p, n-n, and n-p scattering (concepts), nuclear forces. Nuclear models - liquid drop model, shell model. Alpha and Beta Decays: Range of alpha particles, Geiger – Nuttal law. Gammow's theory of alpha decay. Geiger – Nuttal law from Gammow's theory. Beta spectrum - neutrino hypothesis, Particle Detectors: GMcounter, proportionalcounter, scintillationcounter.

UNIT:IV:Solid State Physics &Crystalography (14 Hrs) Crystal Structure: Crystalline nature of matter, Crystal lattice, Unit Cell, Elements of symmetry. Crystal systems, Bravais lattices. Miller indices. Simple crystal structures (S.C., BCC, FCC, CsCl, NaCl, diamond and ZincBlende) X-ray Diffraction: Diffraction of X -rays by crystals, Bragg's law, Experimental techniques - Laue's method and powder method. Bonding in Crystals: Types of bonding in crystals - characteristics of crystals with different bondings. Lattice energy of ionic crystals- determination of Madelung constant for NaCl crystal, Calculation of Born Coefficient and repulsive exponent. Born-Haber cycle.

Paper- V(A) : Modern Physics Practicals (DSE-1: Elective)

1. Measurement of Planck's constant using black body radiation and photo-detector
2. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light

3. To determine the Planck's constant using LEDs of at least 4 different colors.
4. To determine the ionization potential of mercury.
5. To determine the absorption lines in the rotational spectrum of Iodine vapour.
6. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
7. To setup the Millikan oil drop apparatus and determine the charge of an electron.
8. To show the tunneling effect in tunnel diode using I-V characteristics.
9. To determine the wavelength of laser source using diffraction of single slit.
10. To determine the wavelength of laser source using diffraction of double slits.
11. To determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction grating 12. To determine the value of e/m for electron by long solenoid method.
13. Photo Cell – Determination of Planck's constant.
14. To verify the inverse square law of radiation using a photo-electric cell.
15. To find the value of photo electric work function of a material of the cathode using a photoelectric cell.
16. Measurement of magnetic field – Hall probe method.
17. To determine the dead time of a given G.M. tube using double source.
18. Hydrogen spectrum – Determination of Rydberg's constant
19. Energy gap of intrinsic semi-conductor
20. G. M. Counter – Absorption coefficients of a material.
21. To draw the plateau curve for a Geiger Muller counter.

B.Sc. (Physics) - III Year Semester – V Paper – V(B) : Computational Physics (DSE-1: Elective) UNIT I: Programming in C (14 Hrs) Flow charts, algorithms, Integer and floating-point arithmetic, precision, variable types, arithmetic statements, input and output statements, control statements, executable and non-executable statements, arrays, Repetitive and logical structures, Subroutines and functions, operation with files, operating systems, Creation of executable programs.
UNIT II: Numerical methods of Analysis (14 Hrs) Solution of algebraic and transcendental equation, Newton Ramphan method, Solution of simultaneous linear equations. Matrix inversion method, Interpolation, Newton and Lagrange formulas, Numerical differentiation. Numerical integration, Trapezoidal, Simpson and gaussian quadrature methods, Least square curve fitting, Straight line and Polynomial fits.

UNIT III: Numerical solution of ordinary differential equations (14 Hrs) Eulers and Runge kutta methods, simulation. Generation of uniformly distributed random integers, statistical tests of randomness. Monte-Carlo evaluation of integrals and error analysis, Non-uniform probability distributions, Importance sampling, Rejection method.

UNIT IV: Computational methods (14 Hrs) Metropolis algoritham, Molecular diffusion and Brownian motions, Random walk problems and their Montecarlo simulation. Finite element and Finite difference methods. Boundary value and initial value problems, density functional methods. Note: Problems should be solved at the end of every chapter of all unit

Paper – V(B) : Computational Physics Practicals (DSE-1: Elective)

1. Jacobi Method of Matrix diagonalization
2. Solution of Transcendental or Polynomial equations by the Newton Raphson method
3. Linear curve fitting and calculation of linear correlation coefficients
4. Matrix Simulation: Subtraction and Multiplication.
5. Matrix Inversion and solution of simultaneous equations
6. Lagrange interpolation based on given input data
7. Numerical integration using the Simpsons method.
8. Numerical integration using the Gaussian quadrature method.
9. Solution of first order Differential Equation using Runge-kutta method.
10. Numerical first order differentiation of a given function.
11. Fast Fourier transform
12. Monte Carlo Integration
13. Use of a package for data generation and graph plotti

DEPARTMENT ACTIVITIES

2017-2022

1. **WORK SHOP**
2. **NATIONAL SCIENCE DAY**
3. **FIELD TRIP**
4. **QUIZ**
5. **ESSAY WRITING COMPETETION**
6. **STUDENT SEMINAR**
7. **EXTENTION LECTURE**
8. **P.G. ENTRANCE COACHING**
9. **CARRIER GUIDENCE**
10. **ICT BASED TEACHING**
11. **HARITHA HARAM**
12. **SWACHA BHARATH**
13. **STUDY HOURS / REMEDIAL CLASSES**
14. **PLANTATION**
15. **YUVATARAMGAM**
16. **AWARNESS PROGRAMS**

17. INNOVATIVE PROJECTS

18. BEST PRACTICES

19.CERTIFICATE COURSE


Physics Webinar
Govt. Degree & PG College for Women
Karimnagar
Dr Ramesh Thotakura
Asst Professor of Physics
BVRIT Hyderabad College of Engineering for Women
Karimnagar, Telangana, India
Karimnagar, Telangana, India
Jyothi G
SAMATHA
Pull.srividya
GDCW-KNR
Jetti Narmada...
K Soumya mpcs
malyala nithya
Amena sultana
Akshitha
Jakkanapelly M...
Kanna Kavya mpc
Gollapelli rakshi...
Karimnagar, Telangana, India
Department of Physics
Chinthakunta, Telangana, India
Ganesh Veedi Rd Number 1, Jyothinagar,
GPS Map Camera

1. WORK SHOP

Work shop 2017-18

Work shop 2018-19

Work shop 2019-20

Work shop 2021-22

2. NATIONAL SCIENCE DAY

National science day2017-18

National science 2018-19

National science day 2021-22

3. FIELD TRIP

Field trips 2017-18

Field trip 2021-22

4. QUIZ

Quiz 2018-19

Quiz 2019-20

Quiz2021-2022

5. ESSAY WRITING COMPETETION

ESSAY WRITING COMPETETION 2021-22

6. STUDENT SEMINAR

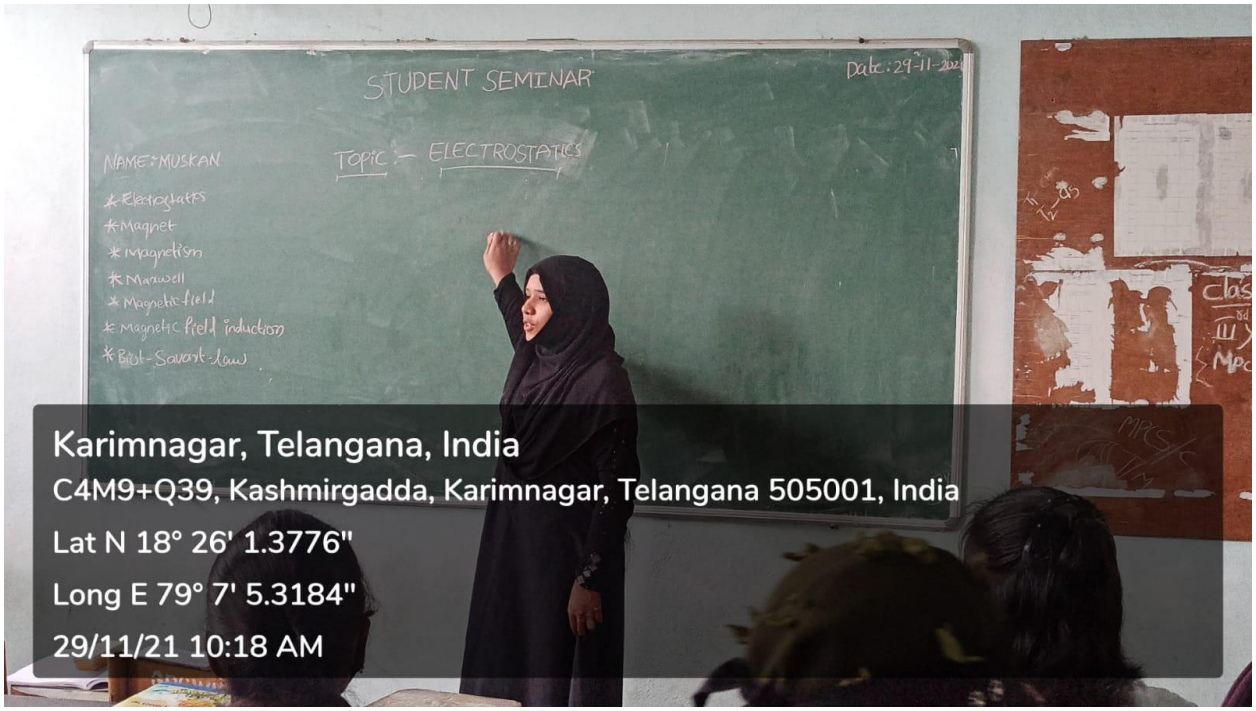
STUDENT SEMINAR 2017-18

Student seminar 2018-19

STUDENT SEMINAR 2019-20

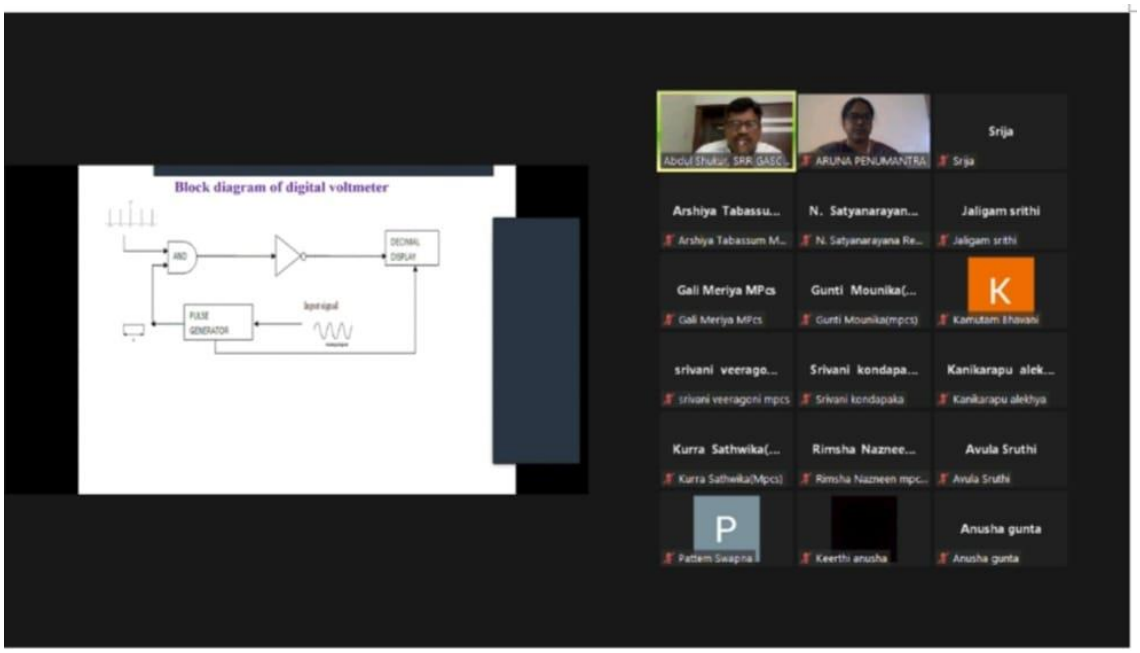
Student seminar 2020-21

STUDENT SEMINAR 2021-22



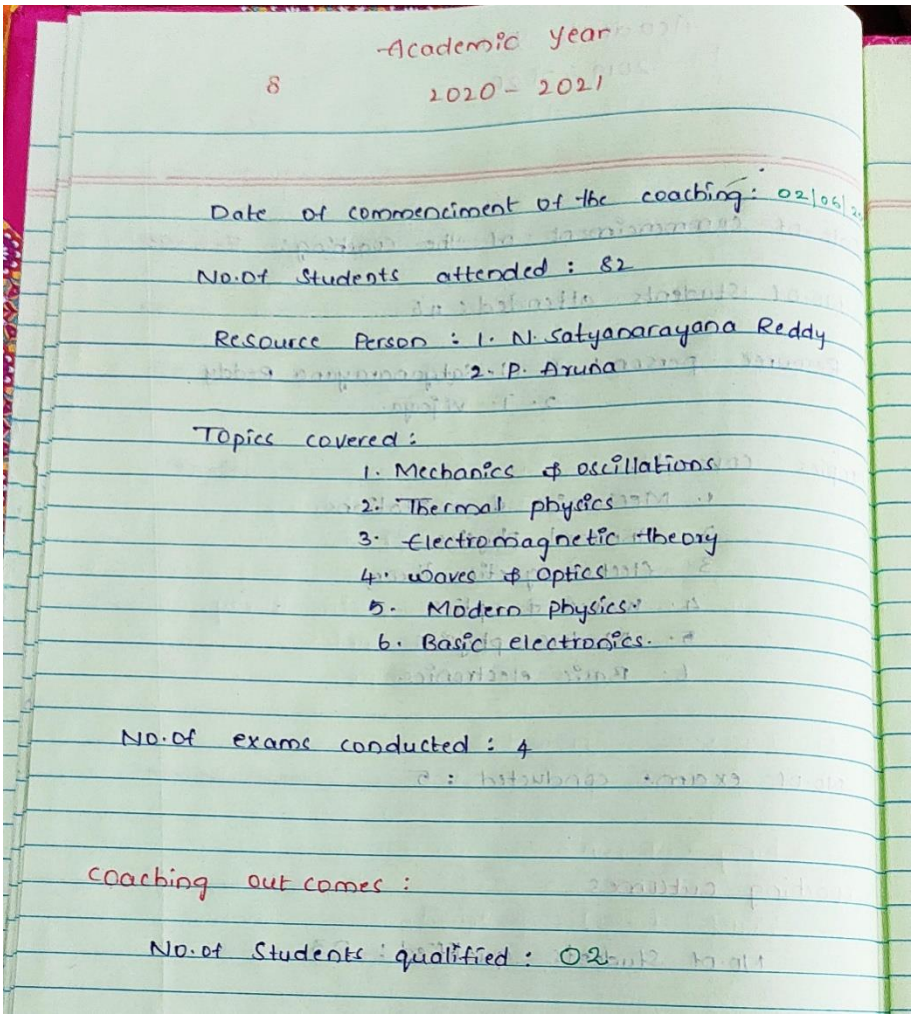
STUDENT SEMINAR 2021-22

7. EXTENTION LECTURE



EXTENSION LECTURE 2021-22

8. P.G. ENTRANCE COACHING



8 Academic year 2020 - 2021

Date of commencement of the coaching: 02/06/2

No. of Students attended : 82

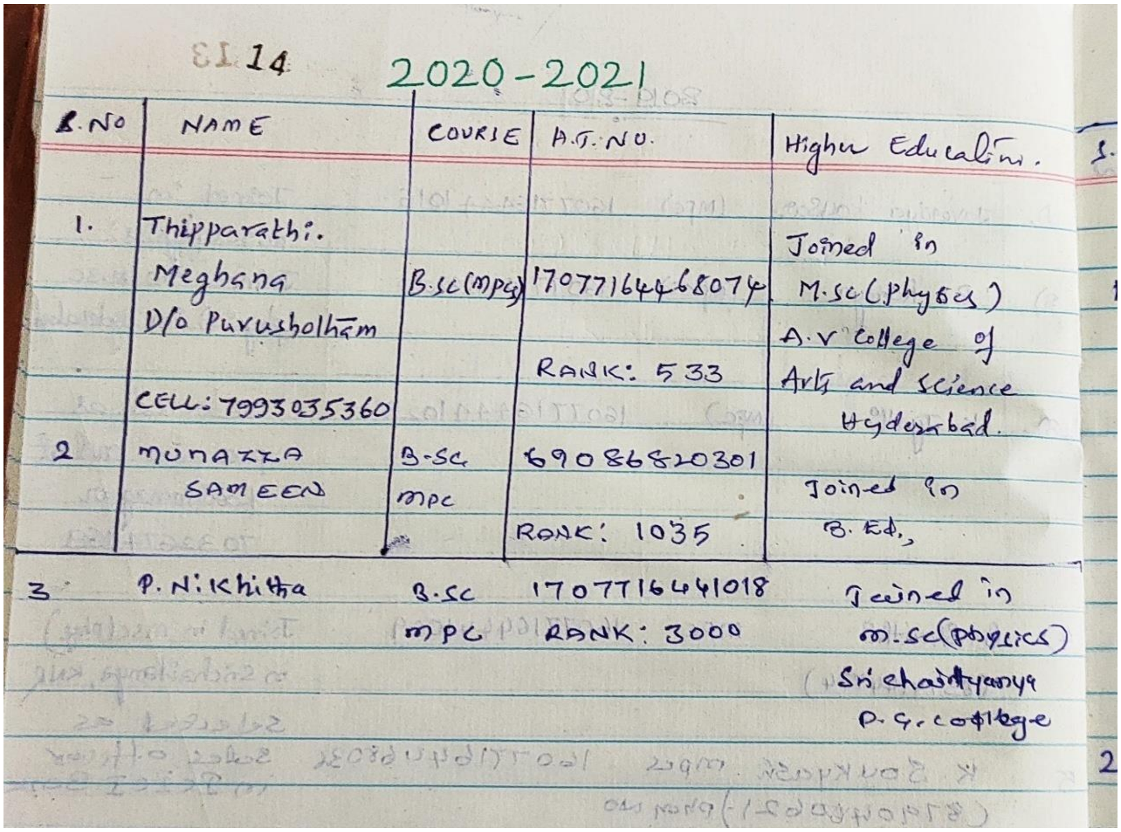
Resource Person : 1. N. Satyanarayana Reddy
2. P. Aruna

Topics covered :
1. Mechanics & oscillations
2. Thermal physics
3. Electromagnetic theory
4. Waves & Optics
5. Modern physics
6. Basic electronics

No. of exams conducted : 4

Coaching out comes :

No. of Students qualified : 02



14

2020-2021

S.NO	NAME	COURSE	A.T.NO.	Higher Education.
1.	Thipparathi. Meghana D/o Purushotham CELL: 7993035360	B.Sc(MPCs)	1707716468074 RANK: 533	Joined in M.Sc (physics) A.V College of Arts and Science Hyderabad.
2	MUNAZZA SAMEEN	B-Sc MPC	69086820301 RANK: 1035	Joined in B. Ed.,
3	P. Nikhitha	B.Sc MPC	1707716441018 RANK: 3000	Joined in M.Sc (physics) (Sri chaitanya P.G. college

P.G. ENTRANCE COACHING 2020-2021

Academic year
2021 - 2022

9

Date of commencement of the coaching: 04/04/2022

No. of students attended : 93

Resource Person : 1. N. Satyanarayana Reddy
2. P. Aruna.

Topics covered :

1. Mechanics & oscillations
2. Thermal physics
3. electromagnetic Theory
4. Waves & optics
5. Modern Physics
6. Basic electronics.

No. of exams conducted : 3

Coaching out comes :

No. of students qualified : 05

* 2021 - 2022 *

S.NO	NAME	COURSE	H.T. NO	HIGHER EDUCATION
1.	ATHIKA FARMEEN D/o MD. Khaja Moinuddin	B.Sc(mpcs)	6908682004 Marks obtained: 46 Rank: 236	Joined in M.Sc(physics) Osmania University
2.	N. RAJESHWARI D/o Gattu Naik.	B.Sc(mpcs)		
3.	G. MAHESHWARI D/o RAJAIAH	B.Sc(mpcs)	6908682402 Mark obtained 39 Rank: 563	
4.	D. MAYA D/o GAJANAN	B.Sc(mpcs)	6908682422 Mark obtained 37 Rank: 854	

S.NO	NAME	COURSE	H.T. NO / PHYSICS	HIGHER EDUCATION
5	M. Emanis	B.Sc(mpcs)	1807716446807~~4~~ Rank: 886	

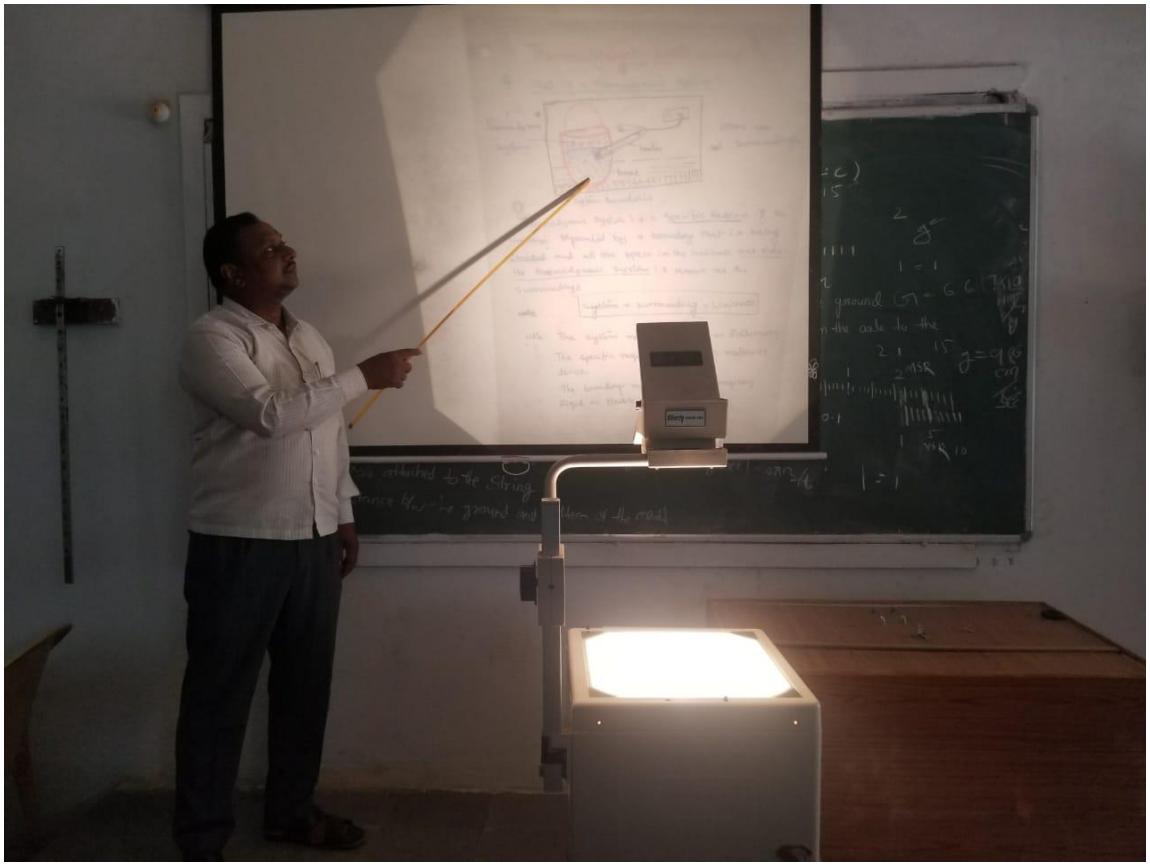
P.G. ENTRANCE COACHING 2021-2022

9. CARRIER GUIDENCE

Carrier guidance 2018-19

10.ICT BASED TEACHING

ICT 2018-19



ICT 2019-20

ICT 2020-21

ICT 2021-2022

ICT 2021-2022

ICT 2021-2022

11.HARITHA HARAM

Haritha haram 2018-19

Haritha haram 2019-20

Haritha haram 2020-21

12.SWACHA BHARATH

SWACHA BHARARATH 2018-19

SWACHA BHARATH 2019-20

Swacha Bharath 2020-21

13.STUDY HOURS / REMEDIAL CLASSES


GPS Map Camera
Karimnagar, Telangana, India
C4M9+7MW, Mankamma Thota,
Karimnagar, Telangana 505001, India
Lat N 18° 26' 0.2328" Long E 79° 7' 5.0592"
10/03/22 11:08 AM
33.72° C
16° N
36.0 µT
Google
Women's College Rd

STUDY HOURS

REMEDIAL CLASSES

REMEDIAL CLASSES

14.PLANTATION

Plantation 2020-21

Plantation 2020-21

Plantation 2020-21

PLANTATION 2021-2022

15.YUVATARAMGAM

Yuvataramgam- 2017-18

YUVATARANGAM 2018-19

16.AWARNESS PROGRAMS

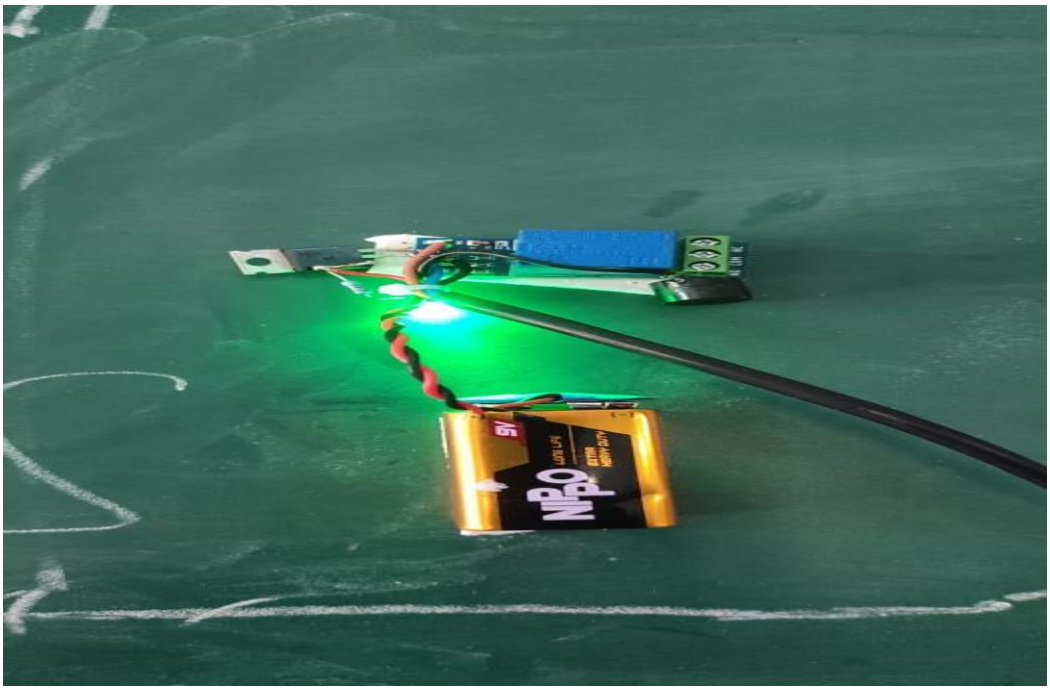
NATIONAL LIBRARY WEEK 2021-22

NATIONAL LIBRARY WEEK 2021-22

17. INNOVATIVE PROJECTS:

Year : 2017-2018

VACCUME CLEANER



YEAR : 2018-2019

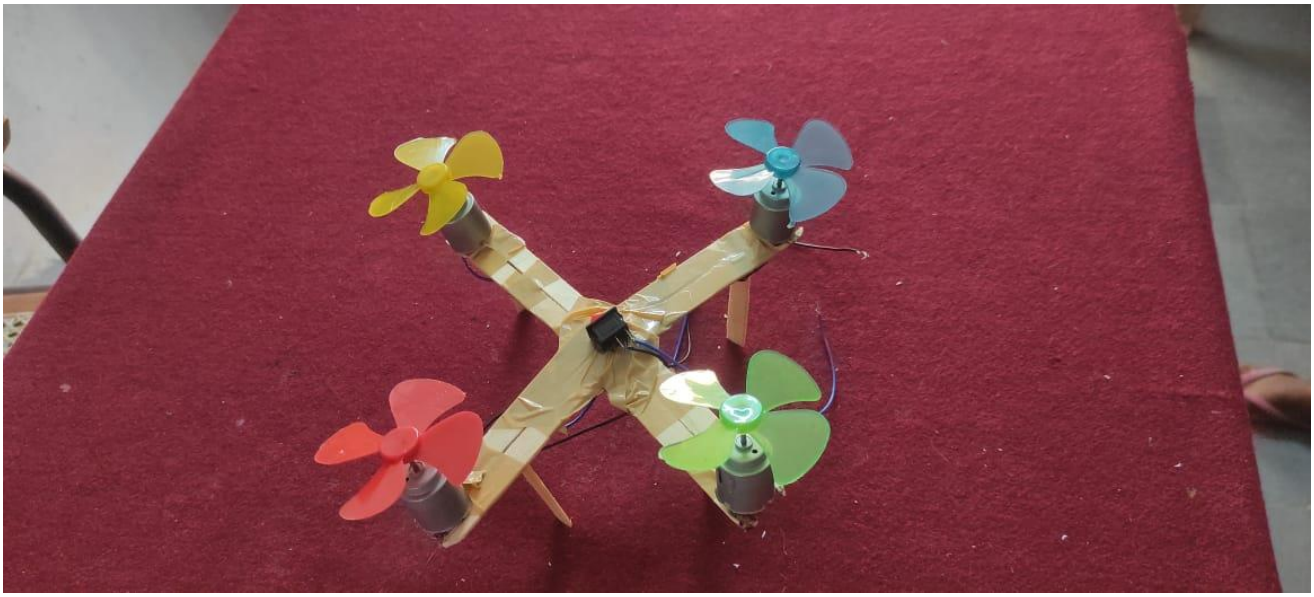
DOOR SECURITY ALARM

YEAR :2019-2020

PROJECTOR

YEAR : 2020-2021

HAND MADE COOLER



YEAR : 2021-2022

WORKING MODEL OF DRONE

18. Best Practices of the Physics Department

01.Title of the practice**: Non-Conventional Energy**

Goals:- To know about different forms of energy.

- To know about importance of solar energy and other non conventional sources of energy.
- To save energy by using CFL, LED lamps, solar lamps & Solar Cooker.

The Context:

Since our College is situated in the urban area, majority of students come of villages. Majority of the students are from economically weak background. Paying electricity bills is very difficult to them. Students and villagers don't know about non conventional source of energy and how to save energy. Therefore department of Physics has run '**Save Energy'** awareness program and a campaign.

The Practice:-

Department of Physics conducted save energy awareness program in the college on 16th March 2021 and also a campaign on 17th March 2021. **Sri. N.Satyanarayana Reddy,HOD Physics , Smt. P.Aruna, Lecturer in Physics** delivered Lectures on Physics in day to day life and importance of solar energy.

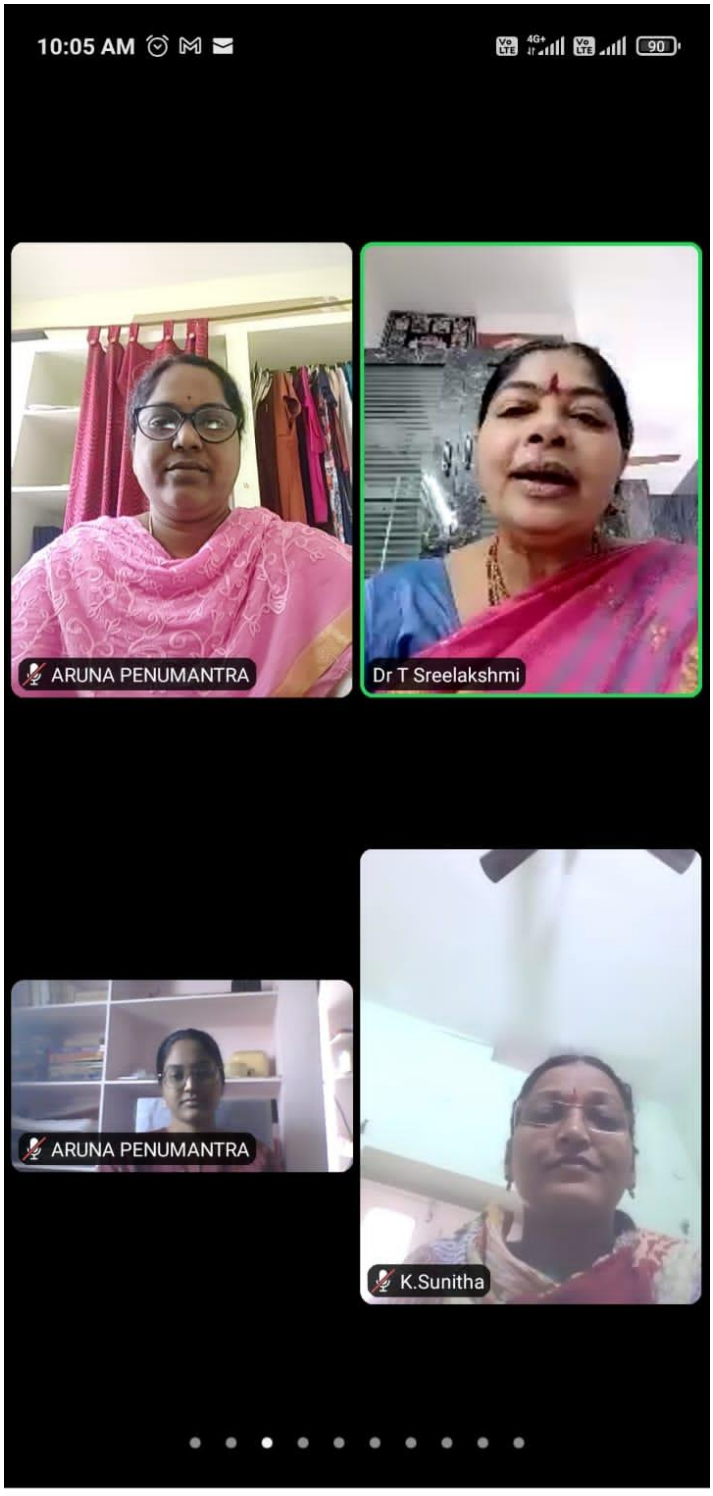
Evidences:-

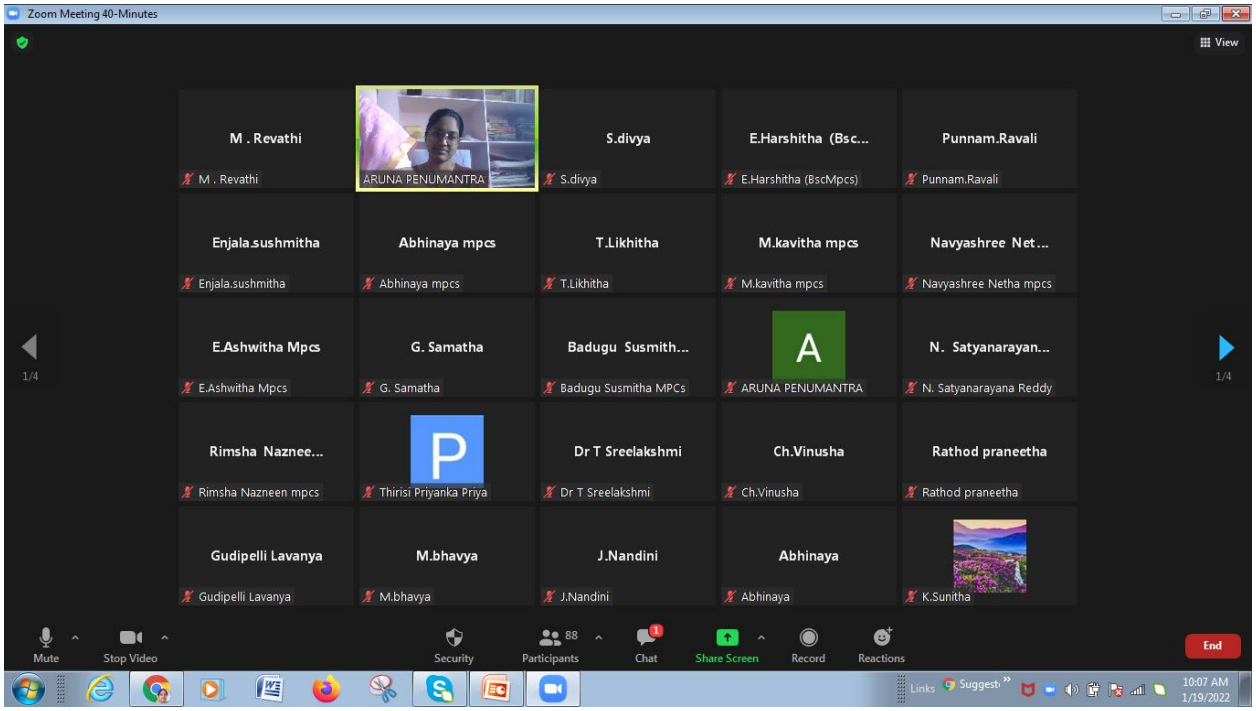
Save Energy awareness program in the college on 16th march 2021.

Save Energy awareness campaign on 17th march 2021.

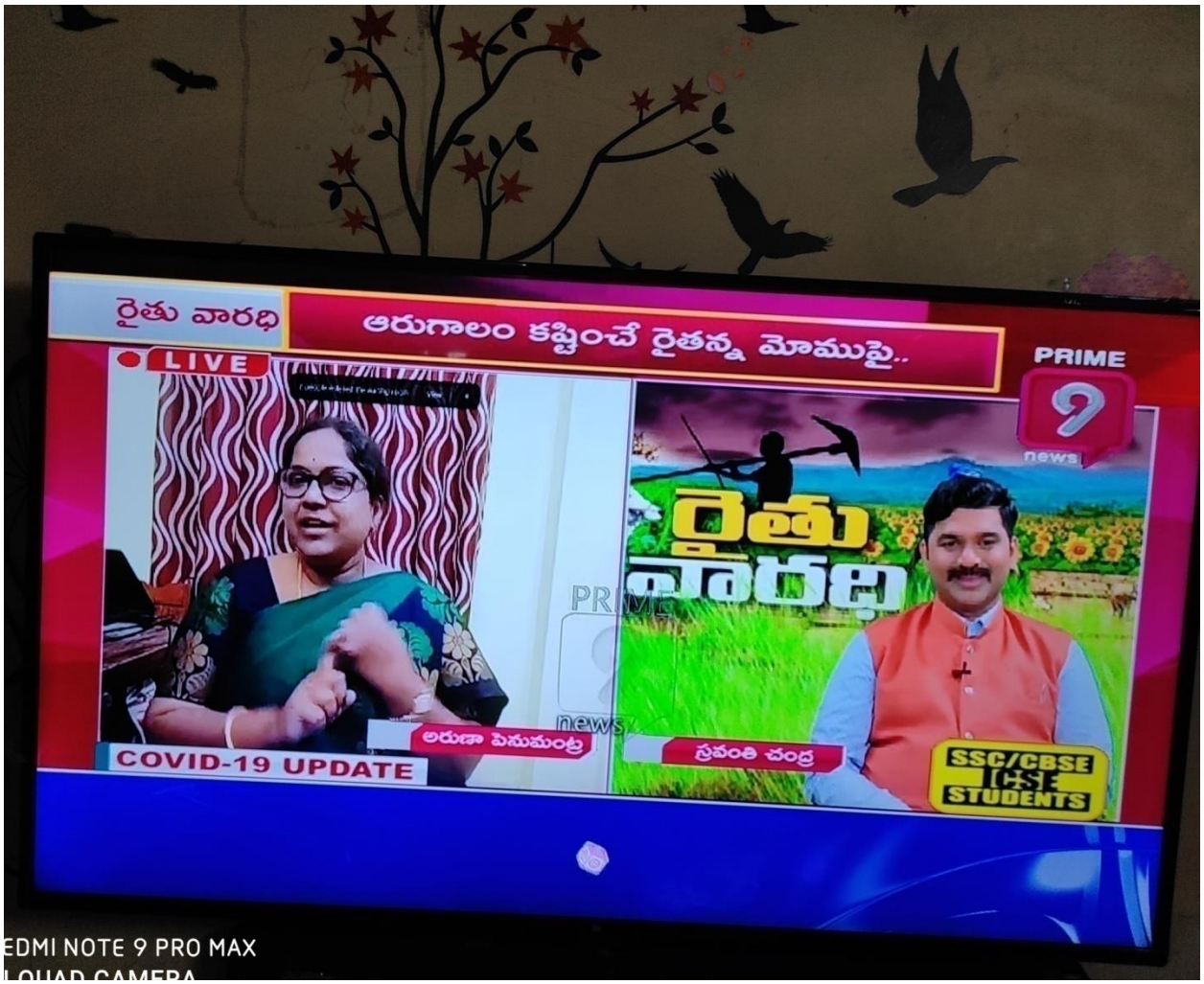
Outcome: Department of Physics is successfully organized the program and run a campaign and educated the students as well as villagers on Non-Conventional energy.

02.HEALTH AWARENESS PROGRAMME : TALK WITH A MEDICO


10:05 AM
ARUNA PENUMANTRA
Dr T Sreelakshmi
ARUNA PENUMANTRA
K.Sunitha



03. AWARENESS PROGRAM ON NATURAL FARMING LIVE TELECAST



EDMI NOTE 9 PRO MAX
QUAD CAMERA

19. CERTIFICATE COURSE

GOVERNMENT DEGREE COLLEGE FOR WOMEN
KARIMNAGAR

(Affiliated to Satavahana University)

NAAC Accredited with "B+" 3rd Cycle

An ISO 9001:2015 Certified Institute

In the collaboration of PHYSICS & MATHEMATICS Departments

CERTIFICATE COURSE

On

"MOBILE PHONE REPAIRING"

ORGANIZING COMMITTEE

N. Satyanarayana Reddy
Incharge
Department of Physics
CH. Narsimhulu
P. Aruna
V. Radha Kishan
E. Sravanthi

Through Zoom app.
From 16/04/2021 (30 hr.s)

For registration :

https://docs.google.com/forms/d/e/1FAIpQLSdD-dbxriv4mcwhunw4s61mosgCUsIIkmZgZJ6enGXJ0v-unw/viewform?usp=sf_link

Dr. T. Sreelakshmi
Principal &
Chairperson


COURSE
Karimnagar, Telangana, India
7-3-275, Kashmirgadda, Karimnagar,
Telangana 505001, India
Lat N 18° 26' 2.022" Long E 79° 7' 5.286"
25/03/22 10:37 AM
Google
Women's College Rd

GOVERNMENT DEGREE COLLEGE FOR WOMEN KARIMNAGAR

(Affiliated to Satavahana University)
NAAC Accredited with "B+" 3rd Cycle
An ISO 9001:2015 Certified Institution

Certificate Course

This is to certify that Mr./Mrs./Ms./Dr. NIDA MAHEEN , B.Sc.,MPCs from Government Degree College for Women, Karimnagar has successfully completed the 30hr online Certificate Course in Mobile Phone Repairing organized by the Departments of Physics and Mathematics during the year 2020-2021.

P. Aruna	CH. Narsimhulu	N. Satyanarayana Reddy	Dr. T. Sreelakshmi
Convenor	Convenor	Convenor	Principal & Chairperson