Sri Vani Degree & PG College
Affiliated to SK University
Kakkalapalli Cross, Near Sakshi Office, Ananthapuramu
Andhra Pradesh, India- 515002

Department Profile: Physics

The Department of Physics is established in the year 1999 with an UG Course- B.Sc (Maths, Physics, and Computer Science).

The Department has equipped with latest laboratory which enables the students to have the best practical knowledge to compete with the Industrial needs.

The Department organized webinars, Quizzes & Competitions. The Department consistently encourages the students to participate in Sports, NSS, NCC and other extracurricular activities.

The Department adopted and made the ICT in teaching techniques effectively.

Vision:

"Education for all and Quality education at affordable cost".

Mission:

"To bring out the best in each and every student and motivate them to carve their path in contemporary society emboldened with knowledge and skills, keeping morality and ethics as underlying forces".

Courses / Programs offered:

Level	Course
UG	B.Sc (MPCS)- Maths, Physics, Computer Science
	B.Sc (MPC)- Maths, Physics, Chemistry
	B.Sc (MPE)- Maths, Physics, Electronics

Course Structure under CBCS:

Year	Sem	Course	Title of the Course	Internal Marks	External Marks	Total Marks
I	I	I	Mechanics & Properties of Matter	25	75	100
			Practical Course- I	-	50	50
	II	II	Waves & Oscillations	25	75	100
			Practical Course- II	-	50	50
	III	III	Wave Optics	25	75	100
			Practical Course- III	-	50	50

II	IV	IV	Thermodynamics & Radiation Physics	25	75	100
			Practical Course- IV	-	50	50
III	V	V	Electricity, Magnetism & Electronics	25	75	100
			Practical Course- V	-	50	50
		VI	Modern Physics	25	75	100
			Practical Course- VI	-	50	50
	VI	VII-C	Renewable Energy	25	75	100
			Practical Course- VII	-	50	50
		VIII-C1	Solar Thermal & Photovoltaic Aspects	25	75	100
			Practical Course- VIII	-	50	50
		VIII-C2	Wind, Hydro & Ocean Energies	25	75	100
			Practical Course- IX	-	50	50
		VIII-C3	Energy Storage Devices	25	75	100
			Practical Course- X	-	50	50

- Participation of Interdisciplinary Courses and the departments/ units involved : NIL
- Participation of the department in the courses offered by other departments : NIL
- Courses collaboration with other universities, Industries, foreign institutions : NIL
- Details of courses/ programmes discontinued (if any) with reasons : NIL

Number of teaching posts:

Post	Sanctioned	Filled
Teaching	01	01

Program outcomes, Program specific outcomes & Course outcomes:

Program outcomes	
PO1	**Critical Thinking:** The curriculum made for the betterment of the students; enhance the ability and thinking power of the students.
PO2	**Effective Communication:** The complete medium of program is learning in English so students will communicate well in the English. Which helps in effective Communication
PO3	**Social Interaction:** Due to continuous interaction with students in terms of various programme run by department i.e. Curiosity Thirsty For Knowledge programme, Celebration of 'Birth Day' of Teaching Staff and Students, Extension activity. Helps to increase Social Interaction.
PO4	**Effective Citizenship:** Being the students of Physics they have to communicate with people, They have developed skills in Interactions among themselves in PPT Competition under curiosity programme.
PO5	**Ethics:** The subject teaches students about the ethical approach, not to waste electricity..
PO6	**Environment and Sustainability:** Conservation practices are studied for sustainable development

Programme Specific outcomes	
PSO1	Students are expected to acquire a core knowledge in physics, including the major premises of classical mechanics, quantum mechanics, electromagnetic theory, electronics, optics, special theory of relativity and modern physics.
PSO2	Students are also expected to develop written and oral communication skills in communicating physics-related topics.
PSO3	Students should learn how to design and conduct an experiment (or series of experiments) demonstrating their understanding of the scientific method and Processes. Not only that they are expected to have an understanding of the Analytical methods required to interpret and analyze results and draw conclusions as supported by their data.
PSO4	Students will develop the proficiency in the acquisition of data using a variety of laboratory instruments and in the analysis and interpretation of such data.
PSO5	Students will learn the applications of numerical techniques for modeling physical systems for which analytical methods are inappropriate or of limited utility.
PSO6	Apply conceptual understanding of the physics to general real-world situations.
PSO7	Describe the methodology of science and the relationship between observation and theory.
PSO8	Learn to minimize contributing variables and recognize the limitations of Equipment. Discover of physics concepts in other disciplines such as mathematics, computer science, engineering, and chemistry.
PSO9	Discover of physics concepts in other disciplines such as mathematics, computer science, engineering, and chemistry.
PSO10	Develop the following experimental tools: Numerically model simple physical systems using Euler's method, curve fitting, and error analysis.
PSO11	Analyze physical problems and develop correct solutions using natural laws and Principles of Physics

Course Outcomes:

SEM-1: Mechanics & Properties of Matter	
CO1	Understand integration of vectors & Derive Stokes, Greens and Gauss theorems
CO2	Understand Collisions in one and two dimensions
CO3	Understand the relation between scattering cross section and impact parameter
CO4	Derive equation of motion, kinematic relations & Euler equations
CO5	Understand the properties of materials, different types of loads, beams & bendings
CO6	Gain knowledge on Central forces – definition and examples, Conservative nature of central forces, Conservative force as a negative gradient of potential energy, Equation of motion under central force
CO7	Understanding special theory of relativity
SEM-II: Waves & Oscillations	
CO1	Understand physical characteristics of SHM and obtaining solution of the oscillator using differential equations & Lissajous figures
CO2	Calculate logarithmic decrement relaxation factor and quality factor of a harmonic oscillator & obtaining solutions of damped and forced oscillator
CO3	Understanding of Fourier theorem and evaluating Fourier coefficients of square wave, saw tooth wave & triangular wave

CO4	Solve wave equation and understand significance of transverse waves
CO5	Solve wave equation of a longitudinal vibrations and its applications, tuning fork
CO6	Understanding concept, properties of ultrasonic's & production, detection of ultrasonic's
SEM-III: Wave Optics	
CO1	Gain knowledge on Aberrations and different types of aberrations
CO2	Understanding the properties of light & Interference phenomenon
CO3	Obtain wavelength of monochromatic light using Newton's rings and Michelson Interferometer
CO4	Understanding the applications of Diffraction & Grating- normal incidence & minimum deviation method & Zone plate
CO5	Understanding the concept, properties & applications of Polarization
CO6	Gain knowledge about Lasers- concept, principle, types & applications
CO7	Gain knowledge on working of holography and their applications in various fields
CO8	Gain the knowledge in optical fiber and their applications in communication
SEM-IV: Thermodynamics and Radiation Physics	
CO1	Gain knowledge in kinetic theory of gases & Understanding the process of thermal conductivity, viscosity and diffusion
CO2	Understanding the process of reversible and irreversible process, efficiency of Carnot's theorem and significance of second law of thermodynamics
CO3	Gain knowledge about Entropy and their applications
CO4	Understand the nature of thermodynamic properties, potentials & derivation of Maxwell's equations
CO5	Obtain equations of ratio and difference of specific heats, joule Kelvin effect-applications
CO6	Concept of low temperature physics & applications of substances
CO7	Understanding the concept of black body, energy spectrum & different laws
CO8	Understanding the concept of pyrometers and their types
SEM-V: Paper-5: Electricity, Magnetism & Electronics	
CO1	Concept of Gauss's law and their applications, Electric potential
CO2	Understand the concept of dielectrics and relation between D, E & P
CO3	Gain knowledge on the basic concepts of electric and magnetic fields
CO4	Gain knowledge on electromagnetic induction, Hall effect and its applications
CO5	Understanding Alternating current and different circuits- LR, CR, LCR series and parallel resonant circuits
CO6	Understand the concept of Diodes- PN, Zener & Tunnel diodes
CO7	Obtain knowledge on transistors and hybrid parameters
CO8	Understand the concept of basic electronics and applications of digital electronics
SEM-V: Paper-6: Modern Physics	
CO1	To understand the difference between Atomic and Molecular spectroscopy
CO2	Understand coupling schemes, Zeeman effect & Raman effect
CO3	Understanding the concept of matter waves, properties, phase and group velocities &

	Davission and Germer experiment
CO4	Understand the concept of Uncertainty principle and their applications
CO5	Understanding the basic postulates of quantum mechanics, wave function, Eigen values and Eigen function
CO6	Obtain equations of Schrodinger time dependent, time independent wave equations and applications
CO7	Understanding the basic concept of Nucleus, general properties of nucleus and nuclear models Radioactivity decay
CO8	Gain knowledge on classification of various crystal systems & Understand the basics of crystallography, x-ray diffraction
CO9	Understand the basics of Superconductivity and applications
SEM-VI: Paper-VII- Renewable Energy	
CO1	Understand the need of energy conversion and the various methods of energy storage
CO2	Understanding the different types of environmental effects
CO3	Understanding the energy consumption, energy resources impact of exponential rise in energy usage in India
CO4	Gain knowledge about energy resources, energy consumption, nuclear energy & renewable energy sources in India
CO5	Gain knowledge on Solar energy, solar water heating systems, solar cookers, types and applications of solar systems
CO6	Understanding the wind energy-principle, components, operation, characteristics and applications
CO7	Understanding the Ocean energy- principle, tidal power generation, tidal technology, wave energy & applications
CO8	Gain knowledge on history, production methods, storage options, problems & uses of hydrogen
CO9	Understanding the biomass, bio-conversion & biogas plants-properties & characteristics of biogas

HoD Profile:

Name : C. Kiran Kumar
Qualification : M.Sc in Physics, M.Ed
Experience : 07
Other Positions:

- **Coordinator, IQAC**
- **NSS Programme Officer (Unit-2)**
- **ODL (Open & Distance Learning) Coordinator**
- **Swachhtta Action Plan member**

Faculty Profile:

Name	Qualification	Designation	Specialization	Teaching Experience
C.Kiran Kumar	M.Sc, M.Ed	Lecturer in Physics	Spectroscopy	07

List of Visiting Faculty:

Name	Qualification	Designation	Institute	Teaching Experience
S.Devendra	M.Sc,B.Ed (PhD)	Assistant Professor	K.T.S Govt. Degree College,Rayadurgam	10 Years

Percentage of Lecturers delivered and Practical Classes handled:

Name of the faculty	Total work load	Classes handled	Practical Classes handled
C.Kiran Kumar	30	22	8

Student-Teacher Ratio:

Level	Class	Number of Teachers	Student Teacher Ratio
UG	I BSC	01	40:1
	II BSC		24:1
	III BSC		20:1

Number of academic staff (technical) and administrative staff:

	Sanctioned	Filled
Lab Assistants	01	01
Lab Attendants	01	-

Qualification of Teaching Faculty:

PDF	PhD	M.Phil	PG with M.Ed	PG
-	-	-	01	01

Publications:

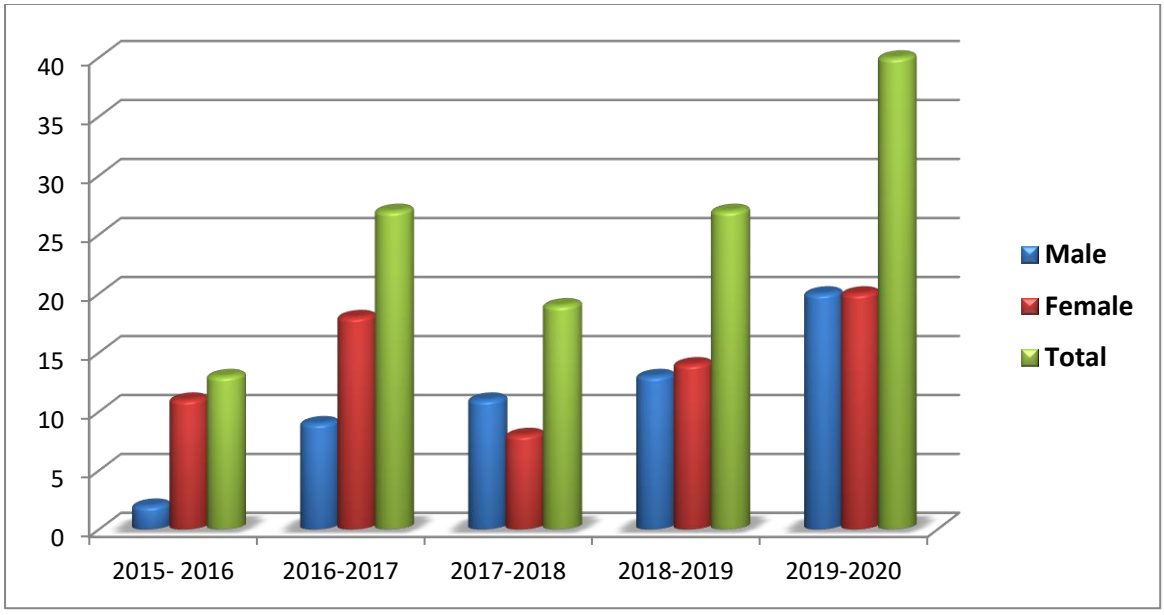
SNO	Details of the Programme	Organizer	Title of the Paper
1	International Conference on Innovations in Engineering Sciences (ICIES-2020)	Global Conference Hub, Coimbatore, Tamilnadu, India	Advance Spectroscopy-A Comprehensive Review

Corpus fund (Toppers Scheme) of College: (On memory of N.Prabhakar Reddy garu)

Name of the Student	Class	Year	Amount
S.Anusha	B.Sc (MPCS)	2016-2019	5000/-
D.Bindu	B.Sc (MPCS)	2017-2019	5000/-

Student Profile program wise:

Name of the course	Year	Total Seats	Enrolled		Total
			Male	Female	
B.Sc (MPCS)	2015- 2016	50	02	11	13
	2016-2017	50	09	18	27
	2017-2018	50	11	08	19
	2018-2019	50	13	14	27
	2019-2020	50	20	20	40

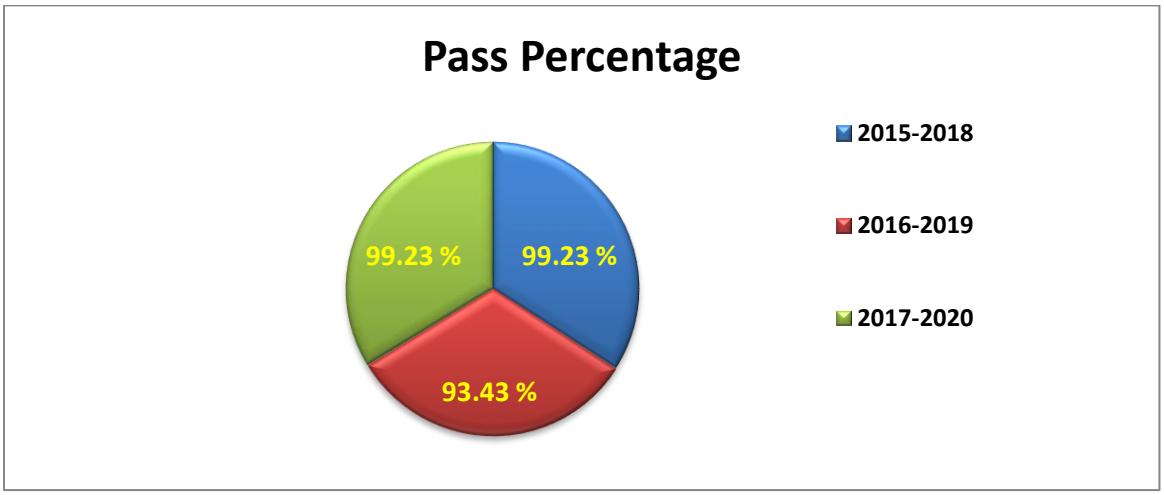


Pass percentage (Semester Wise):

Year	Month	Sem	Appeared		Pass		Pass Percentage
			M	F	M	F	
2015-16	Nov/Dec	I	2	11	2	10	92.30
	Mar/Apr	II	2	8	2	8	100
2016-17	Nov/Dec	I	9	18	8	16	89
		III	2	12	2	12	100
	Mar/Apr	II	9	17	8	16	92
		IV	2	13	2	13	100
2017-18	Nov/Dec	I	11	8	8	7	78.9
		III	9	15	8	14	92
		V (P-5)	2	12	2	12	100
		V (P-6)	2	12	2	12	100
	Mar/Apr	II	9	8	6	8	82.35
		IV	9	13	8	11	86.36
		VI (ELE)	3	9	3	9	100
		C-1	3	9	3	9	100
		C-2	3	9	3	9	100
		C-3	3	9	3	9	100
2018-19	Nov/Dec	I	12	15	8	14	81
		III	8	7	6	7	86.6
		V (P-5)	9	11	8	9	85
		V (P-6)	9	11	8	10	90
	Mar/Apr	II	11	14	7	13	80
		IV	8	7	6	6	80
		VI (ELE)	8	12	8	12	100
		C-1	2	10	2	10	100
		C-2	2	10	2	10	100
		C-3	2	10	2	10	100
2019-20	Nov/Dec	I	19	20	14	18	82
		III	12	12	10	12	92
		V (P-5)	7	8	5	8	86.66
		V (P-6)	7	8	7	8	100
	Mar/Apr	II	17	18	6	15	60
		IV	13	11	5	11	66.66
		VI (ELE)	7	8	7	8	100
		C-1	5	4	5	4	100
		C-2	5	4	5	4	100
		C-3	5	4	5	4	100

Overall (year wise) pass percentage: (Passed out)

SNO	Year	Pass Percentage
1	2015-2018	99.23
2	2016-2019	93.43
3	2017-2020	97.98
4	2018-2021	-
5	2019-2022	-



Diversity of Students:

Name of Course	% of students from the same state	% of students from other state	% of students from abroad
UG	100	-	-

Details of Infrastructure facilities:

Library:

There is a central library to cater to the need of the students. Department does not have a library. But the complimentary copies provided by different publisher are provided in the department for the use of the student.

Details of student enrichment programme (Special lectures/ workshops/ seminar) with external experts:

- Webinar on "Fundamental Concepts of thermodynamics in Physics"

Number of students receiving financial assistance from college, university, government or other agencies:

Data maintained by the college

Teaching methods adopted to improve student learning:

- Lecture
- Demonstration
- Practical
- Assignments
- PPT's
- Class seminars
- Quiz
- Question and answers
- Lab demo
- Question paper discussion
- Test
- Science exhibition
- Group discussion

Facilities:

- Laboratory with equipments and full fledge space
- Internet and ICT Based



Experimental facilities:

- Viscosity of liquid by the flow method (Poiseuille's method)
- Young's modulus of the material of a bar by uniform bending and non uniform bending
- Surface tension of liquid by capillary rise method
- Bifilar suspension
- Fly wheel
- Torsion pendulum
- Volume resonator
- Compound pendulum
- Simple pendulum
- Force constant of a spring
- Coupled oscillators
- Sonometer
- Melde's experiment
- Newton's rings
- Resolve power of grating
- Dispersive power of prism
- Resolving power of telescope
- Grating normal incidence and minimum deviation method
- Wedge method
- Boy's method
- Lee's method
- Thermal conductivity of rubber
- Stefan's constant
- Newton's law of cooling
- Electrical kettle
- Thermistor
- Kirchhoff's law

- PN junction diode characteristics
- Zener diode characteristics
- Transistor CE characteristics
- Logic gates
- De Morgan's theorems
- Joules calorimeter
- Potentiometer
- Solar cell characteristics & parallel and series combination
- Wind generator
- Anemometer
- Charging & discharging of storage battery
- DC to AC inverter
- Charging and discharging of capacitor
- Characteristics of wind

Participation in Institutional Social Responsibility (ISR) and Extension Activities:

Our students participated in NSS activities, seminars and quizzes conducted by college.

- 60 number of NSS volunteers are participated in 5th International Yoga Day Celebrations on June 21th 2019
- 55 number of NSS volunteers are attended the awareness program on Solid Waste Management (6th July 2019)
- 45 number of students marched through the streets of kakkalapalli village to spread awareness on solid waste management (7th July 2019)
- 20 number of NSS volunteers participated in tree plantation programme to create social awareness about the importance of tree as well as planted trees in college campus (23rd July 2019)
- 30 number of NSS volunteers are participated in clean campus programme (25th July 2019)
- On occasion of Jal Shakti Abhiyan (JSA) focused on water conservation, our students did removing thorn trees and digging pits in kakkalapalli pond (29th July 2019)
- On the glorious occasion of our mighty country's 73rd independence day, our college hosted a simple and elegant flag hoisting ceremony
- 60 number of NSS volunteers are participated lecture series on the focus of poshan maah (Nutrition Month) on the occasion of Poshan Abhiyan Jan Andolan Dashboard (14th Sep 2019)
- 40 number of students are participated in blood grouping camp conducted in college on 15th Sep 2019
- On the occasion of Foundation Day of NSS, Unit-II conducting awareness program about NSS, Essay writing & poster presentation on NSS activities, in this event 20 number of students are participated (24th Sep 2019)
- On the occasion of Mahatma Gandhi 150th Birth Anniversary (Gandhiji's Nai Talim), 50 number of NSS Unit-II volunteers participated in tree plantation and cleanliness drive in the college campus (3rd Oct 2019)
- On the occasion of Constitution day, NSS Unit-II conducting classroom lecture(26th Nov 2019)
- 20 number of NSS volunteers are participated in activities (Quiz, Elocution, Poster presentation & Painting) carried out in college on the occasion of 150th Birth Anniversary of Mahatma Gandhi (Dec 2019)

- 20 number of NSS volunteers are participated University level Youth festival will be conducted 22nd Jan at Bhuvanavujayam, Sri Krishnadevaraya University, Anantapuramu



Department Activities:

1. **In the year 2015, first year BSc Physics students have donated food items such as rice, oil, dal, vegetables to the "Andha Mahila Ashramam" in the village Kurugunta**

2. **During the Covid pandemic situation, the Physics department has distributed fruits to the road side people, workers & polices**

3. **In the year 2015, Second year BSc Physics students have prepared paper bags and distributed them to shops in their villages**

Student Achievements:

Academic:

- **On memory of Neelam Prabhakar Reddy garu, S.Anusha of BSc Physics, the topper of College has received a cash prize of Rs.5000/- as she secured 95% during the academic year 2016-2019 on 4th December 2019.**

- **On memory of Neelam Prabhakar Reddy garu, D.Bindu of BSc Physics, the topper of College has received a cash prize of Rs.5000/- as she secured 91% during the academic year 2017-2020 on 4th December 2020.**

Extra Curricular:

- **M.Anusha of Second BSc Physics, won the first prize in Rangoli Competition at campus on occasion of Collage day Celebrations(2016)**

- **B.Sreedevi participate in Rangoli competition in NSS Youth festival 2019**

- **B.Sreedevi of BSc Physics, participated in the Environmental day-2020 online contests MTWU01-drawing contest and MTWU04- Poster making contest conducted by Tamilnadu Council for Science and Technology, Chennai & Mother Teresa Women's University, Kodaikanal.**

- **S.Thasleem of BSc Physics, participated in the Environmental day-2020 online contests MTWU04- Poster making contest conducted by Tamilnadu Council for Science and Technology, Chennai & Mother Teresa Women's University, Kodaikanal.**

- **N.Mahesh, P.Sasikala, M.Anitha & K.Sukanya of Second BSc Physics students won the third prize in Skit competition on occasion of Youth festival at Govt.Degree College for Men, Ananthapuramu -2019.**

Government of Andhra Pradesh
DEPARTMENT OF YOUTH SERVICES
ANSET-ANANTHAPURAMU
MERIT CERTIFICATE

This certificate is awarded to Mr./Ms. N. Mahesh who has participated in Skit Competition organized on the occasion of "NATIONAL YOUTH DAY" held at Government College (A), Ananthapuramu on 07-01-2020 he/ She secured Third prize in the competition.

Chief Executive Officer /
Dist Youth Welfare Officer
ANSET., Ananthapuramu.

Government of Andhra Pradesh
DEPARTMENT OF YOUTH SERVICES
ANSET-ANANTHAPURAMU
MERIT CERTIFICATE

This certificate is awarded to Mr./Ms. G. Anitha who has participated in Skit Competition organized on the occasion of "NATIONAL YOUTH DAY" held at Government College (A), Ananthapuramu on 07-01-2020 he/ She secured Third prize in the competition.

Chief Executive Officer /
Dist Youth Welfare Officer
ANSET., Ananthapuramu.

Government of Andhra Pradesh
DEPARTMENT OF YOUTH SERVICES
ANSET-ANANTHAPURAMU
MERIT CERTIFICATE

This certificate is awarded to Mr./Ms. K. Sukanya who has participated in Skit Competition organized on the occasion of "NATIONAL YOUTH DAY" held at Government College (A), Ananthapuramu on 07-01-2020 he/ She secured Third prize in the competition.

Chief Executive Officer /
Dist Youth Welfare Officer
ANSET., Ananthapuramu.

Government of Andhra Pradesh
DEPARTMENT OF YOUTH SERVICES
ANSET-ANANTHAPURAMU
MERIT CERTIFICATE

This certificate is awarded to Mr./Ms. P. Sasikala who has participated in Skit Competition organized on the occasion of "NATIONAL YOUTH DAY" held at Government College (A), Ananthapuramu on 07-01-2020 he/ She secured Third prize in the competition.

Chief Executive Officer /
Dist Youth Welfare Officer
ANSET., Ananthapuramu.

- **In the year 2020, B.Sc physics students N.Mahesh of final year and G.Poojitha of second year have received second and third prizes in Power Point Presentation, on occasion of Mathematics Day organized by Department of Mathematics, Sri Vani Degree & PG College on 22nd Dec 2020.**

- **In the year 2021, B.Sc Physics students participated in "Techno Science 2021" online competitions organized by Department of Science, Sarhad College of Arts Commerce & Science, Pune.**

Competition	Topic	Participants
Speech Competition	**Role of Science in Covid-19 Pandemic**	M.Madhavi, III BSC (MPCS)
		P.Sasikala, III BSC (MPCS)
		M.Maheswari, II BSC (MPCS)
		G.Poojitha, II BSC (MPCS)
Article writing Competition	**Environmental issues with their Solutions**	B.Sreedevi, III BSC (MPCS)
		P.Nandini, II BSC (MPCS)
Power Point Presentation	**Science behind our Technology**	B.Sreedevi, III BSC (MPCS)
		P.Sasikala, III BSC (MPCS)
		S.Thasleem, III BSC (MPCS)
		A.N.Pallavi, II BSC (MPCS)
		G.Poojitha, II BSC (MPCS)
		P.Nandini, II BSC (MPCS)
		B.Navya sree, II BSC (MPCS)
		N.Akila, II BSC (MPCS)

Sports:

Name	Batch	Game	Achievement	Year
P.Sunitha	2017-2020	khokho	Universitylavel South Zone	2019

NCC:

- **B.Sreedevi won medal in NCC camp.**

SWOC analysis of the department and future plans:

Strength: - Qualified and highly credentialed faculty - Good diversity in experiences - Good equipments in laboratories and other facilities - Excellent support from the senior administration - Equal emphasis both on theory and experiment - Goods results - Finance support	Opportunities: - Increase awareness for physics as an integral part of future education - Creation of a vibrant academic atmosphere in the department with the help of reputed and experienced teachers. - To prepare our students for entrance exam for PG courses & competitive exams
Weakness: - Limited number students in the classrooms - Collaboration with research institutions	Challenges: - To maintain the academic standard of the department in spite of the weaknesses mentioned earlier. - To increase high scientific temper among students. - To link the curricula and teaching learning process with need of industries. - Motivating students to take projects