GOVERNMENT DEGREE COLLEGE (MEN)
ACCREDITED BY NAAC WITH B++ (CGPA 2.90)
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ICT BASED LESSON PLAN

Date and Time (duration)	22.12.2022
Class:	I MPC
No. of students attended	41
Name of the Class Teacher	R.Ravi Kumar, Lecturer in Physics,GDC(M),Srikakulam
Title:	Different modes and velocity of transverse wave along a stretched string
Objectives	1. Define String? 2. What is tension ? 3. Is tension is force? 4. What is velocity? 5. Velocity of the string depends on what factors? 6. Define Harmonic and overtone frequencies? 7. What is the relation between Harmonic frequency and Overtone frequency? 8. What is fundamental frequency?
Materials used	1. Computer with projector 2. Internet access 3. Access videos from YouTube 4. Whiteboard and markers 5. Printed handouts with diagrams of Ruby and He-Ne Laser
Introduction (5 minutes) Begin with a captivating video or images.	1. Did you see the strings earlier? 2 .Where did you see strings earlier? 3. How we increase the tension of the string in lab? 4. Is frequency affected with tension? 5. Tell me some applications?
Virtual Insect Exploration (10 minutes)	Students were visualized the YouTube videoand analyze the various modes of frequencies. https://www.youtube.com/watch?v=MrPTt3pv6xk https://www.youtube.com/watch?v=klN2-bCzJb4 https://www.youtube.com/watch?v=AUBAMlMol1g https://www.youtube.com/watch?v=LNPQmna4xqQ https://www.youtube.com/watch?v=cnH2ltfW48U

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Presentation and Discussion (20 minutes)	The velocity of transverse waves on a stretched string is influenced by the tension and the linear mass density of the string. When you increase the tension in the string, the velocity of the wave also increases. Conversely, if you increase the linear mass density (e.g., by using a thicker or denser string), the velocity of the wave decreases. Factors Affecting Velocity • Tension (T): Increasing tension in the string increases the velocity of the wave. Tension is the force applied to stretch the string, and it is usually measured in newtons (N). • Linear Mass Density (μ): Increasing the linear mass density of the string (by using a thicker or denser string) decreases the velocity of the wave. Linear mass density is the mass per unit length and is usually measured in kg/m. • String Material: The material of the string can also affect the velocity of the wave. Different materials have different properties, such as elasticity, which can influence wave propagation. Transverse waves on a stretched string can exist in various modes or patterns of oscillation, each with distinct characteristics. These modes are a result of the different vibrational patterns that the string can exhibit. • Different modes of transverse waves on a stretched string correspond to different harmonics, with the fundamental mode being the simplest. • Each mode has a unique pattern of nodes and antinodes and a specific frequency and wavelength. • The harmonics or overtones are integer multiples of the fundamental frequency . • The choice of mode depends on the initial conditions and the boundary conditions of the string, such as how it is plucked or anchored.
Conclusion (5 minutes)	The velocity of a transverse wave on a stretched string is determined by the tension in the string and the linear mass density of the string. By adjusting these factors, you can control the speed at which transverse waves travel along the string. When a string is plucked or vibrated, it can support multiple modes of transverse waves simultaneously, each with its own characteristic pattern and frequency. These modes are integral to understanding the behavior of musical instruments, such as guitars and violins, where the manipulation of these modes produces different musical notes and tones.

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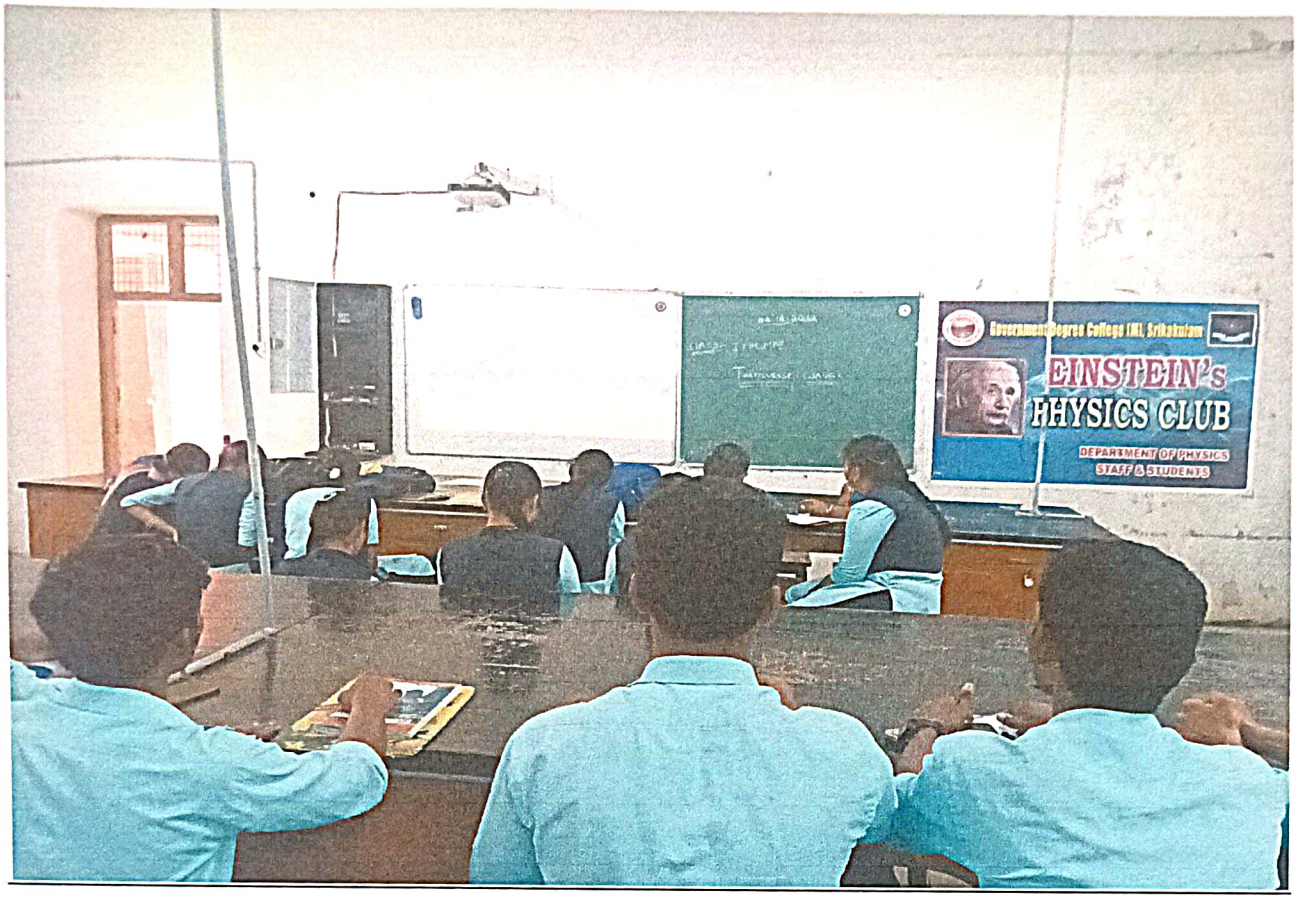
Activity photos



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