

Velammal College of Engineering and Technology, Madurai
Department of Information Technology
Innovative Teaching Methodology

Name of the course: Engineering Physics

Topic: Optical Resonators

Course Incharge: Mr. V. Prasanna Venkatesh

Innovative Method: Role Play



The **role-play method** was employed as an interactive teaching strategy to illustrate the fundamental principles of **optical resonators**. In this activity, students physically represented the components of a resonator system. Several students acted as optical mirrors, with some assigned the role of fully reflecting mirrors responsible for reflecting all incoming light—and others assigned as partially reflecting mirrors, which allow a portion of the light to pass through while reflecting the rest.

The professor played the role of a **photon**, moving back and forth between the “mirrors” to simulate the behaviour of light inside an optical cavity. Through this movement, the professor demonstrated how photons bounce repeatedly between the reflecting surfaces, gradually building up intensity within the resonator. When interacting with the student acting as the partially reflecting mirror, the professor showed how a fraction of the photon energy exits the resonator, representing the output beam of a laser or optical system.

This hands-on demonstration provided students with a clear and engaging visualization of concepts such as photon confinement, multiple reflections, optical feedback, and energy buildup within a cavity. By embodying the components themselves, students gained a deeper and more intuitive understanding of how optical resonators function in real-world applications such as lasers, sensors, and optical communication systems.

Velammal College of Engineering and Technology, Madurai
Department of Information Technology
Innovative Teaching Methodology

Name of the course: Engineering Physics

Topic: Applications of Laser

Course Incharge: Dr. D. Madhan

Innovative Method: Role Play

The students performed a role-play presentation on various applications of lasers, focusing on holography, medical uses, communication, and printing. Each group creatively represented a specific application, with the holography group explaining 3D image formation and security uses

The medical group highlighting laser surgery and treatments,

The communication group demonstrating fiber-optic technology and the printing group showing how lasers produce text and images.

They supported their explanations with a PowerPoint presentation, making the activity interactive and engaging. Overall, the role-play effectively simplified complex concepts and showcased the importance of lasers in modern life.

