PSG INSTITUTE OF TECHNOLOGY AND APPLIED RESEARCH

Neelambur, Coimbatore - 641062

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Report of **"Faculty Development Programme** on **"Physics in Engineering & Technology"** during February 12-16, 2024.

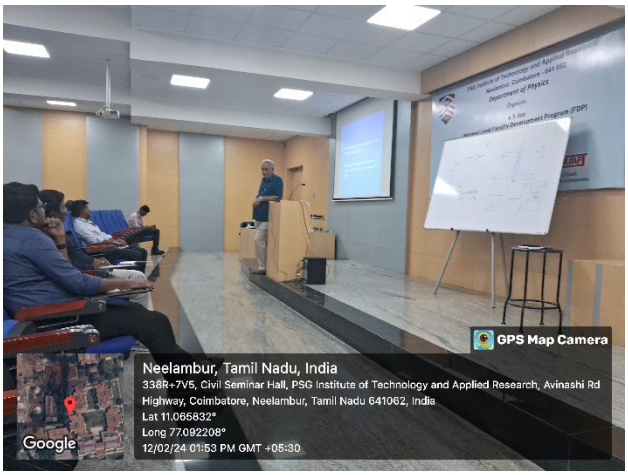
The Department of Physics organized a five day national level Faculty Development Programme on **"Physics in Engineering and Technology "** from February 12 -16, 2024. Around 40 participants from 12 colleges and 8 participants from our college with the total of 52 participants from academic and research institutes attended this Faculty development Program and got benefitted. Seven eminent experts from institutes of national importance like IITD, IITM, IITH, NITT, University of Madras, Gandhigram Rural Institute and PSGIAS were invited to share their experience on the basics, advances and applications in the field of Semiconductors, Quantum Mechanics, Crstallography, Dielectrics AND Magnetic Materials. Interactive sessions, Research lab visits to PSGIAS and Centre for Excellence and teaching pedagogy and phycological wellbeing by Prof. P.V. Mohanram (PSGTech) made a good platform for sharing the synergy with experts, passionate teaching faculties, and focused research scholars.

Dr. S. Maruthmuthu, Associate Professor and Head (i/c), Department of Physics welcomed the gathering and Prof. Vasu, Head, Department of Electrical and Electronics Engineering, PSG iTech, inaugurated the FDP and delivered the presidential address.

<u>Resource Persons and few glimpses of the FDP are given below</u>

Resource Person: Prof. Muralidharan Topic : Semiconductor Physics

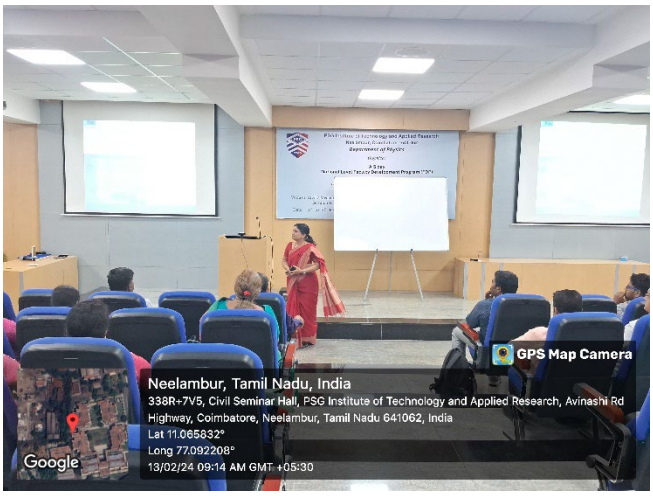
Prof. Muralidharan from Gandhigram Rural Institute began the session by briefing about atom models given by Rutherford, Bohr, and Sommerfield in their respective chronological order. The professor further elucidated the stoichiometric and Direct/Indirect band gap aspects of the semiconductor. The session had an unwavering flow because of Prof. Muralidharan's style of teaching.



Resource Person: Prof. Anuradha Topic : Electron Microscopy

Prof. Anuradha from PSGIAS highlighted the role of Electron microscopy in material characterization. She gave the types of electron microscopes and even the latest models available with structured analysis of their components. Those microscopes include SEM, FESEM, HRTEM,

etc. The entire session was filled with information nearly covering the most basics of electron microscopy.



Resource Person: Prof. Shenoy Topic : Energy bands, Effective mass of electrons and holes

Prof. Shenoy (Energy bands, effective mass of electrons and holes) from IIT Delhi pointed out the necessary fundamentals of semi-conductors to help understand the basic concepts related to optoelectronics. . He made the audience aware of proper doping for the fabrication of ternary and quaternary semiconductors and he related the formation of active layer in a p-n junction diode to the mobility of electrons and holes across the junction.

Resource Person: Prof. Ravichandran Topic: Crystallography

Prof. Ravichandran (Crystallography) from University of Madras gave a detailed analysis of the two types of crystal lattice, the Bravais lattice and non-Bravais lattice. He introduced Miller lattices and spacing of lattice planes by citing the necessary equations related to it. The participants were able to grasp the aspects of crystallography because of Prof. Ravichandran's smooth and steady way of lecturing.

Resource Person: Prof. Justin Joseyphus Topic : Magnetic properties of materials

Prof. Justin from NIT Trichy covered three main topics related to magnetic properties and briefed about different types of magnetics materials such as ferromagnetic, antiferromagnetic and super-paramagnetic materials.. He shared the practical application of magnetic properties by highlighting his work on nano-magnetic material for cancer therapy.

Resource person: Prof. R. Sankaranarayanan, Topic : Qubits and Computational Physics

Prof. Sankaranarayanan from NITT outlined the success of quantum mechanics. The states quantum bits(qubit) which is analogous to classical bits (0 & 1) were illustrated by Bloch

sphere. The professor briefed about one, two, and three qubit operators(gates). Key features of four Quantum algorithms- Superdense coding, Quantum teleportation.

Resource Person: Prof. Ranjith Ramadurai **Topic: Dielectrics and Nano devices**

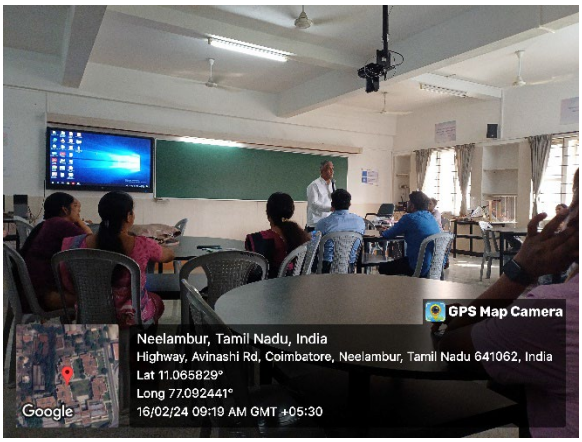
Prof. Ranjith from IIT Hyderabad, started with an introduction about Moore's Law. The concepts were delivered in an organized and commendable manner that was highly exceptional and admirable. The lecture stimulated curiosity and the lesson on quantum states was awe-inspiring. His innovative method of teaching has made the audience feel the pleasure of learning.

Resource Person: Prof. Sashidharan Nair **Topic: Teaching Physics out of the box**

Prof. Shashidharan Nair showed few demos pertaining to showcase how to teach physics out of the box using models. The demo was very simple and easy to understand.

Resource Person: Prof. P. V. Mohanram **Topic: Pschycological Wellbeing**

Prof. Mohanram gave a wonderful lecture on how the psychological well-being is of growing concern in the post-pandemic era. He explained about the sress on the psychological well-being of students and teachers in India. His talk was well appreciated by the audicnce and it was a fruitful discussion.



The final day ended with a wonderful talk on industry 5.0 which refers to people working alongside robots and smart machines.

On the fifth day of the Valedictory Function, certificates were issued to the participants and feedback were collected. All the participants were happy in attending this Faculty Development Program.

Dr. Maruthamuthu	Dr. D. Thangaraj, Dr. T.K. Abilasha,Dr. Deepanitha, Dr. Bhavani and Dr. Kannan
Coordinator	Organizing Secretary