



**Pune Knowledge Cluster (PKC) and Defence institute of Advanced Technology (DIAT)
Present**

A FIVE DAY HANDS-ON RESIDENTIAL TRAINING WORKSHOP ON SENSOR TECHNOLOGY

Organized By	Pune Knowledge Cluster (PKC) in collaboration with Defence Institute of Advanced Technology (DIAT)																
Date	Start Date: 14th November 2022 End Date: 18th November 2022																
Time	9:30 AM to 5:30 PM (IST)																
Location	Defence Institute of Advanced Technology (DIAT), Pune (Under Ministry of Defence, Government of India) Address : DIAT Girinagar, Next to Khadakwasla Dam, Pune, Maharashtra 411025																
Workshop Description	The workshop will cover Introduction to sensors, Sensor characteristics, Material characterization, Data acquisition and signal processing, Introduction to microcomputers, Advanced sensors, Introduction to Machine Learning, and Mini project and prototype development. The workshop will consist of 12 Lectures and 12 Laboratory Sessions																
For whom	<ul style="list-style-type: none">• B.E./B.Tech 4th-year students• M.Sc/M.Tech/M.E/Ph.D. students (completed or pursuing) Physics/Electronics/Instrumentation/Metallurgy or related areas• Faculty/Industry Professionals working in related areas.																
Number of Seats	Seats are limited to 25																
Potential Gains	Comprehensive understanding of sensor development processes, including material synthesis and designing of prototypes																
Registration Fees (including GST)	Workshop enrolment fees (post selection) <table border="1"><thead><tr><th>Fee Category</th><th>Basic Fee</th><th>18% GST</th><th>Total fees to be paid</th></tr></thead><tbody><tr><td>Student</td><td>3000</td><td>540</td><td>3540</td></tr><tr><td>Faculty</td><td>5000</td><td>900</td><td>5900</td></tr><tr><td>Industry professional</td><td>8000</td><td>1440</td><td>9440</td></tr></tbody></table> <p><i>*Fees includes accommodation on DIAT campus and food</i></p>	Fee Category	Basic Fee	18% GST	Total fees to be paid	Student	3000	540	3540	Faculty	5000	900	5900	Industry professional	8000	1440	9440
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Workshop Enrolment Details	Step 1: Interested candidates can register on this Link (Register before: 22 Oct 2022) Step 2: Post eligibility screening by PKC and DIAT Team, eligible candidates will be informed of their selection by email Step 3: Candidates need to confirm their seat by paying the registration fee (details will be shared over email) <i>Note: PKC reserves the right to select/reject candidates based on criteria set by PKC and DIAT Teams.</i>																
For queries	Mail us at : capacitybuilding@pkc.org.in Phone: +91-7823892474																



Trainers

Dr. Suwarna Datar, Head, Dept. of Applied Physics and Associate Professor, DIAT
 Prof. Sangeeta Kale, Professor, Dept. of Applied Physics, DIAT
 Dr. Tejashree Bhawe, Dept. of Applied Physics, Associate Professor, DIAT
 Dr. A.V.R. Murthy, Assistant Professor, Dept. of Applied Physics, DIAT
 Dr. Devnath Dhirhe, Asso Professor, Dept. of Applied Physics, DIAT
 Dr. Shyamal Mondal, Assistant Professor, Dept. of Applied Physics, DIAT
 Dr. Yogeshwar Singh Dadwhal, Assistant Professor, Dept. of Applied Mathematics, DIAT
 Dr. A. A. Bazil Raj, Associate Professor, Dept. of Electronics Engineering, DIAT
 Dr. Dhananjay Bodas, Scientist - 'E', Agharkar Research Institute, Pune
 Dr. Akshay Naik, Asso Prof, CENSE, IISc Bangalore
 Dr. Shivprasad Patil, Asso Prof, IISER Pune

WORKSHOP SCHEDULE

Day	Date	Time	Lectures	Instructor	Laboratory sessions	
DAY 1 Mon	14 NOV	0900-930	Registration			
		0930-1000	Inauguration			
		1000-1030	Tea Break			
		1030-1130	Introduction to Sensors	Suwarna Datar, DIAT Pune		
		1130-1230	Material Science and mechanism of Sensing	Sangeeta Kale, DIAT Pune		
		1230-1330	Introduction to Optical Sensors	Shyamal Mondal, DIAT Pune		
		1330-1415	Lunch Break			
		1430 – 1730	Lab	Sangeeta Kale, Devnath Dhirhe, AVR Murthy, Pramod Bankar DIAT Pune	Material Synthesis and Characterization	
Advanced Sensors						
DAY 2 Tue	15 NOV	0930-1030	Bio sensing the nano way	Dhananjay Bodas, ARI Pune		
		1030-1100	Tea Break			
		1100-1200	Nano-resonators as sensors	Akshay Naik, IISc Bangalore		
		1200-1300	Atomic Force Microscope: The Weighing balance of Molecular Interactions	Shivprasad Patil, IISER Pune		



		1300-1345	Lunch Break			
		1400-1730		Saurabh Parmar, Satyendra Vishwakarma, Chinmay Maisurkar, Fenil Mandela Bishakha Ray, DIAT Pune	Introduction to Microcomputers & Laboratory	
Material Characterization						
DAY 3 Wed	16 NOV	0930-1030	MEMS Systems	Tejashree Bhawe DIAT Pune		
		1030-1100	Tea Break			
		1100-1200	UV vis/PL and FTIR Spectroscopy	Devnath Dhirhe, DIAT Pune		
		1200-1300	Tera Hertz Sensing Technology and its Applications	Shyamal Mondal, DIAT Pune		
		1300-1345	Lunch Break			
		1400-1730		Saurabh Parmar, Satyendra Vishwakarma, Chinmay Maisurkar, Fenil Mandela, Bishakha Ray	Microcomputers Laboratory	
Sensor data acquisition, programming and analysis						
DAY 4 Thu	17 NOV	0900-1045		Devnath Dhirhe AVR Murthy DIAT Pune	Optical Sensors	
		1045-1100	Tea Break			
		1100-1300	Introduction to Machine Learning	Yogeshwar Singh DIAT Pune		
		1300-1345	Lunch Break			
		1400-1730		Saurabh Parmar Satyendra Vishwakarma Chinmay Maisurkar Fenil Mandela Bishakha Ray DIAT Pune	Microcomputers Laboratory	
Sensor data acquisition, programming and analysis						
DAY 5 Fri	18NOV	0930-1030	System Design using FPGA	Brazil Raj DIAT, Pune		
		1030-1100	Tea Break			
		1100-1300		Brazil Raj DIAT, Pune	Hands On experience in	



				FPGA Programming
	1300-1345	Lunch Break		
	1400-1630		Brazil Raj, DIAT, Pune	Hands On experience in FPGA Programming
	1630-1630		Feedback and review	

Trainer Profiles



Dr. Suwarna Datar
Head, Department of Applied Physics,
DIAT, Associate Professor

Dr. Suwarna Datar received her PhD from the University of Pune (SPPU), Pune, Maharashtra, India in the field of Scanning Probe Microscopy and Spectroscopy Techniques. She is currently an Associate Professor and the Head of the Department of Applied Physics, DIAT. Her research interests are probe microscopy, graphene and its composites for EMI shielding and stealth, plasmon polariton and MEMS-based sensors, and breathomics.



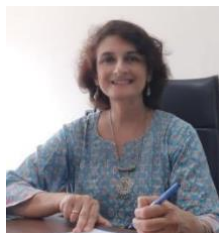
Dr. Shivprasad Patil
Associate Professor, IISER Pune

Dr. Shivprasad Patil obtained his PhD in University of Pune (year 2003). He carried out postdoctoral research at the Wayne State University, USA (2003-2005) and at IMM-CSIC in Madrid, Spain (2005-2008) before joining as a faculty member at IISER Pune. His research areas are Nanotechnology, atomic force microscopy and single molecular interactions. His expertise is in development of novel techniques to understand molecular level processes in variety of areas. In last three years his group has developed new instruments in the field of single molecule force spectroscopy and correlation spectroscopy.



Dr. Akshay Naik
Associate Professor, CENSE IISc Bangalore

Akshay Naik received his Ph.D. in Electrical Engineering from University of Maryland, College Park, in 2006. He then worked at Caltech first as Postdoctoral Associate from 2006 to 2008 and then as Research Engineer from 2008 to 2011. In Dec 2011, he joined the Indian Institute of Science, Bangalore where he is currently an Associate Professor at the Centre for Nano Science and Engineering. His research interests are physics and the application of Nano-mechanical systems.



Prof. Sangeeta Kale
Professor and Director (Policy
and Planning), DIAT

Dr. Sangeeta Kale, did her Masters's from the University of Pune (SPPU), India and Doctoral studies in Material Science from the same university in 1996. She did her post-doctoral studies at the University of Maryland, College Park, U.S.A. She has been working at DIAT, as Professor in Physics, assuming various positions after that as the HoD (Applied Physics), Dean (Academics), Dean (Student Affairs) and so on. Her area of research is Sensors. She works on materials in various forms, including nanomaterials for applications in CBW sensors, low and high electric and magnetic fields sensing, Biosensors and drug delivery vehicles. She also has an incubated company in DIAT, namely, "Navyukti Innovations Private Limited".



Dr. Tejashree Bhawe
Associate Professor, DIAT

Dr. Tejashree Bhawe received her PhD from the University of Pune (SPPU), Pune, Maharashtra, India in the field of Nano Silicon. She worked as a CSIR Research Associate in SPPU and as Post-Doctoral Fellow in Centre for Interdisciplinary Research, Tohoku University, Sendai, Japan. Before joining DIAT she was working as Assistant Professor in the Post Graduate Department of Electronic Science, SPPU. She has been working as an Associate Professor at the Department of Applied Physics, Defence Institute of Advanced Technology, Pune, India. Her broad research areas are Photovoltaics, Microfluidic devices, Nano materials applications for Sensors, Swift heavy ion irradiation.



Dr. Dhananjay Bodas
Scientist - 'E', Agharkar Research
Institute, Pune

Dr. Dhananjay Bodas is working as Scientist 'E' at Agharkar Research Institute, Pune, India. He has over 20+ years of experience in research with many renowned publications in his name and 6 registered patents. His research areas include micro-nano fabrication technologies, bio-medical micro devices, micro-nano fluidics, bio-sensors. His research interests fall broadly in the area of microfabrication technology, specifically micro-fluidics and its applications in life sciences. He has done his PhD from SPPU, Pune and post doc from FEMTO-ST, Department of LPMO, Besancon, France.



Dr. A. A. Bazil Raj
Associate Professor, DIAT

Dr. A A Bazil Raj has been working in the Department of Electronics Engineering, DIAT, since 2015. Before DIAT, he was in the Research Development and Establishment (RDE) section of the DRDO Laser Communication research facility since 2007. He has 16 years of research/academic/consultancy work experience and demonstrated his competency in creating technology (with a high degree of commitment, diligence, and innovation) for several requirements of Govt./Private Sectors/Industries.



Dr. Devnath Dhirhe
Associate Professor, DIAT

Dr. Devnath Dhirhe is working as an Assistant Professor at the Department of Applied Physics, Defence Institute of Advanced Technology, Pune, India. His broad research areas are MiD-IR and THz Quantum Cascade Laser, Quantum Dot Lasers, Integrated Optics and Si-Photonics, Integrated Polarisation Manipulation, Ring Lasers, Fiber Laser/Low Noise Fiber Amplifier, High Speed Free-Space Optical Communication, Telecommunication 1550 nm Semiconductor Laser. He has done his Ph.D from University of Glasgow, Glasgow, UK.



Dr. Shyamal Mondal
Assistant Professor, DIAT

Dr. S.Mondal is working as an Assistant Professor at the Department of Applied Physics, Defence Institute of Advanced Technology, Pune, India. His broad research area is High electric field THz generation and detection, development of Ultrafast fiber and solid-state laser oscillator and amplifiers, Nonlinear Optics and their applications. He completed his PhD from the IIT Kharagpur in 2015 with a specialization in 'Ultrafast Lasers and Nonlinear Optics'. He worked as Rutherford International Fellow at STFC-Daresbury Laboratory, UK for One year Nine months and as Postdoctoral Fellow at Institute of Photonics and Electronics, Prague, Czech Republic for One year 5 months. He published more than 40 peer review articles and three book chapters. He is a regular reviewer of Elsevier, Optica, Wiley, etc., and life member of OSI, ILA and a Young Scientist member of OPTICA.



Dr. Yogeshwar Singh Dadwhal
Assistant Professor, DIAT

Dr. Yogeshwar Singh Dadwhal received his M.Tech. Degree in Instrumentation with Distinction from NIT Kurukshetra and Ph.D. degree with Distinction from CSIR-Academy of Scientific and Innovative Research at CSIR-CSIO Chandigarh. He has worked in two different R&D projects, named Underwater Autonomous Vehicle (UnWar) as PA III in collaboration with CSIR-NIO Goa and Collaborative digital diagnosis system (CollabDDS) as Scientist B in collaboration with AIIMS New Delhi and NIC New Delhi.



Dr. A.V.R. Murthy
Assistant Professor, DIAT

Dr. Murthy is working as an Assistant Professor at the Department of Applied Physics, Defence Institute of Advanced Technology, Pune, India. His broad research areas are Free Space Optical Communication, Optical instrumentation, Bio-photonics, Atomic Force microscopy and spectroscopy of biomimetic systems. He has done his Ph.D from IISER pune and post doc from France. He was awarded DST-Inspire Faculty fellowship in 2015. He published more than 20 peer review articles.