



GLOBAL INITIATIVE OF ACADEMIC NETWORKS



MHRD
Govt. of India

A short term course on **'Recent Advances in Microfluidics, Biochemical & SAW Sensors For Human Healthcare'**

19th –25th October 2016

University of Mumbai

सत्यमेव जयते

Molecules and fluids in micro & nano channels provide an excellent basis for application of Biotechnological, Medical science & Bio-nano technological methodologies. Lab-on-a-chip systems (LOCs) for medical research, drug development as well as for healthcare typically consists of a set of microfluidics along with sensors. LOCs may provide wide platform for transporting and sensing of biosamples on a single chip. Surface acoustic waves (SAW) have smaller active mass with higher operating frequency & can be utilized for fabrication of micropumps, mixers, droplets and mist generators for handling biosamples effectively as well as efficiently. Bulk & SAW based resonators, together become a system which is extremely sensitive to traces of absorbed mass and hence can be utilized for development of high sensitivity biosensors.

The objective of this course is to provide students with valuable information on microfluidics, SAW-based sensor technologies, (bio)chemical microsensors as well as their biological & environmental applications. Students will learn basic concepts behind sensory physiology, sensor design information & how the fundamental ideas of biological systems, relating to their environment, can be adopted as a working model to construct different types of sensor technology. This course work encompasses strategies for gas sensing by means of Surface Acoustic Wave sensors, the capability of SAW devices to probe thin films, SAW devices & microfluidic chip which can probe complex fluids. The designed course work provides unique learning opportunity from eminent French and Indian Scientists.

Prof. (Dr.) Corinne Dejous received her Ph.D. degree in 1994 (Univ. Bordeaux, France).

Since 2009 she is a full-time Professor at Bordeaux Institute of Technology (Bordeaux ENSEIRB-MATMECA), where she teaches electronic systems & instrumentation, chemical sensors & microsystems. She is responsible for the department on Embedded Electronic Systems (work-linked training) since 2013 & currently serves as head of the research group on 'Waves'. Her main research activities have been focused on surface acoustic waves sensors & currently more generally on wave-based resonant (bio)chemical microsensors at IMS laboratory (UMR CNRS 5218, Univ. Bordeaux, France). She has 60 publications in international journals with peer review or book chapters, more than 150 conference proceedings & co-supervised 35 research projects.



Prof. (Dr.) J.V. Yakhmi is a DAE Raja Ramanna fellow at the Homi Bhabha National Institute - a Deemed University of DAE at Mumbai. Before retirement from Bhabha Atomic Research Centre in 2010, where he spent a research career of 45 years, he was Associate Director of Physics Group & Head, Technical Physics & Prototype Engineering Division at BARC, & Adviser to the Chairman of Indian Atomic Energy Commission. Dr. Yakhmi's research interests include use of molecular materials for fabrication of Sensors, Bio-sensors, & Organic Electronic Devices. He has published 385 papers in International journals & 60 Review articles in Journals/Books and has a Google Scholar h-Index of 40.



Prof. (Dr.) Vaishali Bambole is an eminent Scientist and Professor at the Department of Physics, University of Mumbai, where she teaches computer networking, polymer physics & applications of nanotechnology. She is a recipient of 'Best Teacher Award' given by University of Mumbai. Her research interest includes Bio-polymers, Molecular Electronics, Bionics, Biosensors, Molecular Spintronics & Nanotechnology. She has about 70 research papers in International & peer review journals and 4 patents to her credit. She has been awarded research projects & fellowships by some prestigious institutions like UGC, BRNS, DST, NMRL & few others.



Dr. H. Muthurajan is working as Associate Professor at National Centre for Nanosciences & Nanotechnology, University of Mumbai. He has worked in Armament Research & Development Establishment (DRDO) for 8 years & Nanyang Technological University, Singapore for 5 years. His area of research includes fabrication of bio-chemical sensors, micro fluidics, nano-materials synthesis (including bio-route), instrumentation, Nano & Micro (NEMS, MEMS) device fabrication, cytotoxic study using bacteria, fungi, Vero Cell, cervical cancer cells (HeLa cell line). He has more than 100 publications in journals, international & national conferences to his credit.



How To Apply

- Step 1:** Visit & register yourself (if not registered earlier) on <http://www.gian.iitkgp.ac.in/GREGN/index>
- Step2:** Register for the course through your login & password to obtain GIAN registration number
- Step3:** Fill the course registration form & send the scanned copy of the same via email to giansensors@mu.ac.in
- Step4:** Get Demand Draft of applicable registration fee in favor of '**Finance and Accounts Officer, University of Mumbai**' Payable at **Mumbai**
- Step5:** Send the original hard copy and soft copy of course registration form along with DD to Host faculty address mentioned below
- **Final confirmation of participation will be declared after receiving hard copy of Course registration form along with DD.**

Registration fees

The participation fees for taking the course is as follows:

- Participants from abroad: \$200**
- Industry/Research Personnel: Rs. 2,500**
- Faculty of Academic Institutions: Rs. 2,000**
- Students/Research Scholars: Rs. 1000**

*The above fee include all instructional materials, breakfast & lunch. Logistics for accommodation (additional charges to be borne by participant) will be provided.

You should attend if....

You are a student (BTech/MSc/MTech/PhD) or faculty from academic Institutions & technical Institutions or executives, engineers & researchers from industry & government organizations including R&D laboratories.

Contact

Prof. Vaishali Bambole, Host Faculty
Department of Physics, University of Mumbai, Vidyanagari, Kalina Campus, Santacruz(E), Mumbai-400 098, Maharashtra, Email: vabphy@gmail.com

Dr. H. Muthurajan, Host Faculty
National Centre for Nanosciences & Nanotechnology, University of Mumbai. Email: muthurajan@nano.mu.ac.in

Learning Modules

- Introduction to innovative microfluidics
- Development of wave-based (bio)chemical microsensors
- Surface Acoustic Wave (SAW) sensors
- Applications of biochemical sensors
- Introduction to Bio-sensors, Lab-on-Chips
- Nanobiocomposites based electrochemical biosensor
- Hands on training / demo on sophisticated research equipments

PATRON

Hon'ble Prof. Sanjay Deshmukh
Vice Chancellor
University of Mumbai

HOST FACULTY

Prof. Vaishali Bambole
Department of Physics
University of Mumbai

HOST FACULTY

Dr. H. Muthurajan
National Centre for Nanoscience
& Nanotechnology
University of Mumbai



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Registration Form

1. Title (Mr./Ms./Mrs./Dr./Prof.):
2. Full Name:
3. Designation:
(For students, name of the course and the year are to be mentioned clearly)
4. Date of Birth:
5. Gender: Male / Female
6. Name of the Institution (currently working or affiliated):
7. Address for Correspondence:
8. E-mail:
9. Phone:
10. Accommodation Required: YES/NO

Place:

Date:

Signature of the Applicant

Note: Duly filled-up, signed and scanned registration form should be sent to the e-mail id: giansensors@mu.ac.in on or before October 10, 2016 in addition to the application procedure outlined at the GIAN website.