REGISTRATION DETAILS

The Registration fee includes instructional materials, tutorials, laboratory, computer use, internet facility, refreshments and working lunch. Accommodation for outstation participants will be charged separately.
No TA/DA will be paid for any participants.

SELECTION AND MODE OF PAYMENT

Selected candidates will be intimated through email. They have to remit the necessary course fee to the Bank as per the details given below. All faculty and research scholars may be accommodated in the hostel/international hostel on payment basis if they request for it, subjected to availability.

Participants from industry/ research organizations may be provided lodging in the Institute Guest house on payment basis, subject to availability.

Account Name	:	DIRECTOR NIT CALICUT
Account No.	:	35909407299
Bank	:	State Bank of India
Branch Code	:	CREC, Chathamangalam, Kozhikode
IFSC	:	SBIN0002207
MICR Code	:	673002012
SWIFT Code	:	SBINPN BB392

Candidates registering early will be given preference in the shortlisting process. For any queries, please contact the host faculty.

ABOUT THE GIAN COURSE

MHRD, Govt. of India has launched an innovative program titled "Global Initiative of Academic Networks (GIAN)" in Higher Education, in order to garner the best international experience. As part of this, internationally renowned Academicians and Scientists are invited to augment the Country's academic resources, accelerate the pace of quality reforms and elevate India's scientific and technological capacity to global excellence.

ABOUT THE DEPARTMENT

Established in 2006, the Department of Chemical Engineering of National Institute of Technology Calicut offers programmes leading to Bachelor's Degree, Master's Degree as well as Ph.D. In addition to these regular programmes, this Department is also actively involved in conducting International Conferences, GIAN, Faculty Development Programmes, Job-oriented Short-term Training Programmes and Continuing Education Programmes for Engineering professionals and academic faculty. The R&D projects undertaken in the past were sponsored by various agencies like the Ministry of Human Resource Development (MHRD), Department of Science & Technology (DST) and the Kerala State Council for Science, Technology and Environment (KSCSTE).

ABOUT NIT CALICUT

National Institute of Technology Calicut (NITC) is an Institution of National Importance, centrally funded by MHRD and is governed by the NIT Act 2007. Institute has ten departments, three schools and nine research centres. It offers ten UG and thirty PG programmes along with the Ph.D. programme in various fields of Science, Technology and Engineering. Faculties in the various Departments have active with Universities and elite institutions within and outside India for research and have active consultancy for industries.
For details see the website:
www.nitc.ac.in.

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GLOBAL INITIATIVE OF ACADEMIC NETWORKS

New avenues in modelling and simulation of polymer nanocomposites for energy application

CALL FOR REGISTRATION

AND PARTICIPATION

INTERNATIONAL FACULTY

PROF. PROF. GANESAN, VENKAT
KENNETH A. KOBE PROFESSOR OF CHEMICAL ENGINEERING
THE UNIVERSITY OF TEXAS AT AUSTIN

DR. SANTOSH MOGURAMPELLY
DEPARTMENT OF PHYSICS
INDIAN INSTITUTE OF TECHNOLOGY JODHPUR

HOST FACULTIES

DR. PRASANNA KUMAR S MURAL &
PROF. V. SIVASUBRAMANIAN
DEPARTMENT OF CHEMICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, CALICUT, INDIA

GIAN LOCAL COORDINATOR

DR. ASHOK S
DEAN (RESEARCH & CONSULTANCY)
NATIONAL INSTITUTE OF TECHNOLOGY CALICUT

Dec 14 – Dec 18, 2020

ORGANIZED BY
Department of Chemical Engineering
National Institute of Technology Calicut
Kozhikode - 673601, Kerala, India

OVERVIEW OF COURSE

Experimental work on polymer materials span a broad range of applications and time and spatial scales. In this short course, we propose to present an overview of some recent simulation developments which have concerned with developments in nanotechnology and energy applications. Specifically, three contemporary areas will be discussed:

a) The self-assembly of multicomponent polymers are often used as an approach to obtain lithographic templates for semiconductor applications. In such a context, significant interest has arisen for targeting substrate conditions which facilitate the formation of large scale aligned morphologies. For such problems, coarse-grained polymer simulations have proven of value for identifying the conditions. This section of the course will discuss the basics of such coarse-grained models, its implementation and use for the context of predicting self-assembly.

b)The behavior of mixtures of nanoparticles (NP) and polymers, termed nanocomposites (PNC), has been of ongoing interest because these hybrids offer unexpected improvements in properties, well above that predicted by traditional rules of mixtures. For instance, orders of magnitude enhancements in mechanical strength and conductivity have been reported at extremely low NP loadings. Such studies have recently been expanded to consider more complicated situations involving polymer blends and block copolymers, where multifunctionality, e.g., novel electrical, magnetic and optical properties have been reported. In this context, computer simulation tools, ranging from atomistic approaches to coarse-grained simulations have been used for predicting the structure and properties of such materials. This section of the course will present an overview of such simulation approaches and selected applications in the context of predicting the mechanical and barrier properties.

c) Lithium-ion batteries serve as flexible, lightweight and high energy density power sources which have found applications in a number of modern age portable devices and electric vehicles. In such applications, solid polymeric membrane (SPE) materials have emerged as attractive candidates in the quest for electrolytes which are mechanically strong, and also possessing properties such as low vapor pressure, ease of processability and nonflammable. In this context computer simulations have emerged as a valuable complementary aid to experiments to understand the mechanisms underlying experiments and for the design of new materials based on the insights gleaned therein. In this section of the course, an overview

PRIMARY OBJECTIVES

- **Introduction to modelling and simulation of polymer nanocomposites for energy application.**
- **Introduction to course-grained model for predicting the self-assembly of polymers.**
- **Hands on training on simulated model of polymer nanocomposites to predict the mechanical and barrier properties.**
- **Simulation of polymer nanocomposites and their challenges for energy application.**

WHO CAN ATTEND?

Executives, engineers and researchers from biotechnology, pharmaceutical, chemical and other manufacturing industries, technicians from hospitals and government organizations including R&D laboratories.

Student students at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.

Certificate of participation will be issued to participants who have registered and attended the entire course.

No refund policy of registration charges.

ABOUT INTERNATIONAL FACULTY

Professor Ganesan, Venkat obtained his M.S. and Ph.D. from Massachusetts Institute of Technology in Chemical Engineering. He obtained his B. Tech. in Chemical Engineering from Indian Institute of Technology, Madras. He joined the Department of Chemical Engineering at the University of Texas at Austin, USA in 2001 as Assistant Professor, currently he is Professor with Kenneth A. Kobe Professorship, UT Austin. Professor Ganesan, Venkat has published over 150 peer reviewed journal articles, several book chapters and is co-editor of a book on Materials Modeling. He is active in American Physical Society; American Institute of Chemical Engineers; Materials Research Society; American Association for the Advancement of Science and American Chemical Society. He is fellow of American Association for the Advancement of Science (2018) and American Physical Society (2013).

His research focuses on development of a theoretical and computationally-based program aimed at elucidating the fundamental mechanisms underlying the design of novel, self-assembled advanced materials. The goal is to complement the research of experimentalists (synthetic chemists, chemical engineers, and material scientists) by providing simple but quantitative guidelines to rationally design and synthesize these materials. Towards this broad objective, his group's research focuses on the development and use of a wide variety of tools spanning both equilibrium and nonequilibrium statistical mechanics, conventional fluid mechanics, molecular rheology and computational tools to complex fluids and biological systems.

HOW TO REGISTER?

1

Web Portal Registration

Visit GIAN Website at the link:

http://www.gian.iitkgp.ac.in/GREGN/index and create login User ID and Password. Fill up the blank registration form and do web registration by paying Rs. 500/- online through Net Banking/Debit/Credit card as per instructions given their in. This provides the user with lifetime registration to enroll in any number of GIAN courses offered.

2

Course Registration

Login to the GIAN portal again with the user ID and Password already created in Step 1. Click on 'Course Registration' option at the top of Registration form. Select the Course titled "Tailored polymeric membranes for bio-separations and biomedical applications" from the list and click on 'Save' option. Confirm your registration by clicking on 'Confirm Course'. Also send the filled-in registration form to the contact address.

REGISTRATION FEE

	Course Fee (Including GST)
FACULTY / SCIENTISTS	Rs. 5,000/-
PARTICIPANTS FROM INDUSTRY	Rs. 10,000/-
STUDENTS & RESEARCH SCHOLARS	Rs. 3,000/-
STUDENTS FROM ABROAD	US$ 300
OTHER PARTICIPANTS FROM ABROAD	US$ 400