



GIAN

GLOBAL INITIATIVE OF ACADEMIC NETWORKS

GIAN COURSE ON
TRIBOLOGY: FUNDAMENTALS TO CUTTING EDGE

February 12 - 16 , 2018

INTERNATIONAL FACULTY

Prof. Nicholas D. Spencer, FRSC
Professor of Surface Science and Technology
Department of Materials
ETH Zurich HCI H 523, Switzerland

HOST FACULTY / COURSE COORDINATORS

Dr. K. Prabhakaran Nair
and Dr. M. L. Joy
Professors, Department of Mechanical Engineering
National Institute of Technology Calicut, India

COURSE OVERVIEW

Tribology, the study of science and engineering of interacting surfaces in relative motion concerns the phenomena of friction, lubrication, and wear. While the subject has traditionally been explored in the context of machine design and reliability, other areas of Tribology have become equally important in recent years. These include the vital role of lubricant composition and behaviour on energy consumption in transportation systems, and the increasing significance of soft Tribology is highly relevant in such areas as contact lenses and hip implants. While an understanding of Tribology is essential in the design and maintenance of moving systems, many of the fundamentals of the subject are still not well understood. Empirical laws have been developed, however, beginning with the work of Leonardo da Vinci, which facilitate design and prediction, even in the absence of fundamental knowledge. Nevertheless, these laws have their limitations, and engineers, physicists, material scientists and chemists are striving to raise the level of our understanding, in order to improve the performance of tribological systems. This quest has been greatly aided over the last half-century by the development of an array of surface-characterization tools, and most recently by developments in computer hardware and software that render feasible mathematical modelling of tribological systems.

COURSE OBJECTIVES

The primary objectives of the course are as follows:

- i) Introducing participants to the basic concepts of friction, lubrication and wear
- ii) Describing modern developments in surface-analytical methods that can be applied to the understanding of tribological systems
- iii) Raising the participants' awareness of some current active areas of development in Tribology
- iv) Working with participants to solve basic problems in Tribology, and, by means of online research and group activities, to tackle advanced topics that are of current relevance

INTERNATIONAL FACULTY



Dr. Nicholas D. Spencer; is a Professor of Surface Science and Technology in the Department of Materials at ETH Zurich, Switzerland. Prof. Spencer is recipient of many awards and honors like Dow Fellow, University of California, Berkeley, 1981- 82, Lectureship Award, Chem. Soc. of Japan, Surf. and Coll. Division, 1999., Fellow of the Royal Society of Chemistry, 2007-. The principal areas of his research are biocompatibility, tribology, and surface functionalization and analysis. Important surface-analytical approaches used in his group include x-ray photoelectron spectroscopy, the surface-forces apparatus, atomic force microscopy, vibrational spectroscopy and several methods for the characterization of the liquid-solid interface. He is a Fellow of the Royal Society of Chemistry (UK) and member of the Swiss Academy of Engineering Sciences. He has published more than 350 Journals with 20,000+ citations. He is editor-in-chief of the journal "Tribology Letters", editor of an encyclopedia of physical chemistry and chemical physics, and a member of the editorial board of the journals "Tribology", "Tribology International", and "Lubrication Science".

WHO CAN ATTEND ?

- ★ Students at all levels (B.Tech./MSc/M.Tech./Ph.D.), in Mechanical Engineering/Nano Science and Technology/Chemical Engineering/Chemistry/Physics or Faculty from reputed academic institutions and technical institutions with aptitude for doing continuous research in Tribology.
- ★ Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories

REGISTRATION FEES

The registration fee for the course is as follows:

Faculty members from Academic Institutions :Rs. 3000/-

Students from Academic Institutions : Rs. 1000/-

Industry/Research Organization : Rs. 5000

Participants from abroad : US \$ 200

The above fee includes the cost of instructional materials, computer use for tutorials, refreshments and working lunch. In addition to the above fee, one-time online fee of Rs.500/- is to be paid for registration in the GIAN web portal (See the registration process outlined below). Accommodation for outstation participants will be charged separately. No TA/DA will be paid for any participant.

REGISTRATION PROCESS

Step 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 GIAN registration form and do web registration by paying Rs.500/- online through Net Banking/ Debit/ Credit Card as per instructions given there in. This provides the user with life time registration to enroll in any number of GIAN courses offered(Skip this step, if already registered with GIAN portal).

Step 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 "TRIBOLOGY: FUNDAMENTALS TO CUTTING EDGE" from the list and click on the save option. Confirm your registration by clicking on the Confirm Course option. The participant may then proceed for the course registration with the course coordinator by filling out the registration form and paying the course registration fee. The course fee should be paid in the form of Draft/NEFT/RTGS. The account details are given below. The duly filled up registration form and the DD/ NEFT/RTGS receipt must be sent to the course coordinator. For provisional registration, scanned copies of the above documents can be sent to mlj@nitc.ac.in. The DD/Receipt of NEFT/RTGS and the original registration form (hard copy) must reach the coordinator on or before 20th Jan 2018. The maximum number of participants of the program would be limited to 50.

Account Name	: DIRECTOR NIT CALICUT "GIAN COURSE INFO. 171020L02"
Account No.	: 37324305887
Bank	: State bank of India
Branch	: CREC CHATHAMANGALAM , NIT CAMPUS P.O , PIN - 673601
Branch Code	: 002207
IFSC	: SBIN0002207
MICR Code	: 673002012
SWIFT Code	: SBININBB392

IMPORTANT DATES

Last date for receiving applications	: 20th Jan 2018
Last date for Intimation to Participants by email	: 25th Jan 2018
Course Dates	: 12-16 February 2018

ABOUT GIAN COURSE

MHRD, Govt. of India has launched an innovative Programme 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 NIT CALICUT

National Institute of Technology Calicut (NITC) is one of the Leading 31 institutions of national importance governed by the NIT Act 2007 and is fully funded by the Government of India. Originally established in 1961 as a Regional Engineering College (REC), it was transformed into a National Institute of Technology in the year 2002. The institute offers Bachelors, Masters and Doctoral degree programmes in Engineering, Science, Technology and Management. With its pro active collaborations with a multitude of research organizations, academic institutions and industries, the institute has set a new style for its functioning under the NIT regime. The Institute is presently offering ten UG programme and thirty PG programs along with Ph.D programme in various fields of Engineering, Science and Technology.

ABOUT THE DEPARTMENT OF MECHANICAL ENGINEERING @ NITC

Department of Mechanical Engineering, the largest department in the Institute, offers regular undergraduate, postgraduate and doctoral degree programmes. It also offers part time doctoral degree programmes, mainly meant for those employed in industries and academic institutions. Department offers continuing education programmes for industry and academic personnel. Summer/Winter schools have also been organised by the Department. Besides teaching, the members of the faculty are involved in consultancy work (Design & Development, Energy Auditing, Industrial Sickness Evaluation, Testing etc.), sponsored research work (sponsored by DST, AICTE, ARDB etc.), and product development.

ADDRESS FOR CORRESPONDENCE

Dr. K. Prabhakaran Nair/Dr. M. L. Joy
Coordinators
GIAN Programme on Tribology: Fundamentals to Cutting Edge
Department of Mechanical Engineering
National Institute of Technology
Calicut – 673601, Kerala
Phone: +91 495 2286401; +91 9447325988; +91 9447296563
Email: kpn@nitc.ac.in, mlj@nitc.ac.in