

**Short-term course under Global Initiative Academic Networking
(GIAN) scheme of MHRD, Govt. of India**

Corrosion and Tribo-Corrosion of Materials

Overview

Tribo-Corrosion can be defined as a degradation phenomenon of material surfaces due to wear and corrosion. It is important to understand the mechanism of tribo-corrosion for research and development of different materials for service applications that involve simultaneous action of mechanical and electrochemical agents on engineering components.

This course enhance the expertise and understanding of the subject among various faculty and researchers working and intend to work in Tribo-corrosion area and also enhance the awareness of this mode of degradation among various practicing engineer from industry around our institute and elsewhere in India.

Course Participants will learn about

- Corrosion, Electrochemical corrosion and Metallic passivity
- Tribo-Corrosion interaction in various industry
- Failure mechanism due to Tribo-Corrosion
- Failure of engineering components by tribo-corrosion and suggestion of remedial measures

Course participants will learn these topics through lectures and interactive sessions. Also case studies and assignments will be shared to stimulate research motivation of participants.

Modules	<ul style="list-style-type: none">• Duration:- One week (5 days), Start date: December 5, 2016, End Date: December 9, 2016• Total Contact Hours: 25 hours: 4 hours lectures/day, 1 hour tutorial/day over 1-week
Course Outline	<ul style="list-style-type: none">• Introduction to Corrosion, tribology and Tribo-Corrosion• Tribocorrosion at elevated temperatures in the metal working industry• Tribo-Corrosion test techniques and data analysis• Tribo-Corrosion problems in dental implants veneer and orthodontic wires
You Should Attend If...	<ul style="list-style-type: none">• You are an executive, engineer, technician and researcher from manufacturing, service,

	<p>government organizations including R&D laboratories</p> <ul style="list-style-type: none"> • You are a student, at all levels (BTech/MSc/MTech/PhD) • You are a faculty from academic institutions
Fees	<p>Registration Fees: The participation fees for taking the course is as follows:</p> <ul style="list-style-type: none"> • Participants from abroad: US \$300 • Industry/ Research Organizations: Rs. 6000/- • Academic Institutions: Rs. 3000/- for faculties and Rs. 1000/- for students <p>The above fee include all instructional materials, computer use for tutorials and Assignments, laboratory equipment usage charges, 24 hr free internet facility.</p> <p>The Limited accommodation are available on payment basis.</p>
Mode of Registration	<p>All prospective participants need to do web registration for the course on GIAN (http://www.gian.iitkgp.ac.in/GREGN/index) portal by making a onetime non-refundable payment of Rs. 500/-. After the mandatory web registration, only the shortlisted participants will be informed by email to register for the course by making full payment of the course registration fee by sending a demand draft in favour of “Director, NITK Surathkal” payable at any nationalized banks at Surathkal/Srinivasanagar, before the last date of registration. Please send an email to the course coordinator in case of any questions: sbarya@nitk.ac.in and sbhushanarya@gmail.com</p>

Contact address

Course Co-ordinator

Dr. Shashi Bhushan Arya

Assistant Professor

Department of Metallurgical and Materials Engineering

National Institute of Technology Karnataka, Surathkal, Mangalore-575 025 (Karnataka) INDIA

www.nitk.ac.in

Phone: +91-824-2473754 (O),

+91-8762526500

sbarya@nitk.ac.in

sbhushanarya@gmail.com

<http://mme.nitk.ac.in/faculty/shashi-bhushan-arya>

The Faculty

Course instructor

Professor Margaret M Stack (DSc, UMIST, UK)



Prof. Margaret Stack is working at the Department of Mechanical Engineering in the University of Strathclyde, Glasgow, UK. She is the pioneer in the area of Tribo-corrosion. She is professor for last fifteen years and total teaching experiences about more than 23 years in the major area of corrosion and Tribo-corrosion. She is an editor in chief of the international journal Bio and Tribo-Corrosion (Springer). She was chief editor of Tribology International and acting as a senior editorial advisor and members of many editorial boards such as J. Physics D: Applied Physics, Corrosion Engineering Science and Technology, Open Applied Physics, Current Patents on Mechanical Engineering, Advances in Mechanical Engineering, Advances in Automobile Engineering, Current Patents in Corrosion Science and Lubrication Science.

Course Co-ordinator



Dr. Shashi Bhushan Arya is currently working as an Assistant Professor, Dept. of Metallurgical and Materials Engineering, NITK, Surathkal. His research interests in corrosion, passivation, tribology and tribo-corrosion of metallic system including industrial alloy and biomaterials, Passivity and Impedance of ultra-fined grained and nano-crystalline materials and synthesis of new materials using powder metallurgy route. He has guided more than 30 M.Tech students and presently, supervising 5 PhD students. He has published more than 30 papers (international journals, and conference proceedings) and a book chapter (CRC press). He has delivered invited lectures on corrosion and metallic passivity for industry and academic institution in various workshop and conferences.

Objectives of the course:

Primary objective of the course is to develop broad understanding on corrosion, tribology and tribo-Corrosion, selection of materials, failure of components and its mechanism due to synergy of corrosion and wear.

Key learning objectives are:

Corrosion , Electrochemical corrosion and Metallic passivity
Tribology and Tribo-Corrosion
Bio-Tribo-Corrosion for medical applications
Ability to analyze failure of engineering components by tribo-corrosion
in various industries and suggestion of remedial measures
Materials selection and controls

Who can attend this course?

Engineers or research scientists from Universities/Technical institutions / Industries
Undergraduate / Post graduate students (Mechanical Engg, Metallurgical and Materials Engg).
Research scholars / Faculty members, Dentists (MDS)/Orthopedicians (MS)

Course contents:

Day 1 (5th December, 2016)	Introduction to Corrosion, tribology and Tribo-Corrosion Tribocorrosion at elevated temperatures in the metal working industry
Day 2 (6th December, 2016)	Corrosion and Metallic passivity Corrosion monitoring techniques Tribo-Corrosion test techniques and data analysis
Day 3 (7th December, 2016)	Bio-Tribocorrosion of materials Tribo-Corrosion problems in dental implants veneer and orthodontic wires Tribocorrosion problems in artificial hip and knee joints
Day 4 (8th December, 2016)	Tribo-Corrosion in marine renewable energies Factors affecting tribocorrosion in marine environments Failure analysis of Component failed due to Tribo-Corrosion (Case studies)
Day 5 (9th December, 2016)	Failure analysis and Tribo-Corrosion maps Methods for mitigating against Tribo- Corrosion (Metallic materials and Coating for tribo-corrosion systems) Lab visit and Interesting and innovative assignment Valedictory and Certificate distribution

Important dates:

Registration starts on : 05/10/2016 and closes on : 04/12/2016

Participants can also register through Google form link as given below,

https://docs.google.com/forms/d/1YG96rHhZ9fnbxy95MTFvQevuA-Sn9ve_Xdf1Pp8Ef9k/edit

Mode of payment: Prescribed fee in the form of crossed DD drawn in favor of “The Director, NITK Surathkal” payable through any nationalized bank at Surathkal/Srinivasnagar, along with duly filled in registration form must reach the Coordinator on or before 04/12/2016.

Scanned copy of the registration form with DD may be mailed to the Coordinator on or before the last date.