

Fatigue, Fracture and Creep of Engineering Materials and Structures

A two week course under Global Initiative of Academic Network (GIAN)

Overview

The subtle changes in both properties and performance quantified either in terms of endurance; durability and damage tolerance are the salient phenomenon of fatigue. With rapid strides in the development and emergence of spectrum of advance materials and concurrent advancement in fracture machine methodologies, the concept of the sustained performance of the fatigue and ensuing fracture behavior or failure response has grown to emerge as a major area of the scientific and applied research cross-pollinating a spectrum of the disciplines to include materials science and engineering ,the aerospace engineering ,engineering machines, biomechanics and applied physics. With the increasing demands imposed on high performance materials the need for fatigue research has progressively gained increased importance. This course id structured with the purpose of presenting the principles and applications of the fatigue and fracture to materials and structures.

Course Objectives

The design of structures must be both safe and sound to ensure the desired longevity or service life intended for the structure. Structures must be made from the material that can safely resist aging, withstand load spanning both static and dynamic (fatigue), environment-included degradation to include both oxidation and corrosion and even wear. Attendees will learn how to specify and select economically affordable & mechanical property conductive materials that will ensure long life for the intended structures while concurrently assuring a failsafe criterion. This course would provide the option of the selecting alternative materials to the traditionally used choice for structures of need and interest and having far reaching practical application.

Who can attend

- a) Mechanical / manufacturing / metallurgical engineer or scientists
- b) College and University faculty members and scientists from research institutions
- c) PhD and M. Tech students from academic institutions pursuing their research topics in the area of fatigue and creep behavior of engineering materials.

Course Benefits

- 1. Grasp the basic of the fatigue
- 2. Understand the inter relationship between processing, microstructures and mechanical performance
- 3. Learn how to design durable and damage tolerant products
- 4. Learn how to enhance product performance through fatigue design and analysis
- 5. See how to optimize material's intrinsic for the achievement of the optimum end product
- 6. Learn how to identify and fatigue failures
- 7. Learn the fundamentals of creep deformation and failure in materials

Course Duration	16 th December 2019 to 27 th December 2019 <i>Number of participants for the course will be limited to seventy</i>
Fees	The participation fees for taking the course is as follows: Participants from abroad : US \$500 Industry/ Research Organizations: Rs. 20000 + 18% GST Academic Institutions (faculty) : Rs. 8000 + 18% GST Student participants : Rs. 1500 (refundable) The fee has to be paid by DD. It will be returned to students (but not to other participants) once they complete the course.

The Faculty

Dr. T. S. Srivatsan ["Dr. SRI."] successfully finished his undergraduate degree: Bachelor of Engineering (BE 1980) in Mechanical Engineering from Bangalore University (Bangalore, India) in 1980, and subsequently graduate degrees [Master of Science in Aerospace Engineering (M.S. 1981) and Doctor of Philosophy in Mechanical Engineering (Ph.D. 1984)] from Georgia Institute of Technology (Atlanta, GA, USA), specializing in fields synergizing all aspects related to processing, characterization and mechanical behavior of engineering and engineered materials. Subsequent to graduating in 1984, Dr. Srivatsan worked in the position of Research Engineer at the Georgia Tech. Research Institute (Atlanta, Georgia) and Instructor (part-time) at Georgia Institute of Technology and later as Lead Project Engineer and Manager of Research and Development at Materials Modification Inc. (Falls Church, Virginia). Dr. Srivatsan joined the faculty in The Department of Mechanical Engineering at The University of Akron in August 1987. He currently holds the rank of Professor in the Department of Mechanical Engineering.



<https://www.uakron.edu/engineering/research/profile.dot?u=tsrivatsan>

Dr. P.S. Robi completed his undergraduate degree (B. Tech) in Mechanical Engineering from the university of Kerala in 1986m M. Tech in Foundry and Forge Technology from NIFFT, Ranchi in 1988 and Ph.D. in Metallurgical Engineering and Materials Science from IIT Bombay in 1995. Subsequently he joined The Department of Mechanical Engineering at Indian Institute of Technology Guwahati (IITG) as an Assistant Professor in 1997. He was later promoted to Associate Professor and full professor and worked at IITG under various capacities viz., Head, Department of Mechanical Engineering, Dean (Research and Development) and presently as Deputy Director of IITTG. His field of interest includes Materials and Manufacture, Structure property correlation, Characterization and processing of light metals, high temperature materials, fatigue and creep deformation, etc.



<http://www.iitg.ac.in/psr/>

Course Coordinator

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