

## Objectives

In modern materials science, fracture mechanics is an important parameter for improving the mechanical performance of materials and components. It applies the physics of stress and strain, in particular the theory of elasticity and plasticity and the microscopic defects in real materials in order to predict the macroscopic mechanical failure of bodies. Fractography is widely used with fracture mechanics to understand the causes of failures and also verify the theoretical failure predictions with real life failures.

In many cases, failure of engineering structures through fracture can be fatal. Often disasters occur because of the engineering structures which contain cracks arising either during production or during service, due to fatigue, corrosion etc. For instance, growth of cracks in pressure vessels due to crack propagation could cause a fatal explosion. If failure were ever to happen, we would rather prefer it happen by yield or by leak prior to breaking.

Since cracks can lower the strength of the structure beyond that due to the loss of load-bearing area, material property above and beyond conventional strength, its study is needed to describe the fracture resistance of engineering materials.

## Program Contents

Introduction to materials, role of crystal structures, sub-structures and microstructures on mechanical properties of materials, control of microstructures in materials. Micromechanism of fracture and fatigue, concept of stress intensity factor and fracture toughness, kinetics of fatigue crack propagation, prediction of fatigue life of structures and components, Application of fracture mechanics to materials selection, design and failure analysis, Examples of engineering applications, etc.

### Address for Correspondence

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## AICTE Sponsored Staff Development Program

on

Materials Science, Fracture and Fatigue  
(15-03-2010 to 26-03-2010)

**Coordinator**  
Dr. Zahir Hasan  
**Co- Coordinators**  
Mr.Nabi Hasan  
Mr. Md. K. Asif Khan



**Department of Mechanical Engineering**  
**Al-Falah School of Engineering & Technology**  
(An Autonomous Institution)  
Dhauj, Faridabad (Haryana)-121004  
Website: <http://www.afset.org>

## About the Institute

Al-Falah School of Engineering and Technology (AFSET) is a Muslim Minority Institution with an aim to achieve technological excellence through innovation. It is established with a goal to provide quality technical education to the engineering students.

## Department of Mechanical Engineering

Department of Mechanical Engineering is the largest department of the Institute. The department offers a number of programs at different levels, with special reference to two specialized degree programs and two PG programs. The degree programs are accredited by National Board of Accreditation (NBA).

In addition to regular teaching, the faculty members are engaged in active research work in their respective fields of interest covering different areas such as precision metrology, composite materials, welding technology, optimization techniques, modeling and simulation, CAD/CAM, FEA, etc. The department is regularly organizing Workshops/Symposia and training programs etc. to achieve the set goals of the institute.

## Location

The Institute is located at village Dhauj in Faridabad which is about 20 Kms from Delhi (Badarpur border). College bus facility is available from all main locations of Delhi, Faridabad and Palwal. The nearest airport is New Delhi. The weather of Faridabad during this SDP will be a moderate summer as usual in the North India during the month of March. A Comfortable stay is planned for the outstation participants or for those who need accommodation during the program.

## Eligibility for Participation

Faculty members from Engineering Institutions (approved by AICTE), and professionals from research organizations and Industries can attend the course. Course would be counted as a requirement in CAS (Career Advancement Scheme) for the faculty and in accreditation of the institute from NBA. The interested candidates are required to apply to the Course Coordinator in the prescribed form latest by **March 8<sup>th</sup>, 2010** (through proper channel). Advance copy can be sent by E-mail prior to that. For more details visit the website of the institute.

## Course Fee

***There is no course fee for sponsored Teachers / Staff / Research Fellow from AICTE approved institutions. They will also be paid to & fro III-Tier AC Train / AC Deluxe Bus/ State Transport fare via shortest route on producing the tickets in original. Free boarding and lodging in the hostel of the Institute will be provided. However, accommodation will be available for limited participants, on first come first serve basis.***

The participants from Research Organizations and Industries will have to pay a non refundable registration fee of Rs. 3,000/- as DD in favour of "Al-Falah School of Engineering and Technology".

### Contact details of Coordinator: Dr. Zahir Hasan

Phone: 97112-64968 (M), 0129-4254600 Ext.608 (O)

### Co-Cordinators:

**Mr.Nabi Hasan/Md. Kamal Asif Khan**

Cell: 09811348455

**Course email:** zahir\_hasan@yahoo.com,  
asifmechgr@yahoo.co.in

## **APPLICATION FORM**

**AICTE - Sponsored Staff Development Program**

**on**

**'Materials Science, Fracture and Fatigue'**  
(15.03.2010 to 26.03.2010)

Name: Mr./Ms/D \_\_\_\_\_  
(In capital letters)

Designation: \_\_\_\_\_

Department: \_\_\_\_\_

Organization: \_\_\_\_\_

Qualifications: \_\_\_\_\_

Reason for applying for the course

\_\_\_\_\_  
\_\_\_\_\_

Address for correspondence: \_\_\_\_\_

\_\_\_\_\_

E-mail ID: \_\_\_\_\_

Mobile Number: \_\_\_\_\_

Signature and Date \_\_\_\_\_

**Recommendation:** The application is hereby recommended and if selected applicant will be permitted to attend the SDP for the above duration.

Date: \_\_\_\_\_

Signature and Seal of  
Sponsoring Authority