

**INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE**  
(Department of Mechanical and Industrial Engineering)

Dated: May 26, 2020

**ADVERTISEMENT TO FILL UP PROJECT POSITIONS\***

Applications are invited from Indian nationals only for project position(s) as per the details given below for the consultancy/research project(s) under the Principal investigator (**Prof. Indra Vir Singh**), Dept./Centre: **Department of Mechanical and Industrial Engineering, Indian Institute of Technology, Roorkee.**

1. Title of project: **Microstructure based Three-dimensional Elasto-plastic Fatigue Crack Growth Simulations using XFEM**
2. Sponsor of the project : **DMRL, DRDO, Hyderabad**
3. Project position(s) and number : **JRF/Research Associate (02)**
4. Qualifications : **ME/M.Tech in Mechanical Engg./Applied Mechanics/Aerospace Engg. or Equivalent with GATE qualified**
5. Emoluments : **Rs. 35,000/month (including HRA)**
6. Duration : **18 Months**
7. Job description

Project aims to establish FEM/XFEM based scientific methodology for reliable estimation of the crack initiation and 3-D elasto-plastic crack growth under idealized loading conditions. A computational technique will be developed for the estimation of the crack initiation based on the two-phase ( $\alpha + \beta$ ) microstructure. The probabilistic analysis will be carried out to found the variation in the crack initiation. The possible parameter for this analysis will be distribution and volume of the phases, deviation in phase properties. The 3-D elasto-plastic crack growth will be performed under the fatigue loading conditions. Further, based on the material constitutive properties and the loading related data, a comprehensive definition of the crack growth model will be defined subjected to fatigue conditions. The simulation methodology established at the specimen/ sub-component levels will be scaled-up to the actual component like compressor disc, by analyzing crack growth under relevant aeroengine operating conditions.

1. Candidates before appearing for the interview shall ensure that they are eligible for the position they intend to apply. Only the shortlisted candidates will be notified for interview call.
2. Candidates should submit their applications with the following documents to the office of Principal Investigator through email or by post as a **single pdf** file in following order:
  - Application in a plain paper with detailed CV including chronological discipline of degree/certificates obtained.
  - Experience including research, industrial field and others.
  - Attested copies of degree/certificate and experience certificate.
3. Candidate shall bring along with them the original degree(s)/certificate(s) and experience certificate(s) at the time of interview for verification.
4. Preference will be given to SC/ST candidates on equal qualifications and experience.
5. Please note that no TA/DA is admissible for attending the interview.
6. **Note: Selected candidate may get an opportunity to pursue PhD (Once project is over, he/she will be given MHRD fellowship as per Institute Policy)**

The last date for application to be submitted by email to Principal Investigator is **25 June 2020** by **5 PM.**

Tel: +91 1332 285888 / 8077719239

Name and signature  
of Principal Investigator

May 26, 2020

Email: [ivsingh@me.iitr.ac.in](mailto:ivsingh@me.iitr.ac.in)

\*To be uploaded on IIT Roorkee website and copy may be sent to appropriate addresses by PI for wider circulation.

*Mamish*

INDIAN INSTITUTE OF TECHNOLOGY (IIT) ROORKEE 2020