



# INTERFACES IN MATERIALS

5<sup>th</sup> to 9<sup>th</sup> March 2018

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## Overview

The study of interfaces in materials can be approached on a number of length scales, depending on the context. In this intense in-depth graduate level course, the focus will be on the study of interfaces at a level where a knowledge of crystallographic aspects of interfaces in crystalline materials is relevant, such as in deformation twinning, annealing twinning and growth twinning, the crystallography of martensitic phase transformations, the crystallography of grain boundaries and interphase boundaries and the description of orientation relationships between precipitates and matrices within which they form.

On completion of the course, all participants will have an enhanced understanding of the crystallography of interfaces in crystalline materials through the lecture content and the daily two hour tutorials. The course will give participants the confidence and background understanding to be able to read and understand fully research papers and research-level books in these areas.

Modules	DAY ONE
	<b>Lecture 1: Essential interfacial crystallography I</b>
	<b>Lecture 2: Essential interfacial crystallography II</b>
	<i>Tutorial 1: Tutorial on essential interfacial crystallography</i>
	DAY TWO
	<b>Lecture 3: Deformation twinning I</b>
	<b>Lecture 4: Deformation twinning II</b>
	<i>Tutorial 2: Tutorial with questions on the crystallography of twinning</i>
	DAY THREE



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<b>Lecture 5: Martensitic transformations I</b>	<p><b>Lecture 6: Martensitic transformations II</b></p> <p><i>Tutorial 3:</i> Tutorial with questions on the crystallography of martensitic transformations</p>
<b>DAY FOUR</b>	<p><b>Lecture 7: Grain boundaries I</b></p> <p><b>Lecture 8: Grain boundaries II.</b></p> <p><i>Tutorial 4:</i> Tutorial with questions on the crystallography of grain boundaries</p>
<b>DAY FIVE</b>	<p><b>Lecture 9: Interphase boundaries I</b></p> <p><b>Lecture 10: Interphase boundaries II</b></p> <p><i>Tutorial 5:</i> Tutorial with questions on the crystallography of interphase boundaries</p>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>▪ You are an engineer or scientist working in the area of materials science and engineering. You are expected to have an undergraduate degree in materials science and engineering, mechanical engineering, chemical engineering, physics or related disciplines.</li> </ul>
<b>Fees</b>	<p>The participation fees for taking the course is as follows:</p> <p>Participants from abroad: US \$500          Industry/ Research Organizations: 15000 INR          Academic Institutions Faculty: 10000 INR          Students: 5000 INR          Application Deadline: 5<sup>th</sup>. Feb. 2018          Register at: <a href="http://www.gian.iitkgp.ac.in/GREGN/index">http://www.gian.iitkgp.ac.in/GREGN/index</a>          For any queries, please email to ----- <a href="mailto:gian.pml@gmail.com">gian.pml@gmail.com</a></p>

## The Faculty



Dr. Knowles is a world renowned expert in this field and has recently co-authored the second edition of a book entitled *Crystallography and Crystal Defects* published by Wiley in 2012. This book is aimed at final year undergraduate students, graduate students and advanced researchers. The contents of the chapters of this book on twinning, martensitic transformations and crystal interfaces will form the core of the lecture course content, to which will be added more advanced research-level topics not covered by the book.



Professor Rajesh Prasad began teaching Materials Science as a graduate student at University of Cambridge where he was supervisor and demonstrator for undergraduate course IA Crystalline Materials. He now has about three decades of experience of teaching materials science courses at both undergraduate and graduate levels at the Indian Institutes of Technology, at Varanasi, Kanpur and Delhi. He has been awarded a Teaching Excellence Award in 2012 by the Indian Institute of Technology Delhi. In 2013, he received the Distinguished Alumnus Award of the Department of Metallurgical Engineering, IIT-BHU, Varanasi.

## Course Co-ordinator

Prof. Rajesh Prasad  
Phone: 011-26591782  
E-mail: rajesh@am.iitd.ac.in

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