



MHRD Scheme on Global Initiative on Academic Network (GIAN)



Fabrication and Characterization of Nano Hybrid Composites and Ceramic materials and its Impact on Mechanical, Tribology, and Electrical properties

Course Code: [171042B04]

1.0 Over View

The role of product design and manufacturing in the country's economy and societal development has long been established through their wealth generating capabilities. In order to enhance and widen our knowledge of materials by increasing innovation and responsiveness to ever-expanding national and international needs, it is quintessentially important to impart and undertake in-depth studies and research. This course will be a premier forum for the presentation, exchange and sharing of new advancements, approaches and a research result which seeks to benefit the human society at large. The conference will focus on technical challenges, research updates and recent innovations in the field of Fabrication and Characterization of Nano Hybrid Composites and Ceramic materials and its Impact on Mechanical, Tribology, and Electrical properties across the country and particularly the North-Eastern states of India. The course will provide a unique platform for research family in the area Scope of advance research and Application of external fields to technology of composite and ceramic materials. This course will

provide an opportunity for practical classes in manufacturing and characterization of hands on prepared samples by the participants of the course and with the renewed knowledge on advanced viable technologies, the forum hopes to conceive and formulate positive and sustainable measures to remove these constraints at the earliest in order to seek better lives for the people of North-East Indian.

Course Information	Duration: 24th December to 28th December 2018 Place: Department of Mechanical Engineering, NIT Manipur Total Contact Hours:
Who can attend	<ul style="list-style-type: none"> ❖ Students at all levels (BTech/MSc/MTech/PhD). ❖ Executives, faculty from Material Science and Engineering engineers and researchers from manufacturing, service and government organizations including R&D laboratories. ❖ Faculty from academic and technical institutions. ❖ All those who are planning to have startups. ❖ Others who want to learn the basic and advanced concepts dealing with technology based enterprises and entrepreneurship related activities.
Registration Fee	<ul style="list-style-type: none"> ❖ The participation fees for taking the course is as follows: ❖ Participants from abroad : US \$200 ❖ Industry/ Research Organizations: 5000/- ❖ Academic Institutions: <ul style="list-style-type: none"> ✓ UG Students: Rs. 1500/- ✓ PG Students: Rs. 2000/- ✓ PhD Students: Rs. 2500/- ✓ Postdoctoral fellow/Research Associate: Rs. 3000/- ✓ Faculty Members: Rs. 3500/- ❖ The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation in hostel on payment basis by sharing on first cum first serve.

2.0 Objectives

The primary objectives of the course are as follows:

1. Scope of research and Application of external fields to technology of composite and ceramic materials

2. Synthesis and characterization of all nanomaterials and composites. Structures, functions, applications and modeling of these materials.
3. Providing exposure to practical problems in composites and ceramic manufacturing and their solutions, through experimentation and phenomena of problems through characterization
4. Expletory study on mechanical, electrical, ferroelectric properties of ceramic materials. Study on transparent ceramics; lead-free piezoelectrics; ferromagnetics and solid oxide fuel cells etc. practical
5. Experiments' on Dielectical Measurements, I/V Measurements systems, and Permeability measurements etc.
6. Recycling of multi-grain, melt processed bulk (RE)BCO superconductors', Characterization of nano-composite oxide ceramics and monitoring of oxide thin film growth by laser-induced breakdown spectroscopy.

Foreign Faculty

Dr Hari Babu Nadendla Professor, BCAST, Institute of Materials and Manufacturing, Brunel University London, UK

Biography of Dr Hari Babu Nadendla, Foreigner Faculty



Dr Hari Babu Nadendla, Professor in Brunel University, London, he joined in the Institution in the year 2006. His research Interest is on Nano-structured materials, High temperature ceramics, Metal matrix and cermaic matrix composites, Solidification process, grain refinement & crystal growth, High temperature superconducting materials, Magnetic properties of superconductors, Electrolytes for solid oxide fuel cells. Prior to that he was a Research Fellow (1999-2002), then a

Senior Research Fellow (2002-2003) and, ultimately, Advanced Research Fellow (2003-2006) at the University of Cambridge. He has published over 200 papers in international peer reviewed journals and holds 4 international patents. He was awarded the PASREG award of excellence in 2007 for his outstanding contribution to the development and characterization of bulk high temperatures superconductors. During his post-doctoral career, he received best poster presentation awards. Since joining BCAST, his research has expanded from processing of superconducting materials to understanding the heterogeneous nucleation process during solidification, developing chemical grain refiners for Al and Mg alloys, processing of high performance MMCs using intensive melt shearing, and twin roll casting Al-alloys from a recycled source for automotive application.

Academic qualifications:

- Ph. D (Superconducting materials) Defense Metallurgical Research Laboratory, University of Hyderabad, India (1998).
- M. Sc (Physics & Advanced Electronics), University of Hyderabad, India (1992).
- B. Sc (Maths, Phys. & Electronics), Nagarjuna University, India (1990).

Previous positions:

- EPSRC Advanced Research Fellow (Dec'06-Oct'08); BCAST, Brunel University London
- EPSRC Advanced Research Fellow (Oct'03-Nov'06): Department of Engineering, University of Cambridge
- The Sackler Fellow (Dec 2004-Dec 2006): Magdalene College, University of Cambridge, UK.
- Senior Research Associate (Nov'02-Sep'03), Department of Engineering, University of Cambridge, UK
- Leverhulme Special Research Fellow (Dec'00-Nov'02), Department of Engineering, University of Cambridge
- Research Associate (May'98-Nov'00), IRC in Superconductivity, University of Cambridge, UK.

Teaching & Supervision:

- MSc (Structural Integrity - Metallurgy and Materials module), Mechanical Engineering, Brunel University London, 2014 onwards
- MSc (Adv. Manufac. Methods : Metals, Electro-ceramics, Superconductors, Composites, Nanotechnology, (Nano-devices), School of Engineering, Brunel University London, 2007 - 2010
- Teaching (Theory): Ist and IInd year undergraduate Engineering Materials, Cambridge, 2002 - 2006
- IVth year B.Eng student project work
- Summer research project studentships- 2002 - 2003, 2003 -2004, 2004- 2005 (~100h per annum)

- International visiting Ph.D students and students at IRC in collaboration with other academic staff
- Teaching (Experiments): Materials lab, Part I At and IB undergraduate at Eng. Dept. (1999-2004) (~ 80 hours per year)
- Supervised junior post-docs, several Ph. D students and a technician at IRC in Superconductivity for the past 8 years as a senior researcher in the melt processing group headed by Professor D. A. Cardwell.
- Experimental techniques in winter school program conducted yearly (2001-2006) at IRC in Superconductivity.

Awards:

- Awarded “Innovation and Entrepreneurship” (2017) for the impact on industry based on my work.
- Charles Hatchett Award (2016) Institute of Materials, Minerals and Mining (IOM3).
- Innovation Award (Nov 2015) from Cast Metals Federation.
- PASREG award of Excellence (Sept 2007) by the International PASER Board.

Distinctions:

- Fellow of the Institute of Materials, Minerals and Mining
- Fellow of the Institute of Physics
- Fellow of the Institute of Cast Metals Engineers
- Fellow of the UK Higher Education Academy

Please follow the link of his research webpage @ <http://www.brunel.ac.uk/people/hari-babu>

Faculty from, IIT Guwahati

Biography of Prof. P.S. Robi, Indian Faculty



Prof. P.S. Robi is Professor in Mechanical Engineering Department at IIT Guwahati, His research working area is Aluminum alloy development, Composites, Hot deformation Mechanism Maps, High entropy alloys, Creep deformation of High temperature Materials. He

has completed his PhD in the year 1995 from Indian Institute of Technology, Bombay, India. He has around 25 years of teaching and research. Presently he is a Professor in the department of Mechanical Engineering at IIT Guwahati. He has served as the Head, Department of Mechanical Engineering and later as Dean R&D at IIT Guwahati. Prof. Robi has published more than 80 papers in peer reviewed International journals. He has guided many PhD Students, His lectures on Engineering drawing is a basic course for all undergraduate Engineering program at NPTL has inspiring young engineering students to foundation in Engineering.

Biography of Dr. Anil Kumar Birru, Course Coordinator



Dr. Anil Kumar Birru, Assistant Professor & Head, in Mechanical Engineering Department, at NIT Manipur, He is working in Hybrid Metal matrix composites materials, ceramics, sand casting, Die casting, Welding, nano composites preparation by High Energy Ball milling, Solgel method, Quality function deployment, Soft computing Technique and Knowledge management approach. He obtained Ph.D. degree from *Indian Institute of Technology, Roorkee, India*. Branch: Mechanical and Industrial Engineering with specialization in Manufacturing in the year 2013. Title of Ph.D. thesis: “Some studies on Fluidity and Hot Tearing of Aluminum Cast alloys” M.Tech obtained from Shri. G.S.I.T.S, Indore (M.P), India. Branch: Industrial and Production Engg. Dept., specialization in Industrial Engg., and Management. June 2008. B.Tech obtained from V.R. Siddharta Engg., Collage, from Vijayawada, A.P India. Branch: Production Engineering. June 2005. He has around 10 years of teaching and research experience He has serving as the Head, Department of Mechanical Engineering and prior he served as Associate Dean R&C at NIT Manipur. He has published more than 60 papers in peer reviewed International journals and conferences. He got Best Presentation Award from Abroad. He his supervised three PhD Scholars and three scholars are advanced stage of submission. He

has organized one International and one National conference, and shorten course and one day work shop etc.

More information:

Further information on the registration form and other details will be given in the NIT Manipur website @ <http://www.nitmanipur.ac.in/> for any queries please contacts the *course coordinator*

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