

Magnetic Nanomaterials

Overview

This interdisciplinary course will cover the subject of magnetic nanomaterials. Magnetic materials are a core component of many high value added, cutting edge devices and systems. The application space includes information storage, energy production and distribution, bioengineering and transducers. A materials approach will be adopted. The processing-structure-property-performance paradigm will be employed. Magnetic field, magnetic moment, types of magnetic materials and their properties will be discussed. Domains and effects of nanostructuring will be delineated. Soft and hard magnetic materials will be discussed. Relevant applications in, e.g., energy, bioengineering and transducer applications will be presented.

The primary objective of the course is the study of magnetic materials and their applications by employing a processing-structure-property-performance framework.

This course is organized in two modules which should be taken together. **Module A** covers mainly magnetic phenomena: introduction, magnetic poles, magnetic moment, magnetization curves and hysteresis loops, Magnetic field production with a demonstration on lab electromagnet, Types of magnetic order viz Diamagnetism, paramagnetism, ferromagnetism, antiferromagnetism, ferrimagnetism, Magnetic domains and Magnetic materials including introduction nanomagnets

Module B is mainly on applications: demonstration of chemical synthesis methods for magnetic nanoparticles and thin film deposition, Magnetic nanomaterials for biomedical and other applications, soft and hard magnetic nanomaterials, Instrumentation for magnetization measurements. Course participants will learn these topics through lectures, case studies, assignments and experiments and visit to laboratories with the state of art facilities.

Modules	A: Magnetic Phenomena : Dec 19 - Dec 24 B: Applications : Dec 25 – Dec 30 Number of participants for the course will be limited to fifty.
You Should Attend If...	<ul style="list-style-type: none">•You are an engineer or researcher from a manufacturing industry, government organization, R&D laboratory working in the area of magnetic nanomaterials.•A motivated, enthusiastic and self-driven student at BTech/MSc/MTech/PhD level interested in magnetic materials or Faculty from a reputed academic institution keen to know about magnetic materials for teaching and research
Fees	The participation fees for taking the course is as follows: Participants from abroad : US \$500 Industry/ Research Organizations: Rs 30000 Faculty from Academic Institutions: Rs 10000 PhD/MTech Students: Rs 5000 BTech/MSc Students: Rs 2000 The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges and 24 hr free internet facility. Outstation participants may be provided with single bedded accommodation on payment basis on request depending on the availability, on payment basis. Request for hostel accommodation may be submitted by sending a mail along with the registration form given below at GIAN_MagNano@mu.ac.in

The Faculty



Prof. Raju V. Ramanujan is on the faculty of the School of Materials Science and Engineering, Nanyang Technological University, Singapore. His research interests include magnetic nanomaterials for energy, biomedical and transducer applications, extreme materials and multifunctional materials.



Prof Radha Srinivasan is at the Department of Physics, University of Mumbai, Vidyanagari. Her research interests are magnetoresistive and magnetostrictive devices, magnetic materials for biomedical applications, magneto-optic effects and multiferroic materials.

Course Co-ordinator

Dr. Radha Srinivasan
Associate Professor, Department of Physics
University of Mumbai, Vidyanagari, Kalina
MUMBAI-400098

Phone: +91-22-26526250

E-mail: radhas@physics.mu.ac.in

[Under the aegis of MHRD- Global Initiative of Academic Network (GIAN)]

(December 19- 30, 2016)

Registration Form

Title (Mr./Ms./Mrs./Dr./Prof.):

Full Name:

Designation:

(For students, name of the course and the year are to be mentioned clearly)

Name of the Institution:

Address for Correspondence:

E-mail:

Phone:

Accommodation Required:

YES/NO

Reason for Participation:

(Within 150 words on a separate sheet)

Place:

(Signature of the Applicant)

Date:

Forwarded by HOD/Supervisor

Note: Duly filled-up signed and scanned registration form should be sent to the e-mail id: ***GIAN_MagNano@mu.ac.in*** before November 20, 2016 in addition to application procedure outlined at the GIAN website.