

Minutes of Board of Studies Meeting (Department of Biotechnology)

09 June 2017, Venue – Seminar Hall, TERI University

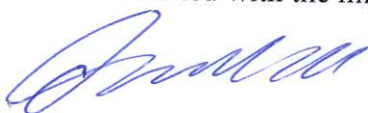
Time: 10.30 am - 12.50 pm

The following persons attended the meeting:

1. Dr. Chaithanya Madhurantakam (Chairperson)
2. Prof Sitaraman Ramakrishnan (Member)
3. Prof. Anandita Singh (Member)
4. Dr. Pallavi Somvanshi (Member Secretary)
5. Dr. Udit Soni (Member)
6. Dr. Gulshan Wadhwa, Joint Director, Department of Biotechnology, New Delhi (Co-opted Member)
7. Prof. B. D. Malhotra, Dept of Biotechnology, Delhi Technological University (External)
8. Dr Shashi Bhushan Tripathi (Member)

Minutes of the meeting:

- 1) Dr. Chaithanya Madhurantakam made introductory remarks. The members were appraised of the mandate of Board of Studies.
- 2) Dr. Udit Soni made a presentation indicating the proposed new course, as was circulated to committee members earlier. The title of the course was modified from “An introduction to Nanostructures” to “Nanomaterials: Introduction and Applications”. The committee unanimously approved the new course title.
- 3) The committee unanimously approved the course structure of “Nanomaterials: Introduction and Applications” as proposed with suggestions. Copy of the same is attached with the minutes.



(Dr. Anandita Singh)



(Dr. S. Ramakrishnan)

(Dr. Gulshan Wadhwa)



(Dr. Pallavi Somvanshi)

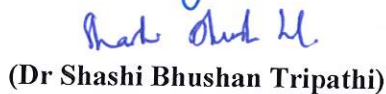


(Dr. Chaithanya Madhurantakam)

(Dr. B. D. Malhotra)



(Dr. Udit Soni)



(Dr Shashi Bhushan Tripathi)

Course title: Nanomaterials: Introduction and Applications				
Course code:		No. of credits: 2	L-T-P: 20-08-0	Learning hours: 28
Pre-requisite course code and title (if any):				
Faculty: Dr Udit Soni			Department: Department of Biotechnology	
Course coordinator: Dr Udit Soni			Course instructor: Dr Udit Soni	
Contact details: udit.soni@teriuniversity.ac.in				
Course type: Open			Course offered in: Semester 2	
Course description: Nanotechnology is an interdisciplinary field and attracts students from various disciplines. This course provides basic overview of nanomaterials and their applications. This course begins with a review of various types of nanomaterials and an introduction to general terminologies. Subsequently the course covers synthesis methodologies, physical and chemical characterization of nanomaterials. Finally, case studies illustrating application of nanomaterials in diverse fields will be discussed.				
Course objectives: 1. To understand the nature and properties of nanomaterials. 2. To provide scientific understanding of nanomaterials for utilization for various applications.				
Course contents				
S.No	Topic	L	T	P
1.	Introduction to nanomaterials; various types of nanomaterials, Three-dimensional, two-dimensional, one-dimensional and zero-dimensional nanomaterials. Carbon nanotubes, Graphene, Carbon dots, metal nanoparticles, metal oxide based nanomaterials, semiconductor nanomaterials, quantum dots, hybrid nanoparticles and core shell nanomaterials. Bio-nanomaterials Upconversion nanophosphors, polymer nanoparticles, lipid nanoparticles, Nanoscale metal-organic frameworks.	4	0	0
2.	Synthetic methodologies; Top down and bottom up approaches for nanomaterial synthesis. Synthesis of nanoparticles by physical, chemical and biological methods.	4	0	0
3.	Properties of nanomaterials; Crystal geometry and structure, chemical properties and surface functionalization, physical properties including photocatalytic, dielectric, magnetic, optical, mechanical, and structural.	4	0	0
4.	Characterization of nanomaterials; by various analytical methods, optical characterization and spectroscopy such as FT-IR, UV-Vis, structural characterization by X-Ray Diffraction, XPS and advanced microscopy (TEM, SEM, AFM)	4	4	0

5.	Applications of nanomaterials; health and disease, diagnosis , delivery vehicles, sensors and biosensors; Nanobiotechnological applications in agriculture, environment and food, environmental remediation, contamination detection, biomedical applications of nanomaterials. Multimodal nanoparticles, targeted drug delivery, theranostics, energy, defence.	4	4	0
Evaluation criteria: 1. 2 minor tests : 20% each 2. 1 major test (end semester) : 50% 3. Assignment: 10%				
Learning outcomes: 1. Familiarity with working principles, tools and techniques in the field of nanomaterials. 2. Understanding of the strengths, limitations and potential uses of nanomaterials..				
Materials: Suggested readings: 1. A. L. Rogach, <i>Semiconductor nanocrystal quantum dots synthesis, assembly, spectroscopy and applications</i> (Springer, Wien; London, 2008). 2. E. Gazit, <i>Plenty of room for biology at the bottom: an introduction to bionanotechnology</i> (Imperial College Press ; Distributed by World Scientific Pub. in the USA, London : Hackensack, NJ, 2007). 3. G. E. J. Poinern, <i>A laboratory course in nanoscience and nanotechnology</i> (CRC Press, Taylor & Francis Group, Boca Raton, 2015). 4. C. A. Mirkin, C. M. Niemeyer, Eds., <i>More concepts and applications</i> (Wiley-VCH, Weinheim, 2007), <i>Nanobiotechnology</i> . 5. A. K. Mishra, Ed., <i>Application of nanotechnology in water research</i> (Wiley, Scrivener Publishing, Hoboken, New Jersey, 2014). 6. K. R. Nill, <i>Glossary of biotechnology and nanobiotechnology terms</i> (Taylor & Francis, Boca Raton, 4th ed., 2006). 7. J. Kim, Ed., <i>Advances in nanotechnology and the environment</i> (Pan Stanford, Singapore, 2012). 8. P. N. Prasad. <i>Nanophotonics</i> (Wiley, New York, 2003). Websites Journals Other readings				
Additional information (if any):				
Student responsibilities: 1. Study of course materials as specified by the instructor 2. Timely submission of given class assignment				

Course reviewed by:

1. Dr.Amit K Dinda, MD, Ph.D
Professor
Department of Pathology
All India Institute of Medical Sciences, New Delhi
President, Indian Society of Renal & Transplant Pathology (ISRTP)
Secretary, Indian Society of Nanomedicine (ISNM)
Fellow, Electron Microscopy Society of India (EMSI)
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2. Dr R. P. Singh, Ph.D
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3. Dr Indrajit Roy, Ph.D
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4. Dr Naveen Kumar Navani, Ph.D
Associate Professor
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Indian Institute of Technology Roorkee
navnifbs@iitr.ac.in



Vidhya Sharma <vidhya.sharma@teriuniversity.ac.in>

Minutes of the meeting - Board of Studies (9th June 2017)

Bansi Malhotra <bansi.malhotra@gmail.com>

To: Vidhya Sharma <vidhya.sharma@teriuniversity.ac.in>

Wed, Jul 12, 2017 at 11:44 AM

Dear Dr Sharma,

Thanks for your e-mail. The soft copy of signed minutes of the Board of Studies Meeting held on 9th June 2017 are in the attachment.

With best regards,

Bansi

[Quoted text hidden]

Dr Bansi D Malhotra, FNA, FNASc, APAM (Asia Pacific Academy of Materials) Academician
Member, Advisory Board, NPG Asia (Materials)
Member, Advisory Board, Biotechnology Journal
(Ex-Chief Scientist & Head, Biomedical Instrumentation Section, National Physical Laboratory, New Delhi, India);
Professor, Department of Biotechnology, Delhi Technological University (Govt. of NCT of Delhi, Shahbad Daulatpur
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E-mail: bansi.malhotra@gmail.com or bansi.malhotra@dce.ac.in
Phones: 9111 27871043 or 91 11 27871022 Extension: 1614; Fax: 91 11 27871023; 919968375812 (Mobile);
ISI Web of science link:
[http://apps.webofknowledge.com/CitationReport.do?product=UA&search_mode=CitationReport
&SID=W2puvr93tFE4GvGB8vP&page=1&cr_pqid=1&viewType=summary](http://apps.webofknowledge.com/CitationReport.do?product=UA&search_mode=CitationReport&SID=W2puvr93tFE4GvGB8vP&page=1&cr_pqid=1&viewType=summary)
Researcher ID : E-8921-2012, Profile URL : <http://www.researcherid.com/rid/E-8921-2012>, [https://orcid.
org/0000-0002-0957-2684](https://orcid.org/0000-0002-0957-2684)
Scopus ORCID ID: 0000-0002-0957-2684
Scopus: [https://www.scopus.com/cto2/main.uri?ctold=CTODS_688034158&authors=7006614599&
origin=AuthorNamesList](https://www.scopus.com/cto2/main.uri?ctold=CTODS_688034158&authors=7006614599&origin=AuthorNamesList)
Google Scholar: <https://scholar.google.co.in/citations?user=qUX3ux8AAAAJ&hl=en>

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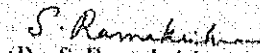
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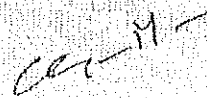
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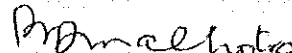

(Dr. Anandita Singh)


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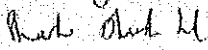
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