



**RAMAIAH**  
Institute of Technology



**Online Short-Term Course on  
“*Nanomaterials: Synthesis, Characterization and Applications*”**

**1 - 16 December 2020  
(Timings: 6-8 PM)**

***Jointly organized by***

**Department of Biotechnology & Department of Chemistry  
Ramaiah Institute of Technology  
Bengaluru-560054, Karnataka, INDIA**

***Organising Chair***

**Dr. N.V.R. Naidu  
Principal, RIT**

***Organising Co-Chair***

**Dr. Bindu S  
Professor and Head  
Department of Biotechnology, RIT**

**Dr. B M Nagabhushana  
Professor and Head  
Department of Chemistry, RIT**

***Course Coordinators***

**Mr. Krishna Murthy T P  
&  
Mr. Samrat K  
Assistant Professors  
Department of Biotechnology, RIT**

**Dr. R Hari Krishna  
Assistant Professor  
Department of Chemistry, RIT**



## **About M.S Ramaiah Institute of Technology**

Ramaiah Institute of Technology is a self financing institution established in the year 1962 by the industrialist and philanthropist, late Dr. M.S. Ramaiah. The mission statement of GEF is to deliver education and health for the betterment of mankind. The Institute runs thirteen undergraduate programs and ten postgraduate programs. Twelve of the departments are recognized as research centers by Visvesvaraya Technological University. All the departments are accredited by the National Board of Accreditation, New Delhi.

The Institute has been granted academic autonomy for both UG and PG programs by Visvesvaraya Technological University from the academic year 2007-08. The Institute participated in the Technical Education Quality Improvement Program (TEQIP), an initiative of the Government of India. Some noteworthy features of RIT are: State of the art laboratories, sufficient number of computer facilities for staff and students, campus wide networking connecting all (~2000) systems to the net. Recently the institute is ranked 59 in the all India technical institutes ranking by NIRF.

## **About the Department of Biotechnology**

The Department of Biotechnology established in 2002 offers a four year B.E. Biotechnology Program with an intake of 60 students and a two years PG Program, M.Tech in Biotechnology with an intake of 18 students. The department also offers a one year PG Diploma in Biopharmaceutical Technology under the Biotechnology Skill Enhancement programme (BiSEP) funded by KBITS , Govt. of Karnataka. The Department has excellent infrastructure and state of the art laboratories. All the classrooms in the Department are spacious, well-furnished and equipped with LCD projectors.

The department has been recognized Research Centre by VTU, Belgaum, offering M.Sc (Engg.) by research and PhD programs. The department has 14 faculty members, of them 11 are PhD holders and the rest are M.Tech. The faculty members have competence in Core areas of Biotechnology viz., Food and Agricultural Biotechnology, Health and Medical Biotechnology & Environmental Biotechnology and Bioprocess Engineering. The department research is focused towards these core areas and funded by national and state funding agencies like DST, AICTE, VGST, VTU and RGUHS.

## **About the Department of Chemistry**

The chemistry department is one of the oldest departments (established in 1962) of MSRIT. The department has well qualified and experienced faculty, with all necessary infrastructure. The department aims at preparing the students for careers in all engineering aspects and also carries out basic and applied research work. It has 09 teaching faculty who are involved in diverse fields of research areas. The department recognized VTU R & D center and, all the faculty members are recognized research supervisors under VTU. Thirteen students have been awarded Ph.D. degree and sixteen students are currently pursuing their doctoral degree. The department has received grants from VGST, Boeing R&T, India, and two projects funded by Gokula Education Foundation. Active research in the department are in the fields of material science, luminescence spectroscopy, water treatment, bioinorganic chemistry, biomaterials and, solid polymer electrolytes for Li-ion batteries.

## Objectives and Highlights of the Short term Course

- ✓ The objectives of the course is to provide an overview, understanding and progress made in development, synthesis, characterization and applications of nanomaterials for future Nanoscale devices and systems.
- ✓ To provide basic insights into various chemical methods of nanomaterial synthesis with practical sessions in virtual mode.
- ✓ This short term course also help participant to learn the detailed analysis of structural and microstructural characterization data to understand the physicochemical properties of nanomaterials.
- ✓ Lectures on advanced application of nanomaterials in diverse fields of science and engineering will be delivered by scientists and experienced researchers in the field of nanotechnology.
- ✓ This workshop also aims at invoking interest in the thrust areas of Nanoscience and Nanotechnology and to motivate students and researchers to develop solutions for various industrial and daily life problems.

## Registration

- UG, PG Students, Research scholars and Faculties working in the field of nanotechnology and allied sciences are eligible to attend this short term course.
- Number of participants are limited to 50 and selection is based on first cum first serve basis.
- Last date of registration is 28.11.2020.
- Registration fee is Rs. 1000/-. Participants can pay registration fee through any online platform. The account details to which the payment has to be made are as follows:

Account Name: HOD, Bio-technology, MSRIT, Bangalore

Bank: Bank of Baroda

Account number: 89250100013978

IFSC code: BARBOVJMSRI (5<sup>th</sup> letter is Zero)

Branch and Code: MSRIT and 8925

- It is compulsory to upload the transaction statement in the registration form.
- There would be two online MCQ based exam requiring compulsory participation by all registrants.
- Minimum 40% marks should be obtained in MCQ test and minimum 85% attendance is compulsory to receive certificate.
- Workshop will be organized through Google meet/Zoom Platform.

## For more information Contact

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**Please click here  
for Registration  
form**

**Mr. Samrat K**  
**+91-90190 25377**  
[samrat@msrit.edu](mailto:samrat@msrit.edu)

# Lecture Schedule

Date	Topic	Speaker
01.12.2020	Inauguration and Orientation	Convenors and Course Coordinators <b>Dr. Venkata Krishnan</b>
01.12.2020	Introduction to Nanotechnology: Current trends and Potential Applications	Associate Professor (Chemistry) School of Basic Sciences Indian Institute of Technology Mandi Himachal Pradesh <b>Dr. R Hari Krishna</b>
02.12.2020	General overview on methods of Nanomaterials synthesis	Assistant Professor Department of Chemistry Ramaiah Institute of Technology Bengaluru <b>Dr. R Hari Krishna</b>
03.12.2020	Practical sessions on methods of nanomaterial synthesis (Virtual Lab)	Assistant Professor Department of Chemistry Ramaiah Institute of Technology, Bengaluru <b>Mr. Samrat K</b>
04.12.2020	Characterization of Nanomaterials (Theory)	Assistant Professor Department of Biotechnology Ramaiah Institute of Technology, Bengaluru <b>Dr. Varadaraja Perumal</b>
05.12.2020	Analysis of characterization data (Hands on using computational tools)	Technology Manager, MNCF, CeNSE, Indian Institute of Science, Bengaluru <b>Dr. R Hari Krishna</b>
06.12.2020	Computational tools for Nanotechnology Research (Hands on training on Overleaf, Mendeley, Design Expert etc.)	Assistant Professor Department of Chemistry Ramaiah Institute of Technology, Bengaluru <b>Mr. Krishna Murthy T P</b>
07.12.2020	Biomedical Applications of Nanomaterials	Assistant Professor Department of Biotechnology Ramaiah Institute of Technology, Bengaluru <b>Dr. Asifkhan Shanavas</b>
		Scientist-C Institute of Nano Science and Technology Mohali, Punjab

08.12.2020	Environmental Applications of Nanomaterials Hands on session on adsorption and photocatalysis (Virtual lab)	<b>Mr. Krishna Murthy T P</b> Assistant Professor Department of Biotechnology Ramaiah Institute of Technology, Bengaluru
09.12.2020	Applications of Nanomaterials as medicine Antimicrobial activity of nanomaterials (virtual lab)	<b>Mr. Samrat K</b> Assistant Professor Department of Biotechnology Ramaiah Institute of Technology, Bengaluru
10.12.2020	Application of Nanotechnology in Food Science and Engineering	<b>Dr. Richa Sharma</b> Newton-Bhabha International Postdoctoral Fellow University of Edinburgh, Scotland & Assistant Professor Sharda University, Noida
11.12.2020	Emerging Concepts in Nanotoxicology	<b>Dr. Dr. Prabhakar Mishra</b> Assistant Professor Department of Biotechnology, School of Applied Sciences, REVA University, Bengaluru
12.12.2020	Nanomaterials for Bioenergy and Biofuel Production	<b>Dr. Dipesh Kumar</b> Research Associate Center for Energy Indian Institute of Technology Guwahati
13.12.2020	How agriculture and Nanotechnology go hand in hand?	<b>Dr. Arvind Bharani R S</b> Research Head - Mahadhi Technologies (Bio Division) & CSO - Ampersand Academy, Chennai
14.12.2020	Nanomaterials for Energy Storage Devices and allied industries	<b>Dr. M Sasikumar</b> Department of Physics, Bishop Heber College, Trichy
15.12.2020	Nanotechnology in traditional and translational medicine	<b>Dr. B P Hari Chandra</b> Associate Professor, Department of Mechanical Engineering Ramaiah Institute of Technology, Bengaluru
16.12.2020	Valedictory, feedback and Assessment	Convenors and Course coordinators

## Brief CV of Speakers



**Dr. Venkata Krishnan** is presently an Associate professor in the Department of Chemistry, Indian Institute of Technology Mandi, Himachal Pradesh. He has obtained his Ph. D. from University of Stuttgart, Germany in 2006, M.Sc. (Materials Science) from P.S.G. College of Technology, Coimbatore. His area of research interest includes bionanotechnology, energy science and surface science. He is recipient of various awards and honours such as DST INSPIRE faculty award – 2011, DOE (Department of Energy) postdoctoral fellowship, DAAD fellowship in the framework of VIGONI program. He has published > 100 research articles in high impact indexed journals. He is also member of several professional societies such as Member of American Association for Advancement of Science (AAAS), Member of American Chemical Society (ACS), Member of American Nano Society (ANS) – 2011 to present, Member of Indian Scientists Association in Japan (ISAJ) – 2010 to present.

**Mr. S. Varadharajaperumal** is a highly skilled materials scientist and engineer in nanoelectronics and nanotechnology from the Indian Institute of Science, Bengaluru, Karnataka, India. He is a doctoral researcher in Physics from NIT, Surathkal, Karnataka, India & Master of Technology in Nanoelectronics from SASTRA University, Tamilnadu. Before that he has obtained Master of Science degree in Physics from AVVM Sri Pushpam College, Bharthidasan University, Tamilnadu. He possesses 10 years of research experience in several advanced materials fabrication and characterization techniques. Provided technical support to users from industries, IISc, R&Ds, National labs, and other academic institutions. Additionally, he has experience in semiconductor device fabrication with more than 16 international journal publications. Also, lead a 17-members technical team in accomplishing technical activities (technical documents, characterization, projects, etc.) of MNCF, CeNSE, IISc.



**Dr. Hari Krishna Rajan** is working as Assistant professor in the department of chemistry, Ramaiah Institute of Technology. He has obtained Ph. D. from Visvesvaraya Technological University, Belgaum and Master's degree in Inorganic chemistry from Bangalore University. He has 9 years of teaching experience and 10 years of research experience. His areas of research include luminescence studies of solids, Solid polymer electrolytes for Li-ion batteries and, Ceramic biomaterials for bone implants. He has published > 85 research articles in indexed journals and presented > 30 papers in international workshops and symposiums. He is member of various professional societies such as American Chemical Society, Materials Research Society of India and, Luminescence society of India: Karnataka Chapter.

**Dr. Asifkhan Shanavas** presently working as Scientist-C at Institute of Nano Science and Technology, Mohali, Punjab. He obtained his BSc and MSc in Biochemistry from PSG College of Arts and Sciences, Coimbatore. He obtained his MTech in Nanomedical sciences from Amrita Centre for Nanosciences, Kochi and PhD in Biomedical engineering from Indian Institute of Technology Bombay. He has received various awards such as DBT Indo-Australian Career Boosting Gold Fellowship (2016- 2017), MHRD Institute Teaching Assistantship, IIT Bombay (2010- 2014), DST Travel Grant (2013), Bioencapsulation Research Group Travel Grant (2011), DST fellowship, MTech Nanomedical Sciences, ACNS (2008-2010) and JNCASR summer research fellowship (2006). His major research interest includes targeted combinatorial nanomedicines, organo-inorganic biomaterials for theranostics, plasmonic nanomaterials for photothermal therapy.



**Dr Arvind Bharani. R S**, Research Head - Mahadhi Technologies (Bio Division) & Chief Scientific Officer - Ampersand Academy - Chennai. He is an experienced bioengineer with intense research and statistical background focussing on data-driven solutions in research-based systems for the past seven years. He has worked extensively on industrial and consumer analytics, as well as application development projects in various domains of Biotechnology. He has completed PhD in the field of Bioengineering from Sathyabama Institute of Science and Technology, Chennai and published around 43 research articles in peer-reviewed journals. Areas of interests and expertise are in the fields of Microbial Technology, Nanotechnology, Environmental biotechnology, and Agricultural Biotechnology. His current areas of research interest focus on nanocomposites and Bio-repellents.



**Dr. Richa Sharma** received her BTech in Biotechnology from the West Bengal University of Technology and MTech in Industrial Biotechnology from NITK. She completed her PhD in Biological Sciences from CSIR-Central Food Technological Research Institute under AcSIR in 2018. She has been working on the development of field-applicable, convenient biosensing strategies for real food samples and her current interests are food and biomedical biosensing, and bionanotechnology. She was working as assistant professor at department of biotechnology, NITW and Sharda University. She is presently working as Newton-Bhabha International Fellow in the University of Edinburgh, Scotland. She has published 13 research publications including 3 book chapters and 2 reviews in reputed international journals.





**Dr. M. Sasikumar** is working as Assistant professor in the department of Physics, Bishop Heber College (Autonomous), Tiruchirappalli, Tamilnadu. He has obtained Ph. D. from Bharathidasan University, Trichy and Master's degree in Physics from Bharathidasan University. He has 12 years of teaching experience and 10 years of research experience. His areas of research include Solid polymer electrolytes for Li-ion batteries and, super capacitor applications. He has published several research articles in indexed journals and conferences. He has completed funded projects from UGC and Tamilnadu state government.

**Dr. Dipesh Kumar** currently serves as a Research Associate in the Center for Energy Engineering at Indian institute of technology Guwahati. He obtained his Ph.D. from the Central University of Jharkhand (Ranchi) and has expertise in the area of biofuels, bioenergy and biomass valorisation. His research contributions were recognised by the Department of Science and Technology, Govt. of India and he was shortlisted to represent India in the 3<sup>rd</sup> BRICS Young Scientists Conclave, which was held in Durban, South Africa in 2018. In his relatively young research carrier he has 10 research articles to his credit among the leading international journals of the field. Besides, he has co-authored a book on Biodiesel (Elsevier) and has also published 10 book chapters as principal contributor.



**Dr. Prabhakar Mishra** is currently working as Assistant Professor, Dept. of Biotechnology, School of Applied Sciences, REVA University. He pursued his doctoral study at VIT, Vellore with a specialization in nanobiotechnology. He was awarded the Senior Research Fellowship from the Indian Council of Medical Research. With his research expertise in nanobiotechnology and nanotoxicology, he has several publications and book chapters in peer-reviewed journals of Elsevier, Springer, Wiley, and Cambridge Press. He was awarded as “Scientist of a great promise” by CRME-ICMR. His research work has been recognized in national and international science-medias like Science Wire from DST, India, and Science Trends. Com from Duke University, USA.



**Dr. B P Harichandra** is an Associate Professor at the Department of Mechanical Engineering, MSRIT. He has wide range of research interest and centered his research on traditional Indian sciences and technologies. His researches are in the area of Agriculture, HIV/AIDS, linguistics, Vaccines, Ramayana, Mahabharata, Vedic sciences, Yoga. Had been apart of 'Azadi Bachavo Andolan' and motivated by Sri. Rajiv Dixit. Authored a couple of books of social interest and research papers pertaining to these research topics. Some of his books include, "kevala sasyaharigalige mattu kevala maamsaharigalige", "Bharata Mateya Kare", "Computer Astothara Shatanamavali", "Ganapati Pooje Maadi AIDSninda dooraviri" (a scientific treatise), "Vishada Soojigalu", "Vedic Mathematics".



**Mr. Krishna Murthy T P** received BE degree in Biotechnology from Visvesvaraya Technological University, Belgaum in 2009 and MTech degree in Chemical Engineering from Manipal University, Manipal in 2012. He has around 9 years of teaching experience and currently is working as assistant professor in department of biotechnology, Ramaiah Institute of Technology, Bengaluru. His research interests include material science, bioinformatics and modelling & simulation of mass transfer operations involved in food, environment and bioprocess engineering. He has published around 30 research papers international journals.



**Mr. Samrat K** is working as an Assistant Professor in Department of Biotechnology, Ramaiah Institute of Technology, Bangalore. He is a doctoral researcher in Biotechnology from VTU, Belgaum. He has 8 years of teaching experience and 5 years of research experience in field nanomaterial synthesis, evaluation of pharmacological activities of nanomaterials. He has published around 14 research articles in peer-reviewed journals and 3 book chapters. His area of research includes nanomaterials related to wound healing applications and antimicrobial nanotechnology.





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